LEA Consulting Ltd.
625 Cochrane Drive, 5th Floor
Markham, ON, L3R 9R9 Canada
T | 905 470 0015 F | 905 470 0030
WWW.LEA.CA

December 19, 2025

Reference Number: 25253.01

Mr. Stephen Aghaei
On The Lake Developments Inc.
976 Four Mile Creek Road
Niagara-on-the-Lake, ON
L0S 1J0

Dear Mr. Aghaei,

RE: Transportation Addendum Letter
Proposed Mixed-Use Development
1544 & 1546 Four Mile Creek Road, Niagara-on-the-Lake

LEA Consulting Ltd. (LEA) has been retained by On The Lake Developments Inc. to prepare a Transportation Addendum letter in support of the Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) applications for the proposed mixed-use development located at 1544 &1546 Four Mile Creek Road in the Town of Niagara-on-the-Lake (herein referred to as the "subject site").

By way of background, LEA prepared the initial Transportation Impact Study (TIS) dated April 8, 2025, for the first OPA/ZBA submission for the proposed development which concluded that the traffic associated with the proposed development did not present any significant traffic impact to the surrounding area. Since the initial TIS report, updated site statistics for the proposed development have been provided and comments have been received from the Town of Niagara-on-the-Lake and Niagara Regional staff in a memorandum dated August 15, 2025, with respect to the traffic analysis and parking review provided in the initial TIS report. A copy of these comments can be found in Exhibit A.

The purpose of this letter will be to provide a response to Town and Regional staff comments regarding the previous OPA/ZBA applications, update the traffic analysis provided in the initial TIS report, and provide an updated parking review based on the updated site statistics and parking comments provided in the August 2025 memorandum.

1 PROPOSED DEVELOPMENT

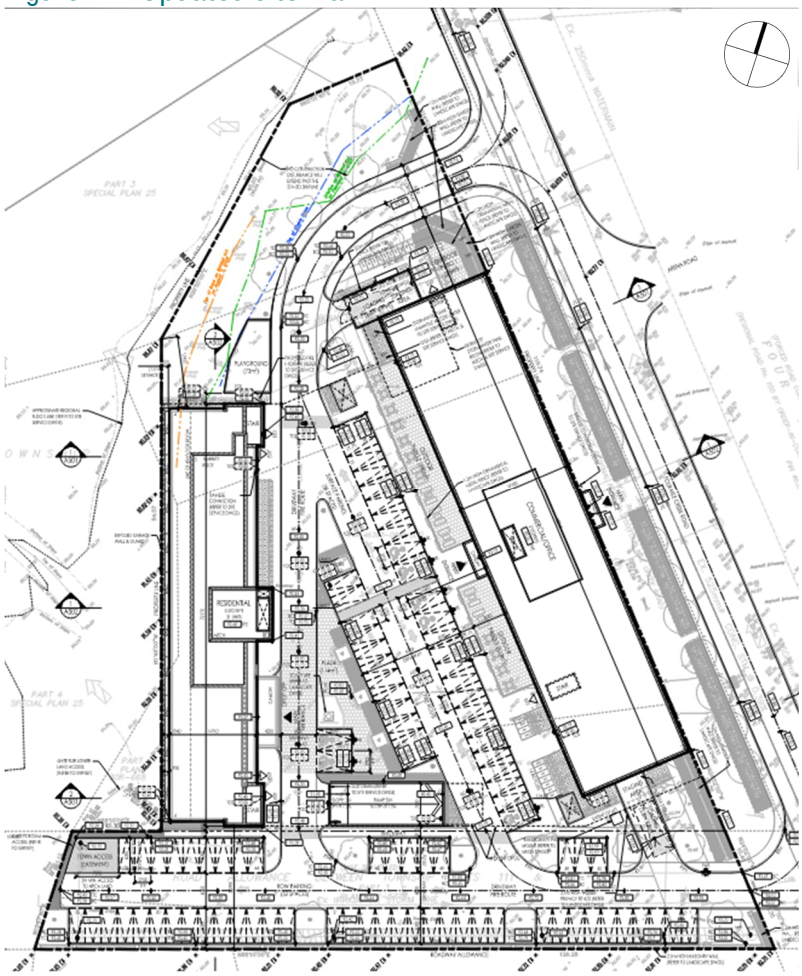
Since the initial TIS report, the site plan and statistics for the proposed development have been revised. The proposed number of residential units has slightly increased (+2 units) over the previous submission while the proposed restaurant GFA as decreased slightly from the April 2025 TIS report. The proposed parking supply has increased by 41 spaces. The loading supply remains consistent with the previous OPA/ZBA application with two (2) loading spaces.

A summary of the latest proposed site statistics and a comparison with the previous site statistics for the OPA/ZBA applications have been provided in Table 1-1 below. The latest site plan is illustrated in Figure 1-1.

Table 1-1: Summary of Site Statistics

Land Use	Units/GFA(m^2)	Previous Submission (April 2025)	Current Submission (December 2025)	Difference
Residential				
Residential	1-Bedroom	6 Units	12 Units	+2
	2-Bedroom	19 Units	17 Units	
	3- Bedroom	4 Units	2 Units	
Non-Residential				
Commercial		1,670 m^2	736 m^2	-934 m^2
Restaurant		-	720 m^2	+720 m^2
Outdoor Patio (Commercial Restaurant)		390 m^2	351 m^2	-39 m^2
Office		1,749 m^2	1,566 m^2	-183 m^2
Parking/Loading Supply	**Vehicle**	**200 Spaces**	**241 Spaces**	**+41**
	Bicycle	**36 Spaces**	**66 Spaces**	**+30**
	Loading	**2 Space**	**2 Space**	**-**

Figure 1-1: Updated Site Plan



Source: ICKE BROCU Architects Inc., December 2025

2 RESPONSE TO COMMENTS

The following section will provide a response to the Town's comments regarding the previous OPA/ZBA application for the proposed development. The comments were received in a memorandum from the Town dated August 19, 2025. The Town's comments are included in their Comment Response Matrix format followed by LEA's response.

2.1 ZONING, TOWN OF NIAGARA-ON-THE-LAKE COMMENTS

Parking

Comment 12.1: Staff have provided minimum parking standards based on the full extent of the requested uses with the following parking rates:

i. Restaurant – 1 per 9m2 GFLA
ii. Medical Office – 1 per 15m2 GFLA
iii. Outdoor Patio Restaurant – 1 per 30m2 GFLA
iv. Apartment Building – 1 per unit

Comment 12.2: Based on the provided ground floor plan of the commercial building, Staff calculated the leasable floor area (minus the lobby, vestibule and stairways) to be approximately 1,466m2. However, Staff note that the final leasable floor area of the commercial uses will be lesser than this, given that there will be additional circulation spaces, storage areas, and washrooms. If using the parking rate for a restaurant for the entire ground floor area, this would necessitate 163 required parking spaces.

Comment 12.3: Similarly, Staff calculated the leasable floor area for the second storey office spaces to be approximately 1,495m2, necessitating 100 required parking spaces for medical office uses.

Comment 12.4: Based on 387m2 of restaurant patio space, the required parking spaces is 13.

Comment 12.5: Based on 29 residential *units, the required parking spaces for the residential component is 29.*

Comment 12.6: In total, the requirement for parking spaces based on the full extent of the requested uses is 305. Based on this number, the site is deficient 105 parking spaces.

Comment 12.7: Staff recognize that it is unlikely that the restaurant use will occupy the entire ground floor, and that the medical office use would not occupy the entire second floor of the commercial building. To ensure this, Staff recommend implementing restrictions on the number of restaurants and medical office uses and their gross leasable floor areas that can be accommodated on-site. Staff also note that there are four (4) outdoor patios, so it is assumed that there would be more than one restaurant.

Comment 12.8: Staff also note that a Parking Impact Analysis was requested to address a shortfall of required parking. Given that there will be a shortfall of required parking based on the future commercial uses as noted above, Staff require the submission of a Parking Impact Analysis to address this issue.

LEA Response to Comments 12.1 to 12.8: Since the initial TIS (April 2025) report, the proposed site statistics for the development have been updated. The updated site statistics have removed the medical use from the office component and overall the proposed land uses comply with the parking rates outlined in By-law 4316-09. As a result, an additional Parking Impact Analysis is not required for the proposed parking supply. Per Section 6 of this Addendum Letter, a total of 226 spaces are required for the entire site, and the current proposal supplies 241 total spaces, satisfying minimum by-law requirements.

2.2 NIAGARA REGION COMMENTS

Comment 13.1: As outlined below, Regional staff are currently unable to support the application from a Regional transportation perspective. An updated Transportation Impact Study (TIS) is required to confirm that the development, as proposed at the zoning stage, can be accommodated by the Regional road network.

LEA Response: Comment noted. This Addendum Letter has been provided to address outstanding transportation comments for the initial TIS report and updates to the developments site statistics.

2.2.1 Transportation Comments

Comment 13.27: The estimated modal split percentage for transit trips, as presented in Table 4-1, appears to be high for the proposed residential units and office. This is mainly because the site is only serviced by on-demand transit and lacks access to the regularly scheduled transit network provided by Niagara Regional Transit. A more conservative estimate should be assumed given current transit availability the site.

LEA Response: Comment noted. The transit modal split percentage provided in the initial TIS has been revised to move the trips assigned previously to transit to auto drivers (transit mode share was set to 0%). This gives a more conservative estimate given the current transit availability. Refer to Section 3 of the Addendum Letter which has provided the updated modal splits.

Comment 13.28: A left-turn lane warrant analysis is required for each access to allow Regional staff to assess potential need.

LEA Response: Comment noted. A left-turn warrant analysis has been provided in Section 5 to address Regional Staff concerns regarding left-turn lanes at each site access. This review has found left-turn lanes to not be warranted.

Comment 13.29: A revised TIS is required prior to approval of the Zoning By-Law Amendment to confirm that the development, as proposed at the zoning stage, can be accommodated by the Regional road network.

LEA Response: Comment noted. The following Addendum letter has been provided to address Town and Regional Staff concerns regarding the traffic analysis and the proposed parking supply of the proposed development.

2.2.2 Regional Cycling Network Comments

Comment 13.41: The subject lands have frontage on a roadway identified as part of the Regional cycling network. If the cycling route is currently not established and identified with signage, it is the intent to make provisions for doing so when an appropriate opportunity arises. Possible future addition or upgrade of cycling facilities could involve other changes to the road cross-section.

LEA Response: Comment noted.

2.2.3 Conclusions Comments

Comment 13.46: In conclusion, Regional staff cannot support the Zoning By-law Amendment application at this time due to concerns with the submitted Transportation Impact Study (TIS), including unjustified transit modal split assumptions and the lack of a left-turn lane warrant analysis. A revised TIS is required to confirm the proposed development can be accommodated by the Regional road network and to ensure any necessary site design changes are reflected in the approved zoning by-law amendment.

LEA Response: Comment noted. This TIS addendum letter provides an update to the traffic analysis.

Comment 13.47: Regional staff request that the updated report, and associated supplementary materials (if applicable), be forwarded to Regional staff for review and additional comment prior to the application being presented to Town Council.

LEA Response: Comment noted.

3 SITE GENERATED TRAFFIC AND FUTURE TOTAL CONDITIONS

Trip generation associated with the proposed development was determined using the standard methodology provided by the Institute of Transportation Engineers (ITE) Trip Generation Manual 11th Edition. The following section discusses the calculation of site-generated trips and the distribution of anticipated site trips on the study area road network.

3.1 MODAL SPLIT

The local area modal split for the proposed development was based on 2022 Transportation Tomorrow Survey (TTS) data using the 2006 traffic analysis zones. Data was filtered for traffic analysis zones (TAZ) 6042 to 6051 and 6190 to 6200 (which contain or surround the subject site) for residential/work trips and retail trips.

For residential/work trips, trip purposes included home-based work and home-based school while for retail trips, trip purposes included home-based work and home-based discretionary. The local modal split applied to each land use during the weekday AM/PM peak periods are provided in Table 3-1. Detailed TTS calculations are provided in Exhibit B. These modal splits were then adjusted to shift all transit trips to auto trips in response to comments from the Region in order to take a most conservative approach given the poor transit availability in the area.

Table 3-1: Residential, Retail, and Office Mode Split

Land Use	Description	Previous Modal Split (2022 TTS)	New Modal Split
Proposed Residential	**External Person Trips**	**100%**	**100%**
	Auto Driver Trips	65%	76%
	Passenger Trip	18%	18%
	Transit Trips	11%	0%
	Pedestrian trips	6%	6%
	Cycling Trips	0%	0%
Proposed Retail	**External Person Trips**	**100%**	**100%**
	Auto Driver Trips	80%	81%
	Passenger Trip	15%	15%
	Transit Trips	1%	0%
	Pedestrian trips	3%	3%
	Cycling Trips	1%	1%
Proposed Office	**External Person Trips**	**100%**	**100%**
	Auto Driver Trips	65%	76%
	Passenger Trip	18%	18%
	Transit Trips	11%	0%
	Pedestrian trips	6%	6%
	Cycling Trips	0%	0%

3.2 TRIP GENERATION

Methodology has been unchanged from the initial submission, the analysis has been updated based on latest site stats and the change in mode split. Trip generation rates for the proposed development were calculated based on the ITE Trip Generation Manual 11th Edition using the following steps:

- Baseline Auto Trips:
  - For proposed residential, used person trips.
  - For proposed retail, used average rates for ITE LUC 822 Strip Retail (<40k) in General Urban/Suburban.
  - For proposed office, used average rates for ITE LUC 710 General Office Building in General Urban/Suburban.
- Conversion to Person Trips:
  - For proposed residential, used average rates for ITE LUC 221 Multifamily Housing (Mid-Rise) in General Urban/Suburban, not close to rail transit.
  - For proposed retail, based on an auto split and average vehicle occupancy for ITE LUC 820 per ITE Trip Generation Handbook, 3rd edition.
  - For proposed office, based on an auto split and average vehicle occupancy for ITE LUC 710 per ITE Trip Generation Handbook, 3rd edition.
- Interaction Trip Reduction:
  - Since the development is mixed-use, assumed some trips would be between residential, retail and office use proposed within the site. As a result, it will not be added to the external network. Internal trip reduction was applied per methodology outlined in ITE Trip Generation Handbook, 3rd Edition (Tables 6.1 and 6.2).
- Mode Split:
  - Per 2022 Transportation Tomorrow Survey (TTS) data, obtained existing mode split for home-based trips and school-based trips for residential/work, and home-based trips and home-based discretionary trips for retail. Traffic analysis zones used are based on 2006 zones.
  - For residential/work, filtered for traffic analysis zones 6042-6051, 6190-6200 (which contain or surround subject site). For retail, filtered for traffic analysis zones 6042-6051, 6150-6200 (which contain or surround subject site), to obtain larger sample size.
  - Using non-auto mode share for each use, reduced external person trips.
- Pass-by Trips:
  - As per the ITE Trip Generation Manual 11th Edition's List of Land Uses with Vehicle Pass-By Rates and Data, pass-by percentage was applied for retail.
  - Due to the lack of a pass-by percentage for ITE LUC 822 Strip Retail, a percentage for ITE LUC 821 Shopping Plaza (40-150k) was applied instead.
  - A pass-by percentage of 40% was applied to the Weekday PM peak period.

