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Transportation Impact Study

PROPOSED MIXED-USE DEVELOPMENT

109 Garden Drive
OAKVILLE, ONTARIO

June 2024
Project No: NT-24-100

520 Industrial Parkway South, Suite 201
Aurora ON L4G 6W8

Phone: 905-503-2563
www.nextrans.ca

nexTrans CONSULTING ENGINEERS
NextEng Consulting Group Inc.

June 27, 2024

Attention: Noah Shechtman

Brightstone
10 Wanless Avenue, Suite 201
Toronto, ON M4N 1V6

Re: Transportation Impact Study
Proposed Residential Mixed-Use Development
109 Garden Drive, Town of Oakville
Our Project No. NT-24-100

NexTrans Consulting Engineers (a Division of NextEng Consulting Group Inc.) is pleased to present the enclosed Transportation Impact Study for the above noted site in support of proposed Official Plan Amendment, Zoning By-law Amendment and Site Plan applications for a proposed residential mixed-use development.

The subject site is located at 109 Garden Drive, east of Garden Drive, between Lakeshore Road W and Rebecca Street, in the Town of Oakville. Currently, the existing site is vacant. The proposed residential mixed-use development consists of 4 blocks, with a total of 42 back-to-back townhouse units and 6 multiple attached units above the proposed 194.39 m^2 of ground related retail gross floor area. The proposed development provides a total of 59 vehicle parking spaces (48 resident spaces and 11 visitor/retail/barrier-free spaces), as well as a total of 68 bicycle parking spaces, including 48 long-term and 20 short-term spaces. The proposed development full moves accesses are provided via 109 Garden Drive, similar to other existing developments in the area.

The transportation impact study is prepared in accordance with the Town of Oakville and the Region of Halton Transportation Impact Study guidelines, and consistent with background transportation studies conducted in the area. The Study concludes that the proposed development can adequately be accommodated by the existing and future transportation network, future transit services for the area, as well as the recommended measures identified in this report.

We trust the enclosed sufficiently addresses your needs. Should you have any questions, please do not hesitate to contact the undersigned.

Yours truly,

Nextrans Consulting Engineers
A Division of NextEng Consulting Group Inc.

Prepared by:

Sam Nguyen, Dipl.
Transportation Analyst

LICENSED PROFESSIONAL ENGINEER
P. P. ILIAS
100147328
27/06/2024
PROVINCE OF ONTARIO

Reviewed by:

Peter Ilias, P.Eng.
Senior Engineer

Reviewed and approved by:

Richard Pernicky, MITE
Principal

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Final Report	June 27, 2024	For Final Submission

EXECUTIVE SUMMARY

NexTrans Consulting Engineers (A Division of NextEng Consulting Group Inc.) was retained by Brightstone (the 'Client') to undertake a Transportation Impact Study in support of proposed Official Plan Amendment, Zoning By-law Amendment and Site Plan applications for a proposed residential mixed-use development. The subject site is located at 109 Garden Drive, east of Garden Drive, between Lakeshore Road W and Rebecca Street, in the Town of Oakville.

The transportation impact study is prepared in accordance with the Town of Oakville and the Region of Halton Transportation Impact Study guidelines, and consistent with background transportation studies conducted in the area.

It should be noted that NexTrans has sent a study terms of reference to the Town of Oakville on May 30, 2024. However, NexTrans has not received any comments or feedback in time for the preparation of this Traffic Impact Study. Therefore, the Town comments, if any, will be fully addressed as part of the future submission for the proposed development.

It should also be noted that, a Transportation Impact Study was prepared by HDR dated September 20. 2021 on behalf of Smart Centres Inc. & Revera entitled "Garden Drive Retirement Residence" in support of different types of land uses.

Proposed Development

The subject site is located at 109 Garden Drive, northwest corner of Garden Drive and Lakeshore Road West in the Town of Oakville. Currently, the existing site is vacant. The area is surrounded by existing low-rise and mid-rise residential developments. The proposed residential mixed-use development consists of 4 blocks, with a total of 42 back-to-back townhouse units and 6 multiple attached units above the proposed 194.39 m^2 of ground related retail gross floor area.

Proposed Development Access

A full moves access will be provided for each proposed townhouse block, with a total of 4 full moves access onto Garden Drive. This is consistent with the existing conditions on the west side of Garden Drive.

The assessment and intersection capacity analysis indicates that the proposed accesses are expected to operate at acceptable levels of service with minimum delay or queue. The corner clearance and throat length corner are also appropriate and meet the Transportation Association of Canada Guidelines (TAC). The recommended lane configurations include for each proposed full moves access:

- One inbound lane (minimum 3.0 m width);
- One outbound lane (minimum 3.0 min width); and
- One shared southbound through/left lane and one northbound shared through/right on Garden Drive

Capacity Analysis

The proposed development is expected to generate 48 total two-way vehicle trips (15 inbound and 33 outbound) and 67 total two-way vehicle trips (39 inbound and 28 outbound) during the morning and afternoon peak hours, respectively.

Auto Mode Assessment

Based on the intersection capacity analysis, under the existing, future background and future total traffic conditions, all intersections considered in the analysis are expected to operate at acceptable levels of service, from overall intersection operational perspective, during both the morning and afternoon peak hours. The estimated queues can be accommodated within the available storage length. No critical movements have been identified and therefore no improvements are required to accommodate the proposed development.

The proposed site accesses are expected to operate at acceptable levels of service with maximum of one vehicle every 8 minutes during the peak hours. No long delays or queues are expected under the future total conditions.

It should also be noted that, a Transportation Impact Study was prepared by HDR dated September 20. 2021 on behalf of Smart Centres Inc. & Revera entitled "Garden Drive Retirement Residence" for the same site as part of the previous application. In this Study, HDR has analyzed several more intersections east and west of the proposed development intersections. The analysis indicates that these intersections are expected to operate at acceptable levels of service with no physical improvements at the intersections considered in the analysis.

Given that the proposed development is very small and is expected to have negligible impact on the surrounding intersections, the inclusion of the two immediately adjacent intersections to the proposed development is appropriate as the proposed development can improve these intersections if required. It should be noted that the proposed development has no control over the improvements at the other intersections are these intersections are located further from the proposed development and are mostly impacted by the background traffic growth and background development traffic.

Walking Mode Assessment

Under the existing conditions, sidewalks are available on both sides of Rebecca Street and Lakeshore Road W. However, sidewalk is only available on the west side of Garden Drive from Rebecca Street to the southerly limit of the Wyndham Place Condominium. Between the condo access and Lakeshore Road W, there is an existing curb-face paved asphalt area acting a continuous sidewalk to Lakeshore Road W. A proper sidewalk can be provided once these existing properties are redeveloped in the future.

As part of the proposed development, sidewalk will be provided on the east side of Garden Drive along the entire frontage of the site. Sidewalk will be designed and provided as per the Town of Oakville standards.

In addition, sidewalks will be provided on both sides of each block that connect each unit to the sidewalk on Garden Drive. This provision is sufficient to provide mobility for each unit.

Cycling Mode Assessment

Currently, there are dedicated cycling lanes along Lakeshore Road W between Dorval Drive and Kerr Street, and Rebecca Street between Southview Road and Navy Street. There is also a multi-use trail along Dorval Drive from Lakeshore Road W to Upper Middle Road W.

NexTrans has reviewed the Town's 2017 Active Transportation Master Plan (ATMP). Based on this review, it is indicated that the Town of Oakville is actively planning and building additional cycling infrastructure in the area such as cycling facilities on Keer Street and Stewart Street. With the completion of these network, the residents from the proposed development can use these facilities as an alternate mode of transportation instead of driving private vehicles to work or to school.

As part of the proposed development, a total of 48 long-term and 20 short-term bicycle parking spaces will be provided, for a total of 68 bicycle parking spaces. This provision will encourage residents to use active transportation modes to work, school and discretionary trips instead of single-occupant-vehicle trips.

Transit Mode Assessment

As the existing transit modal split based on 2016 TTS data is about 10% during both morning and afternoon peak hours, if 10% modal split is applied, the proposed development is expected to generate 5 total two-way transit trips (2 inbound and 3 outbound) and 7 total two-way transit trips (4 inbound and 3 outbound) during the morning and afternoon peak hours, respectively.

As the estimated transit ridership for the proposed development is very low, the two existing transit routes (Oakville Transit Bus Routes 14 & 14A Lakeshore West and 15 Bridge) can accommodate these trips. It is anticipated that no additional transit improvements in the area are required to accommodate the proposed development.

Vehicle Parking Assessment

Based on the applicable Zoning By-law, the proposed development would be required to provide a total of 105 vehicle parking spaces, inclusive of residential, visitor and retail uses. These vehicle parking rates are excessive and do not support the sustainability vision of the Town of Oakville Official Plan. In order to encourage residents to take more sustainable modes of transportation, parking rates should and must be reduced as parking management is the best Transportation Demand Management measure.

However, based on the recommended vehicle parking rates provided in this Study based on the development context and justifications, the proposed development will provide a total of 59 vehicle parking spaces, with 48 for residential and 11 for visitor/retail/barrier-free. This reduction is required to discourage private car ownership in order to reduce single-occupant-vehicle trips to and from the proposed development. It should be noted that the proposed development will provide 1 barrier-free vehicle parking space in Block D.

Bicycle Parking Assessment

Based on the assessment provided in this Study, the proposed development is required to provide a total of 48 bicycle parking spaces for residential and 12 for visitor, for a total of 60 bicycle parking spaces. However, the proposed development will provide a total of 68 bicycle parking spaces, including 48 long-term and 20 short-term spaces. The long bicycle parking spaces will be provided within the residential units and short-term/visitor bicycle parking spaces will be provided at a convenient location on-site, as illustrated in the proposed site plan.

Transportation Demand Management Measures and Incentives

The Report identifies and recommends appropriate Transportation Demand Management measures and incentives to support active transportation and transit, to meet the objectives and requirements of the Town and the Region. These potential measures are included in Section 11 of this Study.

Study Conclusions and Recommendations

Based on the findings of this Study, the following recommendations are provided:

- The Town and the Region approve the proposed residential mixed-use development;
- The proposed development only provides the recommended vehicle parking rates outlined in this Study, with 48 vehicle parking spaces for residential and 11 for visitors/retails/barrier-free;
- The proposed development provides direct shared pedestrian/bicycle connections from the proposed development to Garden Drive and Lakeshore Road W, where appropriate;
- Provide a total of 68 bicycle parking spaces on-site, including 48 long-term and 20 short-term spaces; and
- The proposed development implements the TDM measures and incentives identified in this report to support active transportation and transit and to reduce the numbers of single-occupant-vehicle trips to and from the proposed development

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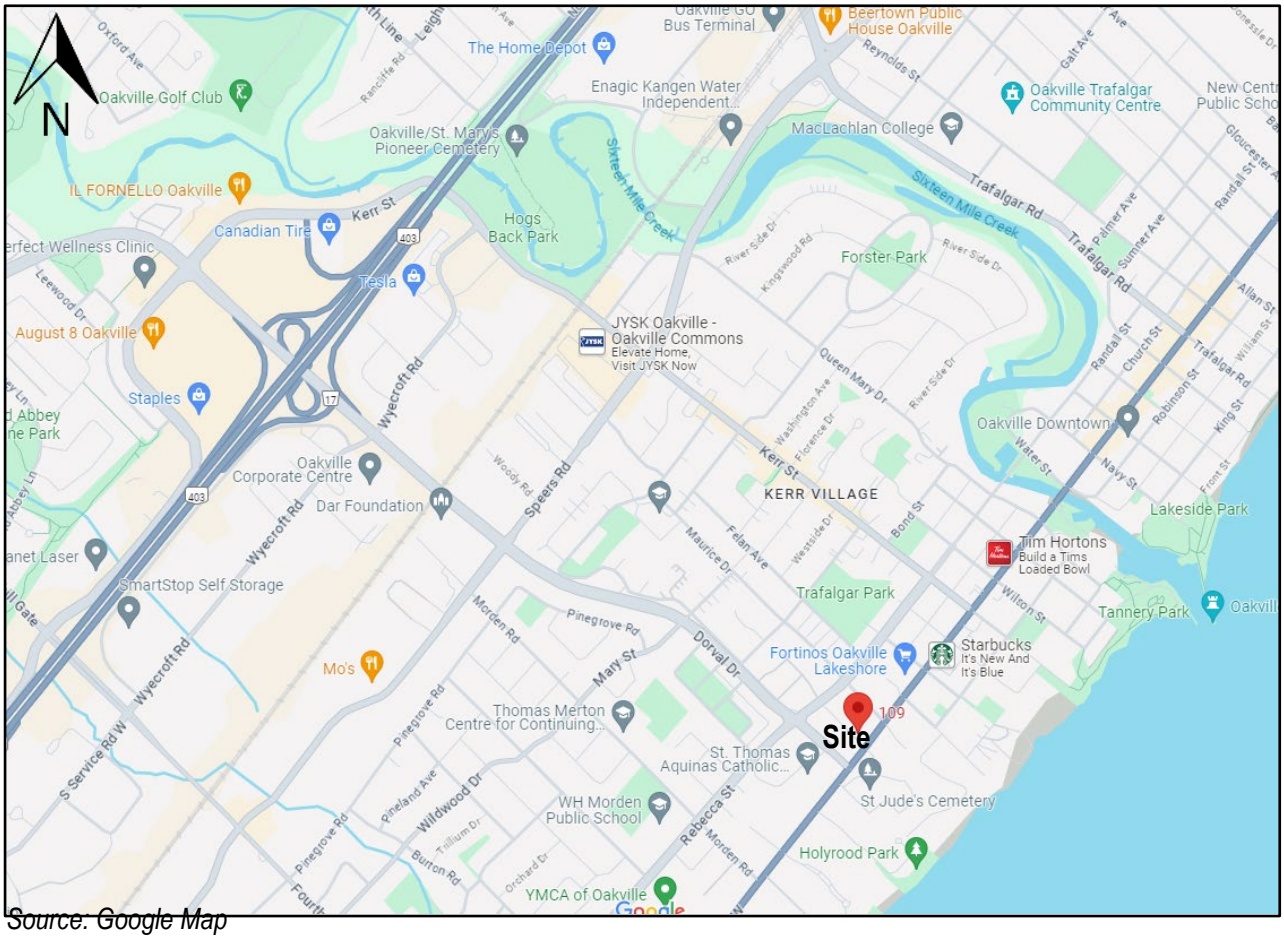
1.0 INTRODUCTION

NexTrans Consulting Engineers (A Division of NextEng Consulting Group Inc.) was retained by Brightstone (the 'Client') to undertake a Transportation Impact Study in support of proposed Official Plan Amendment, Zoning By-law Amendment and Site Plan applications for a proposed residential mixed-use development. The subject site is located at 109 Garden Drive, east of Garden Drive, between Lakeshore Road W and Rebecca Street, in the Town of Oakville. The location of the proposed development is illustrated in **Figure 1**.

The transportation impact study is prepared in accordance with the Town of Oakville and the Region of Halton Transportation Impact Study guidelines, and consistent with background transportation studies conducted in the area. It should be noted that NexTrans has sent a study terms of reference to the Town of Oakville on May 30, 2024. However, NexTrans has not received any comments or feedback in time for the preparation of this Traffic Impact Study. Therefore, the Town comments, if any, will be fully addressed as part of the future submission for the proposed development. It should also be noted that, a Transportation Impact Study was prepared by HDR dated September 20. 2021 on behalf of Smart Centres Inc. & Revera entitled "Garden Drive Retirement Residence" in support of different types of land uses.

Figure 1 – Proposed Development Location

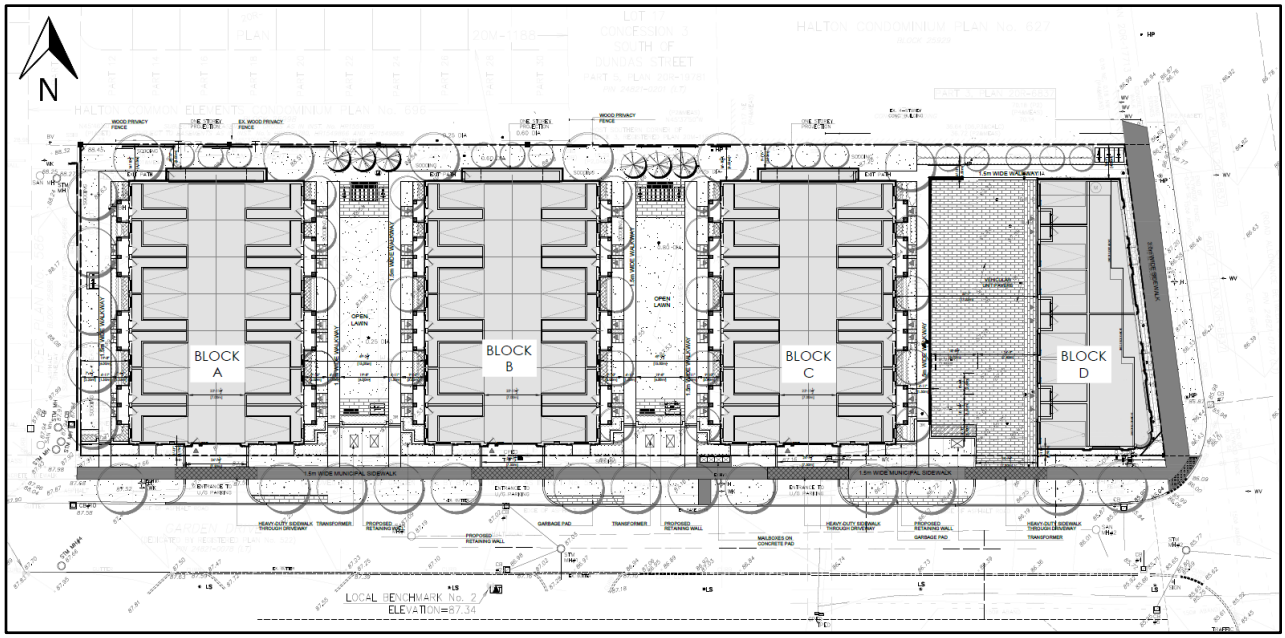


Source: Google Map

The proposed residential mixed-use development consists of 4 blocks, with a total of 42 back-to-back townhouse units and 6 multiple attached units above the proposed 194.39 m^2 of ground related retail gross floor area. The proposed development provides a total of 59 vehicle parking spaces (48 resident spaces and 11 visitor/retail/barrier-free spaces), as well as 68 bicycle parking spaces, including 48 long-term and 20 visitor spaces.

The proposed development full moves accesses are provided via 109 Garden Drive, similar to other existing developments in the area. **Figure 2** illustrates the proposed development site plan.

Figure 2 – Proposed Site Plan



2.0 EXISTING CONDITION ASSESSMENT

2.1. Existing Road Network

As indicated, the subject site is located at 109 Garden Drive, east of Garden Drive, between Lakeshore Road W and Rebecca Street, in the Town of Oakville. The description of the existing road network in the study area is summarizes in **Table 1** below.

Table 1 – Summary of the Existing Road Network in the Study Area

Road Name	Jurisdiction	No. of Lanes	Speed	Road Type	Sidewalk	Cycling
Lakeshore Road W	Town of Oakville	2 lanes	50 km/h	Major Arterial	Sidewalk on both sides	Yes Dorval Dr to Kerr St
Rebecca Street	Town of Oakville	2 lanes	50 km/h	Major Arterial	Sidewalk on both sides	Yes Southview Rd to Navy St
Garden Drive	Town of Oakville	2 lanes	40 km/h	Local Road	Sidewalk on the west side only	None

Figure 3 illustrates the existing lane configurations and traffic control devices for the intersections considered in the analysis.

2.2. Walking Mode Assessment

Under the existing conditions, sidewalks are available on both sides of Rebecca Street and Lakeshore Road W. However, sidewalk is only available on the west side of Garden Drive from Rebecca Street to the southerly limit of the Wyndham Place Condominium. Between the condo access and Lakeshore Road W, there is an existing curb-face paved asphalt area acting a continuous sidewalk to Lakeshore Road W. A proper sidewalk can be provided once these existing properties are redeveloped in the future.

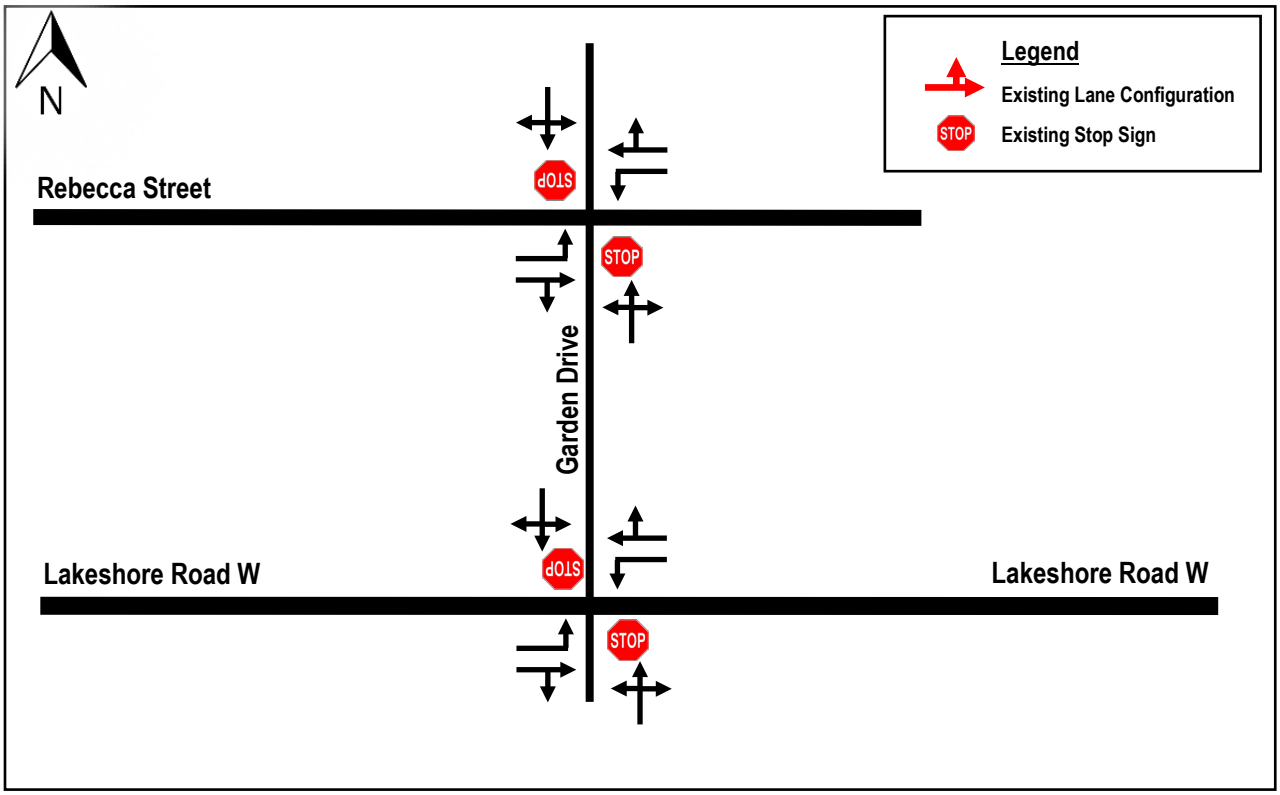
2.3. Cycling Mode Assessment

NexTrans has reviewed the existing active transportation network in the area based on site visit and review of the Town of Oakville Information Map, as well as the Town's 2017 Active Transportation Master Plan (ATMP). It should be noted

that the Town's 2017 Active Transportation Master Plan (ATMP) will be reviewed in more detail under the future total conditions as part of this Study. **Figure 4** illustrates the existing cycling network in the study area.

Currently, there are dedicated cycling lanes along Lakeshore Road W between Dorval Drive and Kerr Street, and Rebecca Street between Southview Road and Navy Street. There is also a multi-use trail along Dorval Drive from Lakeshore Road W to Upper Middle Road W. NexTrans will review the future plan proposed by the Town of Oakville in the subsequent sections of this Study.