3.2.1 Vehicle Trip Generation

As previously discussed, the proposed development will replace the existing single detached residential building with a proposed mixed-use development containing a total of 29 residential units, 1,670 m^2 (17,847 ft^2) of commercial GFA, and 1,749 m^2 (18,826 ft^2) of office GFA. For the purposes of calculating trip generation, commercial and office GFA was rounded up to 18,000 ft^2 and 19,000 ft^2, respectively.

The proposed development is anticipated to generate a total of 68 two-way (44 inbound, 24 outbound) and 128 two-way (69 inbound, 68 outbound) net site auto trips during the weekday AM and PM peak hours, respectively, as shown in Table 3-2.

Table 3-2: Proposed Site Vehicle Trip Generation Rates

Land Use	Description	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
ITE LUC 221 – Multifamily Housing (Mid-Rise) 31 units	ITE Person Trip Rate (/unit)	0.11	0.37	0.48	0.31	0.22	0.53
	ITE Person Trips	3	11	14	9	7	16
	Site Interaction	0	0	0	-4	-3	-7
	Total External Person Trips	3	11	14	5	4	9
	Non-Auto Mode Split Reduction	-1	-3	-4	-1	-1	-2
	External Auto Trips (76%)	2	8	10	4	3	7
	Primary External Auto Trips	**2**	**8**	**10**	**4**	**3**	**7**
ITE LUC 822– Strip Retail (<40k) 18,000 ft^2	ITE Auto Trip Rate (/1000 ft^2)	1.42	0.94	2.36	3.30	3.30	6.59
	ITE Auto Trips	25	17	42	60	59	119
	Adjusted Person Trips	29	20	49	73	70	143
	Site Interaction	-1	-1	-2	-8	-5	-13
	Total External Person Trips	28	19	47	65	65	130
	Non-Auto Mode Split Reduction	-5	-4	-9	-12	-12	-24
	External Auto Trips (81%)	23	15	38	53	53	106
	Pass By Trips (Weekday PM – 40%)	0	0	0	21	21	42
	Primary External Auto Trips	**23**	**15**	**38**	**32**	**32**	**64**
ITE LUC 710– General Office Building 19,000 ft^2	ITE Auto Trip Rate (/1000 ft^2)	1.34	0.18	1.52	0.24	1.20	1.44
	ITE Auto Trips	26	3	29	5	22	27
	Adjusted Person Trips	28	4	32	6	24	30
	Site Interaction	-1	-1	-2	-1	-5	-6
	Total External Person Trips	27	3	30	5	19	24
	Non-Auto Mode Split Reduction	-6	-1	-7	-1	-5	-6
	External Auto Trips (76%)	21	2	23	4	14	18
	Primary External Auto Trips	**21**	**2**	**23**	**4**	**14**	**18**
Pass By Auto Trips		**0**	**0**	**0**	**21**	**21**	**42**
New Site Auto Trips		**46**	**25**	**71**	**61**	**70**	**131**
Existing Trip to Remove		**-2**	**-1**	**-3**	**-1**	**-2**	**-3**
Net Site Auto Trips		**44**	**24**	**68**	**60**	**68**	**128**

3.2.2 Multi-Modal Trip Generation

The multi-modal trip generation for the proposed development is provided in Table 3-3 and was based on the local area mode split as detailed in Section 3.1. Overall, the majority of trips are expected to be auto driver trips, followed by passenger, pedestrian, transit, and cycling trips.

Table 3-3: Subject Site Multi-Modal Trip Generation

Land Use	Description	Modal Split	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	In	In	In	Total
Proposed Residential	**External Person Trips**	**100%**	**3**	**11**	**14**	**5**	**4**	**9**
	Auto Driver Trips	76%	2	8	10	4	3	7
	Passenger Trip	18%	1	2	3	1	1	2
	Transit Trips	0%	0	0	0	0	0	0
	Pedestrian trips	6%	0	1	1	0	0	0
	Cycling Trips	0%	0	0	0	0	0	0
Proposed Retail	**External Person Trips**	**100%**	**28**	**19**	**47**	**65**	**65**	**130**
	Auto Driver Trips	81%	23	15	38	53	53	106
	Passenger Trip	15%	4	3	7	9	9	18
	Transit Trips	0%	0	0	0	0	0	0
	Pedestrian trips	3%	1	1	2	2	2	4
	Cycling Trips	1%	0	0	0	1	1	2
Proposed Office	**External Person Trips**	**100%**	**27**	**3**	**30**	**5**	**19**	**24**
	Auto Driver Trips	76%	21	2	23	4	14	18
	Passenger Trip	18%	5	1	6	1	3	4
	Transit Trips	0%	0	0	0	0	0	0
	Pedestrian trips	6%	1	0	1	0	2	2
	Cycling Trips	0%	0	0	0	0	0	0
Total Proposed	**External Person Trips**	**100%**	**58**	**33**	**91**	**75**	**88**	**163**
	Auto Driver Trips	-	46	25	71	61	70	131
	Passenger Trip	-	10	6	16	11	13	24
	Transit Trips	-	0	0	0	0	0	0
	Pedestrian trips	-	2	2	4	2	4	6
	Cycling Trips	-	0	0	0	1	1	2

3.3 TRIP DISTRIBUTION AND ASSIGNMENT

Vehicle trip distribution was based on 2022 Transportation Tomorrow Survey (TTS) data and 2006 traffic analysis zones using the following parameters:

- Traffic zones: 6042 to 6051 and 6190 to 6200 for residential/work trips and retail trips.
- Trip Types: For weekday AM and PM peak periods, auto trips originating in/destined to residential, work and retail for the traffic zones outlined above.
- Residential/work-use: inbound and outbound distribution was based on PM and AM, respectively (peak flow direction).
- Retail use: inbound and outbound distribution was based on PM due to limited data in the AM.

The vehicle trip assignment was based on local road network, turn restrictions, changes in future network (i.e., assumed none), logical routing, and type of access. Detailed trip distribution and assignment are available in Exhibit B.

Table 3-4: Site Trip Distribution

Origin/ Destination	Assigned Route	Residential/Work		Retail	
		Weekday AM/ Weekday PM		Weekday AM/ Weekday PM	
		In	Out	In	Out
North	Four Mile Creek Road and EW Corridors	17%	14%	8%	9%
South	Four Mile Creek Road and EW Corridors	54%	55%	50%	57%
East	Four Mile Creek Road and EW Corridors	1%	1%	2%	0%
West	Four Mile Creek Road and EW Corridors	29%	30%	41%	34%
TOTAL		100%	100%	100%	100%

3.4 SITE GENERATED TRAFFIC VOLUMES

Existing traffic volumes to be removed (which were removed based on the TMC's collected) are provided in Figure 3-1 while residential, retail, and office traffic volumes are provided in Figure 3-2 to Figure 3-4. New site traffic volumes and net site traffic including pass-by trips are provided in Figure 3-5 and Figure 3-6.

Figure 3-1: Existing Site Trip Traffic to Remove

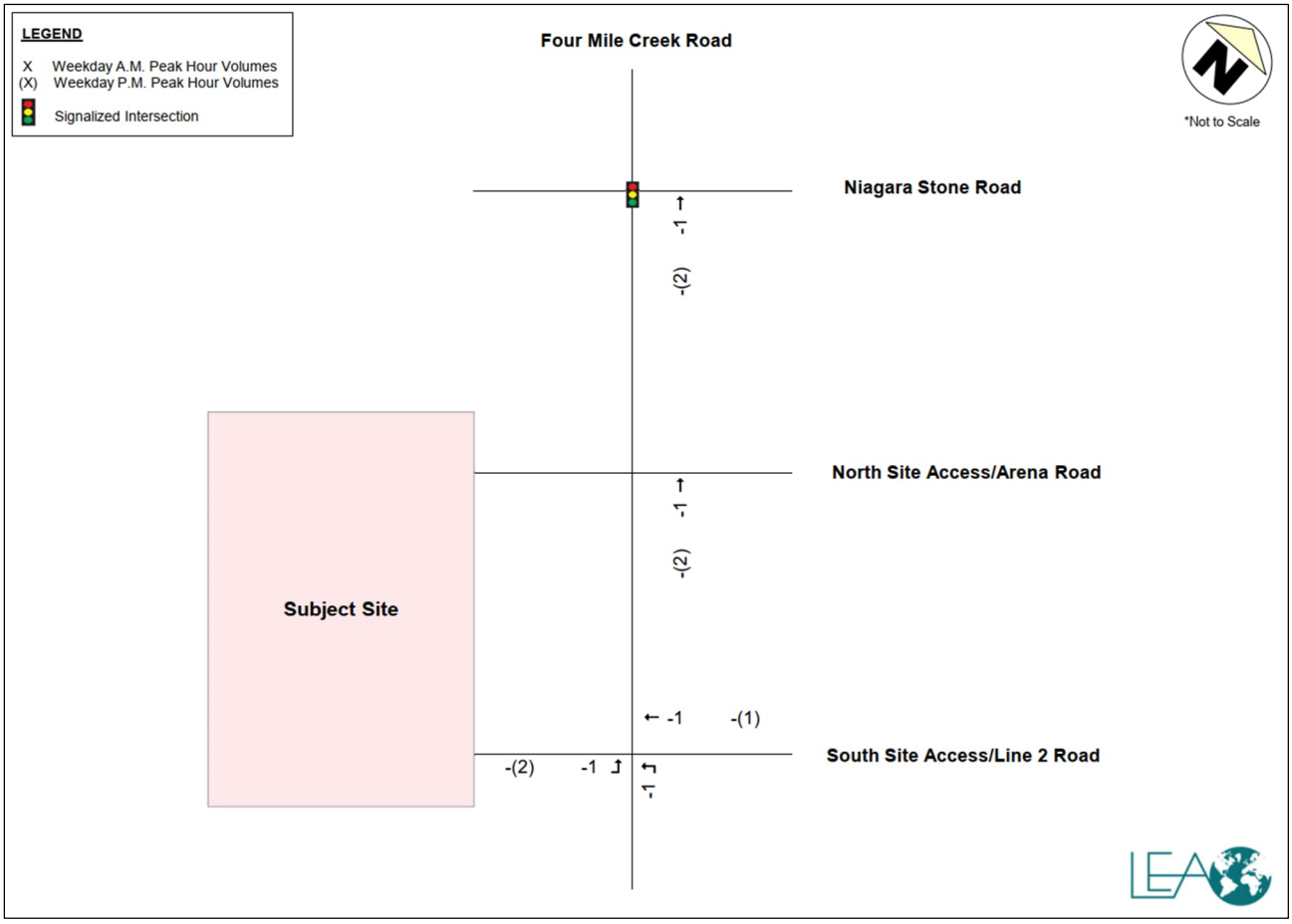


Figure 3-2: Proposed Residential Site Trip Traffic Volumes

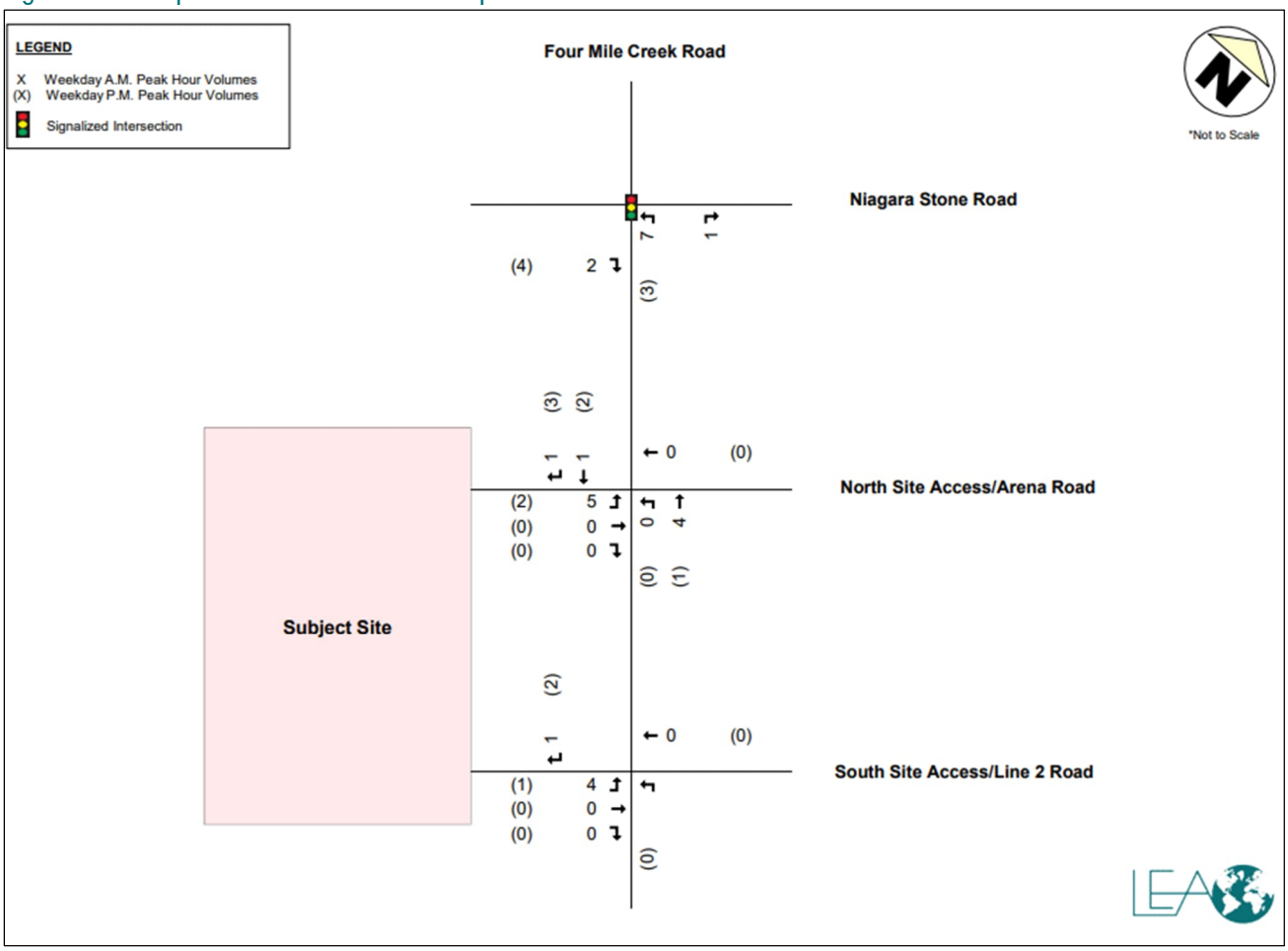


Figure 3-3: Proposed Retail Site Trip Traffic Volumes

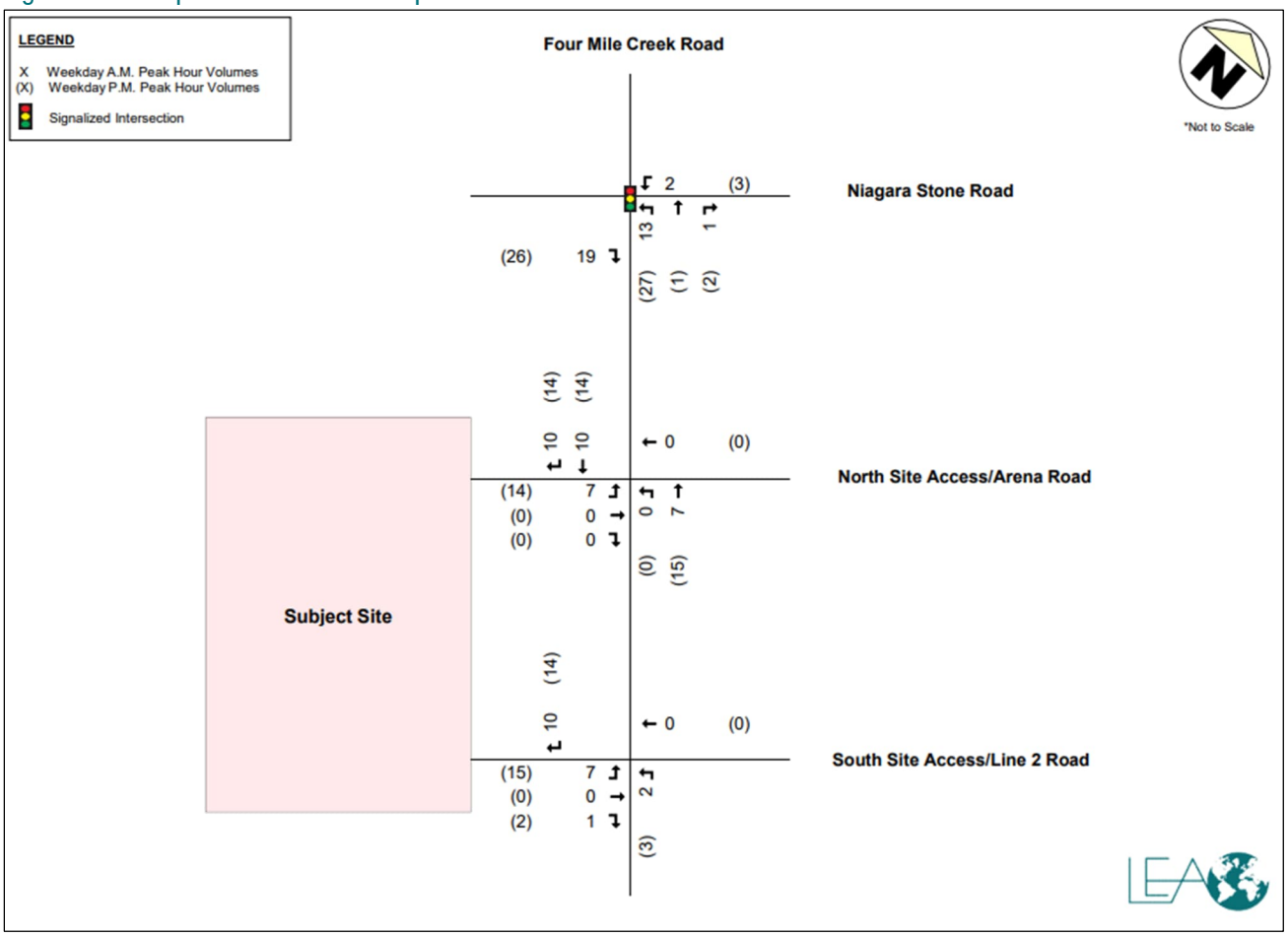


Figure 3-4: Proposed Office Site Trip Traffic Volumes

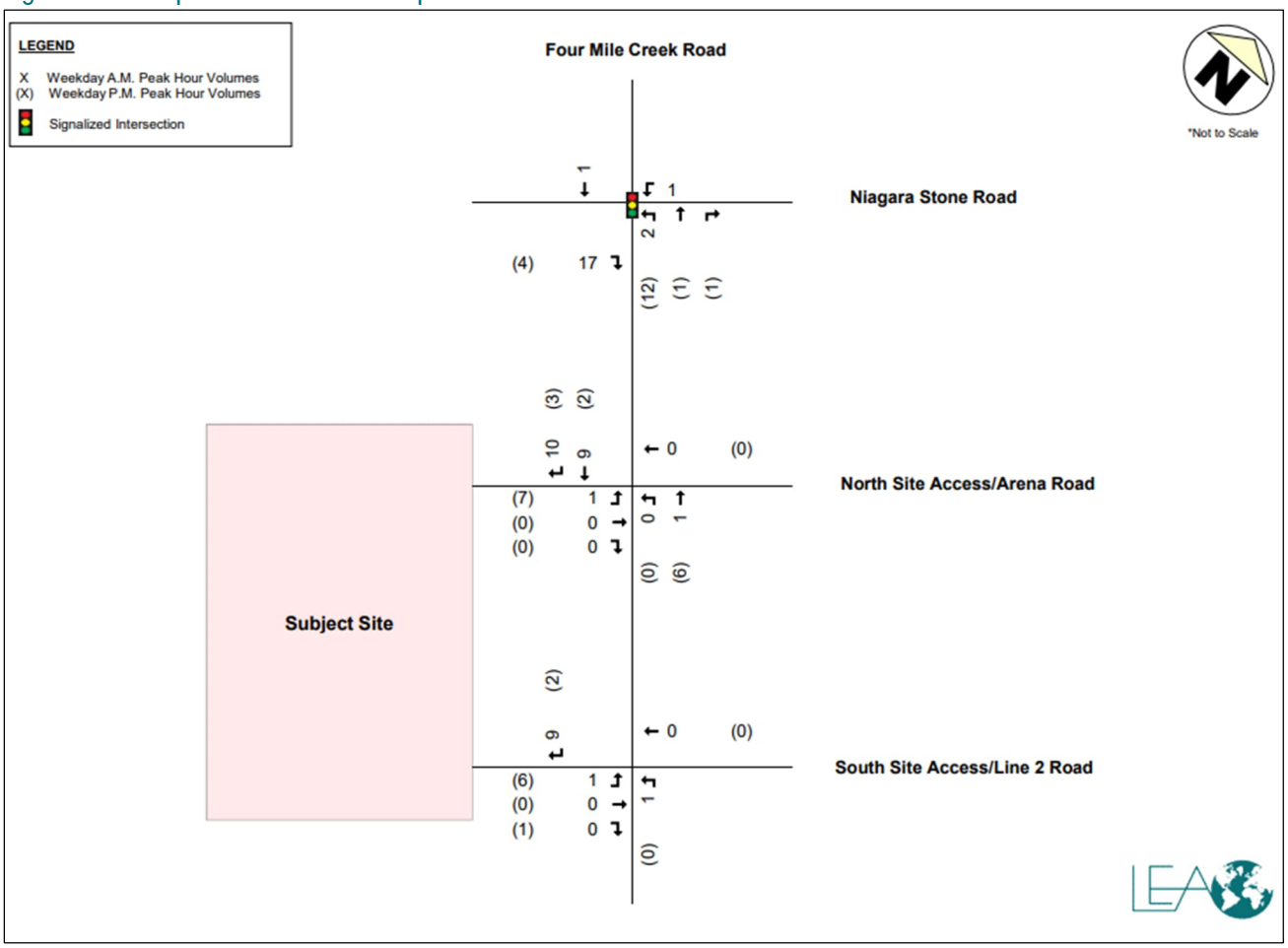


Figure 3-5: New Site Traffic Volumes

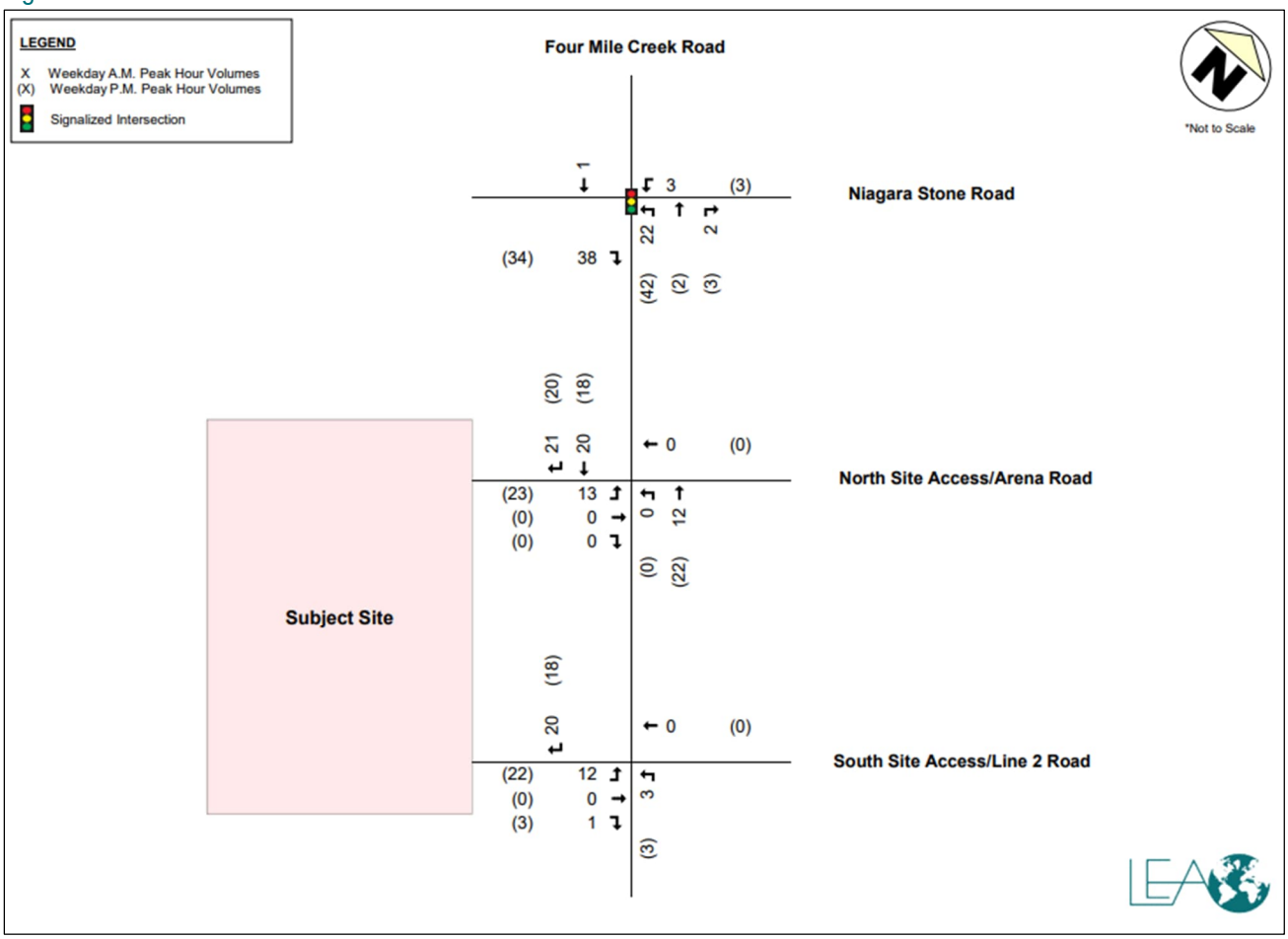
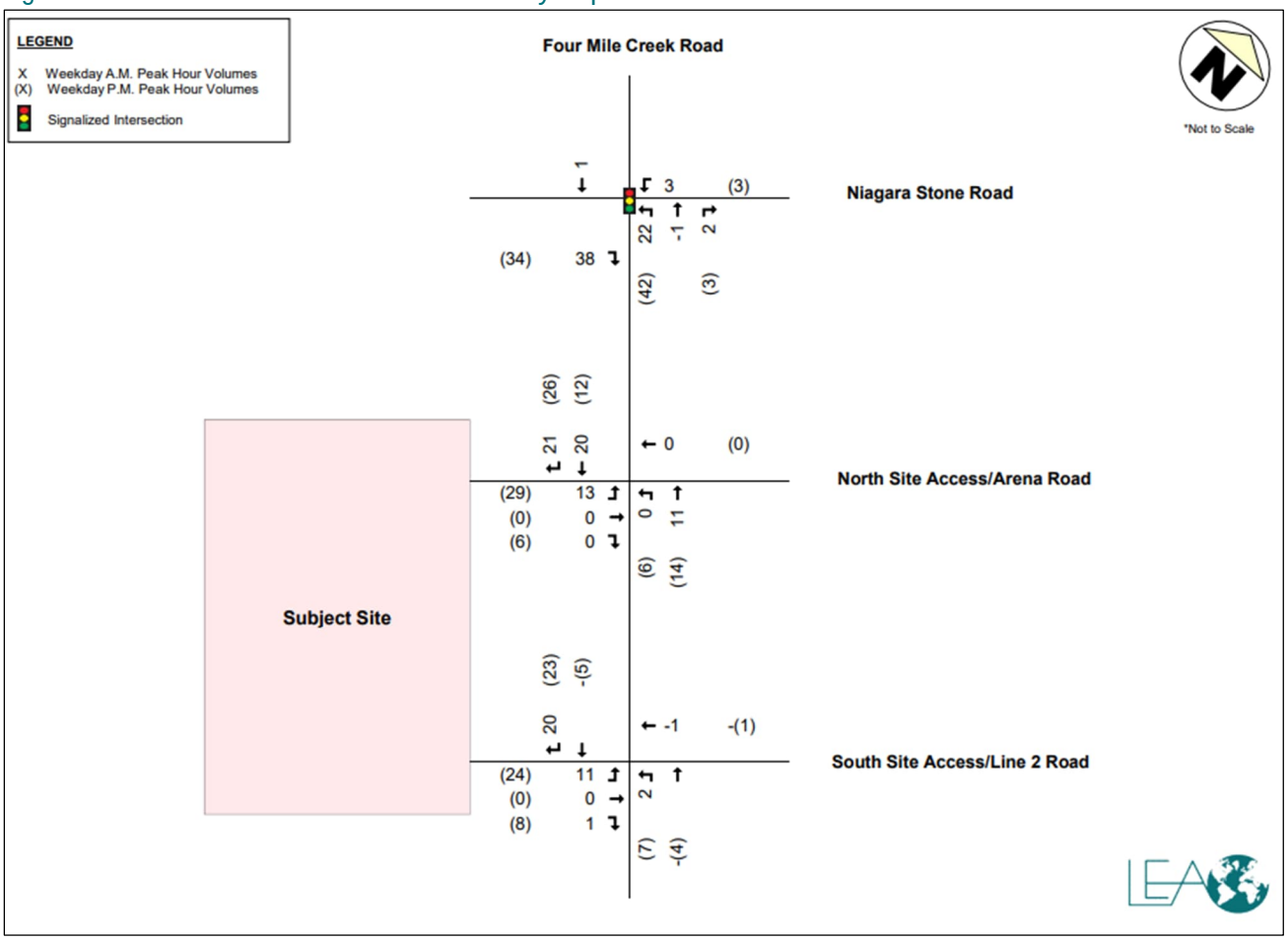


Figure 3-6: New Site Traffic Volumes + Pass By Trips



3.5 FUTURE TOTAL TRAFFIC VOLUMES

Future total traffic volumes were derived by adding the net site traffic volumes to the future background traffic volumes for each horizon year. Future total traffic volumes for the 2026 and 2031 horizon are provided in Figure 3-7 to Figure 3-8.