Figure 3 – Existing Lane Configuration and Traffic Control



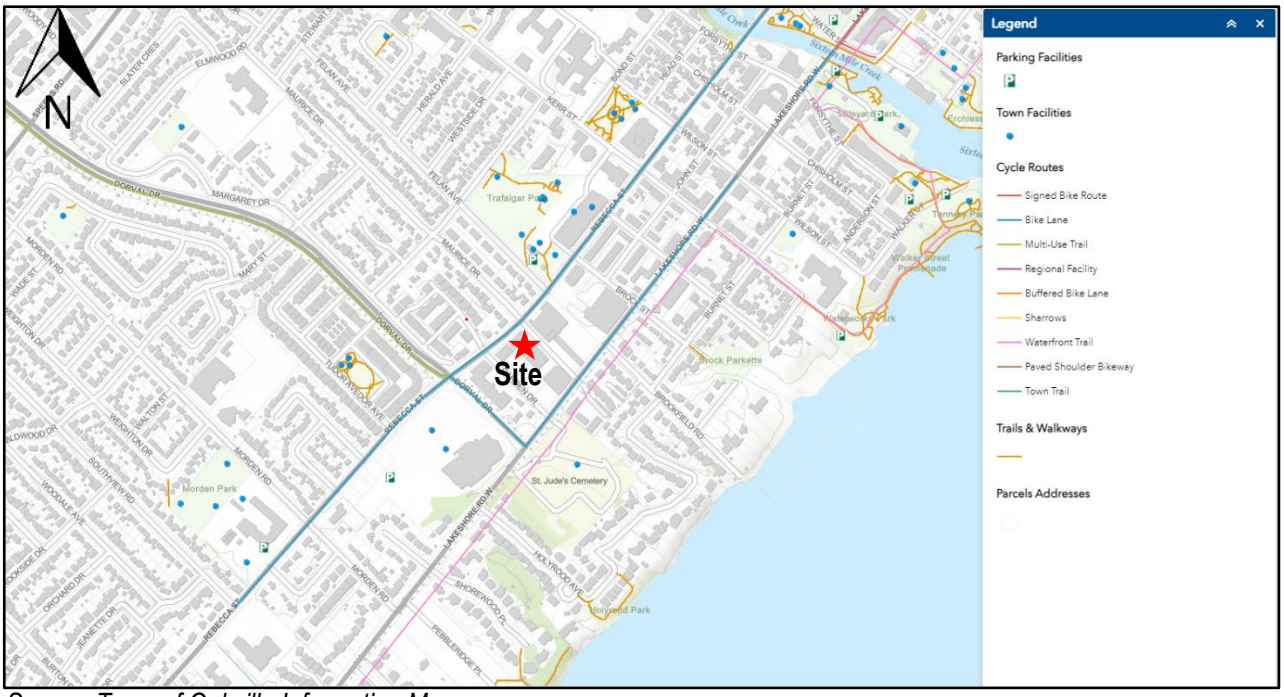
2.4. Transit Mode Assessment

The area is current serviced by two existing Oakville Transit Bus Routes 14 & 14A Lakeshore West and 15 Bridge. The subject site is located approximately 3 km from the Oakville GO Train Station on the Lakeshore West GO Line. **Figure 5** illustrates the existing Oakville Transit System.

Below are the bus route descriptions based on the information provided on the Oakville Transit Website (https://www.oakvilletransit.ca/schedules-and-maps.html):

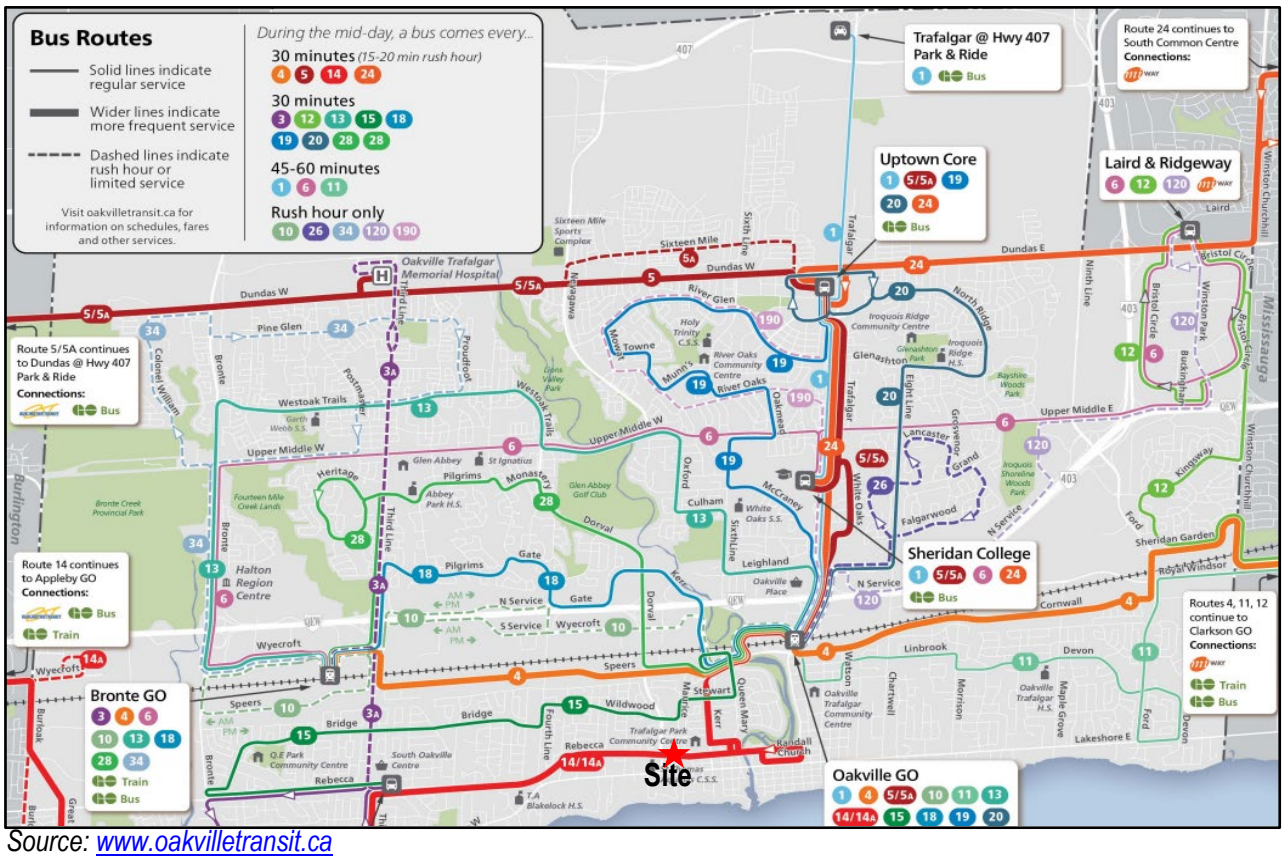
- **Routes 15 & 14A Lakeshore West** – The Lakeshore West Route travels generally in the east-west direction from Appleby GO Train Station to Oakville GO Train Station via Lakeshore Road East and Rebecca Street. This service runs early in the morning (6:05 AM) until after midnight during the weekday. The service frequency is approximately 15-minute during the peak periods.
- **Route 15 Bridge** – The Bridge route travels generally in the east-west direction, from South Oakville Centre to Oakville GO Train Station. This service runs Monday to Sunday from the early morning (6:10 AM) until after 8 PM. The service frequency is approximately 30-minute during the peak periods.
- **Lakeshore West GO Line** – is a GO Train route that operates generally in the east-west direction between Niagara Falls GO Station to Union Station in downtown Toronto, with further connections available east to Oshawa GO Station. This GO Line operates during Monday to Friday, from 6:00 AM to 8:00 PM; weekends from 6:30AM to 8:00PM.

Figure 4 – Existing Cycling Routes



Source: Town of Oakville Information Map

Figure 5 – Existing Oakville Transit



Source: www.oakvilletransit.ca

2.3. Existing Area Context

NexTrans has conducted a comprehensive review of the area with both site visit and desktop review. The subject site is surrounded by some recent mid-rise development with 3-4 storeys. The areas located immediately to the north and south of the proposed development are existing low-rise developments. The existing St. Thomas Aquinas Catholic Secondary School is located on the west side of Dorval Drive, with Trafalgar Park Community Centre and Fortinos Grocery Store are located to the east of the site. There are several schools in the area such as Elementary School Catholic Sainte-Marie and Oakwood Public School. Oakville Downtown is only located approximately 1.0 km east of the proposed development. As indicated in the previous sections of this Study, the area has a complete network of sidewalk, cycling facilities and sufficient transit services. Therefore, the analysis indicates that the proposed development is consistent and appropriate from a transportation planning perspective.

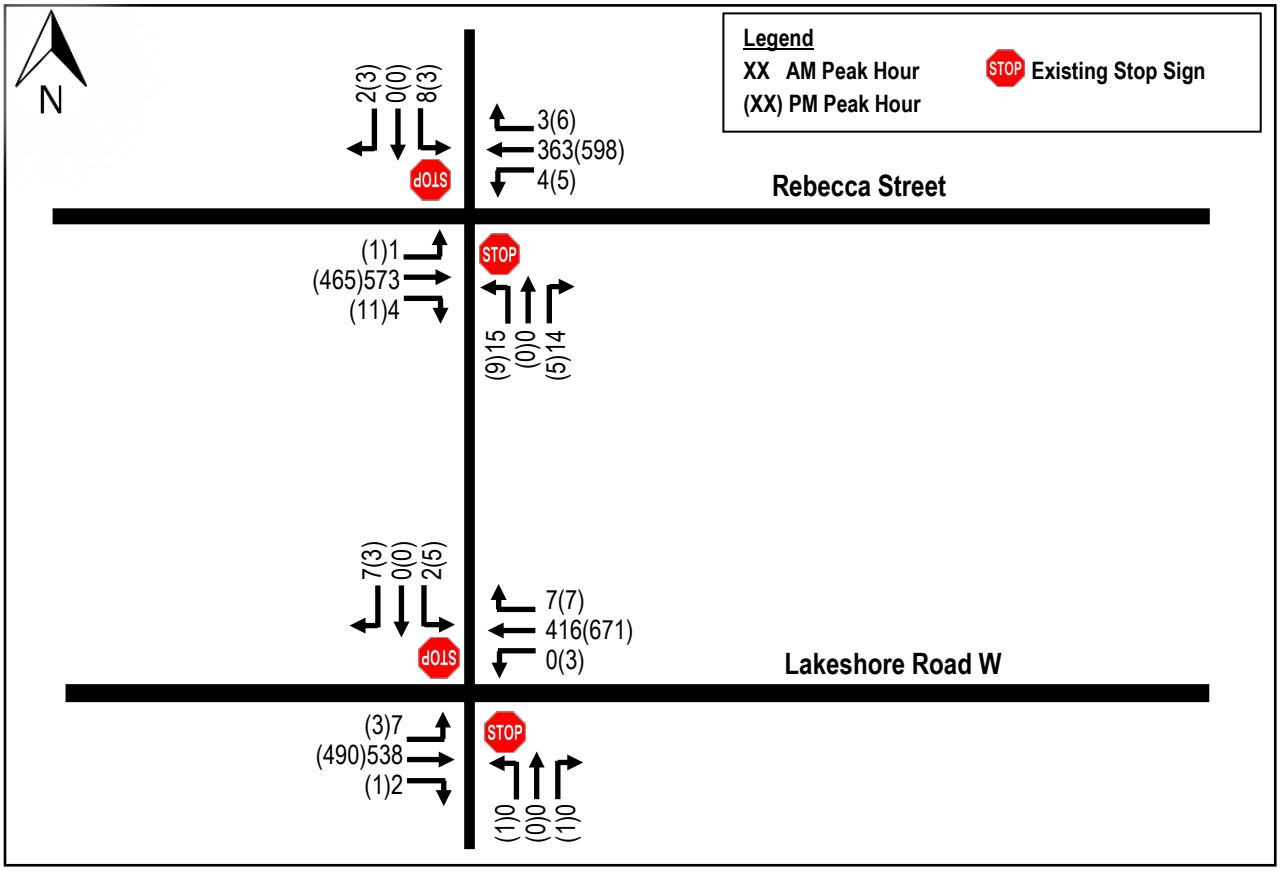
2.4. Existing Traffic Volumes

The turning movement counts were undertaken by Spectrum for the four intersections considered in the study area. The turning movement counts were conducted on June 4th, 2024. The existing traffic volumes were undertaken during the morning (7:00 a.m. to 10:00 a.m.) and afternoon (4:00 p.m. to 7:00 p.m.) peak periods for all area intersections. **Figure 6** illustrates the existing traffic volumes for the study area intersections, with the detailed turning movement counts are included in **Appendix A**.

2.5. Auto Mode Assessment

The existing volumes in **Figure 6** were analyzed using Synchro Version 11 software. The methodology of the software follows the procedures described and outlined in the Highway Capacity Manual, HCM 2000, published by the Transportation Research Board. It should be noted that the printouts for unsignalized intersections are based on HCM outputs. The results are provided in **Appendix C** and summarized in **Table 2**.

Figure 6 – Existing Traffic Volumes



It should also be noted that, a Transportation Impact Study was prepared by HDR dated September 20. 2021 on behalf of Smart Centres Inc. & Revera entitled “Garden Drive Retirement Residence” for the same site as part of the previous

application. In this Study, HDR has analyzed several more intersections east and west of the proposed development intersections. The analysis indicates that these intersections are expected to operate at acceptable levels of service with no physical improvements at the intersections considered in the analysis.

Given that the proposed development is very small and is expected to have negligible impact on the surrounding intersections, the inclusion of the two immediately adjacent intersections to the proposed development is appropriate as the proposed development can improve these intersections if required. It should be noted that the proposed development has no control over the improvements at the other intersections are these intersections are located further from the proposed development and are mostly impacted by the background traffic growth and background development traffic.

Table 2 – Existing Levels of Service

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour			Available Storage Length (m)
		LOS (v/c)	Delay (s)	95th Queue (m)	LOS (v/c)	Delay (s)	95th Queue (m)	
Lakeshore Road W/ Garden Drive (unsignalized)	EB – L	A (0.01)	8	0	A (0.00)	9	0	~20
	EB – TR	A (0.35)	0	0	A (0.31)	0	0	~60
	WB – L	A (0.00)	0	0	A (0.00)	9	0	~20
	WB – TR	A (0.28)	0	0	A (0.43)	0	0	~83
	NB – LTR	A (0.00)	0	0	C (0.01)	22	0	~15
	SB – LTR	B (0.02)	14	1	D (0.04)	25	1	~173
Rebecca Street Garden Drive (unsignalized)	EB – L	A (0.00)	8	0	B (0.00)	11	0	~15
	EB – TR	A (0.40)	0	0	A (0.29)	0	0	~70
	WB – L	A (0.01)	9	0	A (0.00)	8	0	~30
	WB – TR	A (0.26)	0	0	A (0.37)	0	0	~80
	NB – LTR	C (0.15)	23	4	C (0.06)	22	2	~173
	SB – LTR	D (0.07)	26	2	C (0.02)	20	1	~83

2.6. Finding Summary

Based on the intersection capacity analysis, under the existing traffic conditions, all intersections considered in the analysis are operating at acceptable levels of service, from overall intersection operational perspective, during both the morning and afternoon peak hours. The estimated queues can be accommodated within the available storage length. No critical movements have been identified and therefore no improvements are required at this time.

3.0 TRANSPORTATION PLANNING CONTEXT IN THE AREA

3.1. Existing Land Use Context and Amenities

As indicated previously, NexTrans has conducted a comprehensive review of the area with both site visit and desktop review. The subject site is surrounded by some recent mid-rise development with 3-4 storeys. The areas located immediately to the north and south of the proposed development are existing low-rise developments.

The existing St. Thomas Aquinas Catholic Secondary School is located on the west side of Dorval Drive, with Trafalgar Park Community Centre and Fortinos Grocery Store are located to the east of the site. There are several schools in the area such as Elementary School Catholic Sainte-Marie and Oakwood Public School. Oakville Downtown is only located approximately 1.0 km east of the proposed development.

As indicated in the previous sections of this Study, the area has a complete network of sidewalk, cycling facilities and sufficient transit services. Therefore, the analysis indicates that the proposed development is consistent and appropriate from a transportation planning perspective.

3.2. Transportation Planning Context

As indicated, the area is currently well-serviced by a complete network of sidewalk and cycling facilities along Lakeshore Road W and Rebecca Street. There are some missing sidewalks on the east side of Garden Drive that will be provided by the proposed development and a missing south portion on the west side that can be completed by the future

redevelopment of the existing residential lots. Therefore, this proposed infill development will utilize the existing infrastructures that existing today, and will enhance the missing sidewalk where appropriate.

4.0 FUTURE BACKGROUND CONDITIONS

4.1. Analysis Horizon

For the purposes of this assessment, a 5-year horizon (2029) has been carried out for the study analysis. This provision is consistent with the Town of Oakville Traffic Impact Study Guidelines and other background transportation studies conducted in the area.

4.2. Future Transportation Improvements

Based on our review, currently, there are no planned infrastructure improvements are identified in the area. Therefore, the existing transportation network will be assessed under the future background and future total conditions.

4.3. Future Background Corridor Growth

Based on the Town of Oakville's requirement and to be consistent with other background studies in the area, a 2% per annum compounded growth rate will be applied to the 2024 traffic volumes to estimate the 2029 projected traffic volumes. This is equivalent to approximately 10% total growth from 2024 to 2029. **Figure 7** illustrates the background corridor through traffic growth.

4.4. Background Development Applications

Based on NexTrans' review of the proposed active development applications in the area, using the Town's development application website for Ward 2 (https://www.oakville.ca/business/planning-applications-ward-7.html), the following background developments have been identified and will be included in the analysis:

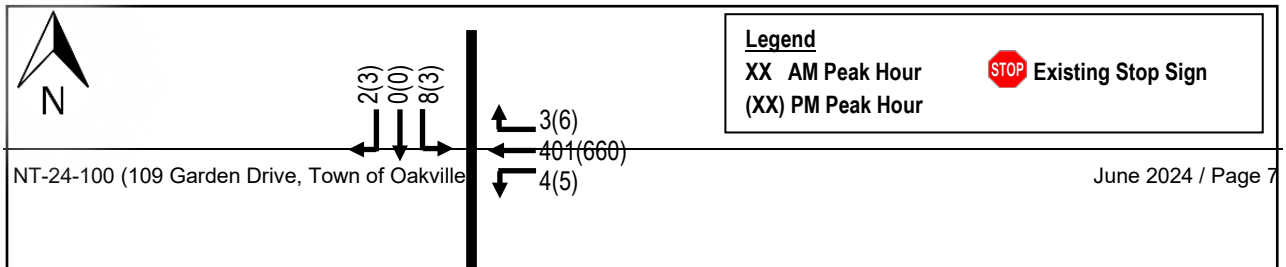
- 42 Lakeshore Road W – LEA Consulting TIS dated August 2023
- 550 Kerr Street – GHD TIS dated June 2019
- Upper Kerr Village – BA Group TIS dated February 2022

For the purposes of this assessment, the proposed background development site trip generation and trip assignment are extracted from the background transportation impact studies noted above. Other smaller background development traffic will be capture through the 2% corridor growth. **Figure 8** illustrates background development traffic volumes. The detailed TIS traffic volume information is included in **Appendix D**.

4.5. Future Background Condition Assessment

The estimated future background traffic volumes are illustrated in **Figure 9** (future background traffic growth traffic volumes + background development traffic volumes) and were analyzed using Synchro Version 11 software. The detailed calculations are provided in **Appendix E** and summarized in **Table 3**.