Figure 3-7: Future Total Traffic Volumes – 2026 Horizon

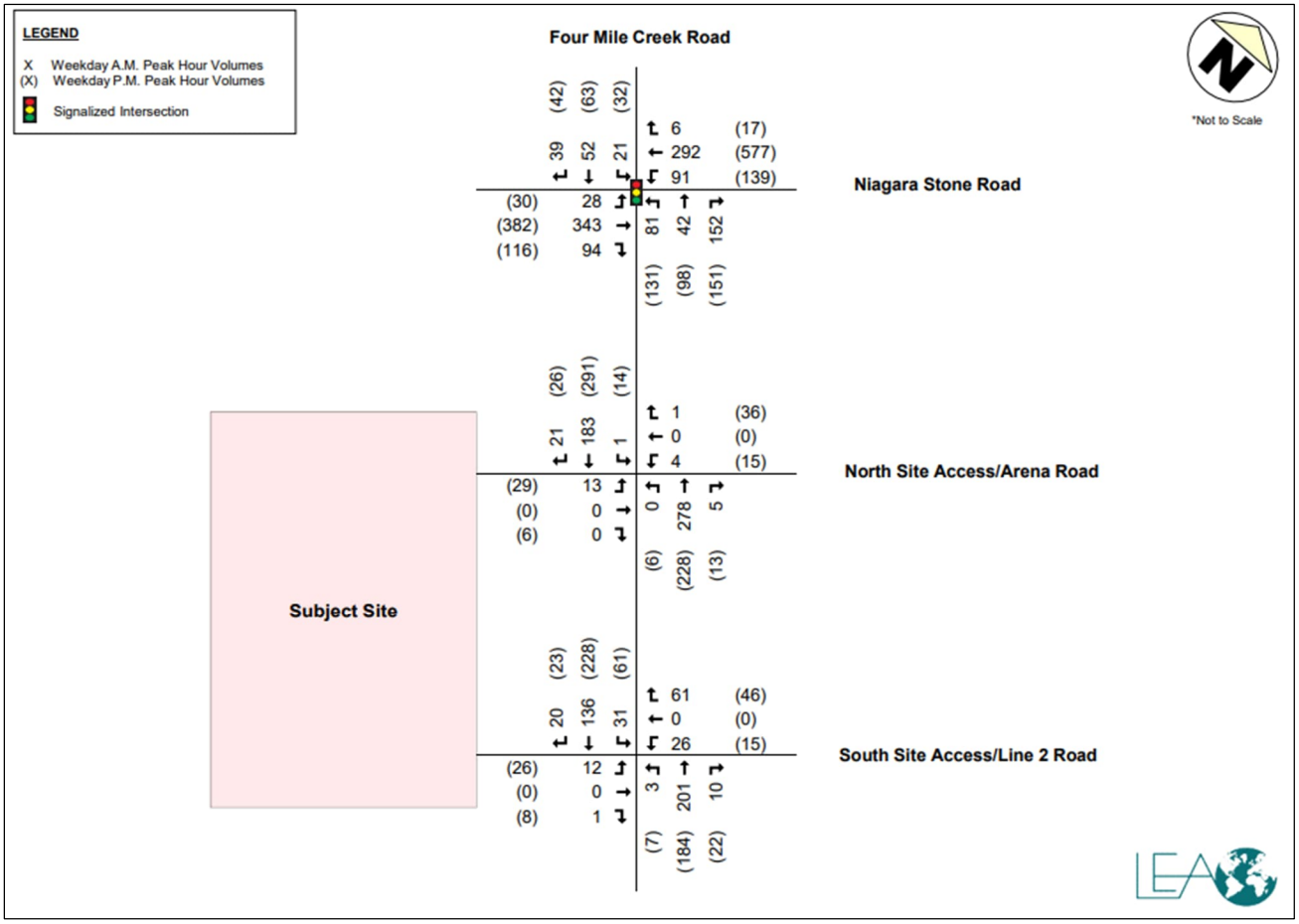
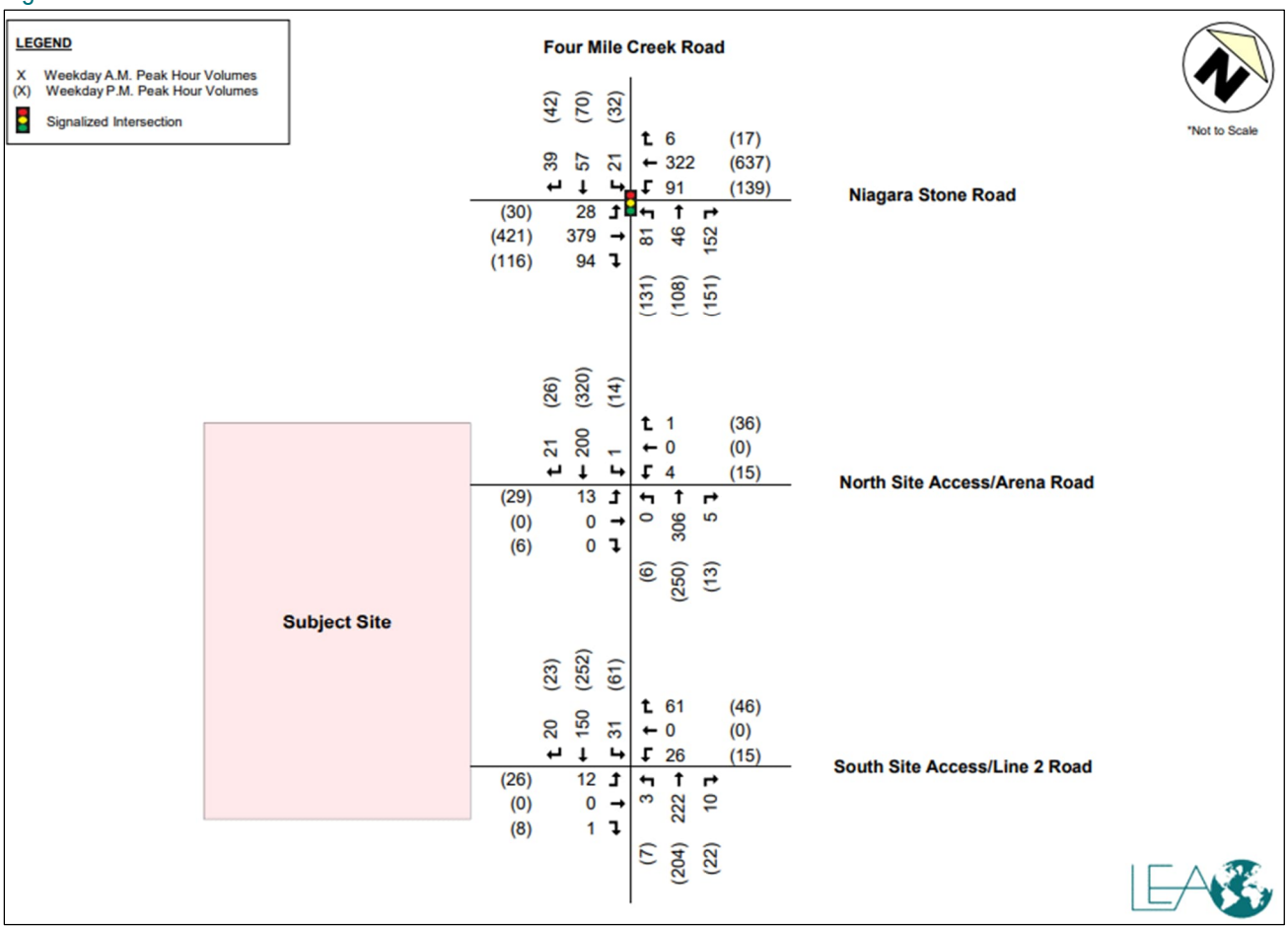


Figure 3-8: Future Total Traffic Volumes – 2031 Horizon



4 INTERSECTION CAPACITY ANALYSIS

The following sections provide an analysis of the intersection operations under existing, future background, and future total scenarios. The intersection capacity analysis for the study area was undertaken using Synchro version 11.0, which is based on the Highway Capacity Manual 2000 methodology. As per Niagara Region *Transportation Impact Assessment Guidelines* (July 2023) the definition of critical intersections/movements for the vehicle traffic analysis is as follows:

- At signalized intersections, movements with v/c ratio greater than 0.85 and/or LOS "E" or worse are deemed to be "critical" in terms of operations. Movements that exceed those thresholds shall be evaluated for possible operational improvements.
- At unsignalized intersections, movements expected to operate at LOS "D" or worse and/or where the estimated 95th percentile queue length for an individual movement exceeds the available queuing space.
- Any site accesses where entrance or egress is anticipated to be blocked by traffic queues from an upstream/downstream intersection
- An exclusive turning movement in which the 95th percentile queue will exceed the available storage space
- Exclusive left- and right turn lanes that are inaccessible due to the length of queues in the adjacent through lanes.

4.1 SIGNALIZED INTERSECTION – 2026

The results of the intersection capacity analysis for the signalized intersection under the 2026 horizon year compared to the existing year are summarized in the following tables below. Detailed results are provided in Exhibit C.

4.1.1 Niagara Stone Road & Four Mile Creek Road Intersection

The intersection capacity analysis for the Niagara Stone Road & Four Mile Creek Road intersection is provided in Table 3-5.

Table 3-5: Niagara Stone Rd & Four Mile Creek Rd Intersection - Synchro Results - 2026

AM	Existing				Future Background 2026				Future Total 2026			
Mvmt	Vol	V/C	LOS (Delay)	Queues (50/95) (m)	Vol	V/C	LOS (Delay)	Queues (50/95) (m)	Vol	V/C	LOS (Delay)	Queues (50/95) (m)
Overall	-	0.42	(0)	-/-	-	0.43	B (12)	-/-	-	0.44	(0)	-/-
EBL	28	0.10	B (10)	1/7	28	0.10	B (10)	1/7	28	0.09	B (10)	1/7
EBT	335	0.61	B (14)	17/54	343	0.62	B (14)	18/56	343	0.60	B (14)	18/56
EBR	56	0.04	A (10)	0/6	56	0.04	A (10)	0/6	94	0.07	B (10)	0/8
WBL	88	0.32	B (12)	4/18	88	0.33	B (12)	4/18	91	0.33	B (12)	4/19
WBT	282	0.51	B (12)	14/45	292	0.52	B (13)	15/46	292	0.51	B (13)	15/47
WBR	6	0.00	A (10)	0/0	6	0.00	A (10)	0/0	6	0.00	A (10)	0/0
NBL	59	0.21	B (13)	3/15	59	0.21	B (13)	3/15	81	0.26	B (13)	4/19
NBTR	192	0.21	B (13)	2/19	193	0.22	B (13)	2/19	194	0.20	B (12)	2/19
SBL	21	0.07	A (9)	1/4	21	0.07	A (9)	1/5	21	0.07	A (9)	1/4
SBTR	89	0.12	A (9)	2/11	90	0.12	A (9)	3/11	91	0.11	A (9)	3/11
PM	Existing				Future Background 2026				Future Total 2026			
Mvmt	Vol	V/C	LOS (Delay)	Queues (50/95) (m)	Vol	V/C	LOS (Delay)	Queues (50/95) (m)	Vol	V/C	LOS (Delay)	Queues (50/95) (m)
Overall	-	0.60	B (15)	-/-	-	0.61	B (15)	-/-	-	0.60	(0)	-/-
EBL	30	0.12	A (9)	2/9	30	0.12	A (9)	2/9	30	0.13	A (9)	2/9
EBT	371	0.42	B (11)	24/71	382	0.43	B (11)	25/74	382	0.44	B (11)	26/73
EBR	82	0.06	A (9)	0/8	82	0.06	A (9)	0/8	116	0.08	A (9)	0/9
WBL	136	0.34	B (11)	8/32	136	0.34	B (10)	9/32	139	0.36	B (11)	9/33
WBT	564	0.66	B (14)	43/123	577	0.66	B (14)	45/131	577	0.66	B (14)	45/126
WBR	17	0.01	A (8)	0/0	17	0.01	A (8)	0/0	17	0.01	A (9)	0/0
NBL	89	0.37	C (24)	10/26	89	0.38	C (25)	10/26	131	0.54	C (26)	15/36
NBTR	244	0.54	C (25)	18/47	246	0.56	C (27)	19/47	249	0.54	C (25)	19/47
SBL	32	0.13	B (17)	3/8	32	0.14	B (18)	3/8	32	0.13	B (17)	3/8
SBTR	104	0.16	B (18)	6/17	105	0.16	B (18)	7/17	105	0.16	B (18)	7/17

Existing (2025): Under existing conditions, the intersection of Four Mile Creek Road and Niagara Stone Road operates well during both weekday peak hours. During the weekday AM, the intersection operates with an overall LOS B with all movements operating with LOS B or better. During the weekday PM, the intersection operates with overall LOS B with all movements operating with LOS C or better. All movements are operating with residual capacity and acceptable delays. All existing 95th percentile queues can be accommodated by their available storage lanes.

Future Background (2026): Under future background conditions, the intersection is expected to generally operate similar to existing conditions with acceptable increases in V/C ratios and delay. No critical movements are identified.

Future Total Conditions (2026): Under future total conditions, the addition of site traffic is expected to have an acceptable impact on intersection operations, with all movements operating similar to future background conditions. All 95th percentile queues can be accommodated in their available storage space. No critical movements are identified. No intersection modifications are recommended.

4.2 UNSIGNALIZED INTERSECTIONS – 2026

The results of the intersection capacity analysis for the unsignalized intersections under the 2026 horizon year compared to the existing year are summarized in the following tables below. Detailed results are provided in Exhibit C.

4.2.1 Four Mile Creek Road & Arena Road/North Site Access Intersection

The intersection capacity analysis for the Four Mile Creek Road & Arena Road/Site Access intersection is provided in Table 3-6.