Figure 7 – 2029 Background Corridor Through Traffic Growth



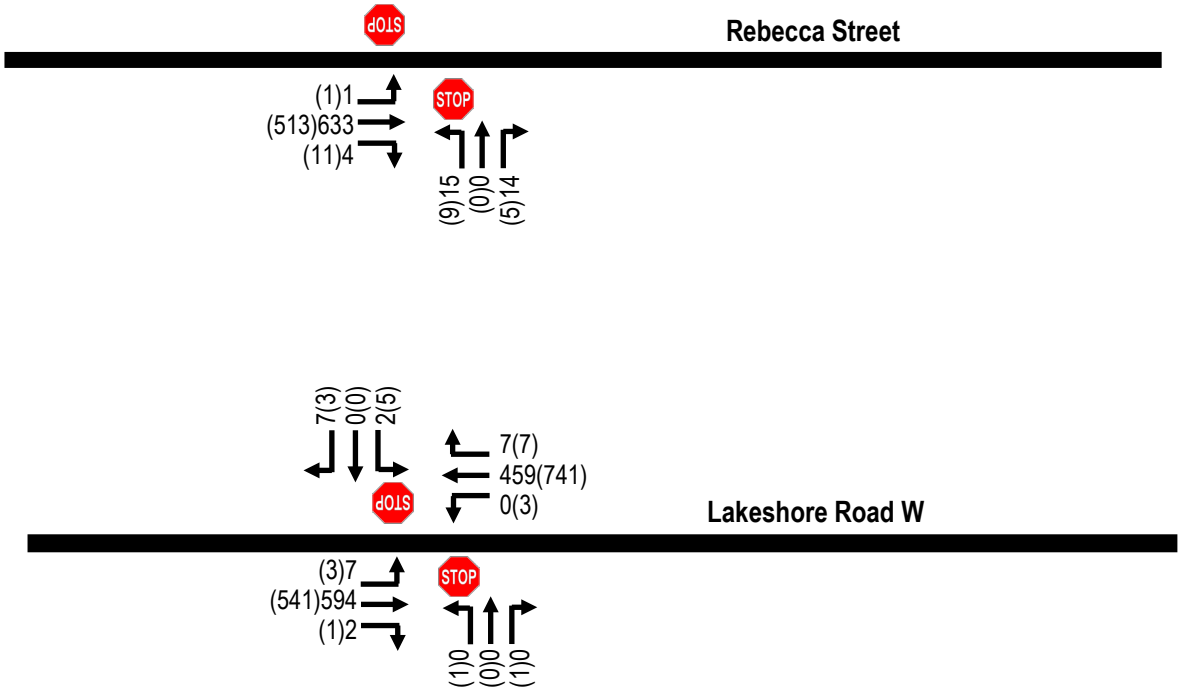


Figure 8 – Background Development Traffic Volumes

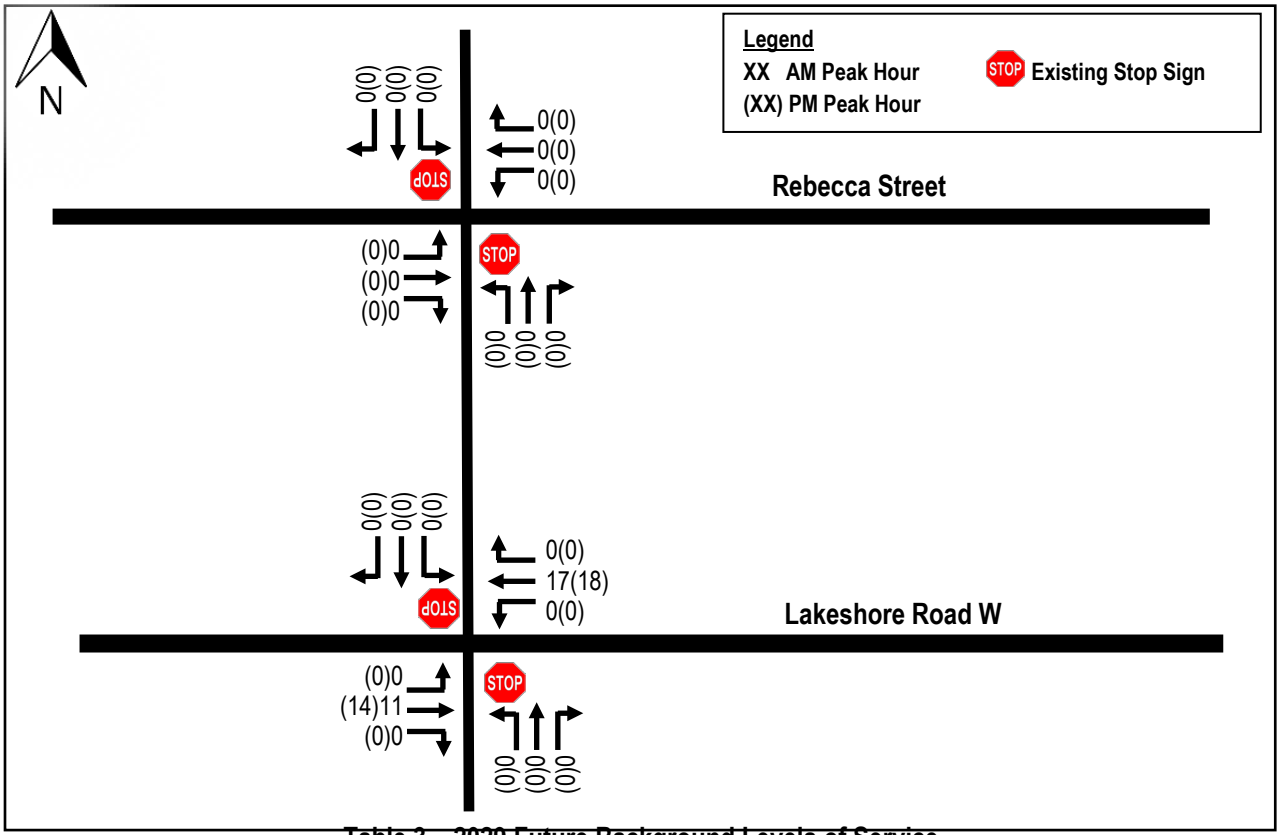
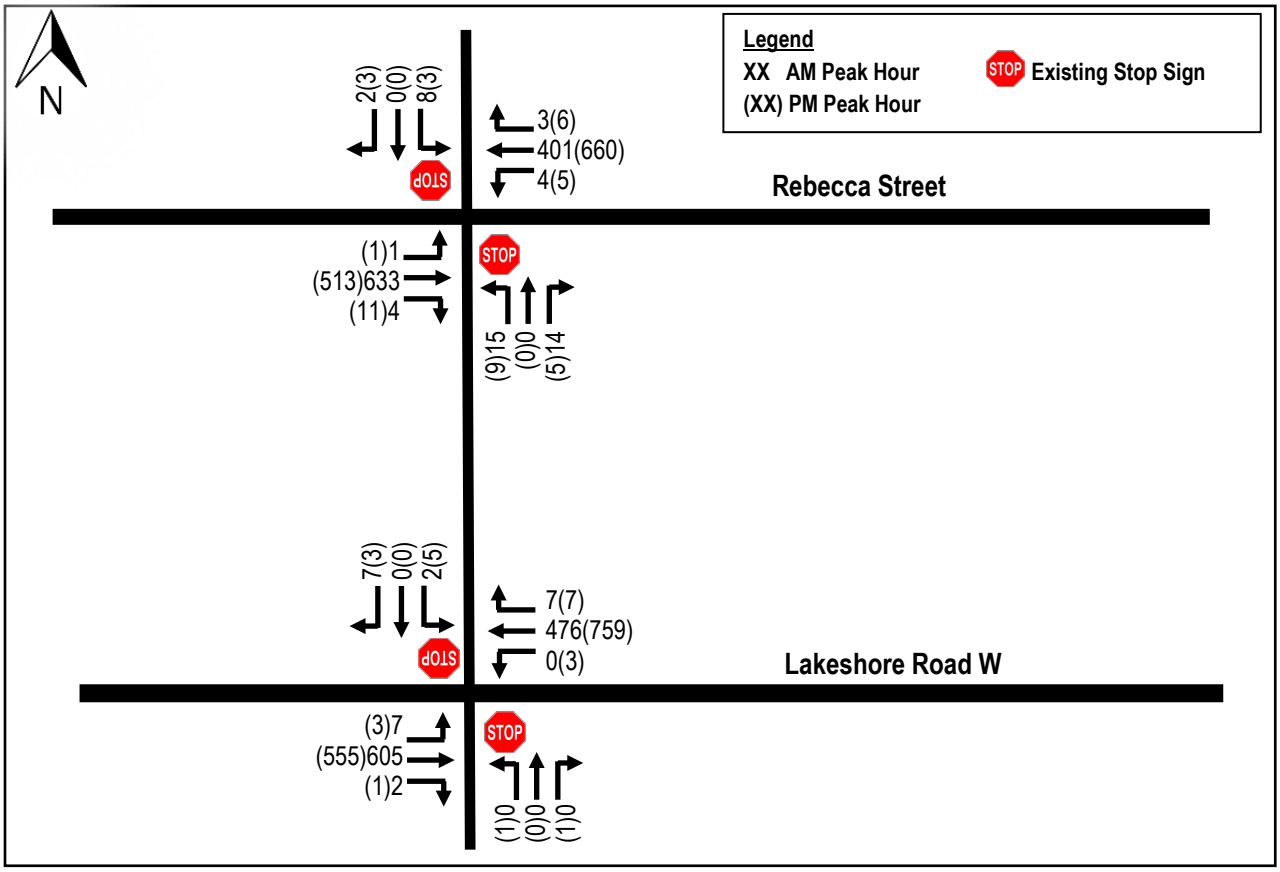


Table 3 – 2029 Future Background Levels of Service

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour			Available Storage Length (m)
		LOS (v/c)	Delay (s)	95th Queue (m)	LOS (v/c)	Delay (s)	95th Queue (m)	
Lakeshore Road W/ Garden Drive (unsignalized)	EB – L	A (0.01)	9	0	A (0.00)	10	0	~20
	EB – TR	A (0.40)	0	0	A (0.35)	0	0	~60
	WB – L	A (0.00)	0	0	A (0.00)	9	0	~20

	WB – TR NB – LTR SB – LTR	A (0.32) A (0.00) C (0.03)	0 0 15	0 0 1	A (0.48) D (0.01) D (0.05)	0 26 31	0 0 1	~83 ~15 ~173
Rebecca Street Garden Drive (unsignalized)	EB – L EB – TR WB – L WB – TR NB – LTR SB – LTR	A (0.00) A (0.45) A (0.01) A (0.28) D (0.17) D (0.08)	8 0 9 0 27 31	0 0 0 0 5 2	B (0.00) A (0.32) A (0.00) A (0.41) D (0.07) C (0.03)	11 0 9 0 25 23	0 0 0 0 2 1	~15 ~70 ~30 ~80 ~173 ~83

Figure 9 – 2029 Future Background Traffic Volumes



4.6. Finding Summary

Based on the intersection capacity analysis, under the future background traffic conditions, all intersections considered in the analysis are expected to operate at acceptable levels of service, from overall intersection operational perspective, during both the morning and afternoon peak hours. The estimated queues can be accommodated within the available storage length. No critical movements have been identified and therefore no improvements are required under this horizon year.

5.0 SITE TRAFFIC

5.1. Proposed Development

As indicated, the proposed residential mixed-use development consists of 4 blocks, with a total of 42 back-to-back townhouse units and 6 multiple attached units above the proposed 194.39 m^2 (or 2,092 ft^2) of ground related retail gross floor area.

For the purposes of this assessment and consistent with other background traffic impact studies prepared for other developments in the area, the *Trip Generation Manual, 11th Edition* published by the Institute of Transportation Engineers (ITE) and 2016 TTS information will be utilized in this Study.

5.2. Non-auto Modal Split

Table 4 summarizes the travel mode split information based on the review of the 2016 Transportation Tomorrow Survey data for Traffic Zones 4006, 4007, 4010, 4012, 4013, 4015 and 4016. The 2016 TTS data extraction is included in **Appendix F**.

Table 4 – Modal Split based on 2016 TTS Data for Traffic Zones

Time	Trips Made by Traffic Zones				
	Auto Driver	Auto Passenger	Transit	Cycle	Walk
AM Peak Period (6:00Am – 9:00AM)	72%	12%	10%	1%	4
PM Peak Period (4:00PM – 7:00PM)	73%	13%	10%	2%	3%

Based on the information above, the non-auto mode of transportation (transit + walking + carpooling) accounts for near 28% during the morning peak period and 27% during the afternoon peak period. Although this is a great trend, however, the auto driver mode is still very high, which is not sustainable and does not meet the sustainable objective of the Town Official Plan policies and directions.

To be conservative, no modal split will be applied to the trip generation. The modal split will be used for vehicle parking and to support TDM measures, where appropriate.

5.3. Site Trip Generation

The ITE Trip Generation Manual 11th Edition Land Use Codes (LUC) 220 "Multifamily Housing Low-Rise General Urban/Suburban" and LUC 821 "Strip Retail Plaza (<40K) General Urban/Suburban" fitted curve equations have been utilized for the proposed development. The site trip generation is summarized in **Table 5**.

Table 5 – Site Traffic Trip Generation Based on ITE Trip Rates

ITE Land Use	Magnitude (units/ft²)	Parameters	Morning Peak Hour			Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Multifamily Housing (Low-Rise) LUC 220	48	Vehicle Trip Rates AM - T = 0.31(X) + 22.85 PM - T = 0.43(X) + 20.55	0.19	0.60	0.79	0.54	0.31	0.85
		Vehicle Trips	**9**	**29**	**38**	**26**	**15**	**41**
Strip Retail Plaza (<40k) LUC 822 General Urban/Suburban	2,092	Vehicle Trip Rates AM - Ln(T) = 0.66*Ln(X) + 1.84 PM - Ln(T) = 0.71*Ln(X) + 2.72	0.50	0.34	0.84	1.70	1.70	3.40
		Vehicle Trips	**6**	**4**	**10**	**13**	**13**	**26**
Total New Vehicle Trips			***15***	***33***	***48***	***39***	***28***	***67***

Based on the analysis noted above, the proposed development is expected to generate 48 total two-way vehicle trips (15 inbound and 33 outbound) and 67 total two-way vehicle trips (39 inbound and 28 outbound) during the morning and afternoon peak hours, respectively.

5.4. Site Trip Distribution Based on Existing Site

The 2016 Transportation Tomorrow Survey (TTS) data was reviewed for Traffic Zones 4006, 4007, 4010, 4012, 4013, 4015 and 4016 in order to estimate the general trip distribution for the proposed development. **Table 6** summarizes the planning district/traffic zones distribution based on the 2016 TTS data, with **Table 7** summarizing the site trip assignment based on the 2016 TTS data and the existing traffic turning movement counts in the area.

Table 6 – General Trip Distribution for the Proposed Development

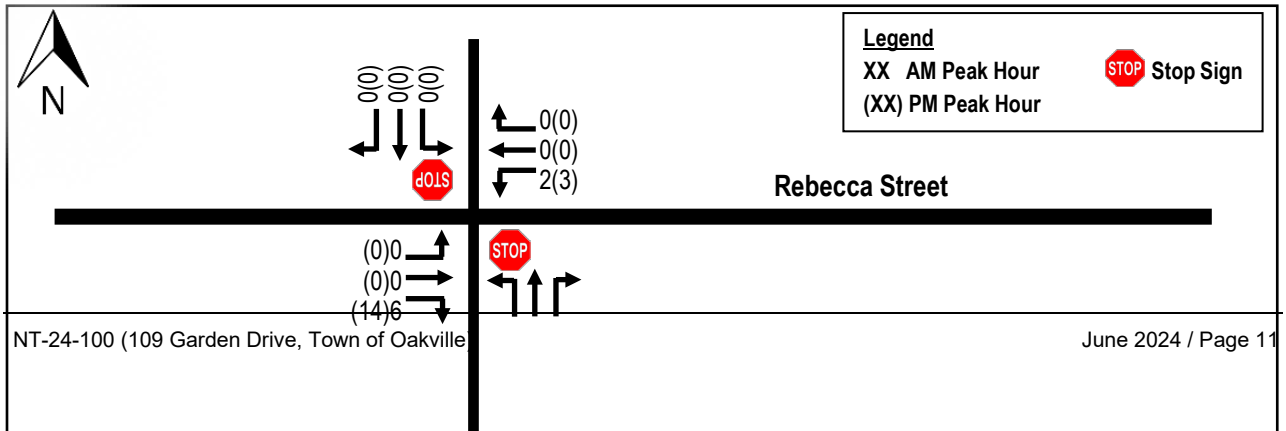
Oakville	Peel Region	Burlington	Milton/ Halton Hills	Toronto	Durham Region	York Region	Hamilton Area	Niagara Region	Total
Auto Trips									
58%	13%	14%	4%	3%	0%	1%	2%	4%	100%
Transit Trips									
90%	1%	0%	0%	9%	0%	0%	0%	0%	100%

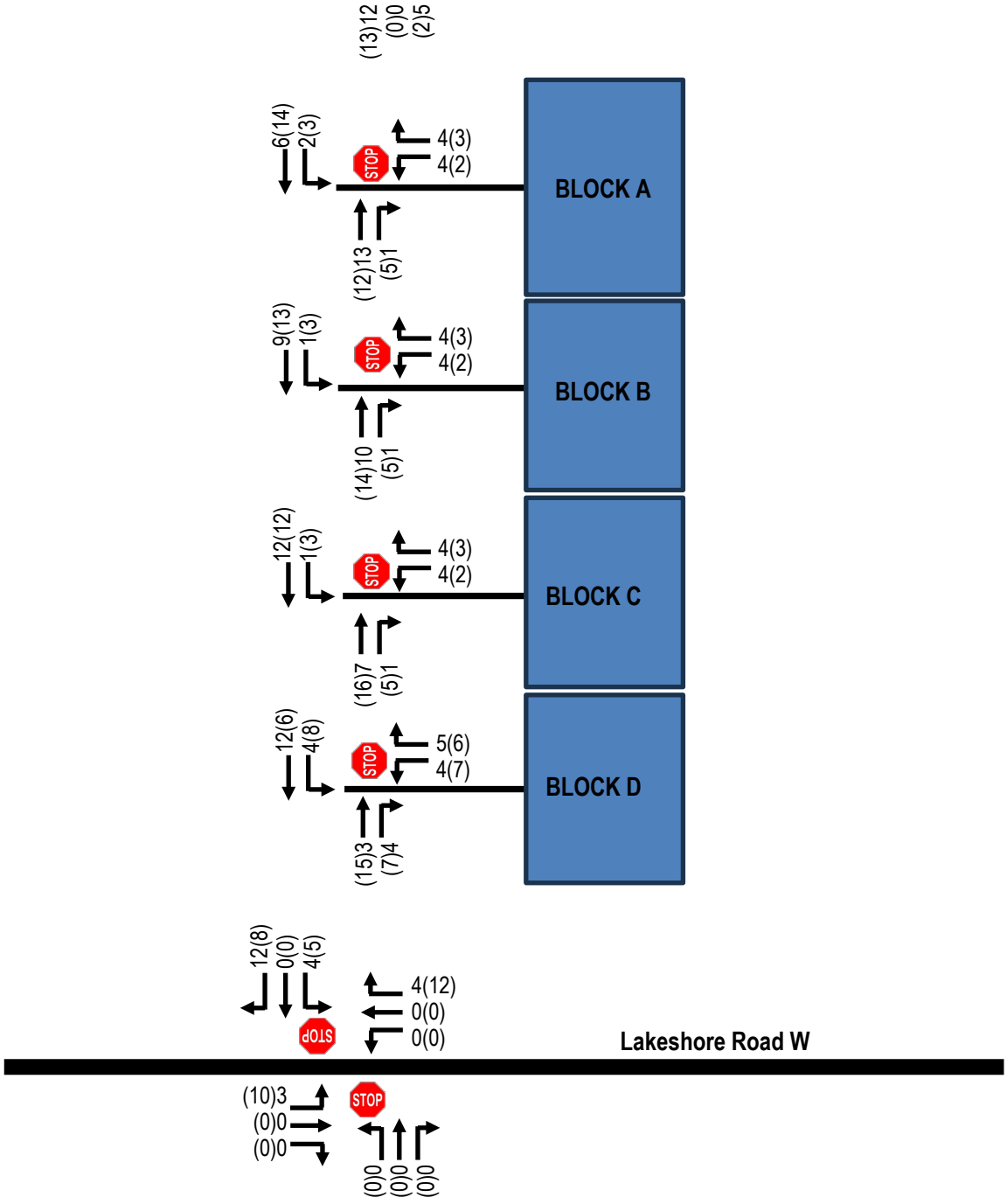
Table 7 – Site Trip Assignment for the Proposed Development

General Direction (To/From)	Auto Trips	Transit Trips
East	50%	40%
West	25%	30%
North	25%	30%
Total	100%	100%

Figure 10 illustrates the proposed development generated traffic volumes. It should be noted that the auto site trip distribution and assignment have been taken into consideration the 2016 TTS information above, existing turning movements and available road network in the study area.

Figure 10 – Site Traffic Volumes



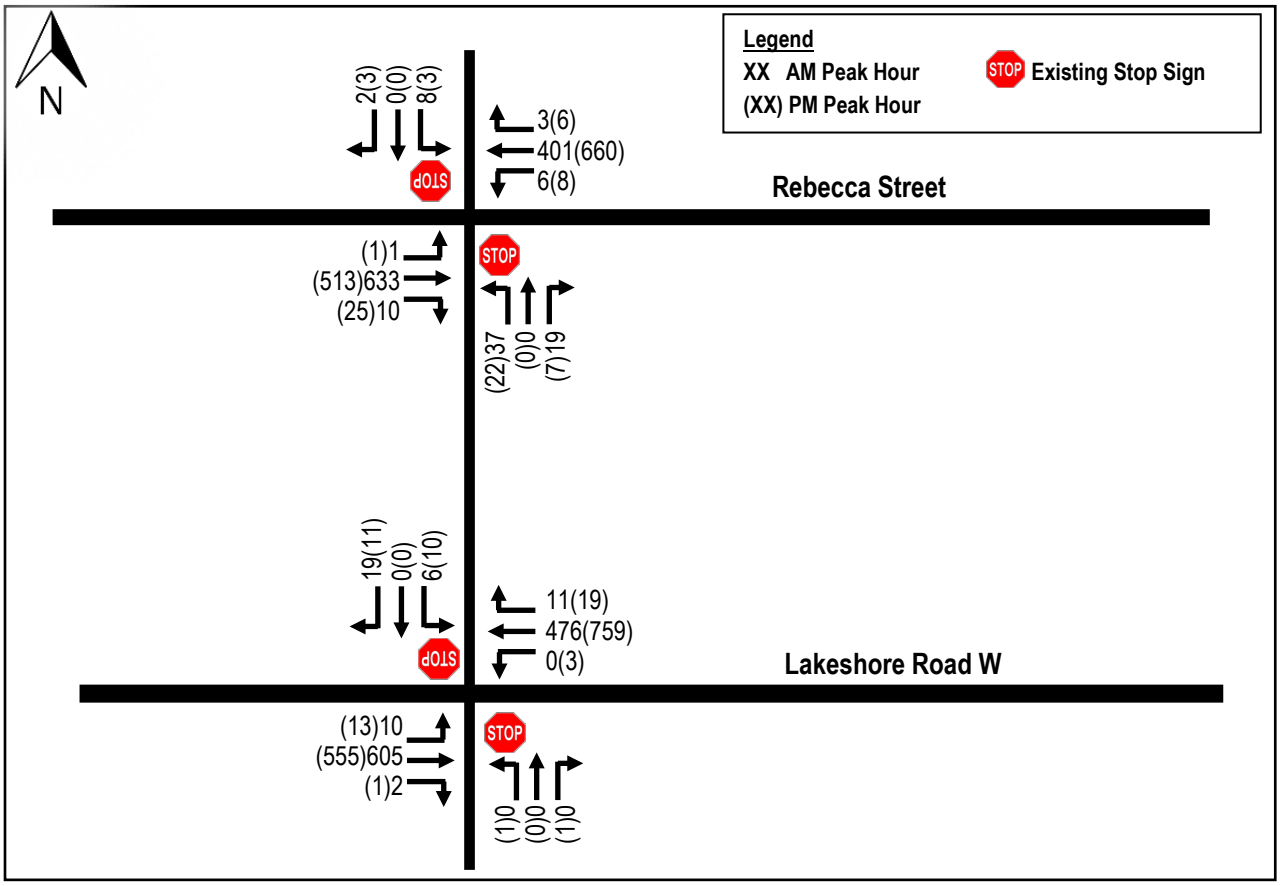


6.0 FUTURE TOTAL TRAFFIC CONDITIONS

6.1. Future Total Traffic Assessment for Auto Mode

The estimated future total traffic volumes (future background traffic volumes + site generated traffic volumes) are illustrated in **Figure 11**, and were analyzed using Synchro Version 11 software. The detailed calculations are provided in **Appendix G** and summarized in **Table 8**.

Figure 11 – 2029 Future Total Traffic Volumes



6.2. Finding Summary

Based on the intersection capacity analysis, under the future total traffic conditions, all intersections considered in the analysis are expected to operate at acceptable levels of service, from overall intersection operational perspective, during both the morning and afternoon peak hours. The estimated queues can be accommodated within the available storage length. No critical movements have been identified and therefore no improvements are required at this time.

The proposed site accesses are expected to operate at acceptable levels of service with maximum of one vehicle every 8 minutes during the peak hours. No long delays or queues are expected under the future total conditions.

As previously indicated, a Transportation Impact Study was prepared by HDR dated September 20. 2021 on behalf of Smart Centres Inc. & Revera entitled “Garden Drive Retirement Residence” for the same site as part of the previous application. In this Study, HDR has analyzed several more intersections east and west of the proposed development intersections. The analysis indicates that these intersections are expected to operate at acceptable levels of service with no physical improvements at the intersections considered in the analysis.

Given that the proposed development is very small and is expected to have negligible impact on the surrounding intersections, the inclusion of the two immediately adjacent intersections to the proposed development is appropriate as the proposed development can improve these intersections if required. It should be noted that the proposed development has no control over the improvements at the other intersections are these intersections are located further from the proposed development and are mostly impacted by the background traffic growth and background development traffic.

Table 8 – 2029 Future Total Levels of Service

Intersection	Movement	Weekday AM Peak Hour			Weekday PM Peak Hour			Available Storage Length (m)
		LOS (v/c)	Delay (s)	95th Queue (m)	LOS (v/c)	Delay (s)	95th Queue (m)	
Lakeshore Road W/ Garden Drive (unsignalized)	EB – L	A (0.01)	9	0	A (0.02)	10	0	~20
	EB – TR	A (0.40)	0	0	A (0.35)	0	0	~60
	WB – L	A (0.00)	0	0	A (0.00)	9	0	~20
	WB – TR	A (0.32)	0	0	A (0.49)	0	0	~83
	NB – LTR	A (0.00)	0	0	D (0.01)	28	0	~15
	SB – LTR	C (0.09)	17	2	D (0.14)	30	4	~173
Rebecca Street Garden Drive (unsignalized)	EB – L	A (0.00)	8	0	B (0.00)	11	0	~15
	EB – TR	A (0.45)	0	0	A (0.33)	0	0	~70
	WB – L	A (0.01)	9	0	A (0.01)	9	0	~30
	WB – TR	A (0.28)	0	0	A (0.41)	0	0	~80
	NB – LTR	E (0.38)	37	13	D (0.18)	31	5	~173
	SB – LTR	D (0.08)	32	2	C (0.03)	23	1	~83

6.3. Walking Mode Assessment

As indicated, under the existing conditions, sidewalks are available on both sides of Rebecca Street and Lakeshore Road W. However, sidewalk is only available on the west side of Garden Drive from Rebecca Street to the southerly limit of the Wyndham Place Condominium. Between the condo access and Lakeshore Road W, there is an existing curb-face paved asphalt area acting a continuous sidewalk to Lakeshore Road W. A proper sidewalk can be provided once these existing properties are redeveloped in the future.

As part of the proposed development, sidewalk will be provided on the east side of Garden Drive along the entire frontage of the site. Sidewalk will be designed and provided as per the Town of Oakville standards.

In addition, sidewalks will be provided on both sides of each block that connect each unit to the sidewalk on Garden Drive. This provision is sufficient to provide mobility for each unit.

6.4. Cycling Mode Assessment

Currently, there are dedicated cycling lanes along Lakeshore Road W between Dorval Drive and Kerr Street, and Rebecca Street between Southview Road and Navy Street. There is also a multi-use trail along Dorval Drive from Lakeshore Road W to Upper Middle Road W.

NexTrans has reviewed the Town's 2017 Active Transportation Master Plan (ATMP). **Figure 12** illustrates the existing and proposed cycling network in the study area.

Based on this review, it is indicated that the Town of Oakville is actively planning and building additional cycling infrastructure in the area such as cycling facilities on Keer Street and Stewart Street. With the completion of these network, the residents from the proposed development can use these facilities as an alternate mode of transportation instead of driving private vehicles to work or to school.