Table 3-6: Four Mile Creek Rd & Arena Rd/North Site Access Intersection - Synchro Results - 2026

AM	Existing				Future Background 2026				Future Total 2026			
Mvmt	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)
Overall	-	-	- (0)	-/-	-	-	- (0)	-/-	-	-	- (1)	-/-
NBL	0	0.00	A (0)	-/0	0	0.00	A (0)	-/0	0	0.00	A (0)	-/0
NBT	262	0.00	(0)	-/0	267	0.00	(0)	-/0	277	0.00	(0)	-/0
NBR	5	0.00	(0)	-/0	5	0.00	(0)	-/0	5	0.00	(0)	-/0
EBLTR	0	0.00	A (0)	-/0	0	0.00	A (0)	-/0	13	0.03	B (0)	-/0
WBLTR	5	0.01	B (0)	-/0	5	0.01	B (13)	-/0	5	0.01	B (0)	-/0
SBL	1	0.00	A (0)	-/0	1	0.00	A (8)	-/0	1	0.00	A (0)	-/0
SBT	160	0.00	A (0)	-/0	163	0.00	A (0)	-/0	183	0.00	A (0)	-/0
SBR	0	0.00	(0)	-/0	0	0.00	(0)	-/0	21	0.00	(0)	-/0
PM	Existing				Future Background 2026				Future Total 2026			
Mvmt	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)
Overall	-	-	- (1)	-/-	-	-	- (1)	-/-	-	-	- (2)	-/-
NBL	0	0.00	A (0)	-/0	0	0.00	A (0)	-/0	6	0.01	A (0)	-/0
NBT	210	0.00	(0)	-/0	214	0.00	(0)	-/0	228	0.00	A (0)	-/0
NBR	13	0.00	(0)	-/0	13	0.00	(0)	-/0	13	0.00	(0)	-/0
EBLTR	0	0.00	A (0)	-/0	0	0.00	A (0)	-/0	35	0.13	C (0)	-/0
WBLTR	51	0.11	B (12)	-/0	51	0.11	B (12)	-/0	51	0.12	B (0)	-/0
SBL	14	0.01	A (8)	-/0	14	0.01	A (8)	-/0	14	0.01	A (0)	-/0
SBT	274	0.00	A (0)	-/0	279	0.00	A (0)	-/0	290	0.00	A (0)	-/0
SBR	0	0.00	(0)	-/0	0	0.00	(0)	-/0	26	0.00	(0)	-/0

Existing (2025): Under existing conditions, the intersection of Four Mile Creek Road and Arena Road/North Site Access operates well during both weekday peak hours. All movements are operating with residual capacity and acceptable delays operating at LOS B or better. All existing 95th percentile queues can be accommodated by their available storage lanes. No critical movements have been identified.

Future Background (2026): Under future background conditions, the intersection is expected to generally operate similar to existing conditions with acceptable increases in V/C ratios and delay. No major constraints are noted.

Future Total Conditions (2026): Under future total conditions, the addition of site traffic is expected to have an acceptable impact on intersection operations, with all movements operating similar to future background conditions. No intersection modifications are recommended.

4.2.2 Four Mile Creek Road & Line 2 Road/South Site Access Intersection

The intersection capacity analysis for the Four Mile Creek Road & Line 2 Road/South Site Access intersection is provided in Table 3-7.

Table 3-7: Four Mile Creek Rd & Line 2 Rd/South Site Access Intersection - Synchro Results - 2026

AM	Existing				Future Background 2026				Future Total 2026			
Mvmt	Vol	V/C	LOS (Delay) (veh)	Queues (50/95)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)
Overall	-	-	- (3)	-/-	-	-	- (3)	-/-	-	-	- (3)	-/-
NBL	1	0.00	A (0)	-/0	1	0.00	A (8)	-/0	3	0.00	A (0)	-/0
NBT	197	0.00	A (0)	-/0	201	0.00	A (0)	-/0	200	0.00	A (0)	-/0
NBR	10	0.00	(0)	-/0	10	0.00	(0)	-/0	10	0.00	(0)	-/0
EBLTR	1	0.00	B (0)	-/0	1	0.00	B (13)	-/0	13	0.03	B (0)	-/0
WBLTR	88	0.14	B (0)	-/0	88	0.14	B (11)	-/1	87	0.14	B (0)	-/0
SBL	31	0.03	A (0)	-/0	31	0.03	A (8)	-/0	31	0.03	A (0)	-/0
SBT	133	0.00	A (0)	-/0	136	0.00	A (0)	-/0	136	0.00	A (0)	-/0
SBR	0	0.00	(0)	-/0	0	0.00	(0)	-/0	20	0.00	(0)	-/0
PM	Existing				Future Background 2026				Future Total 2026			
Mvmt	Vol	V/C	LOS (Delay) (veh)	Queues (50/95)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)
Overall	-	-	- (2)	-/-	-	-	- (2)	-/-	-	-	- (3)	-/-
NBL	0	0.00	A (0)	-/0	0	0.00	A (0)	-/0	7	0.01	A (0)	-/0
NBT	184	0.00	(0)	-/0	188	0.00	(0)	-/0	183	0.00	A (0)	-/0
NBR	22	0.00	(0)	-/0	22	0.00	(0)	-/0	22	0.00	(0)	-/0
EBLTR	2	0.01	C (16)	-/0	2	0.01	C (16)	-/0	34	0.10	C (0)	-/0
WBLTR	62	0.11	B (11)	-/0	62	0.11	B (12)	-/0	61	0.11	B (0)	-/0
SBL	61	0.05	A (8)	-/0	61	0.05	A (8)	-/0	61	0.05	A (0)	-/0
SBT	228	0.00	A (0)	-/0	233	0.00	A (0)	-/0	228	0.00	A (0)	-/0
SBR	0	0.00	(0)	-/0	0	0.00	(0)	-/0	23	0.00	(0)	-/0

Existing (2025): Under existing conditions, the intersection of Four Mile Creek Road and Line 2 Road/South Site Access operates well during both weekday peak hours. All movements are operating with residual capacity and acceptable delays operating at LOS C or better. All existing 95th percentile queues can be accommodated by their available storage lanes. No critical movements have been identified.

Future Background (2026): Under future background, the intersection is expected to generally operate similar to existing conditions with acceptable increases in V/C ratios and delay. No major constraints are noted.

Future Total Conditions (2026): Under future total conditions, the addition of site traffic is expected to have an acceptable impact on intersection operations, with all movements operating similar to future background conditions. No intersection modifications are recommended.

4.3 SIGNALIZED INTERSECTION – 2031

The results of the intersection capacity analysis for the signalized intersections under the 2031 horizon year compared to the existing year are summarized in the following tables below. Detailed results are provided in Exhibit D.

4.3.1 Niagara Stone Road & Four Mile Creek Road Intersection

The intersection capacity analysis for the Niagara Stone Road & Four Mile Creek Road intersection is provided in Table 3-8.

Table 3-8: Niagara Stone Rd & Four Mile Creek Rd Intersection - Synchro Results - 2031

AM	Existing				Future Background 2031				Future Total 2031			
Mvmt	Vol	V/C	LOS (Delay)	Queues (50/95) (m)	Vol	V/C	LOS (Delay)	Queues (50/95) (m)	Vol	V/C	LOS (Delay)	Queues (50/95) (m)
Overall	-	0.42	(0)	-/-	-	0.46	B (13)	-/-	-	0.46	(0)	-/-
EBL	28	0.10	B (10)	1/7	28	0.10	A (10)	1/7	28	0.09	B (10)	1/7
EBT	335	0.61	B (14)	17/54	379	0.65	B (15)	20/62	379	0.63	B (14)	20/62
EBR	56	0.04	A (10)	0/6	56	0.04	A (10)	0/6	94	0.07	A (10)	0/8
WBL	88	0.32	B (12)	4/18	88	0.35	B (12)	4/18	91	0.35	B (12)	4/19
WBT	282	0.51	B (12)	14/45	322	0.55	B (13)	16/51	322	0.54	B (13)	16/52
WBR	6	0.00	A (10)	0/0	6	0.00	A (10)	0/0	6	0.00	A (10)	0/0
NBL	59	0.21	B (13)	3/15	59	0.22	B (13)	3/16	81	0.26	B (13)	4/20
NBTR	192	0.21	B (13)	2/19	197	0.23	B (13)	2/21	198	0.21	B (13)	2/20
SBL	21	0.07	A (9)	1/4	21	0.08	A (10)	1/5	21	0.07	A (10)	1/5
SBTR	89	0.12	A (9)	2/11	95	0.13	A (10)	3/13	96	0.12	A (10)	3/13
PM	**Existing**				**Future Background 2031**				**Future Total 2031**			
Mvmt	Vol	V/C	LOS (Delay)	Queues (50/95) (m)	Vol	V/C	LOS (Delay)	Queues (50/95) (m)	Vol	V/C	LOS (Delay)	Queues (50/95) (m)
Overall	-	0.60	B (15)	-/-	-	0.67	B (16)	-/-	-	0.65	(0)	-/-
EBL	30	0.12	A (9)	2/9	30	0.15	A (9)	2/10	30	0.15	A (9)	2/10
EBT	371	0.42	B (11)	24/71	421	0.47	B (11)	30/85	421	0.47	B (11)	30/84
EBR	82	0.06	A (9)	0/8	82	0.06	A (9)	0/8	116	0.08	A (9)	0/10
WBL	136	0.34	B (11)	8/32	136	0.37	B (11)	9/34	139	0.38	B (11)	9/35
WBT	564	0.66	B (14)	43/123	637	0.73	B (16)	55/168	637	0.71	B (16)	54/164
WBR	17	0.01	A (8)	0/0	17	0.01	A (8)	0/0	17	0.01	A (8)	0/0
NBL	89	0.37	C (24)	10/26	89	0.37	C (25)	10/26	131	0.55	C (27)	15/36
NBTR	244	0.54	C (25)	18/47	256	0.60	C (28)	21/51	259	0.59	C (27)	21/51
SBL	32	0.13	B (17)	3/8	32	0.14	B (18)	3/8	32	0.14	B (18)	3/8
SBTR	104	0.16	B (18)	6/17	112	0.17	B (18)	7/18	112	0.17	B (18)	7/18

Future Background (2031): Under future background conditions, the intersection is expected to generally operate similar to existing conditions with acceptable increases in V/C ratios and delay. No critical movements are identified.

Future Total Conditions (2031): Under future total conditions, the addition of site traffic is expected to have an acceptable impact on intersection operations, with all movements operating similar to future background conditions. All 95th percentile queues can be accommodated in their available storage space. No critical movements are identified. No intersection modifications are recommended.

4.4 UNSIGNALIZED INTERSECTIONS – 2031

The results of the intersection capacity analysis for the unsignalized intersections are summarized in the following tables below. Detailed results are provided in Exhibit D.

4.4.1 Four Mile Creek Road & Arena Road/North Site Access Intersection

The intersection capacity analysis for the Four Mile Creek Road & Arena Road/Site Access intersection is provided in Table 3-9.

Table 3-9: Four Mile Creek Rd & Arena Rd/North Site Access Intersection - Synchro Results - 2031

AM	Existing				Future Background 2031				Future Total 2031			
Mvmt	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)
Overall	-	-	- (0)	-/-	-	-	- (0)	-/-	-	-	- (1)	-/-
NBL	0	0.00	A (0)	-/0	0	0.00	A (0)	-/0	0	0.00	A (0)	-/0
NBT	262	0.00	(0)	-/0	295	0.00	(0)	-/0	305	0.00	(0)	-/0
NBR	5	0.00	(0)	-/0	5	0.00	(0)	-/0	5	0.00	(0)	-/0
EBLTR	0	0.00	A (0)	-/0	0	0.00	A (0)	-/0	13	0.04	B (0)	-/0
WBLTR	5	0.01	B (0)	-/0	5	0.01	B (14)	-/0	5	0.01	B (0)	-/0
SBL	1	0.00	A (0)	-/0	1	0.00	A (8)	-/0	1	0.00	A (0)	-/0
SBT	160	0.00	A (0)	-/0	180	0.00	A (0)	-/0	200	0.00	A (0)	-/0
SBR	0	0.00	(0)	-/0	0	0.00	(0)	-/0	21	0.00	(0)	-/0
PM	**Existing**				**Future Background 2031**				**Future Total 2031**			
Mvmt	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)
Overall	-	-	- (1)	-/-	-	-	- (1)	-/-	-	-	- (2)	-/-
NBL	0	0.00	A (0)	-/0	0	0.00	A (0)	-/0	6	0.01	A (0)	-/0
NBT	210	0.00	(0)	-/0	236	0.00	(0)	-/0	250	0.00	A (0)	-/0
NBR	13	0.00	(0)	-/0	13	0.00	(0)	-/0	13	0.00	(0)	-/0
EBLTR	0	0.00	A (0)	-/0	0	0.00	A (0)	-/0	35	0.14	C (0)	-/0
WBLTR	51	0.11	B (12)	-/0	51	0.12	B (13)	-/0	51	0.13	B (0)	-/0
SBL	14	0.01	A (8)	-/0	14	0.01	A (8)	-/0	14	0.01	A (0)	-/0
SBT	274	0.00	A (0)	-/0	308	0.00	A (0)	-/0	319	0.00	A (0)	-/0
SBR	0	0.00	(0)	-/0	0	0.00	(0)	-/0	26	0.00	(0)	-/0

Future Background (2031): Under future background conditions, the intersection is expected to generally operate similar to existing conditions with acceptable increases in V/C ratios and delay. No major constraints are noted.

Future Total Conditions (2031): Under future total conditions, the addition of site traffic is expected to have an acceptable impact on intersection operations, with all movements operating similar to future background conditions. No intersection modifications are recommended.

4.4.2 Four Mile Creek Road & Line 2 Road/South Site Access Intersection

The intersection capacity analysis for the Four Mile Creek Road & Line 2 Road/Site Access intersection is provided in Table 3-10.

Table 3-10: Four Mile Creek Rd & Line 2 Rd/South Site Access Intersection - Synchro Results - 2031

AM	Existing				Future Background 2031				Future Total 2031			
Mvmt	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)
Overall	-	-	- (3)	-/-	-	-	- (3)	-/-	-	-	- (3)	-/-
NBL	1	0.00	A (0)	-/0	1	0.00	A (8)	-/0	3	0.00	A (0)	-/0
NBT	197	0.00	A (0)	-/0	222	0.00	A (0)	-/0	221	0.00	A (0)	-/0
NBR	10	0.00	(0)	-/0	10	0.00	(0)	-/0	10	0.00	(0)	-/0
EBLTR	1	0.00	B (0)	-/0	1	0.00	B (14)	-/0	13	0.03	B (0)	-/0
WBLTR	88	0.14	B (0)	-/0	88	0.15	B (11)	-/1	87	0.15	B (0)	-/0
SBL	31	0.03	A (0)	-/0	31	0.03	A (8)	-/0	31	0.03	A (0)	-/0
SBT	133	0.00	A (0)	-/0	150	0.00	A (0)	-/0	150	0.00	A (0)	-/0
SBR	0	0.00	(0)	-/0	0	0.00	(0)	-/0	20	0.00	(0)	-/0
PM	**Existing**				**Future Background 2031**				**Future Total 2031**			
Mvmt	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)	Vol	V/C	LOS (Delay)	Queues (50/95) (veh)
Overall	-	-	- (2)	-/-	-	-	- (2)	-/-	-	-	- (3)	-/-
NBL	0	0.00	A (0)	-/0	0	0.00	A (0)	-/0	7	0.01	A (0)	-/0
NBT	184	0.00	(0)	-/0	208	0.00	(0)	-/0	203	0.00	A (0)	-/0
NBR	22	0.00	(0)	-/0	22	0.00	(0)	-/0	22	0.00	(0)	-/0
EBLTR	2	0.01	C (16)	-/0	2	0.01	C (17)	-/0	34	0.11	C (0)	-/0
WBLTR	62	0.11	B (11)	-/0	62	0.12	B (12)	-/0	61	0.12	B (0)	-/0
SBL	61	0.05	A (8)	-/0	61	0.05	A (8)	-/0	61	0.05	A (0)	-/0
SBT	228	0.00	A (0)	-/0	257	0.00	A (0)	-/0	252	0.00	A (0)	-/0
SBR	0	0.00	(0)	-/0	0	0.00	(0)	-/0	23	0.00	(0)	-/0

Future Background (2031): Under future background conditions, the intersection is expected to generally operate similar to existing conditions with acceptable increases in V/C ratios and delay. No major constraints are noted.