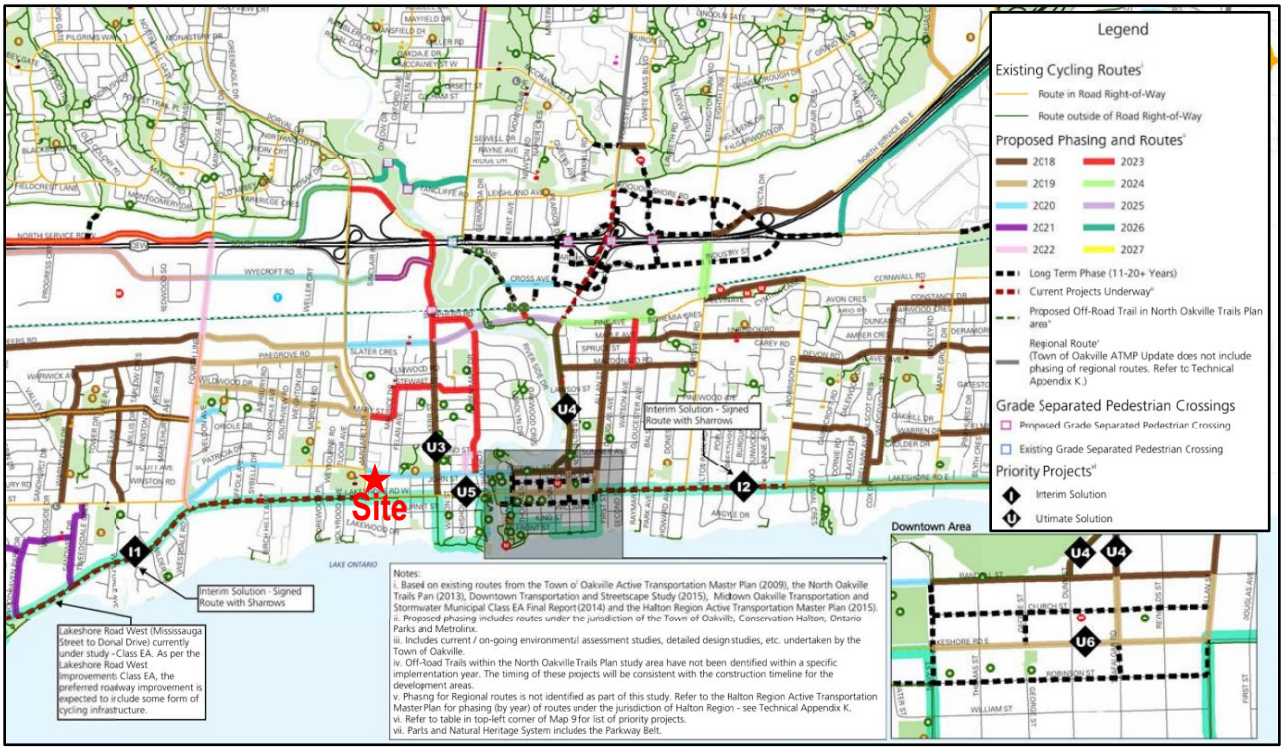
As part of the proposed development, a total of 48 long-term and 20 short-term bicycle parking spaces will be proposed, for a total of 68 bicycle parking spaces. This provision will encourage residents to use active transportation modes to work, school and discretionary trips instead of single-occupant-vehicle trips.

6.5. Transit Mode Assessment

As indicated in Table 4 of Section 5.2 of this Study, the existing transit modal split based on 2016 TTS data is about 10% during both morning and afternoon peak hours. If 10% modal split is applied, the proposed development is expected to generate 5 total two-way transit trips (2 inbound and 3 outbound) and 7 total two-way transit trips (4 inbound and 3 outbound) during the morning and afternoon peak hours, respectively.

As the estimated transit ridership for the proposed development is very low, the two existing transit routes (Oakville Transit Bus Routes 14 & 14A Lakeshore West and 15 Bridge) can accommodate these trips. It is anticipated that no additional transit improvements in the area are required to accommodate the proposed development.

Figure 12 – Town of Oakville Proposed Pedestrian Network Phasing



7.0 SITE PLAN REVIEW

7.1. Proposed Development Access

A full moves access will be provided for each proposed townhouse block, with a total of 4 full moves access onto Garden Drive. This is consistent with the existing conditions on the west side of Garden Drive.

The assessment and intersection capacity analysis indicates that the proposed accesses are expected to operate at acceptable levels of service with minimum delay or queue. The corner clearance and throat length corner are also appropriate and meet the Transportation Association of Canada Guidelines (TAC). The recommended lane configurations include for each proposed full moves access:

- One inbound lane (minimum 3.0 m width);
- One outbound lane (minimum 3.0 min width); and
- One shared southbound through/left lane and one northbound shared through/right on Garden Drive

7.2. Vehicle Turning Movement Analysis

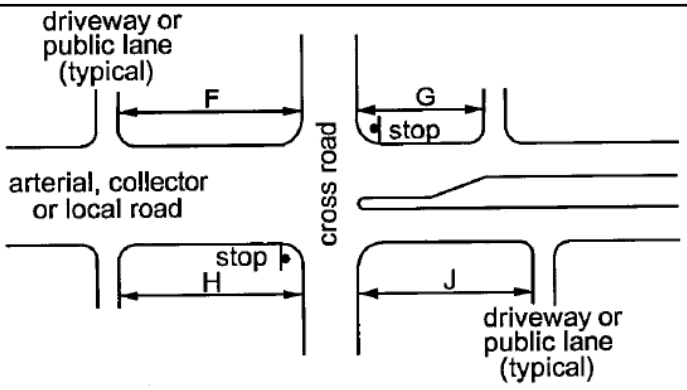
Passenger car turning movement analysis is provided in **Figure 17** of this Study. The analysis is provided to demonstrate that passenger cars can enter and exit the proposed parking spaces and the proposed accesses onto Garden Drive.

7.2.1. Corner Clearance

In accordance with Section 8.8.1 and Figure 8.8.2 of the TAC 2017 (as illustrated in **Figure 13** below), the minimum corner clearance at an intersection is 15m for a local road. It should be noted that all corner clearances provided by the

development exceed 21m from Lakeshore Road W and 13m from the adjacent existing development (as illustrated in **Figure 14**). Therefore, the proposed site access corner clearances exceed the minimum TAC 2017 *suggested* corner clearance guideline of 15m from a public roadway such as Lakeshore Road W.

Figure 13 – Corner Clearance at Major Intersection



item	min. clearance, m		
	arterial	collector [b]	local [b]
F	35	20	15
G	# [a]	25	15
H	25	25	15
J	35	20	15

Notes: a. Distance (#) positions driveway or public lane in advance of the left turn storage length (min.) plus bay taper (des.).
b. Lesser values reflect lower volumes and reduces level of service on collectors and locals.

Source: TAC 2017 Figure 8.9.2

7.2.2. Sightline

Based on Table 9.9.4 of the 2017 Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads, a stopping sight distance of 50-65m is required for a 40-50km design speed. This is the design speed for Garden Drive as a local road. Our analysis indicates that the existing Garden Drive is relative flat and straight with no horizontal curves or slopes. Therefore, the proposed site accesses can achieve this required stopping sight distance of 50-65m. **Figure 15** illustrates the sightlines.

7.2.3. Daylight Triangle

The proposed development will provide approximately 3m x 3m daylight triangle at the north-east corner of the Lakeshore Road W/Garden Drive intersection. This has been illustrated in the proposed site plan.

7.3. Solid Waste Management

The solid waste will be pick-up on the curb side along Garden Drive. This is consistent with other existing developments along Rebecca Street, Garden Drive, Margeret Drive.

7.4. Proposed Pavement Marking and Signage Plan

The proposed signage and pavement marking plan is illustrated in **Figure 18**. This plan will be finalized as part of the final site plan submission if approved by the Town in principle.

Figure 14 – Proposed Site Access Corner Clearance

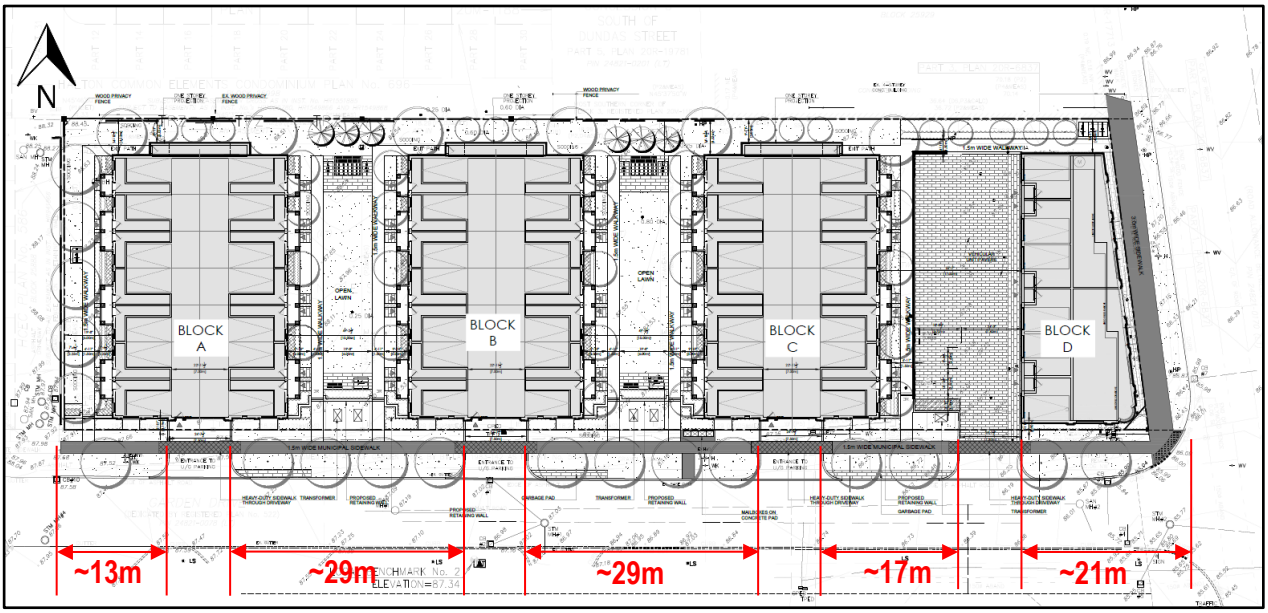
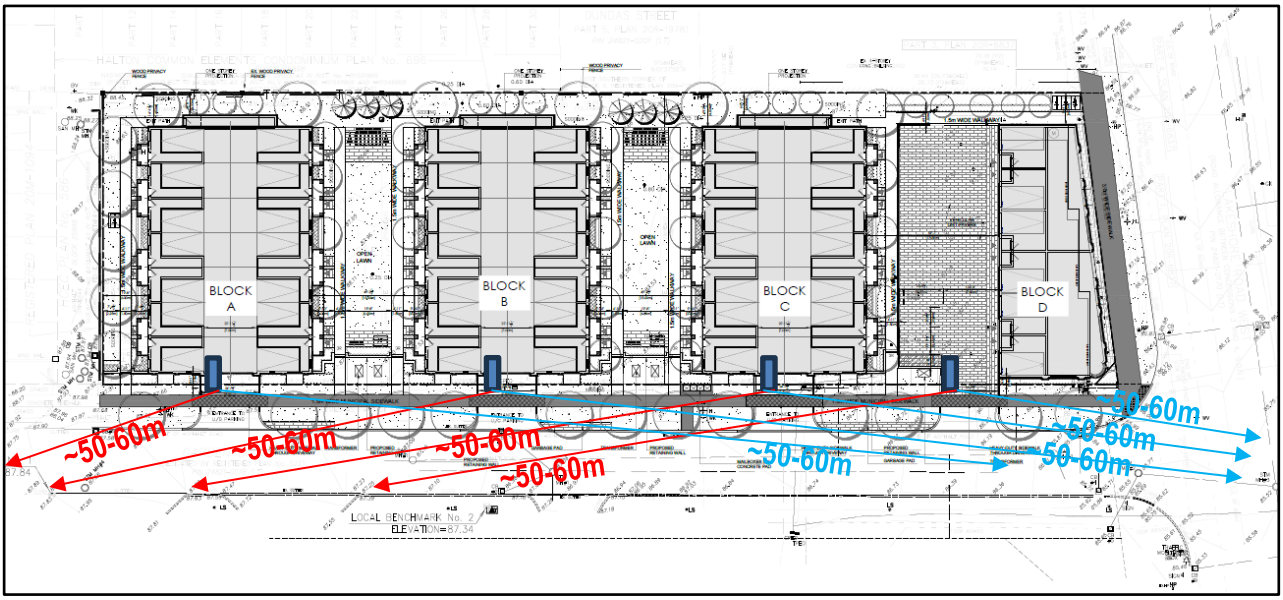


Figure 15 – Proposed Site Access Sightlines



7.5. Traffic Calming

Given that Garden Drive has a short segment between Lakeshore Road W and Rebecca Street, there is very limited chance for speeding through this road. In addition, with the proposed development accesses and existing accesses on both sides of Garden Drive that will create more frictions, it is anticipated that speeding will not be an issue and therefore no traffic calming is required under this horizon year or as part of this proposed development.

8.0 VEHICLE PARKING ASSESSMENT

8.1. Zoning By-law Vehicle Parking Requirement

The Town of Oakville Zoning By-law No. 2014-014 (Consolidated to December 12, 2023) has been reviewed for vehicle parking requirements. **Table 9** below summarizes the vehicle parking requirements based on the noted Zoning By-law

requirements.

Table 9 – Town of Oakville Zoning By-law Vehicle Parking Requirements

Unit Type	No. of Unit/GFA	Parking Rates	Parking Requirement
Back-to-back Townhouse	42 units	1.5 spaces/unit	63 spaces
Multiple Dwelling	6 units	1.05 spaces/unit	6 spaces
Visitor	6 units	0.20 spaces/unit	1 space
Retail	194.39 m^2	1.00 space/40m^2	5 spaces
Total			***75 spaces***

Based on the assessment noted above, the proposed development would be required to provide a total of 75 vehicle parking spaces, inclusive of residential, visitor and retail uses. These vehicle parking rates are excessive and do not support the sustainability vision of the Town of Oakville Official Plan. In order to encourage residents to take more sustainable modes of transportation, parking rates should and must be reduced as parking management is the best Transportation Demand Management measure.

8.2. Benefits of Vehicle Parking Reduction

8.2.1. Appropriate Parking Management is the best TDM Measure

Appropriate parking demand management is the best transportation demand management measure at this time because:

- Limited available parking spaces will encourage residents not to own a car
- It encourages residents to take other sustainable modes of transportation available in the area such as walking, cycling and public transit
- It maximizes transit ridership and therefore maximizes the impact of major transit infrastructure improvements

8.2.2. Support Alternative Modes of Transportation

Public Transit is an important mode of transportation for both short and longer distance trips to and from the proposed development. As indicated in Section 2.3 of this Study, the area is current serviced by the existing Oakville Transit Bus Routes 14 & 14A Lakeshore West and 15 Bridge. In addition, the proposed development is located only 3 km from the Oakville GO Train Station on the Lakeshore West GO Line, which is accessible with the two existing transit routes noted.

In addition, as the Town and the Region are planning and building a more comprehensive active transportation network in the area such as the cycling network, therefore, the residents can use these facilities to commute to work or school instead of driving private vehicles.

As vehicle capital costs along with high gas prices are the major concerns for housing affordability, building less parking spaces will keep the housing construction costs low for consumers.

8.3. Recommended Vehicle Parking Requirement for the Proposed Development

Given the reasons noted above, the following are recommended parking rates (**Table 10**) for the proposed development, based on the parking justification provided in subsequent sections of this Study.

Table 10 – Recommended Vehicle Parking Rates for the Proposed Development

Unit Type	No. of Unit/GFA	Maximum Parking Rates	Parking Requirement
Residential	48 units	1.0 spaces/unit	48 spaces
Visitor	48 units	0.2 spaces/unit for visitor shared with retail	11 spaces
Total			***59 spaces***

Based on the recommended vehicle parking rates, the proposed development will need to provide a total of 59 vehicle parking spaces for residential, visitor and retail components. This is about 57% reduction from the applicable Zoning By-law requirement. It should be noted that the proposed development is required and will provide 1 barrier-free parking space in Block D. This space will be shared between visitor and commercial spaces.

9.0 REDUCED VEHICLE PARKING JUSTIFICATION

9.1. Subject Site Strategic Location

The proposed development is located only 1.0 km west of the Oakville Downtown area. As the proposed development is a compact infill development on a vacant land, the proposed development will utilize the existing infrastructures to its fullest potential

9.2. Subject Site Walk Score

NexTrans has reviewed the walk score for the subject site using the information in www.walkscore.com website. **Table 11** below summarizes the walk score for the subject site.

Table 11 – Walk Score for 109 Garden Drive, Oakville

Mode	Score	Description
Walking	88	Very Walkable – Most errands can be accomplished on foot
Public Transit	40	A few nearby public transportation options
Cycling	68	Bikeable – Some bike infrastructure

As indicated in the table above, the area has alternate modes of transportation and the future residents in the proposed development will not require to drive or to own a private vehicle.

9.3. Existing Mode Share

Table 12 summarizes the travel mode split information based on the review of the 2016 Transportation Tomorrow Survey data for Traffic Zones 4006, 4007, 4010, 4012, 4013, 4015 and 4016. The 2016 TTS data extraction is included in **Appendix F**.

Table 12 – Modal Split based on 2016 TTS Data for Traffic Zones

Time	Trips Made by Traffic Zones				
	Auto Driver	Auto Passenger	Transit	Cycle	Walk
AM Peak Period (6:00Am – 9:00AM)	72%	12%	10%	1%	4
PM Peak Period (4:00PM – 7:00PM)	73%	13%	10%	2%	3%

Based on the information above, the non-auto mode of transportation (transit + walking + carpooling) accounts for near 28% during the morning peak period and 27% during the afternoon peak period. Although this is a great trend in 2016, however, it is anticipated that this trend is higher if the TTS was to be conducted today. It should be noted that in order to reduce single-occupant-vehicle trips to and from the proposed development, private car ownership must be discouraged by reducing the site parking supply. Therefore, it is recommended that the proposed development only provide the vehicle parking rates recommended in this Study.

9.4. More Housing Supply for the Town of Oakville

Demand for new housing is all time high at this time. With high mortgage interest rates and high costs of living, housing availability and affordability are expected to further decline if no measures are implemented. One component that increases the cost of new units in multi-storey buildings, is the requirement to provide a minimum rate of parking; even in areas well serviced by transit with historically low vehicle ownership and use rates. The cost of providing one underground parking space is in the range of $48,000 to $160,000 per space due to the aggregate impact of land costs,

constructability, site constraints and other factors leading to high construction costs (*Source: City of Toronto Presentation: Review of Parking Requirements for New Development - Sept 2021*).

Furthermore, the more residential or visitor parking spaces that a proposed development has to provide, the more expensive the maintenance costs will be for the owners. Monthly maintenance cost for a parking space could be up to $100 per month, on top of the capital costs of a parking space. The provision of less parking can reduce overall maintenance costs and result in lower housing costs/greater housing affordability.

9.5. Hybrid Working Model

Through the impact of the pandemic, the Province of Ontario, and particularly, the Town of Oakville and Halton Region, this pandemic will permanently alter the way people work and travel in the future. Based on various reporting from media, this hybrid working from home trend for office workers may continue even when the pandemic is over. Hybrid working is described as employes are working at the official several days a week and several days at home. Both employees and employers have invested in equipment and technology to accommodate this hybrid working model.

9.6. High Residential Vehicle Parking Rates Result in More Car Ownership and More Driving While Reducing Transit Usage

Many municipalities have historically required new development projects to include parking, out of fear that if new residents are not provided with parking they will park around the local community and this will cause issues. The assumption here, behind both the policy and the pushback on reductions, is that people will always choose to drive, and the urban environment should be designed to accommodate that inevitable choice. But new research shows how that assumption is often backwards — offering the strongest evidence yet that parking doesn't just follow driving in cities, but can actually cause it. The new work comes from a group of urban planning scholars at UCLA and UC-Santa Cruz, led by Adam Millard-Ball, and has been published in an issue of the journal Urban Studies. Using an innovative and elegant study method, the researchers show clearly that "increased parking causes more car ownership and more driving while reducing transit use." They continue: "In summary, the evidence from our study robustly supports that urban residents' transportation behavior — but not their employment — is affected by local features of the built environment, and particularly so by parking." The conclusion underscores the importance of urban design in shaping behavior.

This new study distinguishes itself by finding a way to effectively (and ethically) randomize a population: San Francisco's housing lottery. In San Francisco, inclusionary zoning regulations typically require new developments with 10 or more residential units to provide affordable housing, which is offered to income-eligible households through a lottery. This is the gold standard for showing causation through a randomized trial.

In spring 2019 — pre-pandemic — the researchers mailed a travel behavior survey to housing lottery winners in 197 development projects across San Francisco. The short questionnaire, provided in four different languages, asked about typical travel mode (car, transit, bike, walking), car-ownership status, and employment status. Roughly 780 households responded.

When the researchers matched travel behavior to parking requirements, they found "a clear and substantive trend:" as parking supply rose, so did car-ownership. In buildings without any parking, only 38 percent of respondents owned a car. Car-ownership climbed as parking requirements increased, reaching 81 percent of respondents in buildings that required one parking space per housing unit. **Figure 16** illustrates the survey responses for car ownership by residential parking ratio.

Owning a car isn't the same as using it, but further analysis found a statistically significant relationship between parking supply and driving, too. Generally speaking, households that lived near public transit, or that had good walking or cycling access, tended to use those options more often than households that did not. But when it came to using transit, in particular, the effect of a building's parking ratio was "more than twice as large" as that of its transit access.

In other words, even in buildings with transit access, parking supply was the stronger pull — increasing driving behavior by the same amount it reduced transit use. When buildings provide ample parking, residents buy a car and drive. But when buildings have transit access without easy parking, residents use other ways to get around.

"Where streets are relatively walkable and transit service is frequent," writes the research team, "parking emerges as the key factor shaping household travel behavior."

One final, critical result: the researchers found no connection at all between parking supply and full-time employment status. That's very important, because it suggests that reducing or eliminating parking spaces won't negatively impact a household's ability to keep a job, as is often feared.

Figure 16 – Survey Responses for Car Ownership by Residential Parking Ratio

The study represents a significant step forward for urban mobility policy and offers robust, conclusive and definitive evidence through a controlled study that parking minimums do indeed cause more driving. In alignment with this study, San Francisco eliminated parking minimums. And likewise, supported by this study, San Jose; Cambridge, Massachusetts; Culver City, California; Lexington, Kentucky; and Anchorage, Alaska have all eliminated parking minimums as of October of this year.
(Source: https://people.ucsc.edu/~jwest1/articles/MillardBall_West_Rezaei_Desai_SFBMR_UrbanStudies.pdf).

9.7. A Reduction to the Minimum Vehicle Parking Requirements Increases the Supply of Housing

Increasing the supply of affordable housing is a Provincial and local municipality priority. Parking minimums increase the cost of housing, by adding to construction costs which may in turn be passed on to residents. Typical underground parking costs in the GTA Complex conditions can add up to $200/ft^2 more (*Source: AltusGroup - 2021 Canadian Cost Guide*).

This translates to a $48,000 - $160,000 increase in the cost of housing. There are also short term and long-term maintenance/condo fees related to this parking. The ability to avoid the cost of parking by choosing housing without parking is limited by the existence of minimum parking requirements. Many municipalities in Ontario, Canada and abroad have acknowledged that current automobile parking standards represent a barrier to the Town achieving its housing vision and have recently made decisions to severely reduce and / or eliminate parking minimums in areas well-served by transit.

9.7.1. City of Toronto

The City of Toronto has recognized that the requirement of excessive parking is a barrier to achieving the City's housing needs and objectives, auto-independence and promoting other modes of transportation such as public transit, walking and cycling. In March, 2022, the City of Toronto Council has adopted Zoning By-Law Amendments that removed the minimum parking requirement for residential component, instead, the Zoning By-law only speaks to the maximum parking rates that can be applied to a proposed residential development (By-law 89-2022 - removal of minimum residential parking space requirements and the establishment of residential parking maximums provided in Provision 18).

9.7.2. City of Edmonton

In June of 2020, the City of Edmonton Council voted unanimously to change the Zoning By-law with no minimum vehicle parking requirements. Maximum parking requirements will remain in effect downtown and are being expanded in transit-oriented developments and main street areas.

9.7.3. Other Cities in the United States

A number of American cities have eliminated minimum parking requirements on new developments:

- City of Buffalo, 2017
- City of Minneapolis, 2021
- City of San Diego, 2021
- City of San Jose, 2022
- City of San Francisco, 2018
- City of Portland,
- City of Berkeley, 2021
- City of Sacramento, 2021
- City of South Bend, 2021
- City of Alameda, 2021
- City of Richmond, 2021
- City of St. Paul, 2021
- City of Emeryville, 2019
- City of Raleigh, 2022
- City of Ann Arbor, 2022
- City of Canandaigua, 2020
- City of Jackson, 2021
- Culvert City, 2022
- City of Dunwoody, 2019
- City of Lexington, 2022
- City of Albemarle, 2021
- City of Hudson, 2019

9.7.4. City of Vaughan

The City of Vaughan Council passed Zoning By-law 001-2021 in October of 2021 (part of the By-law is being appealed to the LPAT), that includes a reduction in the minimum number of parking spaces required. Under the previous Zoning

By-law No. 1-88, a minimum of 1.5 parking spaces per dwelling unit was required. The City's new Zoning By-law No. 001-2021 will include a notable reduction in parking rates in the Vaughan Metropolitan Centre (VMC) area, with a rate of only 0.55 spaces/unit (0.40 spaces/unit for residents and 0.15 spaces/unit for visitors). While the Zoning By-law rates have been set, we do know that lower rates than the new by-law rates have been approved in the VMC. It should be noted that the VMC shares similar characteristics with the subject site's area with significant transit investments by all levels of government.

9.7.5. City of Ottawa

The City of Ottawa Zoning By-Law parking requirements were revised to eliminate minimum parking requirements for developments within 600 metres of an LRT station, and similar to the City of Toronto, it adopts a maximum allowable parking rates for new development. This is to support the new major transit investment of the Confederation Line which opened in December 2019 and services through the downtown area. New residential developments near LRT stations are not required to provide any resident parking and only require to provide visitor parking at a rate of 0.10 spaces per unit.

9.7.6. City of Brampton

The City of Brampton has adopted Zoning By-law Amendment No. 45-2021 to the Zoning By-law No. 270-2004 for the Downtown, Central Area and Hurontario/Main Street Corridor. The By-law states that, notwithstanding any minimum parking requirement prescribed in Sections 10.9.2(a), 10.9.3, 20.3.1 and 30.5, there shall be no minimum required parking for any use within the boundaries of Schedule B-7.

This is a very encouraging provision to support and address housing affordability and shortage in the City of Brampton. This is also in-line with other jurisdictions in the GTA such as the City of Toronto as indicated above. Given that the proposed development is located adjacent to three rapid transit lines (Hurontario LRT, Milton GO Line and Dundas BRT further to the south). We recommend the proposed development have a much lower rate, or no minimum, similar to the City of Brampton and the City of Toronto, as presented in this Study.

The municipalities that have severely reduced and / or remove parking minimums have not re-imposed them, noting that they have been successful. They have found that the reduction to the minimum automobile parking requirements does not remove or prohibit parking in new developments but rather recognizes that parking minimums embedded in their prevailing zoning by-laws may not be nuanced enough or be updated frequently enough to be applicable in all situations and equitable access, such as for accessible parking, can still maintain. Specifically, the City of Toronto cited:

".. the amount of parking that is required sorts itself out through market mechanisms. If someone wants a parking spot, they can get one through renting or purchasing a property that includes a parking spot. If developers realize they are unable to sell units without parking, parking will be provided."

9.8. A Reduction to the Minimum Vehicle Parking Requirements Will Help Supporting Local Businesses

A lower parking rate can help to support local businesses and improve the overall vibrancy of the community. When tenants are encouraged to use alternative forms of transportation, they are more likely to walk or bike to local shops, restaurants, and other businesses. This can help to support the local economy and create a more vibrant and dynamic community. A study from London England found that implementing policies aimed at reducing auto-dependence and encouraging transportation alternatives to automobiles, increased retail spend by 30% in local town centres and on main streets. And over a month, people who walk to the main street spend up to 40% more than people who drive there. *(Source: https://content.tfl.gov.uk/town-centres-report-13.pdf).* This is consistent with other policy and design interventions implemented in other cities like the City of Toronto, New York City and Seattle. For example, the introduction of bike lanes, and the recent removal of parking minimums, on Vanderbilt Avenue, in New York City, led to a 102% increase in retails sales and, similarly, on Latona Avenue and 65 Street, in Seattle, a similar intervention increased retail sale by 400%.

(Source: https://www.toronto.ca/wp-content/uploads/2019/11/8fd3-Bloor-Bike-Lane-Economic-Impact-Research-Summary-2019.pdf).

9.9. A Reduction to the Minimum Vehicle Parking Requirements has a Number of General Benefits

A reduction in the minimum parking requirements which decreases vehicle trips and increases transit usage (as proven via the UCLA study above) also provides the following benefits:

- Reduced traffic congestion in the area. Refer to Section 3.2 (2016 TTS Mode Share) of this report which demonstrates that a reduction in vehicle parking reduces the number single-occupancy trips.
- Reduced GHG emissions. The grams of CO2 per person kilometer traveled for a car is 243.8 grams, 20 grams for a streetcar, and zero grams for walking and biking.
  (Source: https://sensibletransport.org.au/project/transport-and-climate-change/)
- Safer streets for all road users, other drivers, bicyclists, pedestrians. A new controlled study from the Department of Safety and the Environment Institute of Transport Economics in Oslo, Norway showed that the more bikes there were, the more drivers saw bikes and were able to coexist safely with riders. The number of accidents between cars and bicycles decreased substantially as the number of people riding bicycles increased.

9.10. Sustainable Halton – Maintaining and Improving the Urban System - Transit First

Through the Working Paper #1 of the Sustainable Halton (prepared by Urban Strategies Inc.) indicates that priority for transit is a fundamental principle in developing growth management concepts. Opportunities are being sought to enhance transit service and access and increase ridership through new opportunities for higher density, a mix of uses and a focus on nodes and corridors in both existing and new development areas. There are opportunities to reinforce existing higher order GO Transit services through the GO Expansion Program with the Lakeshore West GO Line all-day, two-way and 15-minute train service between Toronto Downtown and Oakville. Therefore, the proposed development is supportive of this strategy and will provide a health transit ridership supply to the future transit system for the area. However, in order to continue to support this initiative, reducing vehicle parking supply is a must to make it a reality.

9.11. Conclusion on Why Vehicle Parking Rate Reduction is Justified

Based on the comprehensive justifications provided above, it is concluded that reduction to the residential parking rate is justified, desirable and would support the Town of Oakville Official Plan Sustainability Policies and Objectives:

- The proposed parking rate reductions would be consistent with the PPS, the Growth Plan, Halton Region Official Plan and the Town Official Plan sustainability objectives. In particular, the experience in these other cited municipalities demonstrates that automobile parking minimums can be eliminated and still achieve Official Plan policies which require adequate or sufficient parking off-street or on-site.
- Given these considerations, and in the context of the area, the proposed reduction to the minimum automobile parking requirements is justified, desirable and would better support various planning requirements to:
  - create compact complete communities
  - encourage transportation alternatives to automobiles
  - be consistent with policies aimed at reducing auto-dependence
  - support and encourage land- and cost-efficient forms close to the downtown area

10.0 BICYCLE PARKING ASSESSMENT

Table 13 summarizes the Town of Oakville Zoning By-law No. 2014-014 bicycle parking requirement for the proposed development.

Table 13 – Bicycle Parking Space Requirements

Land Use	No. of Unit / GFA	Short-term		Long-term		Total
		Rates	Spaces	Rates	Spaces	

Residential	48 units	0.25 spaces/unit	12	1.0 spaces/unit	48	48
Retail	200 m^2	1.0 spaces/1000 m^2	0	NA	0	0

Based on the assessment provided above, the proposed development is required to provide a total of 48 bicycle parking spaces for residential and 12 for visitor, for a total of 60 bicycle parking spaces. However, the proposed development will provide a total of 68 bicycle parking spaces, including 48 long-term and 20 short-term spaces. The long bicycle parking spaces will be provided within the residential units and short-term/visitor bicycle parking spaces will be provided at a convenient location on-site, as illustrated in the proposed site plan.

11.0 TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) is a co-ordinated series of actions aimed at maximizing the people moving capability of the transportation system. Intended to reduce single-occupant auto use, potential TDM measures include: TDM supportive land use, bicycle and pedestrian programs and facilities, public transit improvements, preferential treatments for buses and ridesharing, where appropriate.

As the gas price is record high, along with increasing inflation, the residents will automatically find ways to conduct hybrid working as noted in Section 9 of this Study, carpool or taking transit to curb the costs of living. It is the responsibility of the Region and the Town to provide these major infrastructure options for residents, such as providing public transit and active transportation facilities, which are beyond the scope and ability of the proposed development.

The following TDM incentives are recommended for the proposed residential development, based on NexTrans' review of the development area context:

- Given that parking management is the best TDM measures, the proposed development should implement the recommended parking rates provided in this Study based on the comprehensive parking justifications to support TDM and minimize the numbers of single-occupant-vehicle trips;
- The proposed development only provides the recommended vehicle parking rates outlined in this Study;
- Provide direct shared pedestrian/bicycle connections from the proposed development to Garden Drive as illustrated in the proposed site plan, where appropriate;
- Provide a total of 68 bicycle parking spaces on-site, including 48 long-term and 20 short-term spaces; and
- Provide information package for new residents in a form of an electronic letter or email. The information package will include Oakville Transit schedules, GO Transit schedules, and community and cycling maps

These measures will be implemented through site plan submission, agreement and prior to unit occupancy.

12.0 CONCLUSIONS / FINDINGS

12.1. Study Conclusions

The findings and conclusions of the analysis are as follows:

- The proposed development is expected to generate 48 total two-way vehicle trips (15 inbound and 33 outbound) and 67 total two-way vehicle trips (39 inbound and 28 outbound) during the morning and afternoon peak hours, respectively.
- Based on the intersection capacity analysis, under the existing, future background and future total traffic conditions, all intersections considered in the analysis are expected to operate at acceptable levels of service, from overall intersection operational perspective, during both the morning and afternoon peak hours. The estimated queues can be accommodated within the available storage length. No critical movements have been identified and therefore no improvements are required to accommodate the proposed development.

The proposed site accesses are expected to operate at acceptable levels of service with maximum of one vehicle every 8 minutes during the peak hours. No long delays or queues are expected under the future total conditions.

- As the existing transit modal split based on 2016 TTS data is about 10% during both morning and afternoon peak hours, if 10% modal split is applied, the proposed development is expected to generate 5 total two-way transit trips (2 inbound and 3 outbound) and 7 total two-way transit trips (4 inbound and 3 outbound) during the morning and afternoon peak hours, respectively.

  As the estimated transit ridership for the proposed development is very low, the two existing transit routes (Oakville Transit Bus Routes 14 & 14A Lakeshore West and 15 Bridge) can accommodate these trips. It is anticipated that no additional transit improvements in the area are required to accommodate the proposed development.

- The area will also have a complete network of active transportation facility in the future as identified in the Town of Oakville Active Transportation Master Plan. Therefore, no improvements are required beyond the identified plans to accommodate the proposed development.

- Based on the applicable Zoning By-law, the proposed development would be required to provide a total of 105 vehicle parking spaces, inclusive of residential, visitor and retail uses. These vehicle parking rates are excessive and do not support the sustainability vision of the Town of Oakville Official Plan. In order to encourage residents to take more sustainable modes of transportation, parking rates should and must be reduced as parking management is the best Transportation Demand Management measure.

  However, based on the recommended vehicle parking rates provided in this Study based on the development context and justifications, the proposed development will provide a total of 59 vehicle parking spaces for residential, visitor and retail components. This reduction is required to discourage private car ownership in order to reduce single-occupant-vehicle trips to and from the proposed development. It should be noted that the proposed development is required and will provide 1 barrier-free parking space in Block D.

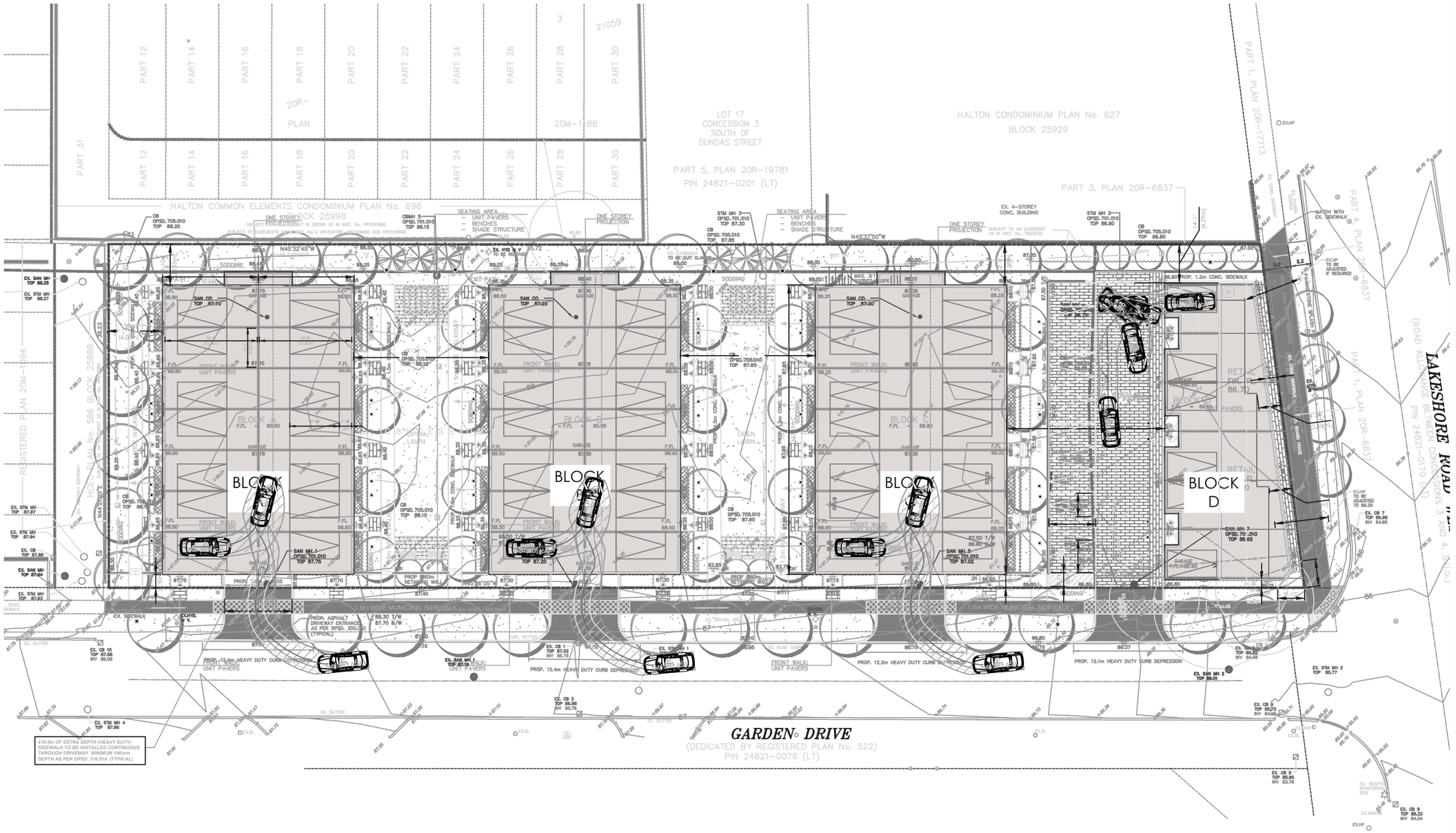
- Based on the assessment provided in this Study, the proposed development is required to provide a total of 48 bicycle parking spaces for residential and 12 for visitor, for a total of 60 bicycle parking spaces. However, the proposed development will provide a total of 68 bicycle parking spaces, including 48 long-term and 20 short-term spaces. The long bicycle parking spaces will be provided within the residential units and short-term/visitor bicycle parking spaces will be provided at a convenient location on-site, as illustrated in the proposed site plan.

- Solid waste pick-up will be conducted along Garden Drive, similar to the existing developments in the area.

12.2. Study Recommendations

Based on the findings of this Study, the following recommendations are provided:

- The Town and the Region approve the proposed residential mixed-use development;
- The proposed development only provides the recommended vehicle parking rates outlined in this Study, with 48 vehicle parking spaces for residential and 11 for visitors/retails/barrier-free;
- The proposed development provides direct shared pedestrian/bicycle connections from the proposed development to Garden Drive and Lakeshore Road W, where appropriate;
- Provide a total of 68 bicycle parking spaces on-site, including 48 long-term and 12 short-term spaces; and
- The proposed development implements the TDM measures and incentives identified in this report to support active transportation and transit and to reduce the numbers of single-occupant-vehicle trips to and from the proposed development



KEY PLAN

BENCHMARK

REVISONS

NO	REVISION	DATE	BY

STAMP

nextrans
CONSULTING ENGINEERS
Suite 201, 520 Industrial Parkway South
Aurora ON L4G 6W8
Tel: 905-503-2563
Web: www.nextrans.ca

PROJECT NAME:

Residential Development

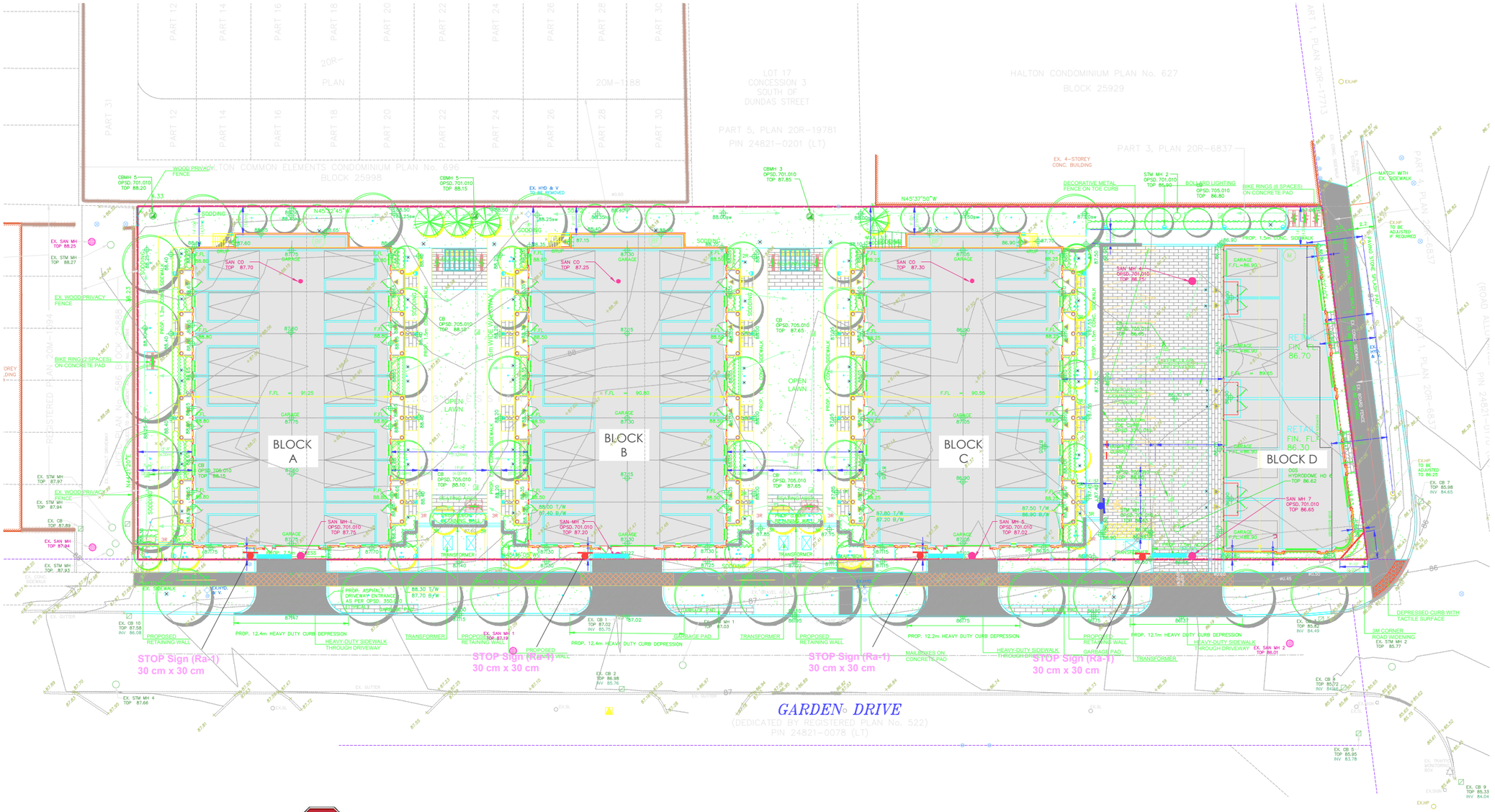
109 Garden Drive

Town of Oakville

DRAWING TITLE:

AutoTURN Analysis
P TAC-2017

DESIGN BY: K.A.	DATE: June 12, 2024
CHECKED BY: R.P.	PROJECT NO. NT-24-100
DRAWN BY: K.A.	
SCALE: NTS	DRAWING NO. Figure 17



STOP

RA-1

STOP Sign (Ra-1)
30 cm x 30 cm

ACCESSIBLE PARKING PERMIT Sign (Rb-93)
30 cm x 45 cm

STOP BAR
Solid White Retro-Reflective Line
between 30cm and 60 cm Wide

KEY PLAN

BENCHMARK

REVISONS

NO	REVISION	DATE	BY

STAMP

nexTrans
CONSULTING ENGINEERS
Suite 201, 520 Industrial Parkway South
Aurora ON L4G 6W8
Tel: 905-503-2563
Web: www.nextrans.ca

PROJECT NAME:
Residential Development
109 Garden Dr
Town of Oakville

DRAWING TITLE:
Signage and Pavement Marking Plan

DESIGN BY: K.A.	DATE: June 25, 2024
CHECKED BY: R.P.	PROJECT NO. NT-24-100
DRAWN BY: K.A.	
SCALE: NTS	DRAWING NO. Figure 18

Appendix A
Submitted Study Terms of Reference

From: Sam Nguyen
Sent: May 30, 2024 11:49 AM
To: Syed Rizvi
Cc:
Subject: 109 Garden Drive, Oakville - Proposed TIS Terms of Reference
Attachments: 2417-Site plan 2024.05.23-.pdf

Hi Syed,

We have been retained to undertake a TIS to support a proposed mixed-use development located at 109 Garden Drive, in the Town of Oakville. Please find the attached conceptual plan, without prejudice, for your information and reference. The following is a proposed scope of the TIS that takes into consideration both the Town's Traffic Impact Study Guidelines (January 2015):

1. Study Area intersection:
    a. Garden Drive / Rebecca Street (unsignalized)
    b. Garden Drive / Lakeshore Road West (unsignalized)
2. Horizon Year
    a. Anticipated project completion by 2026-2027
    b. Analysis horizon year 2029 (*five-year horizon from 2024)*
3. Background Developments and Growth Rate
    a. Background corridor through traffic growth – assumed 2.0%or based on background studies
    b. To follow this link for active background applications Active Development Applications
4. Trip Generation
    a. ITE Trip Generation Manual 11th Edition
    b. Use engineering judgement, local knowledge, trip generation parameters and other data, where appropriate
5. Trip Distribution
    a. Extract 2016 TTS data based on the surrounding traffic zones or use existing trip distribution, where appropriate
    b. Use engineering judgement, catchment area or marketing information, where appropriate
6. Transportation Assessment
    a. Existing conditions
    b. Future background conditions; and
    c. Future total conditions
    d. The following tasks will be conducted:
        i. Intersection operation assessment for Auto Mode (using existing signal timing and optimize as necessary) *(use existing signal timings. If optimized timings are provided, they are to be provided in addition to the existing signal timings)*
        ii. Non-auto mode assessment (walking, cycling and public transit)
        iii. Proposed development access assessment
        iv. Vehicular and Bicycle Parking Assessment
        v. Internal Site Circulation and loading assessment
7. Transit, Active Transportation and TDM
    a. Conduct a review of the existing and proposed future transit network in the area. Based on these findings, appropriate recommendations will be provided to ensure adequate walking distances to/from the proposed development to transit stations/stops.
    b. Review the existing and proposed future active transportation network in the area. Based on these findings, NexTrans will identify missing gaps and additional interconnections and connections

from the proposed development to adjacent land uses, the Town's facilities, as well as to transit stations/stops.

c. A Transportation Demand Management (TDM) assessment will be undertaken to identify specific measures and programs to reduce single-occupant-vehicle trips to/from the proposed development. These TDM measures and programs may include but not limited to, Carpooling, Auto Share, Bike racks, Parking management strategies, etc. The TDM report will be completed and included as part of this Study for submission purposes submitted in accordance with the Town's requirements. *(The Applicant does not have to do a TDM report, but Transportation Planning requires:*
   - *Short-term bicycle parking within the property limits as per applicable Zoning Bylaw;*
   - *Long-term bicycle parking that is secure and shielded from the elements as per applicable Zoning Bylaw;*

d. *Transportation Planning recommends that the Applicant provides*
   - *Transit incentives;*
   - *Carshare spaces;*
   - *Bike repair station*

8. Parking Justification Study based on:
   - Policies
   - TDM
   - Proposed land use contexts

Thanks

Trang Nguyen (Sam)
Transportation Analyst

o: 905-503-2563 ext. 207
e: sam@nextrans.ca
w: www.nextrans.ca

NexTrans Consulting Engineers
A Division of NextEng Consulting Group Inc.
520 Industrial Parkway South, Suite 201
Aurora ON L4G 6W8

Appendix B
Existing Traffic Data and Signal Timing Plans

Spectrum

Turning Movement Count
Location Name: GARDEN DR & LAKESHORE RD W
Date: Tue, Jun 04, 2024 Deployment Lead: David Chu

NexTrans
SUITE 201 520 INDUSTRIAL PARKWAY
SOUTH
AURORA ONTARIO, L4G 6W8
CANADA

Turning Movement Count (2 . GARDEN DR & LAKESHORE RD W)