Future Total Conditions (2031): Under future total conditions, the addition of site traffic is expected to have an acceptable impact on intersection operations, with all movements operating similar to future background conditions. No intersection modifications are recommended.

4.5 ANALYSIS CONCLUSION

Both signalized and unsignalized intersections under a 2026 and 2031 horizon year are not expected to show critical movements and are expected to operate at acceptable levels with no delays. Thus, the proposed development is expected to have an acceptable impact on the surrounding study area road and transportation networks.

5 LEFT TURN WARRANT ANALYSIS

To address regional staff comments regarding the need for a left turn lane at the proposed site accesses a left turn warrant analysis has been conducted with the review summarized in Table 5-1 and Table 5-2. Warrant details are provided in Exhibit E.

Table 5-1: North Site Access Left Turn Warrant Analysis

Criteria / Value	AM	PM
Design Speed (km/h)	50	
Advance Volume (vph) (VA)	310	268
Left Turning Volume (vph) (VL)	0	6
% of Left Turning Volume	0%	0
Opposing Volume (vph) (VO)	220	356
Warrant Met?	no	no
Storage Lane (m)	n/a	n/a

Table 5-2:South Site Access Left Turn Warrant Analysis

Criteria / Value	AM	PM
Design Speed (km/h)	50	
Advance Volume (vph) (VA)	235	233
Left Turning Volume (vph) (VL)	3	7
% of Left Turning Volume	1%	0
Opposing Volume (vph) (VO)	200	334
Warrant Met?	no	no
Storage Lane (m)	n/a	n/a

The conclusion of this analysis indicates that a left turn lane is not warranted at either of the proposed site accesses.

6 PARKING AND LOADING REVIEW

The following section will review the applicable parking standards for the proposed development based on updated site statistics for the proposed development, town comments regarding the parking rates for each land use, and the current zoning by-law requirements.

6.1 VEHICLE PARKING REVIEW

Vehicle parking for the proposed development was assessed against Niagara-on-the-Lake Comprehensive By-law 4316-09. The proposed and required vehicle parking supply for the subject development is summarized in Table 6-1.

Table 6-1: Niagara-on-the-Lake Comprehensive By-law 4316-09 - Vehicle Parking Summary

Use	Units/GFLA	By-law 4316-09		Proposed Supply
		Parking Rate	Min. Requirements	
Dwelling Units	29 Units	1 sp./unit	29 Spaces	51 Spaces
Commercial	750 m^2	1 sp./18.5m^2	41 Spaces	40 Spaces
Restaurant	720 m^2	1 sp./9.00m^2	80 Spaces	80 Spaces
Outdoor Patio (Commercial Restaurant)	363 m^2	1 sp./30 m^2	13 Spaces	14 Spaces
Office	1,749 m^2	1 sp./28 m^2	63 Spaces	56 Spaces
		Total	**226 Spaces**	**241 Spaces**

*Note: *non-res parking is based on GFLA (Gross Leasable Floor Area) which should slightly smaller than the GFA*

As detailed in Table 6-1, By-law 4316-09 requires a minimum vehicle parking supply of 226 spaces. The development proposes an overall parking supply of 241 total vehicle parking spaces (444 residential, 5 visitor, 40 commercial, 144 patio, and 56 office spaces) complies with the overall minimum parking requirements outlined in the Town of Niagara-on-the-Lake By-law 4316-09 and is acceptable. As the minimum supply for each individual use is not met, the provision of parking spaces will be coordinated through subsequent applications.

6.2 ACCESSIBLE PARKING REVIEW

Accessible parking for the proposed development was assessed against the Niagara-on-the-Lake Comprehensive By-law 4316-09. The required and proposed accessible parking supply for the proposed development is summarized in Table 6-2.

Table 6-2: Niagara-on-the-Lake Comprehensive By-law 4316-09 - Accessible Parking Summary

Use	Total Required Supply	Required Accessible Spaces Rate	Accessible Spaces Required	Spaces Provided
Apartment	226	Between 201 and 300 parking spaces	7 Spaces	7 Spaces
Commercial				
Outdoor Patio				
Office				
		Total	**7 Spaces**	**7 Spaces**

As detailed in Table 6-2, By-law 4316-09 requires a minimum accessible vehicle parking supply of seven (7) spaces. The proposed accessible parking supply of seven (7) accessible vehicle parking spaces which complies with the Town of Niagara-on-the-Lake By-law 4316-09.

6.3 BICYCLE PARKING SUPPLY

Bicycle parking for the proposed development was assessed against the Niagara-on-the-Lake Comprehensive By-law 4316-09. The required and proposed bicycle parking supply for the proposed development are summarized in Table 6-3.

Table 6-3: Niagara-on-the-Lake Comprehensive By-law 4316-09 - Bicycle Parking Summary

Use	GFLA	Required Number of Accessible Spaces Rate	Minimum Supply	Spaces Provided
Commercial	750 m^2	1 sp./ 200 m^2	4	8
Restaurant	1,083 m^2	2 sp./100 m^2	22	21
Restaurant Take Out				
Office	1,749 m^2	1 sp./ 250 m^2	7	7
		Total	**34**	**36**

As detailed in Table 6-3, By-law 4316-09 requires a minimum bicycle parking supply of 34 spaces. The proposed bicycle parking supply of 36 parking spaces meets the overall minimum parking requirements outlined in the Town of Niagara-on-the-Lake By-law 4316-09. As the minimum supply for each individual use is not met, the provision of bicycle parking spaces will be coordinated through subsequent applications.

6.4 LOADING REVIEW

Loading requirements for the proposed development were assessed against the Niagara-on-the-Lake Comprehensive By-law 4316-09. The required and proposed loading supply for the proposed development are summarized in Table 6-4.

Table 6-4: Niagara-on-the-Lake Comprehensive By-law 4316-09 - Loading Summary

Use	GFA	Non-Residential GFA Requirements	Loading Required	Loading Proposed
Non-Residential	3,498 m^2	930 m^2 to 4645 m^2	2 spaces	2 spaces

As detailed in Table 6-4, By-law 4316-09 requires a minimum loading supply of two (2) spaces. The proposed loading supply of two (2) loading spaces complies with the minimum requirements outlined in the Town of Niagara-on-the-Lake By-law 4316-09.

In support of the site plan for the proposed development a functional design review has been provided, which includes swept path drawings for waste collection vehicles and loading vehicles, the proposed fire route, and provides review of the parking and ramp geometry.

This review demonstrates that the site plan is compliant with all zoning by-law requirements and confirms that vehicles can safely and effectively circulate the driveway, access the proposed loading spaces, and enter/exit the proposed parking ramp. Functional design review drawings for the proposed development are provided in Exhibit F.

7 CONCLUSION

The purpose of this letter is to provide an updated traffic analysis and parking review for the initial TIS update based on comments received from the Town of Niagara-on-the-Lake in their August 19, 2025, memorandum.

In particular, this letter addresses any comments with respect to the developments modal split, the trip generation traffic volumes, and a left turn warrant analysis which determined no left turn lane is warranted for the proposed site accesses.

With respect to the parking supply, the proposed development land uses continue to comply with By-law 4316-09 vehicle and bicycle parking requirements for overall supply, the provision of parking spaces will be coordinated through subsequent applications.

Furthermore, the loading provisions continue to satisfy applicable requirements. An updated Functional Design Review finds that the loading spaces can be accessed and egressed by the appropriate vehicles.

Should you have any questions regarding these responses in this letter, please do not hesitate to contact the undersigned.

Yours truly,

LEA CONSULTING LTD.

ZARA MCCORMICK

Zara McCormick,M.Eng., P.Eng.
Manager, Transportation Engineering (Western Canada)

E Gilmour

Eric Gilmour, B.Eng
Project Coordinator, Transportation & Systems, Transportation

Encl.:
Exhibit A: Comments Received
Exhibit B: Trip Generation Rates
Exhibit C: Intersection Capacity Analysis – 2026 Synchro Results
Exhibit D: Intersection Capacity Analysis – 2031 Synchro Results
Exhibit E: Left Turn Lane Warrant Analysis
Exhibit F: Functional Design Review

EXHIBIT A

Comments Received

Outlook

RE: New Application - ZBA-04-2025 - 1544-1546 Four Mile Creek Road, NOTL

From donna@theherringtongroup.ca <donna@theherringtongroup.ca>
Date Fri 7/11/2025 12:52 PM
To Victoria Nikoltcheva, MCIP, RPP <Victoria.Nikoltcheva@notl.com>

Hi Victoria, I don't have any accessibility related comments on this application.

Donna Herrington
The Herrington Group Ltd
53 Greenmeadow Court
St. Catharines ON
L2N 6Y7 Canada
theherringtongroup.ca

Department of Community and Development Services
1593 Four Mile Creek Road
P.O. Box 100, Virgil, ON L0S 1T0
905-468-3266 • Fax: 905-468-0301

www.notl.com

August 15, 2025

VIA EMAIL ONLY

Dana Anderson
MHBC Planning
12 James Street North, Unit 301
Hamilton, ON L8R 2J9

Re: Application for Zoning By-law Amendment
File No. ZBA-04-2025
1544-1546 Four Mile Creek Road, Niagara-on-the-Lake, ON
First Round of Comments from Town & External Agency Staff

Town Staff have conducted a review of the submitted application materials and provide the following comments:

1. Building	a) No concerns with the application. b) It should be noted that the Ontario Building Code requirements for spatial separation, particularly with regards to the West elevation of the residential building, will need to be confirmed. This can be included, along with the OBC matrix, as part of the SPA stage.
2. Finance	No objections.
3. Fire and Emergency	Fire has no comments with the ZBA proposal. The comments below are SPA related: a) Site plan drawing to show all fire routes, including width, turning radius and location for fire route signs. b) A building matrix is requested for each proposed building, including showing any proposed fire protection systems. c) Drawings to show the location of standpipe connections within the buildings and parking garage. d) Site plan drawing to show the location and distances from the hydrant to the fire department connections. e) Site plan to show the principal firefighter's entrance for all proposed structures, including hydrant distances from principal firefighter entrances. f) Is a private fire hydrant proposed for the 2-storey commercial building?
4. Heritage	a) The subject lands are not mapped as having archaeological potential. b) The property is not a heritage resource in the Municipal Heritage Register, nor is it adjacent to one. c) There are no heritage related concerns for this proposal.

5. Operations	Please refer to the attached Operations Review Commenting Letter, dated July 25, 2025, for detailed comments. As such, the following reports require updates: • Functional Servicing Brief • Stormwater Management Report • Hydrogeological Report Please note that Staff have provided the applicant's legal opinion to the Town's legal counsel regarding the road allowance (Line 2 Road), and are waiting to hear back.
6. Irrigation	Access is required to the Line 2 Road dam for management purposes. There is a private pumphouse and an irrigation pipe buried across the property. The Town requires access to these utilities and would need to cross the property to serve lands east of Virgil.
7. Parks	The comments below are limited to the information provided, as the Landscape Plan is currently conceptual. The comments below should be considered at the detailed stage of the process (SPA). a) Kentucky Coffeetree Gymnocladus dioicus – it is suggested that a seedless cultivar such as 'Espresso' be considered. b) Red maple Acer rubrum – due to the relatively high pH of local soils, and the associated inconsistent performance of red maples, it is suggested that a higher pH tolerant cultivar or alternative tree be considered. c) Acer saccharum – sugar maple – As the straight species of this tree does not tolerate stressful growing conditions, it is suggested that a drought tolerant and leaf scorch resistant cultivar, or alternative tree be considered. d) Buxus x 'Green Mountain' Green mountain boxwood – though this cultivar is reportedly less susceptible to box tree moth than other boxwood species and cultivars, alternative plants may be considered.
8. Climate Change	As it relates to the long-term stability and protection of the community in order to increase resilience to climate change, the applicant will be required to implement all recommendations of the supporting studies (i.e. Arborist Report and Stormwater Management Report).
9. Urban Forestry	Staff note that a number of regulated trees were removed. Staff inquired with the applicant on August 8, 2025, via email regarding the removals, in which Staff also noted that the trees may have been a part of the Other Woodland feature.

10. Planning	**General Comments/Questions** a) The development's proposed residential net density exceeds the Town's maximum prescribed residential net density of 30 units per hectare. The development would facilitate a residential net density of approximately 50 units per hectare. This is calculated by dividing the number of residential units with the total area of development lands (in hectares) which excludes roads, parkland, and environmental areas. As a result, the proposed density does not conform to the Town Official Plan. b) The proposed parking arrangement, primarily at the southern limits of the property, are not situated behind the building. Pursuant to Section 6A(4.4) subsection (f) under Built-Up Area Intensification Policies, parking for all new mixed-use development will be located at the rear of the building. Staff's understanding of the intent of this policy is to provide parking at the rear of buildings as to not overwhelm the streetscape with parking. As a result, the proposed parking arrangement does not conform with the built-up area intensification directives of the Town Official Plan. c) The lots are required to merge in title prior to the implementation of the proposal. d) Please review the Town's Fence By-law (By-law No. 4778-14) to ensure that the proposed fencing around the property is in compliance with the maximum permitted heights as prescribed in the fence by-law. e) Staff recommend implementing visitor parking spaces to support the residential use on the property, given the lack of parking on Four Mile Creek Road. f) Staff recommend adding bike storage for the residential uses. g) Please ensure that all supporting studies/materials/drawings are updated to reflect any changes resulting from the comments received. **ZBA Application Form** h) Section 7: please check off the correct box for storm drainage. i) Section 10: "No" is checked off regarding the application being consistent with policy statements. Please correct and explain how the application conforms to the applicable provincial legislation in the text box of the section. j) Section 11: Staff are of the opinion that the proposal does not conform to the Town Official Plan, as per the previously stated comments. i. This section also asks if the lands have a predetermined maximum height or density. "No" is checked off. However, they do as per the applicable zoning provisions and maximum residential density in the Town OP. At a minimum, this subsection should be updated. **Planning Justification Report**

	k) Section 2.1 of the PJR states that the subject lands contain two residential dwellings. Please clarify, as only one dwelling is visible through available aerial imagery and site visit. l) Section 3.1 of the PJR states "A 238 m^2 outdoor patio area, internal to the Subject Lands, is also proposed for the commercial building." Further along on the same page, the report states "outdoor patio spaces are proposed for the commercial building totalling 390 square metres of amenity space." The two sentences appear to conflict with each other. Since the site plan drawing demonstrates a total patio area of 390 m^2 for the four (4) outdoor patios associated with the commercial building, where is the 238m^2 area allocated? m) Section 5.0 of the PJR references 1544 and 1546 Maitland Street. n) Please provide a discussion and analysis on Section 6.4 of the Town OP (Building Height Restrictions). **Site Plan Drawing (A102)** o) Please include a site statistics table to reference applicable setbacks and show building setbacks to lot lines on the drawing itself. p) The building height site statistics table should also reference height in metres, rather than only the number of storeys. q) The lot coverage site statistics table should reference the coverage of each individual building, rather than only the total building coverage. r) The density provided in the site statistics table is not accurately representing the density of the development, as per the definition of "Residential Net Density" in the applicable zoning by-law. Density is calculated by dividing the number of residential units with the total development area (minus roads/driveways/laneways and environmental areas) in hectares. s) The supporting materials and site statistics state that there will be 29 residential units, but the labelling on the residential building states 30 units. Please clarify. t) Outdoor patio 4 is labelled to be 41m^2 on the drawing, but the site statistics table states 44m^2. Please revise to align with the intended size of the patio. u) As per the comments from Town Staff regarding Irrigation, please delineate the location and size of the irrigation pipe traversing the lands on the site plan drawing. v) Are there any preliminary images/renderings of the proposed sculpture? The site plan drawing labelling states to refer back to the landscape drawing, but the submitted landscape concept plan does not provide that detail. w) Similar to the previous comment, the site plan drawing states to refer back to the landscape drawing for details on the 1.2m garden wall and 1.8m wood privacy fence, but such details are not shown on the landscape concept plan.