Start Time	Southbound GARDEN DR						Westbound LAKESHORE RD W						Northbound SOUTH ENTRANCE						Eastbound 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		
07:00:00	0	0	0	0	1	0	0	25	0	0	0	25	0	0	0	0	2	0	0	46	2	0	0	48	73	
07:15:00	1	0	0	0	0	1	1	36	0	0	0	37	0	0	0	0	2	0	0	65	1	0	0	66	104	
07:30:00	1	0	0	0	2	1	0	37	0	0	1	37	0	0	0	0	0	0	0	69	1	0	1	70	108	
07:45:00	0	0	0	0	4	0	0	50	0	0	0	50	0	0	0	0	4	0	0	96	1	1	0	98	148	433
08:00:00	2	0	0	0	5	2	2	74	0	0	0	76	0	0	0	0	4	0	0	117	2	0	0	119	197	557
08:15:00	3	0	1	0	3	4	1	116	0	0	0	117	0	0	0	0	7	0	1	133	4	0	0	138	259	712
08:30:00	3	0	1	0	1	4	1	115	0	0	0	116	0	0	0	0	6	0	0	150	2	0	0	152	272	876
08:45:00	0	0	0	0	2	0	3	98	0	0	0	101	0	0	0	0	5	0	1	138	1	0	0	140	241	969
09:00:00	1	0	0	0	0	1	2	87	0	0	0	89	0	0	0	0	2	0	0	117	0	0	0	117	207	979
09:15:00	3	0	0	0	2	3	1	76	0	0	1	77	0	0	0	0	5	0	0	103	1	0	0	104	184	904
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09:45:00	1	0	1	0	4	2	2	91	0	0	0	93	0	0	0	0	11	0	0	119	0	0	0	119	214	808
BREAK																										
16:00:00	1	0	0	0	2	1	1	177	1	0	0	179	0	0	1	0	3	1	1	136	1	0	0	138	319	
16:15:00	1	0	1	0	4	2	2	181	1	0	0	184	1	0	0	0	11	1	0	123	1	0	0	124	311	
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16:45:00	1	0	3	0	0	4	2	167	0	0	0	169	0	0	0	0	1	0	0	107	1	0	0	108	281	1185
17:00:00	1	0	0	0	2	1	1	163	0	0	0	164	0	0	0	0	4	0	0	132	2	0	0	134	299	1165
17:15:00	0	0	0	0	5	0	0	163	0	0	0	163	0	0	0	0	5	0	0	125	1	0	0	126	289	1143
17:30:00	1	0	1	0	3	2	2	129	0	0	0	131	0	0	0	0	5	0	0	119	0	0	0	119	252	1121
17:45:00	3	0	0	0	0	3	0	111	0	0	0	111	1	0	0	0	3	1	2	111	0	0	1	113	228	1068
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18:15:00	2	0	0	0	0	2	0	101	0	0	0	101	0	0	0	0	8	0	0	104	2	0	0	106	209	951
18:30:00	2	0	1	0	1	3	1	113	0	0	0	114	0	0	0	0	2	0	0	94	0	0	0	94	211	910
18:45:00	1	0	0	0	5	1	3	111	0	0	0	114	0	0	0	0	4	0	0	91	0	0	0	91	206	888
Grand Total	29	0	11	0	52	40	33	2594	3	1	2	2631	2	0	1	0	111	3	6	2645	25	1	3	2677	**5351**	-
Approach%	72.5%	0%	27.5%	0%		-	1.3%	98.6%	0.1%	0%		-	66.7%	0%	33.3%	0%		-	0.2%	98.8%	0.9%	0%		-	**-**	-
Totals %	0.5%	0%	0.2%	0%		0.7%	0.6%	48.5%	0.1%	0%		49.2%	0%	0%	0%	0%		0.1%	0.1%	49.4%	0.5%	0%		50%	**-**	-
Heavy	0	0	0	0		-	1	35	0	0		-	0	0	0	0		-	0	36	0	0		-	**-**	-
Heavy %	0%	0%	0%	0%		-	3%	1.3%	0%	0%		-	0%	0%	0%	0%		-	0%	1.4%	0%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: GARDEN DR & LAKESHORE RD W
Date: Tue, Jun 04, 2024 Deployment Lead: David Chu

NexTrans
SUITE 201 520 INDUSTRIAL PARKWAY SOUTH
AURORA ONTARIO, L4G 6W8
CANADA

Peak Hour: 08:15 AM - 09:15 AM Weather: Overcast Clouds (15.6 °C)

Start Time	Southbound GARDEN DR						Westbound LAKESHORE RD W						Northbound SOUTH ENTRANCE						Eastbound 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	
08:15:00	3	0	1	0	3	4	1	116	0	0	0	117	0	0	0	0	7	0	1	133	4	0	0	138	259
08:30:00	3	0	1	0	1	4	1	115	0	0	0	116	0	0	0	0	6	0	0	150	2	0	0	152	272
08:45:00	0	0	0	0	2	0	3	98	0	0	0	101	0	0	0	0	5	0	1	138	1	0	0	140	241
09:00:00	1	0	0	0	0	1	2	87	0	0	0	89	0	0	0	0	2	0	0	117	0	0	0	117	207
Grand Total	7	0	2	0	6	9	7	416	0	0	0	423	0	0	0	0	20	0	2	538	7	0	0	547	**979**
Approach%	77.8%	0%	22.2%	0%		-	1.7%	98.3%	0%	0%		-	0%	0%	0%	0%		-	0.4%	98.4%	1.3%	0%		-	**-**
Totals %	0.7%	0%	0.2%	0%		0.9%	0.7%	42.5%	0%	0%		43.2%	0%	0%	0%	0%		0%	0.2%	55%	0.7%	0%		55.9%	**-**
PHF	0.58	0	0.5	0		0.56	0.58	0.9	0	0		0.9	0	0	0	0		0	0.5	0.9	0.44	0		0.9	**-**
Heavy	0	0	0	0		0	0	10	0	0		10	0	0	0	0		0	0	7	0	0		7	**-**
Heavy %	0%	0%	0%	0%		0%	0%	2.4%	0%	0%		2.4%	0%	0%	0%	0%		0%	0%	1.3%	0%	0%		1.3%	**-**
Lights	7	0	2	0		9	7	403	0	0		410	0	0	0	0		0	2	527	7	0		536	**-**
Lights %	100%	0%	100%	0%		100%	100%	96.9%	0%	0%		96.9%	0%	0%	0%	0%		0%	100%	98%	100%	0%		98%	**-**
Single-Unit Trucks	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	0	4	0	0		4	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	1.2%	0%	0%		1.2%	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.7%	**-**
Buses	0	0	0	0		0	0	4	0	0		4	0	0	0	0		0	0	2	0	0		2	**-**
Buses %	0%	0%	0%	0%		0%	0%	1%	0%	0%		0.9%	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.4%	**-**
Articulated Trucks	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	1	0	0		1	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.2%	**-**
Bicycles on Road	0	0	0	0		0	0	3	0	0		3	0	0	0	0		0	0	4	0	0		4	**-**
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.7%	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.7%	**-**
Pedestrians	-	-	-	-	5	-	-	-	-	-	0	-	-	-	-	-	19	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	19.2%		-	-	-	-	0%		-	-	-	-	73.1%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	3.8%		-	-	-	-	0%		-	-	-	-	3.8%		-	-	-	-	0%		**-**

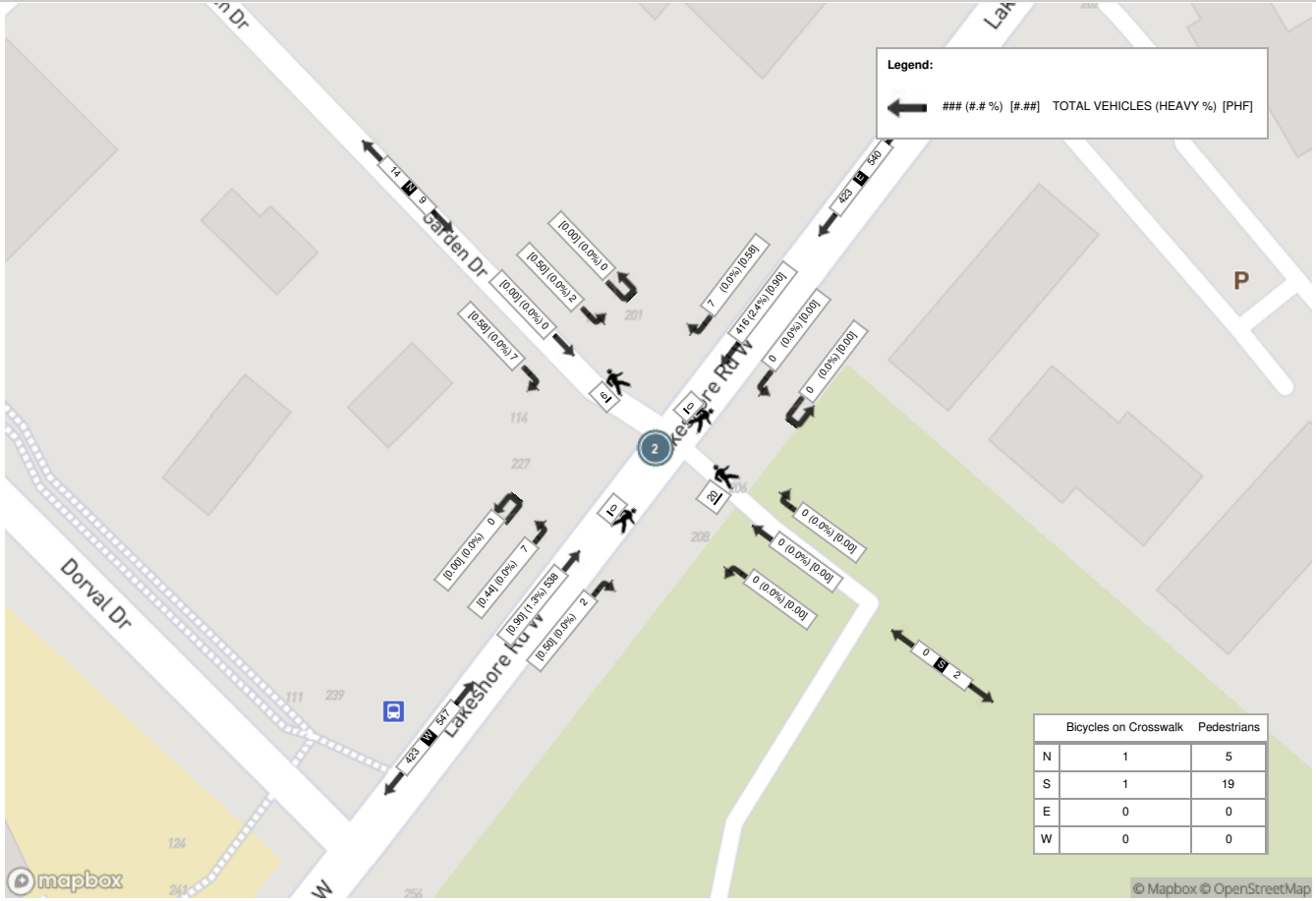
NexTrans
SUITE 201 520 INDUSTRIAL PARKWAY
SOUTH
AURORA ONTARIO, L4G 6W8
CANADA

Peak Hour: 04:00 PM - 05:00 PM Weather: Overcast Clouds (25.02 °C)

Start Time	Southbound GARDEN DR						Westbound LAKESHORE RD W						Northbound SOUTH ENTRANCE						Eastbound 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	
16:00:00	1	0	0	0	2	1	1	177	1	0	0	179	0	0	1	0	3	1	1	136	1	0	0	138	319
16:15:00	1	0	1	0	4	2	2	181	1	0	0	184	1	0	0	0	11	1	0	123	1	0	0	124	311
16:30:00	0	0	1	0	2	1	2	146	0	1	0	149	0	0	0	0	4	0	0	124	0	0	0	124	274
16:45:00	1	0	3	0	0	4	2	167	0	0	0	169	0	0	0	0	1	0	0	107	1	0	0	108	281
Grand Total	3	0	5	0	8	8	7	671	2	1	0	681	1	0	1	0	19	2	1	490	3	0	0	494	**1185**
Approach%	37.5%	0%	62.5%	0%		-	1%	98.5%	0.3%	0.1%		-	50%	0%	50%	0%		-	0.2%	99.2%	0.6%	0%		-	**-**
Totals %	0.3%	0%	0.4%	0%		0.7%	0.6%	56.6%	0.2%	0.1%		57.5%	0.1%	0%	0.1%	0%		0.2%	0.1%	41.4%	0.3%	0%		41.7%	**-**
PHF	0.75	0	0.42	0		0.5	0.88	0.93	0.5	0.25		0.93	0.25	0	0.25	0		0.5	0.25	0.9	0.75	0		0.89	**-**
Heavy	0	0	0	0		0	0	9	0	0		9	0	0	0	0		0	0	8	0	0		8	**-**
Heavy %	0%	0%	0%	0%		0%	0%	1.3%	0%	0%		1.3%	0%	0%	0%	0%		0%	0%	1.6%	0%	0%		1.6%	**-**
Lights	3	0	5	0		8	7	656	2	1		666	1	0	1	0		2	1	472	3	0		476	**-**
Lights %	100%	0%	100%	0%		100%	100%	97.8%	100%	100%		97.8%	100%	0%	100%	0%		100%	100%	96.3%	100%	0%		96.4%	**-**
Single-Unit Trucks	0	0	0	0		0	0	4	0	0		4	0	0	0	0		0	0	4	0	0		4	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	0.6%	0%	0%		0.6%	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.8%	**-**
Buses	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	0	4	0	0		4	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.7%	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.8%	**-**
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Bicycles on Road	0	0	0	0		0	0	6	0	0		6	0	0	0	0		0	0	10	0	0		10	**-**
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0.9%	0%	0%		0.9%	0%	0%	0%	0%		0%	0%	2%	0%	0%		2%	**-**
Pedestrians	-	-	-	-	8	-	-	-	-	-	0	-	-	-	-	-	17	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	29.6%		-	-	-	-	0%		-	-	-	-	63%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	7.4%		-	-	-	-	0%		**-**

NexTrans
SUITE 201 520 INDUSTRIAL PARKWAY SOUTH
AURORA ONTARIO, L4G 6W8
CANADA

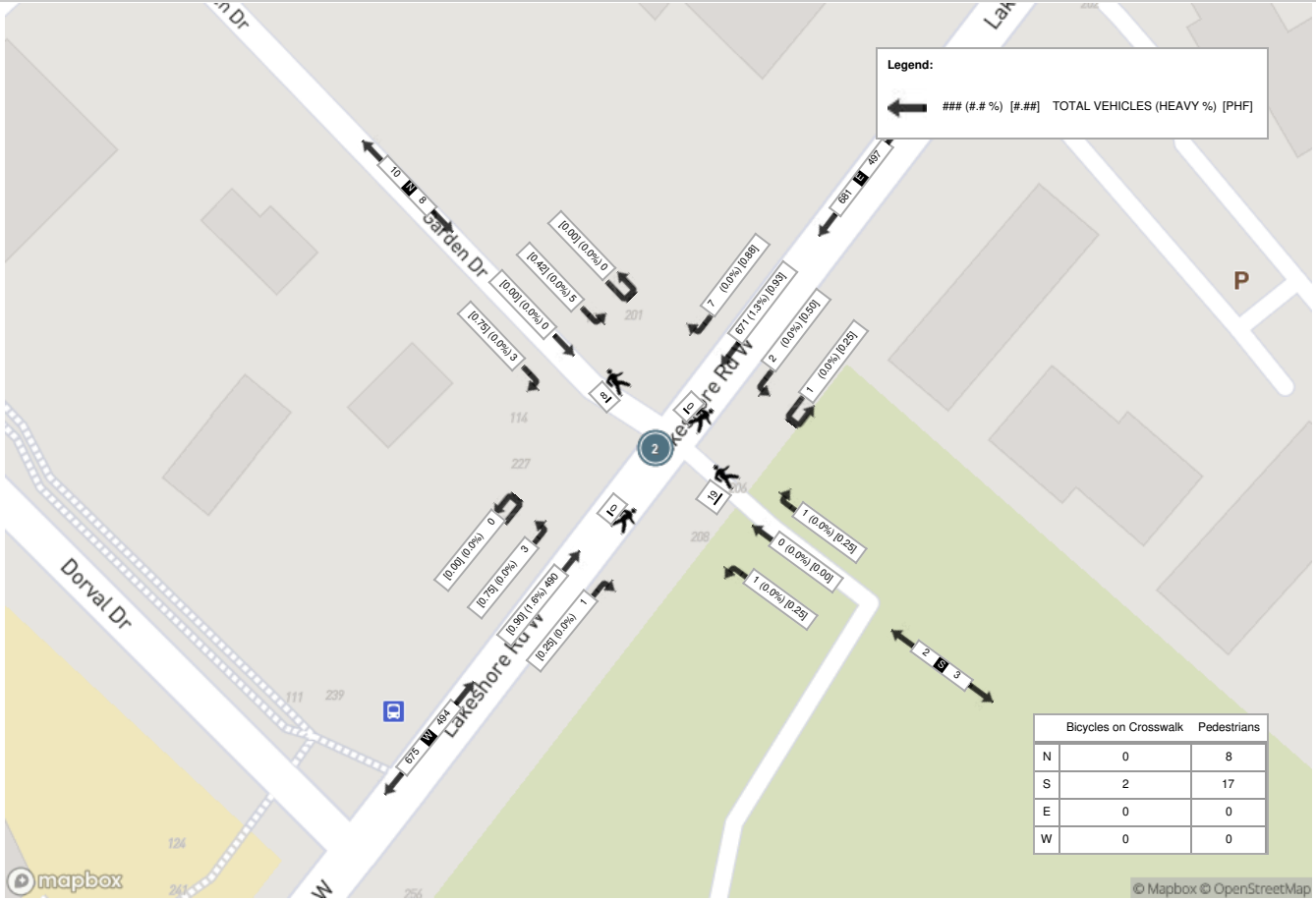
Peak Hour: 08:15 AM - 09:15 AM **Weather: Overcast Clouds (15.6 °C)**



	Bicycles on Crosswalk	Pedestrians
N	1	5
S	1	19
E	0	0
W	0	0

NexTrans
SUITE 201 520 INDUSTRIAL PARKWAY SOUTH
AURORA ONTARIO, L4G 6W8
CANADA

Peak Hour: 04:00 PM - 05:00 PM **Weather: Overcast Clouds (25.02 °C)**



	Bicycles on Crosswalk	Pedestrians
N	0	8
S	2	17
E	0	0
W	0	0

Spectrum

Turning Movement Count
Location Name: GARDEN DR & REBECCA ST
Date: Tue, Jun 04, 2024 Deployment Lead: David Chu

NexTrans
SUITE 201 520 INDUSTRIAL PARKWAY
SOUTH
AURORA ONTARIO, L4G 6W8
CANADA

Turning Movement Count (1 . GARDEN DR & REBECCA ST)

Start Time	Southbound GARDEN DR						Westbound REBECCA ST						Northbound GARDEN DR						Eastbound REBECCA ST						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		
07:00:00	0	0	0	0	0	0	0	29	1	0	0	30	2	0	1	0	0	3	0	43	0	0	0	43	76	
07:15:00	0	0	2	0	2	2	0	38	1	0	0	39	4	0	6	0	0	10	0	43	0	0	0	43	94	
07:30:00	0	0	1	0	1	1	0	49	0	0	0	49	1	0	4	0	3	5	1	69	0	0	1	70	125	
07:45:00	2	0	0	0	7	2	0	62	1	0	2	63	4	0	2	0	1	6	1	93	0	0	0	94	165	460
08:00:00	1	0	0	0	9	1	0	109	2	0	0	111	4	0	2	0	11	6	0	84	0	0	0	84	202	586
08:15:00	0	0	2	0	5	2	0	100	2	0	1	102	6	0	4	0	9	10	0	154	0	0	1	154	268	760
08:30:00	1	0	2	0	8	3	2	115	0	0	0	117	4	0	5	0	6	9	1	131	0	0	0	132	261	896
08:45:00	1	0	2	0	3	3	1	69	0	0	0	70	1	0	2	0	5	3	2	169	1	0	0	172	248	979
09:00:00	0	0	2	0	0	2	0	79	2	0	0	81	3	0	4	0	1	7	1	119	0	0	1	120	210	987
09:15:00	0	0	1	0	1	1	1	72	1	0	0	74	2	0	3	0	5	5	2	106	2	0	0	110	190	909
09:30:00	0	0	1	0	0	1	1	67	2	0	0	70	3	1	3	0	4	7	2	118	0	0	0	120	198	846
09:45:00	1	0	3	0	2	4	1	71	0	0	0	72	1	0	4	0	4	5	3	110	1	0	0	114	195	793
BREAK																										
16:00:00	0	0	0	0	3	0	0	146	1	0	0	147	1	0	2	0	2	3	2	81	1	0	0	84	234	
16:15:00	0	0	0	0	3	0	0	157	3	0	1	160	1	1	0	0	2	2	3	96	0	0	0	99	261	
16:30:00	0	0	0	0	6	0	1	133	1	0	0	135	2	0	1	0	6	3	0	89	1	0	0	90	228	
16:45:00	1	0	1	0	1	2	1	136	1	0	0	138	2	0	0	0	4	2	4	110	0	0	0	114	256	979
17:00:00	1	0	1	0	1	2	1	156	1	0	0	158	2	0	4	0	3	6	3	115	0	0	0	118	284	1029
17:15:00	1	0	1	0	3	2	3	182	2	0	1	187	1	0	3	0	6	4	1	123	0	0	0	124	317	1085
17:30:00	0	0	0	0	6	0	1	124	1	0	1	126	0	0	2	0	3	2	3	117	1	0	0	121	249	1106
17:45:00	0	0	1	0	5	1	0	114	6	0	0	120	3	0	2	0	1	5	3	96	0	0	0	99	225	1075
18:00:00	0	1	0	0	1	1	2	106	4	0	0	112	4	0	4	0	1	8	1	95	0	0	1	96	217	1008
18:15:00	1	0	0	0	2	1	2	99	2	0	0	103	2	0	3	0	1	5	3	97	1	0	0	101	210	901
18:30:00	0	0	2	0	6	2	1	84	3	0	0	88	0	0	2	0	1	2	5	97	1	0	0	103	195	847
18:45:00	0	1	1	0	0	2	1	76	3	0	0	80	0	0	2	0	3	2	3	95	1	0	0	99	183	805
Grand Total	10	2	23	0	75	35	19	2373	40	0	6	2432	53	2	65	0	82	120	44	2450	10	0	4	2504	**5091**	-
Approach%	28.6%	5.7%	65.7%	0%		-	0.8%	97.6%	1.6%	0%		-	44.2%	1.7%	54.2%	0%		-	1.8%	97.8%	0.4%	0%		-	**-**	-
Totals %	0.2%	0%	0.5%	0%		0.7%	0.4%	46.6%	0.8%	0%		47.8%	1%	0%	1.3%	0%		2.4%	0.9%	48.1%	0.2%	0%		49.2%	**-**	-
Heavy	1	0	0	0		-	0	62	0	0		-	1	0	0	0		-	0	60	2	0		-	**-**	-
Heavy %	10%	0%	0%	0%		-	0%	2.6%	0%	0%		-	1.9%	0%	0%	0%		-	0%	2.4%	20%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

NexTrans
SUITE 201 520 INDUSTRIAL PARKWAY
SOUTH
AURORA ONTARIO, L4G 6W8
CANADA

Peak Hour: 08:15 AM - 09:15 AM **Weather: Overcast Clouds (15.6 °C)**

Start Time	Southbound GARDEN DR						Westbound REBECCA ST						Northbound GARDEN DR						Eastbound REBECCA ST						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	
08:15:00	0	0	2	0	5	2	0	100	2	0	1	102	6	0	4	0	9	10	0	154	0	0	1	154	268
08:30:00	1	0	2	0	8	3	2	115	0	0	0	117	4	0	5	0	6	9	1	131	0	0	0	132	261
08:45:00	1	0	2	0	3	3	1	69	0	0	0	70	1	0	2	0	5	3	2	169	1	0	0	172	248
09:00:00	0	0	2	0	0	2	0	79	2	0	0	81	3	0	4	0	1	7	1	119	0	0	1	120	210
Grand Total	2	0	8	0	16	10	3	363	4	0	1	370	14	0	15	0	21	29	4	573	1	0	2	578	**987**
Approach%	20%	0%	80%	0%		-	0.8%	98.1%	1.1%	0%		-	48.3%	0%	51.7%	0%		-	0.7%	99.1%	0.2%	0%		-	**-**
Totals %	0.2%	0%	0.8%	0%		1%	0.3%	36.8%	0.4%	0%		37.5%	1.4%	0%	1.5%	0%		2.9%	0.4%	58.1%	0.1%	0%		58.6%	**-**
PHF	0.5	0	1	0		0.83	0.38	0.79	0.5	0		0.79	0.58	0	0.75	0		0.73	0.5	0.85	0.25	0		0.84	**-**
Heavy	0	0	0	0		0	0	14	0	0		14	0	0	0	0		0	0	14	0	0		14	**-**
Heavy %	0%	0%	0%	0%		0%	0%	3.9%	0%	0%		3.8%	0%	0%	0%	0%		0%	0%	2.4%	0%	0%		2.4%	**-**
Lights	2	0	8	0		10	3	341	4	0		348	14	0	15	0		29	4	554	1	0		559	**-**
Lights %	100%	0%	100%	0%		100%	100%	93.9%	100%	0%		94.1%	100%	0%	100%	0%		100%	100%	96.7%	100%	0%		96.7%	**-**
Single-Unit Trucks	0	0	0	0		0	0	7	0	0		7	0	0	0	0		0	0	6	0	0		6	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	1.9%	0%	0%		1.9%	0%	0%	0%	0%		0%	0%	1%	0%	0%		1%	**-**
Buses	0	0	0	0		0	0	7	0	0		7	0	0	0	0		0	0	8	0	0		8	**-**
Buses %	0%	0%	0%	0%		0%	0%	1.9%	0%	0%		1.9%	0%	0%	0%	0%		0%	0%	1.4%	0%	0%		1.4%	**-**
Articulated Trucks	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Bicycles on Road	0	0	0	0		0	0	8	0	0		8	0	0	0	0		0	0	5	0	0		5	**-**
Bicycles on Road %	0%	0%	0%	0%		0%	0%	2.2%	0%	0%		2.2%	0%	0%	0%	0%		0%	0%	0.9%	0%	0%		0.9%	**-**
Pedestrians	-	-	-	-	15	-	-	-	-	-	1	-	-	-	-	-	21	-	-	-	-	-	2	-	**-**
Pedestrians%	-	-	-	-	37.5%		-	-	-	-	2.5%		-	-	-	-	52.5%		-	-	-	-	5%		**-**
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	2.5%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

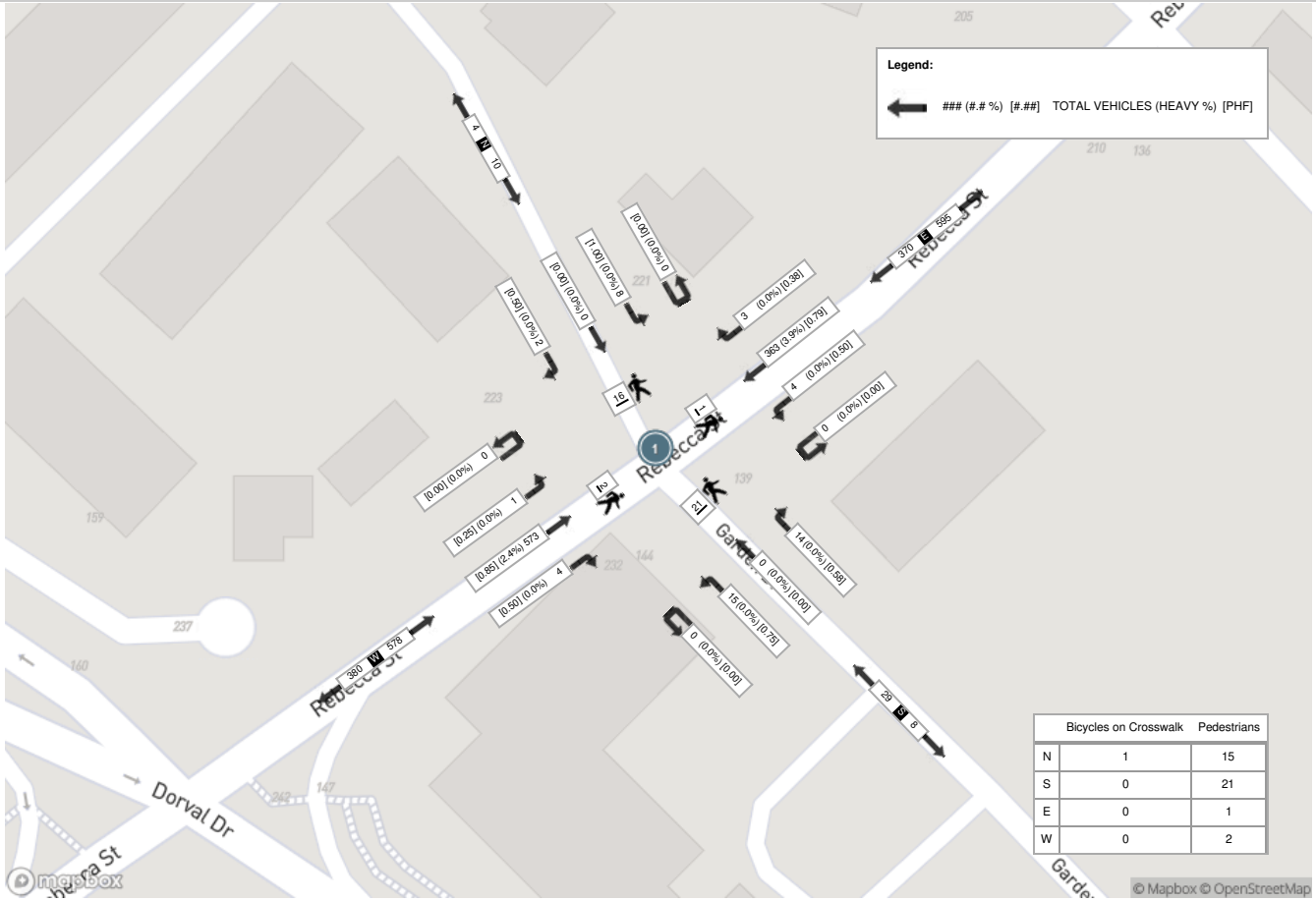
Turning Movement Count
Location Name: GARDEN DR & REBECCA ST
Date: Tue, Jun 04, 2024 Deployment Lead: David Chu

NexTrans
SUITE 201 520 INDUSTRIAL PARKWAY
SOUTH
AURORA ONTARIO, L4G 6W8
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (25.02 °C)

Start Time	Southbound GARDEN DR						Westbound REBECCA ST						Northbound GARDEN DR						Eastbound REBECCA ST						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	
16:45:00	1	0	1	0	1	2	1	136	1	0	0	138	2	0	0	0	4	2	4	110	0	0	0	114	256
17:00:00	1	0	1	0	1	2	1	156	1	0	0	158	2	0	4	0	3	6	3	115	0	0	0	118	284
17:15:00	1	0	1	0	3	2	3	182	2	0	1	187	1	0	3	0	6	4	1	123	0	0	0	124	317
17:30:00	0	0	0	0	6	0	1	124	1	0	1	126	0	0	2	0	3	2	3	117	1	0	0	121	249
Grand Total	3	0	3	0	11	6	6	598	5	0	2	609	5	0	9	0	16	14	11	465	1	0	0	477	**1106**
Approach%	50%	0%	50%	0%		-	1%	98.2%	0.8%	0%		-	35.7%	0%	64.3%	0%		-	2.3%	97.5%	0.2%	0%		-	**-**
Totals %	0.3%	0%	0.3%	0%		0.5%	0.5%	54.1%	0.5%	0%		55.1%	0.5%	0%	0.8%	0%		1.3%	1%	42%	0.1%	0%		43.1%	**-**
PHF	0.75	0	0.75	0		0.75	0.5	0.82	0.63	0		0.81	0.63	0	0.56	0		0.58	0.69	0.95	0.25	0		0.96	**-**
Heavy	1	0	0	0		1	0	7	0	0		7	0	0	0	0		0	0	6	1	0		7	**-**
Heavy %	33.3%	0%	0%	0%		16.7%	0%	1.2%	0%	0%		1.1%	0%	0%	0%	0%		0%	0%	1.3%	100%	0%		1.5%	**-**
Lights	2	0	3	0		5	6	584	5	0		595	5	0	9	0		14	11	454	0	0		465	**-**
Lights %	66.7%	0%	100%	0%		83.3%	100%	97.7%	100%	0%		97.7%	100%	0%	100%	0%		100%	100%	97.6%	0%	0%		97.5%	**-**
Single-Unit Trucks	1	0	0	0		1	0	1	0	0		1	0	0	0	0		0	0	2	1	0		3	**-**
Single-Unit Trucks %	33.3%	0%	0%	0%		16.7%	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0.4%	100%	0%		0.6%	**-**
Buses	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	0	3	0	0		3	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.8%	0%	0%	0%	0%		0%	0%	0.6%	0%	0%		0.6%	**-**
Articulated Trucks	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	1	0	0		1	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.2%	**-**
Bicycles on Road	0	0	0	0		0	0	7	0	0		7	0	0	0	0		0	0	5	0	0		5	**-**
Bicycles on Road %	0%	0%	0%	0%		0%	0%	1.2%	0%	0%		1.1%	0%	0%	0%	0%		0%	0%	1.1%	0%	0%		1%	**-**
Pedestrians	-	-	-	-	10	-	-	-	-	-	2	-	-	-	-	-	15	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	34.5%		-	-	-	-	6.9%		-	-	-	-	51.7%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	3.4%		-	-	-	-	0%		-	-	-	-	3.4%		-	-	-	-	0%		**-**

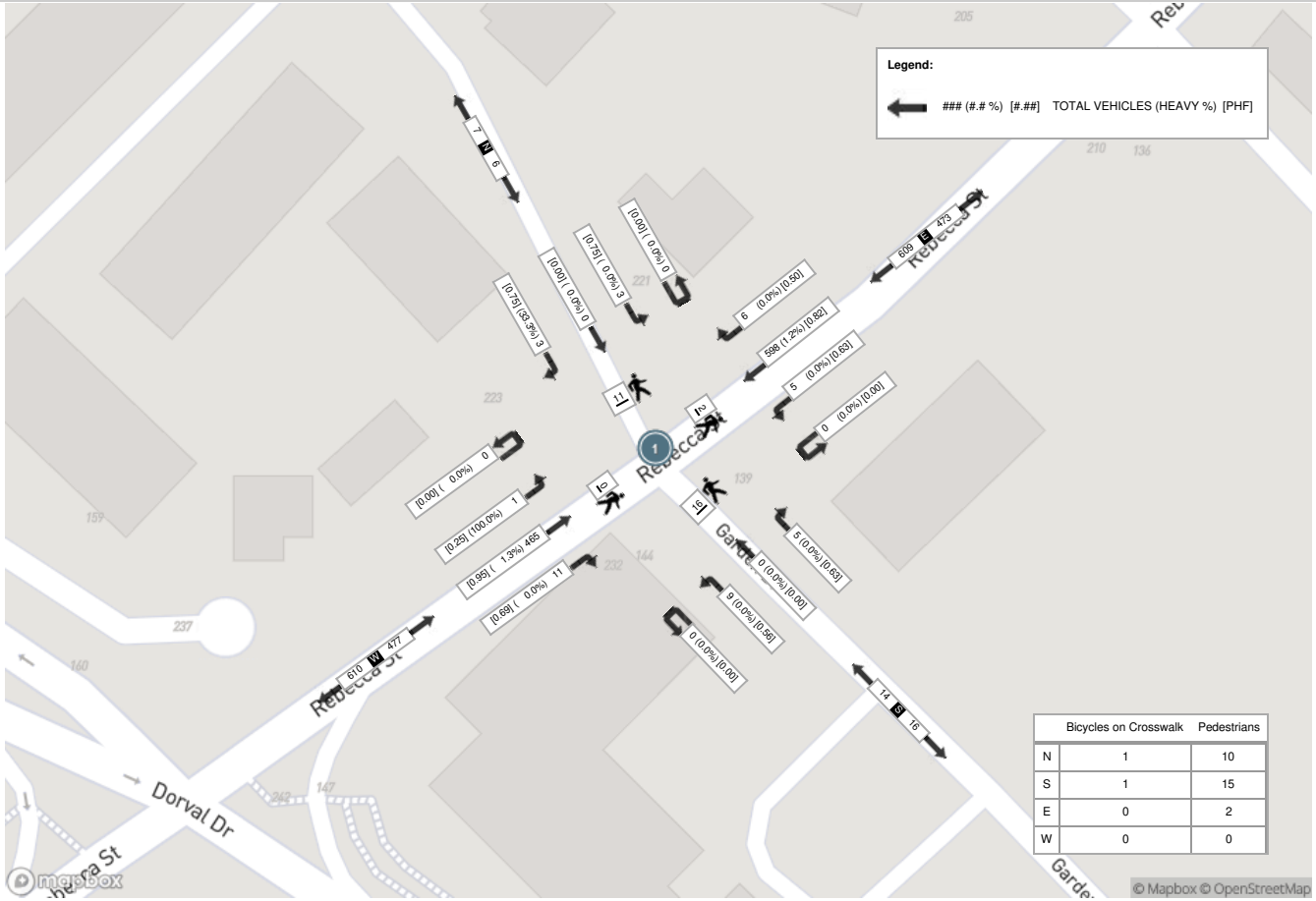
Peak Hour: 08:15 AM - 09:15 AM **Weather: Overcast Clouds (15.6 °C)**



	Bicycles on Crosswalk	Pedestrians
N	1	15
S	0	21
E	0	1
W	0	2

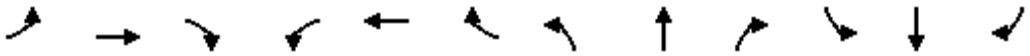
NexTrans
SUITE 201 520 INDUSTRIAL PARKWAY
SOUTH
AURORA ONTARIO, L4G 6W8
CANADA

Peak Hour: 04:45 PM - 05:45 PM Weather: Overcast Clouds (25.02 °C)



	Bicycles on Crosswalk	Pedestrians
N	1	10
S	1	15
E	0	2
W	0	0

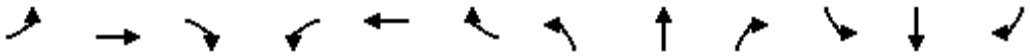
Appendix C
Existing Traffic Level of Service Calculations



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	538	2	0	416	7	0	0	0	2	0	7
Future Volume (Veh/h)	7	538	2	0	416	7	0	0	0	2	0	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	598	2	0	462	8	0	0	0	2	0	8
Pedestrians								20			6	
Lane Width (m)								3.5			3.5	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								2			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	476			620			1105	1111	619	1086	1108	472
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	476			620			1105	1111	619	1086	1108	472
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	99	100	99
cM capacity (veh/h)	1091			955			180	205	484	190	206	593

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	8	600	0	470	0	10
Volume Left	8	0	0	0	0	2
Volume Right	0	2	0	8	0	8
cSH	1091	1700	1700	1700	1700	417
Volume to Capacity	0.01	0.35	0.00	0.28	0.00	0.02
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.0	0.6
Control Delay (s)	8.3	0.0	0.0	0.0	0.0	13.8
Lane LOS	A				A	B
Approach Delay (s)	0.1		0.0		0.0	13.8
Approach LOS					A	B

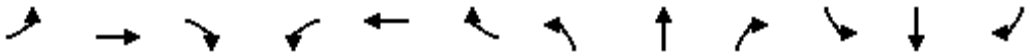
Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	38.4%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	573	4	4	363	3	15	0	14	8	0	2
Future Volume (Veh/h)	1	573	4	4	363	3	15	0	14	8	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	1	682	5	5	432	4	18	0	17	10	0	2
Pedestrians		2			1			21			16	
Lane Width (m)		3.5			3.5			3.5			3.5	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	452			708			1154	1170	706	1162	1170	452
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	452			708			1154	1170	706	1162	1170	452
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			89	100	96	94	100	100
cM capacity (veh/h)	1105			885			167	188	431	160	187	603

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1	687	5	436	35	12
Volume Left	1	0	5	0	18	10
Volume Right	0	5	0	4	17	2
cSH	1105	1700	885	1700	238	182
Volume to Capacity	0.00	0.40	0.01	0.26	0.15	0.07
Queue Length 95th (m)	0.0	0.0	0.1	0.0	4.1	1.7
Control Delay (s)	8.3	0.0	9.1	0.0	22.7	26.1
Lane LOS	A		A		C	D
Approach Delay (s)	0.0		0.1		22.7	26.1
Approach LOS					C	D

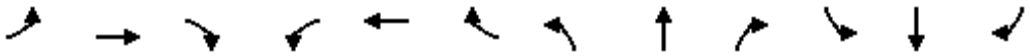
Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	41.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	490	1	3	671	7	1	0	1	5	0	3
Future Volume (Veh/h)	3	490	1	3	671	7	1	0	1	5	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	3	527	1	3	722	8	1	0	1	5	0	3
Pedestrians								19			8	
Lane Width (m)								3.5			3.5	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	738			547			1284	1296	546	1274	1293	734
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	738			547			1284	1296	546	1274	1293	734
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	96	100	99
cM capacity (veh/h)	872			1017			137	159	533	141	160	421

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	3	528	3	730	2	8
Volume Left	3	0	3	0	1	5
Volume Right	0	1	0	8	1	3
cSH	872	1700	1017	1700	218	188
Volume to Capacity	0.00	0.31	0.00	0.43	0.01	0.04
Queue Length 95th (m)	0.1	0.0	0.1	0.0	0.2	1.1
Control Delay (s)	9.1	0.0	8.6	0.0	21.7	25.0
Lane LOS	A		A		C	D
Approach Delay (s)	0.1		0.0		21.7	25.0
Approach LOS					C	D

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	45.7%	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)	1	465	11	5	598	6	9	0	5	3	0	3
Future Volume (Veh/h)	1	465	11	5	598	6	9	0	5	3	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1	484	11	5	623	6	9	0	5	3	0	3
Pedestrians					2			16			11	
Lane Width (m)					3.5			3.5			3.5	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	640			511			1144	1158	508	1140	1160	637
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	640			511			1144	1158	508	1140	1160	637
tC, single (s)	5.1			4.1			7.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	3.1			2.2			3.5	4.0	3.3	3.5	4.0	3.6
p0 queue free %	100			100			95	100	99	98	100	99
cM capacity (veh/h)	605			1051			171	192	561	172	192	422

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1	495	5	629	14	6
Volume Left	1	0	5	0	9	3
Volume Right	0	11	0	6	5	3
cSH	605	1700	1051	1700	228	245
Volume to Capacity	0.00	0.29	0.00	0.37	0.06	0.02
Queue Length 95th (m)	0.0	0.0	0.1	0.0	1.6	0.6
Control Delay (s)	11.0	0.0	8.4	0.0	21.8	20.1
Lane LOS	B		A		C	C
Approach Delay (s)	0.0		0.1		21.8	20.1
Approach LOS					C	C

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	42.5%	ICU Level of Service		A
Analysis Period (min)	15			

Appendix D
Background Development Traffic Volumes

Format Lakeshore LP

TRANSPORTATION IMPACT STUDY

Proposed Mixed-Use Development

42 Lakeshore Road West,
Town of Oakville

August 2023

23129

Trip distribution was determined based on apartment dwelling and retail trip distributions during AM and PM peak hours. Trip assignment was based on the local road network, turn restrictions, changes in future network (i.e., assumed none for this analysis), logical routing and type of access proposed for the site.

The distribution of residential and retail site trips is summarized in **Table 4-4**. Detailed TTS calculations are provided in **Appendix D.**

Table 4-4: Subject Site Trip Distribution

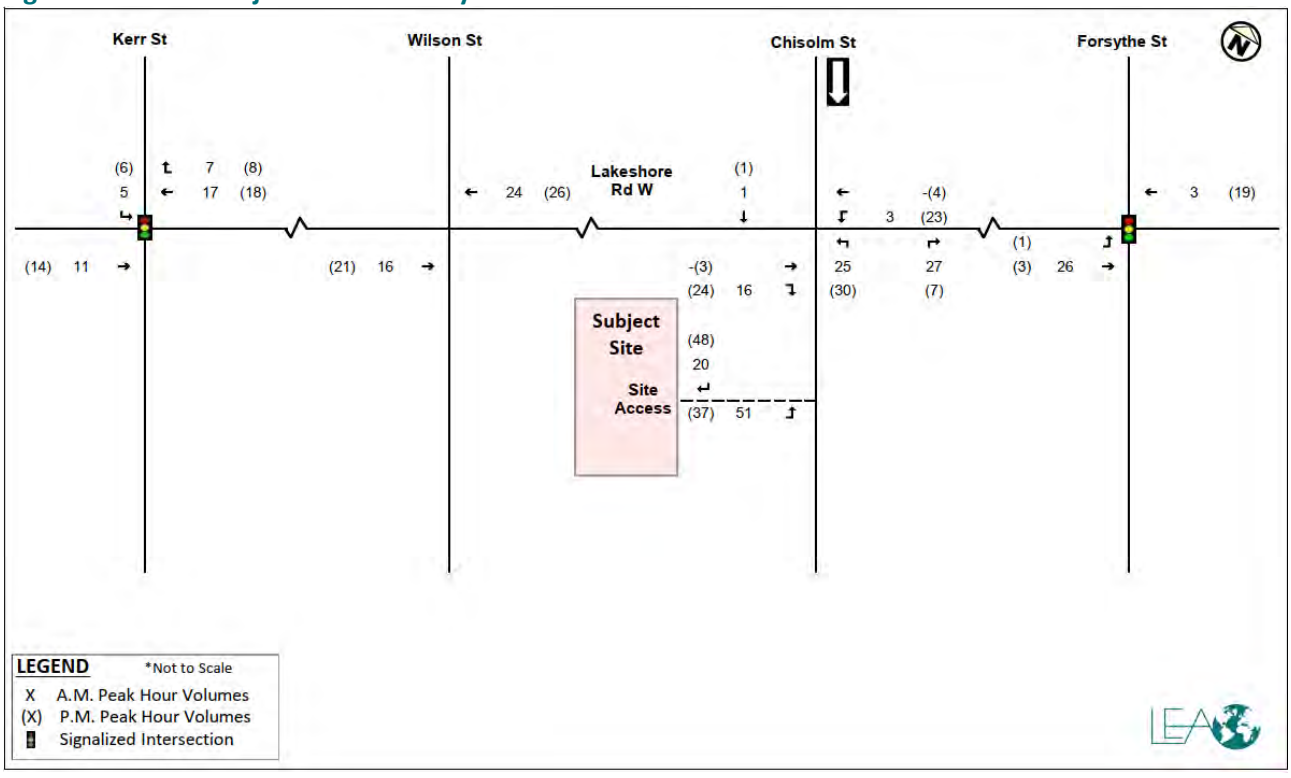
Path	Residential				Retail			
	AM		PM		AM		PM	
	In	Out	In	Out	In	Out	In	Out
Kerr North	27%	14%	14%	27%	26%	21%	21%	26%
Kerr South	0%	0%	0%	0%	1%	0%	0%	1%
Chisolm North	0%	0%	0%	0%	0%	0%	0%	0%
Chisolm South	0%	0%	0%	0%	0%	3%	3%	0%
Forsythe North	2%	0%	0%	2%	6%	3%	3%	6%
Lakeshore West	56%	31%	31%	56%	55%	40%	40%	55%
Lakeshore East	15%	55%	55%	15%	12%	33%	33%	12%
Total	100%	100%	100%	100%	100%	100%	100%	100%

4.3.1 Subject Site Traffic Volumes and Access Assumptions

The subject development will introduce a new site access that will intersect with Chisolm Street. The site access will facilitate one lane of traffic in each direction and will be a full-moves access accommodate left- and right-turns into and out of the site.

The total site-generated traffic volumes for the weekday AM and PM peak hours on the study area road network, including the proposed site access, are illustrated in **Figure 4-1.**

Figure 4-1: Total Subject Site Weekday Peak Hour Traffic Volumes



Traffic Impact Study

Proposed Residential Development
550 Kerr Street

Zelinka Priamo Ltd.