Underground P1 Plan (A201)

x) Please show the direction in which cars will travel within the underground parking garage.

y) Staff recommend moving the office bike rack closer to the stairs connecting to the commercial building for easier and more convenient access.

Phase 1 & 2 Environmental Site Assessment

z) Based on the conclusions of the Phase 2 assessment, has there been re-sampling of the elevated pH values and/or any remediation works done to-date?

aa) A non-potable request was provided to Niagara Region Staff and a letter of no objection was provided to the applicant's environmental consultant on May 16, 2025.

bb) What is the timing of filing a Record of Site Condition for the property?

Retail Market Study

cc) The Town does not have the in-house expertise to review and provide comments on the submitted study. As such, Staff will provide this study to a peer-reviewer for a more detailed review of the findings and to provide feedback on the analysis. The peer review will be at the applicant's expense.

dd) Page 7 of the document references that the site can accommodate 3,500 square feet of commercial space. Is this meant to be square metres? In addition, the supporting drawings show that the commercial component is approximately 3,718 square metres. Please update accordingly.

ee) The end of the analysis for Section 10.2.6 of the Town OP (on page 8) is missing from the document.

Shadow Analysis

Town Staff use the Region's Sun/Shadow Study Terms of Reference (TOR) to review shadow analysis/studies. The comments below are based on the TOR.

ff) With respect to outdoor amenity spaces on adjacent residential properties (Section 4.2.1 of the TOR), the shadowing of the proposed development does not appear to cast on such private amenity spaces. During September at 4pm, shadows will be cast on the front yards of the dwellings directly across the subject lands on Four Mile Creek, south of Arena Road. However, these front yards will receive full sunlight for the majority of the day prior to 4pm. There are also limited shadowing impacts to the Lower Virgil Reservoir, as the shadows appear to not cast on those lands between 11am-4pm.

gg) Private realm amenity spaces on the subject property (Section 4.2.2) should receive at least 4 hours of sun between 10am-6pm, April 21-September 21 of each year. The playground supporting the

	residential building may experience fewer shadowing impacts in June, demonstrating that at least 4 hours of sunlight can occur, but may be primarily casted by shadows during the month of September. Please show the extent of the playground area on the shadow analysis to demonstrate shadows in that amenity space. hh) The remaining amenity spaces (i.e. plaza, patios) within the proposed development appear to receive sunlight for at least 4 hours between the hours of 10am-6pm during the months of April 21-September 21. ii) Section 4.3.1 suggests full sun for at least 5 hours between 10am-6pm on April 21 for public outdoor amenity spaces. Further, Section 4.3.3 states that shadowing on surrounding parks and open space should not exceed 3 hours between 10am-6pm on April 21 and September 21. In reviewing the shadow impacts for March 21, June 21, and September 21, the trail of the Lower Virgil Reservoir and environmental conservation area do not appear to be affected for an extended period of time. jj) Section 4.3.2 advises that sidewalk and boulevards along the frontage of the development should receive at least 4 hours of sun between 10am-6pm on April 21. The analysis demonstrates that the frontage will receive approximately 3-4 hours on March 21 and June 21, which is an acceptable amount of sun in that area. **Urban Design Brief & Streetscape Study** kk) Section 4.1 of the brief states that there will be 30 units in the residential building, but then further states that 29 residential units will be provided at a rate of one per unit. Please clarify, as other materials state 29 units. ll) Section 6.1 specifies that the residential building is set back 3.1 metres from the western property line, but the site plan and draft zoning amendment shows this setback at approximately 1.6 metres. Figure 6.1 in the brief also does not accurately represent the rear yard setback. Please clarify this in the brief. mm) Staff are of the opinion that the brief lacks justification for the parking arrangement on the south side of the lands. This row of parking will be visible from the street, creating a parking-dominant appearance off Four Mile Creek Road, and could result in compatibility impacts to the southern neighbour (motor sounds, headlights, etc.). While the requested zoning amendment proposes a 1-metre-wide buffer strip along the southern interior side yard, Staff recommend incorporating additional landscaping and larger buffers between the street and southern property line to mitigate any potential impacts that the parking arrangement may pose to the streetscape and neighbouring residential property. nn) Section 7 (Streetscape Study) should make reference to the policies of the 2024 Provincial Planning Statement, rather than the 2020

	Provincial Policy Statement. The 2024 PPS also replaced the Growth Plan. oo) Staff note that, although Table 7.1 (Attributes Table) demonstrates that the majority of the parking orientation in the block face is along the front of the properties, most of these lots support single-detached dwellings where parking in the front yard is not typically restricted through any local policy framework. The proposed built-form of the proposed development versus the usage of single-detached dwelling lots is not a fair comparison. **Property Index Maps & Parcel Registers** pp) The PIN Map and parcel register document for PIN 46383-0086 (LT) (the larger parcel) is outdated from October 2024. Please submit new documents that are dated within the last 30 days.
11. Urban Design	As the subject lands are on a Regional Road, the Town has engaged with a Regional Urban Design Specialist to review urban design considerations with respect to the proposed development. Please refer to the attached Urban Design Review Letter, dated August 6, 2025, for detailed comments.
12. Zoning	**Parking** a) Staff have provided minimum parking standards based on the full extent of the requested uses with the following parking rates: i. Restaurant – 1 per 9m^2 GFLA ii. Medical Office – 1 per 15m^2 GFLA iii. Outdoor Patio Restaurant – 1 per 30m^2 GFLA iv. Apartment Building – 1 per unit b) Based on the provided ground floor plan of the commercial building, Staff calculated the leasable floor area (minus the lobby, vestibule and stairways) to be approximately 1,466m^2. However, Staff note that the final leasable floor area of the commercial uses will be lesser than this, given that there will be additional circulation spaces, storage areas, and washrooms. If using the parking rate for a restaurant for the entire ground floor area, this would necessitate 163 required parking spaces. c) Similarly, Staff calculated the leasable floor area for the second storey office spaces to be approximately 1,495m^2, necessitating 100 required parking spaces for medical office uses. d) Based on 387m^2 of restaurant patio space, the required parking spaces is 13. e) Based on 29 residential units, the required parking spaces for the residential component is 29. f) In total, the requirement for parking spaces based on the full extent of the requested uses is 305. Based on this number, the site is deficient 105 parking spaces. g) Staff recognize that it is unlikely that the restaurant use will occupy the entire ground floor, and that the medical office use would not occupy the entire second floor of the commercial building. To ensure this, Staff

recommend implementing restrictions on the number of restaurants and medical office uses and their gross leasable floor areas that can be accommodated on-site. Staff also note that there are four (4) outdoor patios, so it is assumed that there would be more than one restaurant.

h) Staff also note that a Parking Impact Analysis was requested to address a shortfall of required parking. Given that there will be a shortfall of required parking based on the future commercial uses as noted above, Staff require the submission of a Parking Impact Analysis to address this issue.

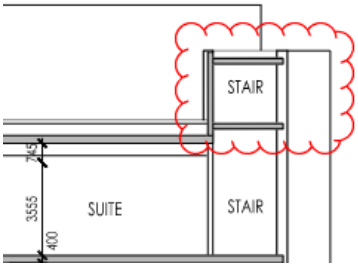
Other

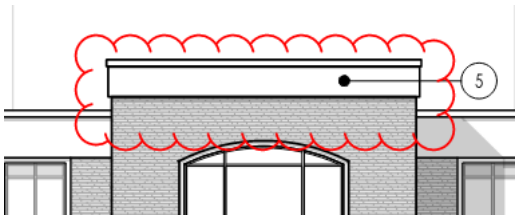
i) The conservation area shall be rezoned as "Open Space" to allow for its continued protection and preservation. Please revise the zoning schedule to reflect this additional zone boundary.

j) While the draft ZBA requests a 0-metre setback to the underground garage, the drawings demonstrate the setback to be 0.6 metres. Staff will be implementing this setback in a future ZBA.

k) There are no minimum amenity space requirements for stand-alone residential buildings, except for the requirement for a children's play area at the rate of 2.5m^2 per unit. Based on 29 units, the minimum required playground area is 72.5m^2, which the proposal aligns with as it provides 77m^2.

l) The elevator/stair structure in the middle of the façade of the residential building shall be included in the overall height, as per the definition of height in the Zoning By-law (see markups and definition below).





"BUILDING HEIGHT when used in reference to a building or structure, means the vertical distance measured from the average finished grade around the structure to the peak, except:
(c) Where an exterior wall other than a required fire wall extends above the top of the roof of a building, the topmost part of such exterior wall."

m) As per Section 6.37(d), no outdoor storage shall be visible from any street or abutting lot, and any open storage area shall be screened by a fence or wall of at least 2 metres in height. Staff note that there is a label near the southern loading space of the commercial building of the site plan drawing stating "10m^2 bulk storage" – please ensure that this outdoor storage area complies with the applicable provisions. Pursuant to subsection (g), please also confirm that the usage of the outdoor storage will not impede with the required loading space.

	n) Staff recommend prohibiting the following permitted uses under the Village Commercial (VC) Zone to ensure compatibility with the residential use and other surrounding commercial uses on the property, including, but not limited to: automobile sales & service establishment, automobile service station, gas bar. o) Please ensure that the building coverage noted in the site statistics of the site plan drawing include all covered areas, including the various canopies on both buildings.

Agency Staff have conducted a review of the submitted application materials and provide the following comments:

12. Niagara Region	Please refer to the attached letter from Niagara Region Staff dated July 10, 2025, for detailed comments. The Town and Region have entered into a Service Level Agreement for the Region to continue providing comments and recommendations on matters associated with land use compatibility and the environmental system on behalf of the Town. The recommendations in the Region's letter are considered requirements under the Town's review. The points below summarize the comments and requirements in the letter: **Land Use Compatibility** a) The submitted Land Use Compatibility Study (LUCS) recommends that screening-level air quality modelling be conducted to assess potential impacts to nearby facilities; however, no such assessment was included with the application submission. b) The LUCS also recommends screening-level noise assessment to evaluate impacts from a rooftop cooling tower and municipal works yard in the surrounding area. The submitted Noise Study assesses HVAC equipment at Millbrook Cabinetry, but the location assessed appears to be a standard rooftop HVAC unit, rather than the cooling tower located on the eastern portion of the roof. The Noise Study also does not assess any non-HVAC stationary sources as identified in the LUCS, including the front loader and dump truck operations at the municipal works yard. c) A number of loading docks are approximately 130-140 metres from the subject property at 11 and 13 Henegan Road (Closets by Design and Peninsula Flooring), as well as outdoor storage and potential work activity at Whirlpool Jet Boat Tours (7 Henegan Road) approximately 150 metres away. The LUCS identifies these facilities as Class I industrial uses, having a Potential Area of Influence of 70 metres. However, the D-Series Guidelines define Class II facilities as those with "frequent movement of products and/or heavy trucks with the majority of movements during daytime hours" and/or "outdoor storage," having a

	Potential Area of Influence of 300 metres. Depending on the actual operations, these facilities may meet the criteria for Class II justification. The LUCS does not provide sufficient justification for the Class I designation, such as any documentation of site visits or consultation with the facility operators. Further details are required. d) The LUCS does not specify the timing or methodology of the observations stated regarding the Whirlpool Jet Boat Tours operation. Additional information is needed to determine whether the Class I classification is appropriate on a year-round basis, given the seasonal nature of the operation. e) The LUCS must be updated to evaluate whether mitigation is required to ensure that the lands within the Virgil Business Park can continue to develop and expand in accordance with their existing planning permissions. f) Additional analysis is required in the LUCS to support the conclusion for the vacant Enterprise (E) zoned lands, as it is not reasonable to conclude that the parcel could only accommodate smaller-scale industrial uses given its size. g) The LUCS must be revised to reflect the requirement of Section 4.4.5 of Guideline D-6 and to determine whether mitigation is necessary to support compatibility with both existing and future industrial uses. h) The Noise Study includes projections for Four Mile Creek Road and Niagara Stone Road but only to the year 2034. Regional Road Traffic Noise Control Policy PW5.NO1.0 requires a 20-year projection for both Regional Roads. The Noise Study must be updated to reflect this requirement. i) The Noise Study excludes the proposed playground (outdoor living area – OLA), stating that it is not directly exposed to traffic noise. NPC-300 requires that all OLAs be assessed if they are within the area of influence of a noise source. While buildings may be considered as noise barriers, their effectiveness must be demonstrated through modelling, which was not included in the submission. The Noise Study must be updated to assess the OLA and demonstrate the effectiveness of any proposed mitigation. j) Town Staff require updates to the LUCS and Noise Study to reflect the comments/requirements noted above and in the Region's commenting letter. A detailed Air Quality Study shall be provided as a standalone document, or comprehensively addressed within the updated LUCS. Due to the scope of the modelling included in the updated documents, a third-party peer review may be required. **Transportation**