GHD | 6705 Millcreek Drive Mississauga Ontario L5N 5M4 Canada

11192948 | 800 | June 2019

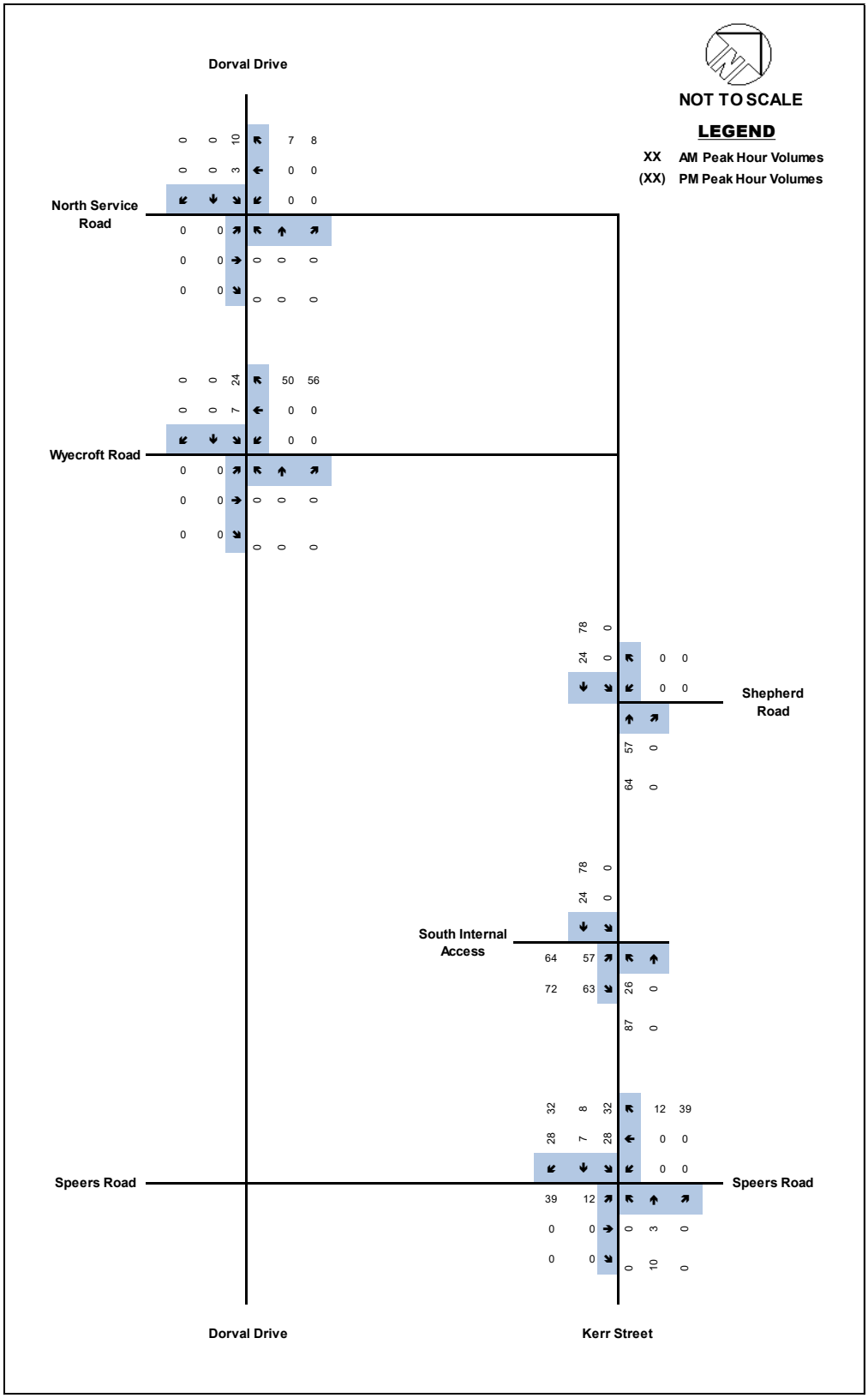


Figure 9 Site Trip Assignment

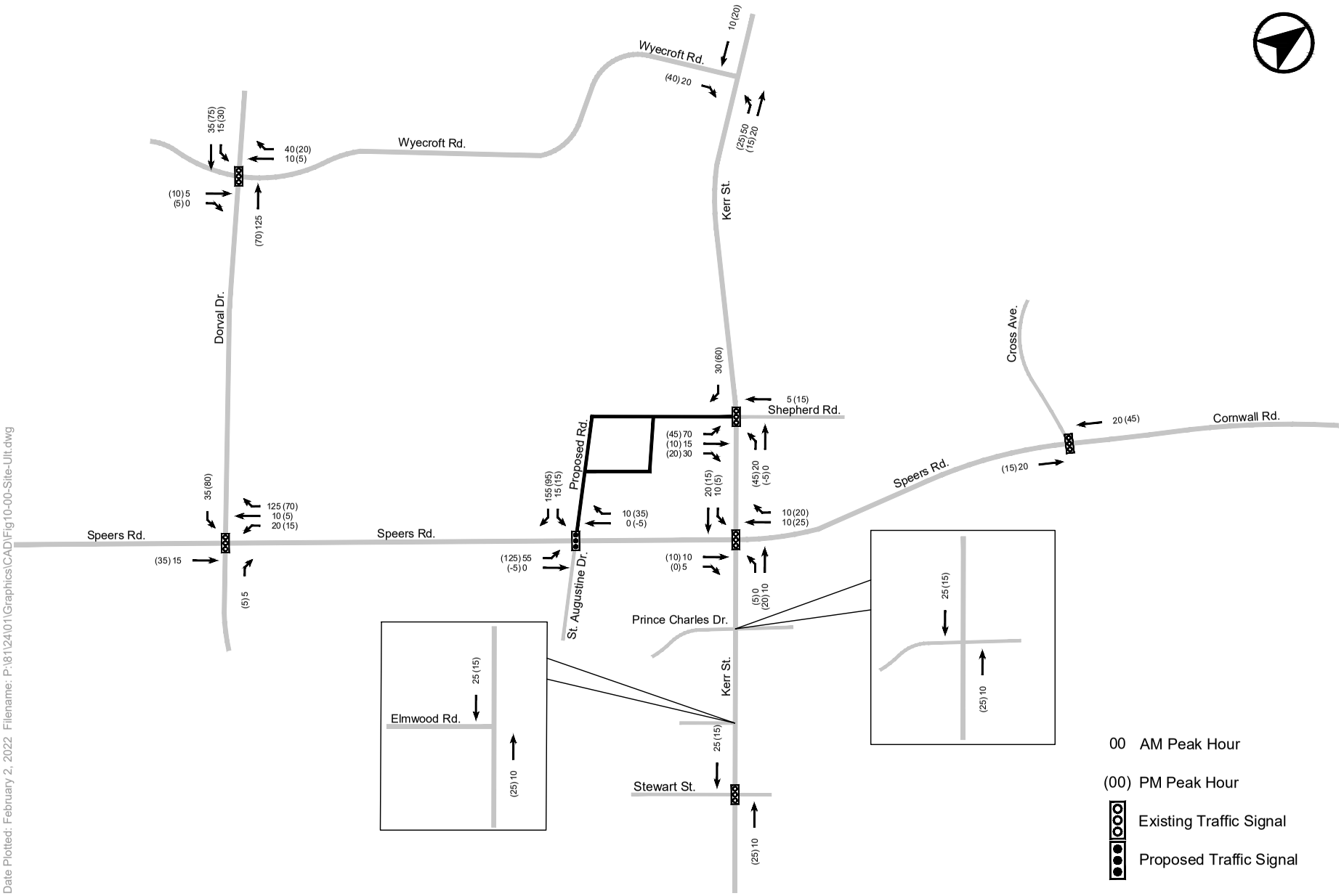
Upper Kerr Village

Part 2 Transportation Assessment - Official Plan Amendment

Transportation Considerations Report

Prepared For: Urban Strategies Inc.

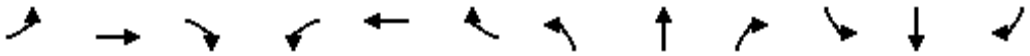
February 2, 2022



Date Plotted: February 2, 2022 Filename: P:\8\124\01\Graphics\CAD\Fig10-00-Site-Ult.dwg

FIGURE 10 NEW SITE TRAFFIC VOLUMES (ULTIMATE)

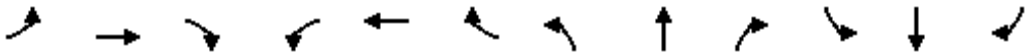
Appendix E
Future Background Level of Service Calculations



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	605	2	0	476	7	0	0	0	2	0	7
Future Volume (Veh/h)	7	605	2	0	476	7	0	0	0	2	0	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	672	2	0	529	8	0	0	0	2	0	8
Pedestrians								20			6	
Lane Width (m)								3.5			3.5	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								2			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	543			694			1246	1252	693	1227	1249	539
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	543			694			1246	1252	693	1227	1249	539
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	99	100	99
cM capacity (veh/h)	1031			896			144	169	440	152	170	544

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	8	674	0	537	0	10
Volume Left	8	0	0	0	0	2
Volume Right	0	2	0	8	0	8
cSH	1031	1700	1700	1700	1700	359
Volume to Capacity	0.01	0.40	0.00	0.32	0.00	0.03
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.0	0.7
Control Delay (s)	8.5	0.0	0.0	0.0	0.0	15.3
Lane LOS	A				A	C
Approach Delay (s)	0.1		0.0		0.0	15.3
Approach LOS					A	C

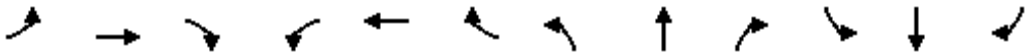
Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	42.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	633	4	4	401	3	15	0	14	8	0	2
Future Volume (Veh/h)	1	633	4	4	401	3	15	0	14	8	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	1	754	5	5	477	4	18	0	17	10	0	2
Pedestrians		2			1			21			16	
Lane Width (m)		3.5			3.5			3.5			3.5	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	497			780			1270	1286	778	1279	1287	497
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	497			780			1270	1286	778	1279	1287	497
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			87	100	96	92	100	100
cM capacity (veh/h)	1063			832			139	160	392	132	160	569

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1	759	5	481	35	12
Volume Left	1	0	5	0	18	10
Volume Right	0	5	0	4	17	2
cSH	1063	1700	832	1700	202	152
Volume to Capacity	0.00	0.45	0.01	0.28	0.17	0.08
Queue Length 95th (m)	0.0	0.0	0.1	0.0	4.9	2.0
Control Delay (s)	8.4	0.0	9.4	0.0	26.5	30.8
Lane LOS	A		A		D	D
Approach Delay (s)	0.0		0.1		26.5	30.8
Approach LOS					D	D

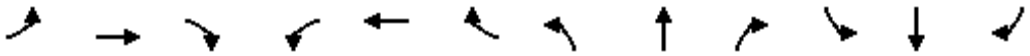
Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	44.2%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	555	1	3	759	7	1	0	1	5	0	3
Future Volume (Veh/h)	3	555	1	3	759	7	1	0	1	5	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	3	597	1	3	816	8	1	0	1	5	0	3
Pedestrians								19			8	
Lane Width (m)								3.5			3.5	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	832			617			1448	1460	616	1438	1457	828
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	832			617			1448	1460	616	1438	1457	828
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	95	100	99
cM capacity (veh/h)	804			958			105	127	486	109	127	372

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	3	598	3	824	2	8
Volume Left	3	0	3	0	1	5
Volume Right	0	1	0	8	1	3
cSH	804	1700	958	1700	173	148
Volume to Capacity	0.00	0.35	0.00	0.48	0.01	0.05
Queue Length 95th (m)	0.1	0.0	0.1	0.0	0.3	1.4
Control Delay (s)	9.5	0.0	8.8	0.0	26.0	30.7
Lane LOS	A		A		D	D
Approach Delay (s)	0.0		0.0		26.0	30.7
Approach LOS					D	D

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	50.4%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	513	11	5	660	6	9	0	5	3	0	3
Future Volume (Veh/h)	1	513	11	5	660	6	9	0	5	3	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1	534	11	5	688	6	9	0	5	3	0	3
Pedestrians					2			16			11	
Lane Width (m)					3.5			3.5			3.5	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	705			561			1258	1272	558	1255	1275	702
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	705			561			1258	1272	558	1255	1275	702
tC, single (s)	5.1			4.1			7.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	3.1			2.2			3.5	4.0	3.3	3.5	4.0	3.6
p0 queue free %	100			100			94	100	99	98	100	99
cM capacity (veh/h)	566			1007			143	164	526	144	164	386

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1	545	5	694	14	6
Volume Left	1	0	5	0	9	3
Volume Right	0	11	0	6	5	3
cSH	566	1700	1007	1700	193	209
Volume to Capacity	0.00	0.32	0.00	0.41	0.07	0.03
Queue Length 95th (m)	0.0	0.0	0.1	0.0	1.9	0.7
Control Delay (s)	11.4	0.0	8.6	0.0	25.1	22.7
Lane LOS	B		A		D	C
Approach Delay (s)	0.0		0.1		25.1	22.7
Approach LOS					D	C

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	45.8%	ICU Level of Service		A
Analysis Period (min)	15			

Appendix F
2016 Transportation Tomorrow Survey (TTS) Data Analysis

Mode of Transportation - AM Peak Period

Cross Tabulation Query Form - Trip - 2016

Row: Primary travel mode of trip - mode_prime
Column: 2006 GTA zone of household - gta06_hhld

Filters:
Primary travel mode of trip - mode_prime In B C D G J M P T U W
and
2006 GTA zone of household - gta06_hhld In 4006 4007 4010 4012 4013 4015 4016
and
Start time of trip - start_time In 600-900

Trip 2016
Table:

Mode of Transportation/Traffic Zones	4006	4007	4010	4012	4013	4015	4016	Total	Percentage
Transit excluding GO rail	0	0	52	114	0	0	0	166	2%
Cycle	57	19	35	0	21	0	0	132	1%
Auto driver	613	2490	559	1632	462	509	308	6573	72%
GO rail only	138	161	64	87	56	12	60	578	6%
Joint GO rail and local transit	0	0	61	118	22	0	0	201	2%
Motorcycle	0	0	0	6	0	0	0	6	0%
Auto passenger	97	480	74	329	74	9	20	1083	12%
Walk	57	101	35	178	21	0	0	392	4%
Total	962	3251	880	2464	656	530	388	9131	100%

Mode of Transportation - PM Peak Period

Cross Tabulation Query Form - Trip - 2016

Row: Primary travel mode of trip - mode_prime
Column: 2006 GTA zone of household - gta06_hhld

Filters:
Primary travel mode of trip - mode_prime In B C D G J M P T U W
and
2006 GTA zone of household - gta06_hhld In 4006 4007 4010 4012 4013 4015 4016
and
Start time of trip - start_time In 1600-1900

Trip 2016
Table:

Mode of Transportation/Traffic Zones	4006	4007	4010	4012	4013	4015	4016	Total	Percentage
Transit excluding GO rail	10	80	0	67	0	0	0	157	2%
Cycle	0	37	0	98	21	0	9	165	2%
Auto driver	922	2161	529	1861	538	440	353	6804	73%
GO rail only	146	130	76	101	22	0	60	535	6%
Joint GO rail and local transit	0	0	50	82	8	0	14	154	2%
Auto passenger	189	522	104	250	64	9	52	1190	13%
Taxi passenger	0	0	0	0	0	8	0	8	0%
Walk	18	26	15	172	5	68	0	304	3%
Total	1285	2956	774	2631	658	525	488	9317	100%

Auto Distribution - External

Cross Tabulation Query Form - Trip - 2016

Row: 2006 GTA zone of origin - gta06_orig
Column: Planning district of destination - pd_dest

Filters:
Primary travel mode of trip - mode_prime In D: M, P, T, U
and
2006 GTA zone of origin - gta06_orig In 4006: 4007, 4010, 4012, 4013, 4015, 4016
and
Start time of trip - start_time In 1600-1900

Trip 2016
Table:

	PD 1 of Toronto	PD 2 of Toronto	PD 3 of Toronto	PD 4 of Toronto	PD 5 of Toronto	PD 7 of Toronto	PD 8 of Toronto	Whitby	Aurora	Vaughan	Brampton	Mississauga	Halton Hills	Milton	Oakville	Burlington	Flamborough	Ancaster	Stoney Creek	Hamilton	Grimsby	Lincoln	Niagara Falls	Fort Erie	Kitchener	City of Guelph	Erin	Orangeville	Bradford-West Gwillimbury	Brant	Severn	External	
4006	0	0	0	0	0	0	0	0	0	0	0	218	0	0	547	158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4007	0	0	0	0	0	0	9	0	0	0	0	43	0	33	863	311	0	0	0	7	0	0	0	11	0	0	0	0	0	8	28	0	
4010	0	0	0	0	0	0	0	0	0	0	0	31	21	42	290	19	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	
4012	9	0	16	0	0	0	0	0	0	30	0	380	0	191	1686	330	21	0	0	56	16	12	73	0	25	14	0	11	0	19	0	52	
4013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4015	10	74	0	0	15	0	0	0	0	0	12	50	0	9	417	82	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4016	7	0	0	24	14	40	37	28	19	0	3	400	16	14	901	303	16	0	27	0	0	18	0	0	46	0	6	0	52	19	0	9	
	26	74	16	24	29	40	46	28	19	30	15	1122	37	289	4863	1203	37	17	27	79	16	30	73	11	71	14	6	11	52	46	28	61	8440
	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%	0%	13%	0%	3%	58%	14%	0%	0%	0%	1%	0%	0%	1%	0%	1%	0%	0%	0%	1%	1%	0%	1%	100%

Toronto	3%
Oakville	58%
York Region	1%
Durham Region	0%
Peel Region	13%
Burlington	18%
Hamilton Area	2%
Niagara Region	4%
	100%

Auto Distribution - Oakville

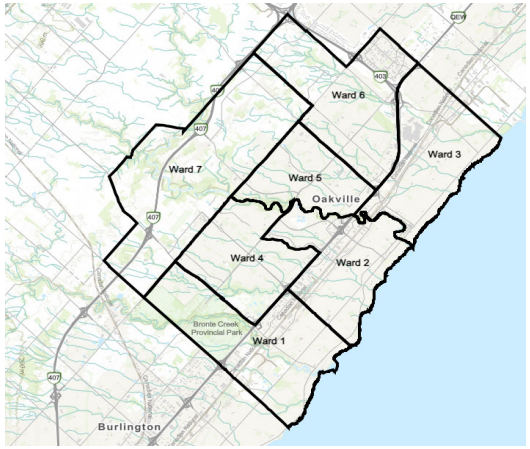
Cross Tabulation Query Form - Trip - 2016

Row: 2006 GTA zone of origin - gta06_orig
Column: Ward number of destination - ward_dest

Filters:
Primary travel mode of trip - mode_prime In D M P T U
and
2006 GTA zone of origin - gta06_orig In 4006 4007 4010 4012 4013 4015 4016
and
Start time of trip - start_time In 1600-1900
and
Ward number of destination - ward_dest In 159-164

Trip 2016
Table:

	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	
	159	160	161	162	163	164	
4006	104	284	31	85	30	13	
4007	338	244	86	133	0	62	
4010	27	187	17	59	0	0	
4,012	208	437	219	390	0	0	
4013	0	84	59	16	0	0	
4015	71	76	114	134	12	10	
4016	78	224	160	137	234	67	
	985	1696	847	1116	439	316	5399
	18%	31%	16%	21%	8%	6%	100%
58%	11%	18%	9%	12%	5%	3%	58%



Transit Distribution - External

Cross Tabulation Query Form - Trip - 2016

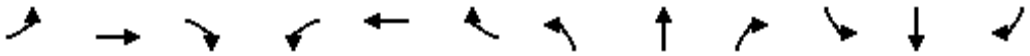
Row: 2006 GTA zone of origin - gta06_orig
Column: Planning district of destination - pd_dest

Filters:
Primary travel mode of trip - mode_prime In B C G J W
and
2006 GTA zone of origin - gta06_orig In 4006 4007 4010 4012 4013 4015 4016
and
Start time of trip - start_time In 1600-1900

Trip 2016
Table:

	PD 1 of Toronto	PD 2 of Toronto	Mississauga	Oakville	
4006	0	0	0	55	
4007	0	0	0	90	
4010	0	0	0	12	
4012	11	5	8	265	
4015	0	0	0	34	
4016	44	0	0	161	
	55	5	8	617	685
	8%	1%	1%	90%	

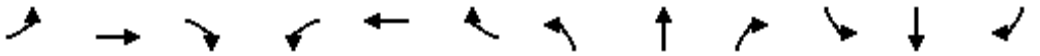
Appendix G
Future Total Level of Service Calculations



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	605	2	0	476	11	0	0	0	6	0	19
Future Volume (Veh/h)	10	605	2	0	476	11	0	0	0	6	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	11	672	2	0	529	12	0	0	0	7	0	21
Pedestrians								20			6	
Lane Width (m)								3.5			3.5	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								2			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	547			694			1265	1262	693	1235	1257	541
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	547			694			1265	1262	693	1235	1257	541
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	95	100	96
cM capacity (veh/h)	1027			896			136	166	440	150	167	542

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	674	0	541	0	28
Volume Left	11	0	0	0	0	7
Volume Right	0	2	0	12	0	21
cSH	1027	1700	1700	1700	1700	328
Volume to Capacity	0.01	0.40	0.00	0.32	0.00	0.09
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.0	2.2
Control Delay (s)	8.5	0.0	0.0	0.0	0.0	17.0
Lane LOS	A				A	C
Approach Delay (s)	0.1		0.0		0.0	17.0
Approach LOS					A	C

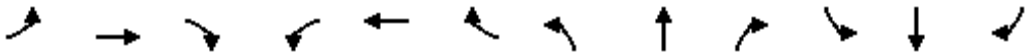
Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	42.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	633	10	6	401	3	37	0	19	8	0	2
Future Volume (Veh/h)	1	633	10	6	401	3	37	0	19	8	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	1	754	12	7	477	4	44	0	23	10	0	2
Pedestrians		2			1			21			16	
Lane Width (m)		3.5			3.5			3.5			3.5	
Walking Speed (m/s)		1.2			1.2			1.2			1.2	
Percent Blockage		0			0			2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	497			787			1278	1294	782	1289	1298	497
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	497			787			1278	1294	782	1289	1298	497
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			68	100	94	92	100	100
cM capacity (veh/h)	1063			827			137	158	390	128	157	569

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1	766	7	481	67	12
Volume Left	1	0	7	0	44	10
Volume Right	0	12	0	4	23	2
cSH	1063	1700	827	1700	176	147
Volume to Capacity	0.00	0.45	0.01	0.28	0.38	0.08
Queue Length 95th (m)	0.0	0.0	0.2	0.0	13.1	2.1
Control Delay (s)	8.4	0.0	9.4	0.0	37.4	31.7
Lane LOS	A		A		E	D
Approach Delay (s)	0.0		0.1		37.4	31.7
Approach LOS					E	D

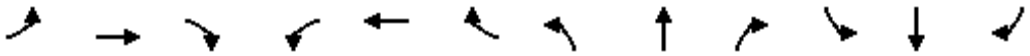
Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	44.6%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	555	1	3	759	19	1	0	1	10	0	11
Future Volume (Veh/h)	13	555	1	3	759	19	1	0	1	10	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	14	597	1	3	816	20	1	0	1	11	0	12
Pedestrians								19			8	
Lane Width (m)								3.5			3.5	
Walking Speed (m/s)								1.2			1.2	
Percent Blockage								2			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	844			617			1478	1494	616	1466	1485	834
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	844			617			1478	1494	616	1466	1485	834
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	100	89	100	97
cM capacity (veh/h)	796			958			97	119	486	103	121	369

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	14	598	3	836	2	23
Volume Left	14	0	3	0	1	11
Volume Right	0	1	0	20	1	12
cSH	796	1700	958	1700	161	165
Volume to Capacity	0.02	0.35	0.00	0.49	0.01	0.14
Queue Length 95th (m)	0.4	0.0	0.1	0.0	0.3	3.8
Control Delay (s)	9.6	0.0	8.8	0.0	27.6	30.4
Lane LOS	A		A		D	D
Approach Delay (s)	0.2		0.0		27.6	30.4
Approach LOS					D	D

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	51.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	513	25	8	660	6	22	0	7	3	0	3
Future Volume (Veh/h)	1	513	25	8	660	6	22	0	7	3	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1	534	26	8	688	6	23	0	7	3	0	3
Pedestrians					2			16			11	
Lane Width (m)					3.5			3.5			3.5	
Walking Speed (m/s)					1.2			1.2			1.2	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	705			576			1272	1286	565	1263	1296	702
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	705			576			1272	1286	565	1263	1296	702
tC, single (s)	5.1			4.1			7.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	3.1			2.2			3.5	4.0	3.3	3.5	4.0	3.6
p0 queue free %	100			99			84	100	99	98	100	99
cM capacity (veh/h)	566			994			139	161	521	141	158	386

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1	560	8	694	30	6
Volume Left	1	0	8	0	23	3
Volume Right	0	26	0	6	7	3
cSH	566	1700	994	1700	168	207
Volume to Capacity	0.00	0.33	0.01	0.41	0.18	0.03
Queue Length 95th (m)	0.0	0.0	0.2	0.0	5.0	0.7
Control Delay (s)	11.4	0.0	8.7	0.0	31.0	22.9
Lane LOS	B		A		D	C
Approach Delay (s)	0.0		0.1		31.0	22.9
Approach LOS					D	C

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	45.8%	ICU Level of Service		A
Analysis Period (min)	15			