	k) A more conservative estimate of the modal split percentage for transit trips should be assumed given current transit availability on the site. l) A left-turn lane warrant analysis is required. m) A revised TIS is required. **Natural Environment System** n) Regional Staff are satisfied with the findings and recommendations of the Environmental Impact Study (EIS) and consider them in conformity with NOP policies. Regional and Town Staff are continuing to investigate the recent tree removals and its compliance with applicable environmental policies and regulated tree requirements. o) The delineated NES features, associated buffers, and restoration areas shall be included within a restrictive environmental zoning category, as required under Policy 3.1.4.8 of the NOP. The draft zoning by-law shall be revised to confirm conformity with applicable natural heritage policies. p) The Region will recommend conditions as part of future Planning Act approvals to secure implementation of the EIS mitigation measures and recommendations. **Urban Design** q) Comments with respect to urban design are referenced in section 10 of the Town commenting table and attached to this letter.
13. Niagara Peninsula Conservation Authority	Please refer to the attached letter from Niagara Peninsula Conservation Authority Staff dated July 10, 2025, for detailed comments. The points below summarize the comments and requirements in the letter: a) The proposed playground extends past the stable top of slope. This area will need to be removed or revised on future plans to be landward of the tops of the slope. b) The stable top of slope needs to be indicated on the Grading Plans. c) Lands past stable or physical top of slope (whichever is more restrictive) are to be zoned in an appropriate category to protect the hazard. The zone boundaries must be revised to reflect this. d) The associated drawings shall be revised to reflect the reduction of the physical top of slope limit to the ‘orange flag’ immediately north of the residential building. e) The Stormwater Management Report must be revised to reflect the 100-year storm regulatory floodplain. f) Regarding access to the Virgil Dam and Reservoir lands, the following is required:

	i. Location of the existing NPCA Access Gate be noted on the drawings, and that a driveway be included to ensure a means of unimpeded access is provided. ii. The curb proposed around the perimeter of the parking lot would serve as a barrier to NPCA vehicles. This must be revised. iii. As currently designed, it does not appear that anything would prevent tenants from parking on the Town Access Easement. This space shall be reconfigured into a 5-metre minimum wide dedicated driveway to allow the NPCA to access the Virgil Dam lands. The NPCA requests that the Easement Agreement also be in favour of the NPCA, including the Town.
14. Niagara Catholic District School Board	Please refer to the attached letter from Watson & Associates on behalf of the Niagara Catholic District School Board (NCDSB), dated July 20, 2025, for detailed comments. The points below summarize the comments and requirements in the letter: a) The NCDSB is eligible to collect Education Development Charges (EDCs) from this development to support the acquisition of land required for new school sites and related future school construction needs. These chargers are to be collected on behalf of the NCDSB prior to the issuance of building permits. b) To ensure that future residents are fully informed of potential impacts and that adequate arrangements are made for student accommodation, the Board recommends the inclusion of the following conditions in the future site plan approval: i. Accommodation within a Catholic school operated by the Niagara Catholic District School Board may include temporary facilities; including but not limited to accommodation in a portable classroom or directing students to an alternative attendance boundary. ii. Student busing is at discretion of the Niagara Student Transportation Services. iii. If school buses are required within the [development] in accordance with Board Transportation policies, as may be amended from time to time, school bus pick up points will generally be located on the through street at a location as determined by Niagara Student Transportation Services.
15. Enbridge Gas	No objections to the proposed application; however, Enbridge Gas reserves the right to amend or remove development conditions.
16. Joint Accessibility Advisory Committee	There are no accessibility-related comments on this application.

In accordance with *Planning Act* requirements, the 90-day timeline for a decision on the application is on September 18, 2025. In lieu of this, Staff are committed to continue to work with your team on the processing of this proposal to bring forward a future recommendation to Town Council. Please provide further information in the form of a response table and resubmission of revised materials based on the comments above by September 12, 2025. If you have any questions or comments, please do not hesitate to contact me by telephone at (905) 468-6451 or by email at victoria.nikoltcheva@notl.com.

Respectfully,

Victoria Nikoltcheva, MCIP, RPP
Senior Planner
Town of Niagara-on-the-Lake

Operations Department - Public Works Division
1593 Four Mile Creek Road
P.O. Box 100, Virgil, ON L0S 1T0
905-468-3266 • Fax: 905-468-1722
www.notl.org

MEMORANDUM

TO:	VICTORIA NIKOLTCHEVA, MCIP, RPP COMMUNITY & DEVELOPMENT SERVICES
FROM:	KIEFER PATON C.TECH. ENGINEERING TECHNOLOGIST
DATE:	JULY 25, 2025
SUBJECT:	1544-1546 FOUR MILE CREEK ROAD - ZONING BYLAW AMENDMENT
LOCATION:	1544-1546 FOUR MILE CREEK ROAD, NIAGARA-ON-THE-LAKE

We have reviewed the above noted submission and supporting documents provided by the applicant's agent and will provide further detailed comments once a comprehensive Site Plan application has been submitted.

The following is a summary of our review, comments, and recommendations for the proposed Zoning By-Law Amendment application.

EXISTING SERVICES

Four Mile Creek Road

Water	250mm PVC (1996)
Sanitary Sewer	250mm AC (1976)
Storm Sewer	525mm CP (2000) (partial frontage) 1050mm CP (2000) (partial frontage)
Sidewalks	1.25m/1.5m (east side)
Road Allowance	22.6m/30.44m (varies)
Road Surface	Asphalt
Road Authority	RMN

Department of Public Works
1593 Four Mile Creek Road
P.O. Box 100, Virgil, ON L0S 1T0
905-468-3266 • Fax: 905-468-1722
www.notl.org

WATER

The submitted Functional Servicing Brief (FSB) proposes to utilize the existing 250mm municipal watermain on Four Mile Creek Road to provide domestic water supply and fire protection to the proposed development proposal. The FSR notes that maximum day domestic water demands for the site are estimated to be 0.23 L/s, with 0.04L/s attributed to the proposed commercial building and 0.19 L/s attributed to the proposed residential building.

The FSB also discusses minimum fire flow requirements for the proposed development and uses the maximum demands of the commercial building as the governing factor for the site. The theoretical demands expressed in the Brief show that minimum fire flow requirements for the site are approximately 250 L/s. The brief includes fire hydrant flow testing results that verify that these water demands can be accommodated via the existing municipal watermain network.

Staff note that the existing water service to the subject lands is shown and noted on the submitted documents as being slated for decommissioning. Please note that the Town will require that all decommissioned water services be capped at the respective main.

Further detailed review of the proposed service connections, metering, and other water appurtenances will be carried out once a detailed comprehensive site plan application has been circulated.

SANITARY

The submitted Functional Servicing Brief (FSB) proposes to utilize the existing 250mm municipal sanitary sewer on Four Mile Creek Road to receive sanitary flows from the proposed development. The FSB indicates that the proposed development is estimated to discharge a total peak flow rate of 2.03L/s to the existing sanitary sewer system, representing an estimated population of 123 persons. The Brief also includes a downstream sanitary capacity analysis that assesses available capacity in the existing municipal sewer system to a point located at the Niagara Stone Road/Four Mile Creek Road intersection. In summary, the analysis shows that available capacity does exist, and that the most critical section of sewer within the study area is currently flowing at approx. 58% full. Under proposed sanitary flow conditions the sewer's available capacity is anticipated to decrease by approx. 5% to flow at approx. 63% full.

Staff note that the existing sanitary service to the subject lands are shown and noted on the submitted documents as being slated for decommissioning. Please note that the Town will require that all decommissioned sanitary services be capped at the respective main.

Further detailed review of the proposed sanitary sewer system will be carried out once a detailed comprehensive site application has been circulated.

SIDEWALKS and ROADS

As part of this proposed development, the Town will require that the owner install new sidewalk across the site's full Four Mile Creek Road frontage. The submitted preliminary plans show a proposed curb-face sidewalk along Four Mile Creek Road, however the submitted materials do not appear to show how the proposed development will provide for connectivity to the existing sidewalk network in proximity to the site. Town Staff note that a proposed curb-face sidewalk may require that further buffer strip be implemented to shift the sidewalk away from the curb, which may impact the proposed width of installed sidewalk. Further dialogue with Regional Staff may be necessary to determine the most appropriate location and alignment of proposed sidewalk along Four Mile Creek Road to ensure future sidewalk extensions are appropriately located.

Four Mile Creek Road is under the ownership and jurisdiction of the Niagara Region and Town Staff will defer further road-related comments to Regional Staff.

The applicant has provided a written legal opinion as part of this ZBA application package, which discusses the ownership and use of the Line 2 Road road allowance. Town staff were not afforded the opportunity to review this opinion prior to this application and as such do not have a response from Town Legal Counsel to provide at this time. Until such time as the Town can verify ownership of this road allowance via Town Legal Counsel, the Town cannot support the proposed development of the road allowance lands. Given that the applicant's proposed use of the road allowance includes a paved driveway access to Four Mile Creek Road, extensive parking areas, as well as buried stormwater management infrastructure, the determination of ownership and future desired use of the road allowance has the potential to affect the scale of the overall proposal.

The Town cannot provide further detailed comments, nor support the proposed use of the Line 2 Road allowance until such time as ownership of those lands can be verified.

LOT GRADING AND STORMWATER MANAGEMENT

The submitted Functional Servicing Brief (FSB) proposes to utilize the existing 525mm municipal storm sewer on Four Mile Creek Road to receive storm flows from the proposed development. The report also indicates that the proposed SWM strategy will attenuate post-development flows up to and including the 100-year storm to the pre-development 5-

year flows. This proposed stormwater management approach meets the Town's overall municipal design criteria.

Further detailed review of the proposed storm sewer system and associated SWM controls will be carried out once a detailed comprehensive site application has been circulated.

Staff have also carried out a preliminary review of the submitted hydrogeological report to determine any impacts the proposed development may have from a stormwater perspective. The report discusses post-development dewatering of the site, consisting of directing approximately 71,000 L/day of groundwater to the municipal sanitary sewer network. The Town's sewer use bylaw prohibits stormwater (including groundwater) connections to the Town's sanitary sewer infrastructure, and as such the Town does not support outletting groundwater flows in any capacity to the municipal sanitary sewer. If long term de-watering is deemed necessary to achieve the proposed build-out of the site, and if an outlet is required to accommodate that de-watering Town Staff will require that those flows be integrated into the overall SWM strategy for the site and directed to the appropriate outlet.

GENERAL

All infrastructure works shall be constructed to current Town specifications, as per industry best practices, and per all relevant legislation. All submitted plans, reports, and supporting documents shall be subject to a peer review at the owner's expense. All proposed works shall be subject to inspection and all necessary testing at the owner's expense.

CONCLUSION

The Operations Department has reviewed the information submitted by the applicant with respect to the Zoning By-law Amendment applications for 1544-1546 Four Mile Creek Road. Operations Staff cannot support the proposed application in its current form due to the items noted in the comments above. Considering the potential ramifications of the road allowance lands remaining under Town ownership the extent of comments Staff can provide at this time is limited. Please note that submitted documents will be subject to peer review as part of subsequent re-submissions.

Operations Staff will reserve further comments with respect to the ZBA submission until such time as the supporting information is received. The above noted analysis does not preclude further detailed comments or requirements being brought forward by this department upon future review of submitted plans, reports and supporting documents for the current applications or a future Site Plan application submission.

Department of Public Works
1593 Four Mile Creek Road
P.O. Box 100, Virgil, ON L0S 1T0
905-468-3266 • Fax: 905-468-1722
www.notl.org

Please advise should you have any questions or require additional information.

Sincerely,

Kiefer Paton, C.Tech.
Engineering Technologist
905-468-3061 ext. 319
kiefer.paton@notl.com

1544-1546 Four Mile Creek Road August 6, 2025

Urban Design Review

The Proposal:

The proposal is a mixed use development with commercial, office, and residential uses. The proposal consists of two buildings with commercial and office uses in one building that addresses the street with a 2 storey form and another 4 storey residential only building. Both buildings will sit atop 1 level of underground parking. Surface parking is also provided along with various outdoor amenity spaces.

The following comments are a review of the proposal from an Official Plan policy perspective and best practices.

Existing Context:

The existing site is located along Four Mile Creek Road RR100 at the south end of Virgil. The site is approximately 2.64 acres with a varied surrounding context of typical detached houses across the Regional Road and a drinking water reservoir abutting the site. The proposal seeks to create a mixed-use development through a zoning amendment that would complement site's proximity to the Virgil village core.

Planned Context:

The Niagara-on-the-Lake Official Plan provides urban design policy directions that seeks to achieve intensification of core areas including Virgil, ensure compatibility with residential uses, the consolidation of commercial development along primary corridors. These policies are supplemented by urban design policies that seek high quality urban design that includes well designed buildings and spaces that respond to enhance streetscapes.

Site Design:

The proposal consists of 2 buildings with commercial and office uses in one building that addresses the street with a 2 storey form and another 4 storey residential only building.

The overall design of the site demonstrates best practices and implementation of the urban design policies of the Town. The commercial building is located along the frontage which establishes a street line and with vision glass proposed and direct doorway access will contribute to animation and activation of the street. The proposed commercial/office building is complemented by various landscape spaces and patios to contribute to a rewarding experience of the development. Parking is located behind and to the side of the commercial/office building which is a best practice. Load and service areas are screened from view with landscaping and board fencing.

The residential building is proposed at 4 storeys. Placement of the taller building at the rear is a best practice that allows the street facing building to provide a compatible built form and allows the residential building to maximize the visual amenity of the reservoir to the residents of the building. The bulk of the 4 storey building will be visually diminished and will not impact the quality of the streetscape.

Surface Parking:

The site design attempts to limit the street exposure of surface parking through the placement of the commercial/office building, use of low screen walls, and landscaping. Notwithstanding, a significant portion of the surface parking remains exposed and the poor interface of the surface parking with the adjacent land use to the south of the site is an urban design concern that should be addressed by the proposal and the supporting urban design brief. The quantum of parking provided is the result of the intensity and proposed uses which include medical uses. Having a smaller commercial/office building footprint would result in a poorer urban design solution with less built frontage.

The design should explore means of extending the underground parking so as to lessen the impact of surface parking and ensure that the site interface along the south boundary of the site is able to provide a more robust landscape buffer to set away the parking from the property line and comprising board fencing, trees, and shrubs. Alternatively, if the proposed parking along the south boundary is acceptable it should be accompanied by a masonry wall that is able to buffer the parking ensuring vehicle headlights and noise is mitigated. This is a best practice approach where commercial/mixed uses abut sensitive residential uses.

Underground Parking:

Consider extension of the underground parking limits to create more parking below grade. Consider approaches such as tandem parking arrangements that do not require another aisle. Along the east limits of the below grade parking tandem configurations could yield 22 more spaces. This could support to lessen the impact of surface parking and ensure the site fits in and is able to interface with adjacent land uses in a best practice approach.

Building Design:

The commercial and office building is a relatively large building to this context and is designed to include large windows and doors that appear to open to the street. The ground floor comprises commercial uses while the upper floor is for office uses. The provision of commercial uses and office together is a powerful and important element of any core or downtown. With the residential uses, the commercial and office uses together create complementary and symbiotic relationship that generates economic and social activity that is fundamental to the success of core areas. This is a best practice approach.

To ensure that the proposal genuinely creates activity, the design of the commercial units should welcome patrons from both the surface parking areas and from the street. The St. Davids example below shows the importance of providing vision glazing that enlivens the street with views of the interiors – especially at evening or nighttime. That is a best practice that should be required and implemented through the zoning provisions. It is not clear from the plans if the glazing along Four Mile Creek will be vision glazing. This should be labeled on plans and elevations.

While the overall architectural design approach represents good practice, a further contextual nuance can be added to the architectural design that would help break up the long façade. This can be done simply by variation of exterior materials and colours, variation of the cornicing element,

window sizes etc. This level of variation will enhance visual interest and complement the visual plurality of the streetscape.

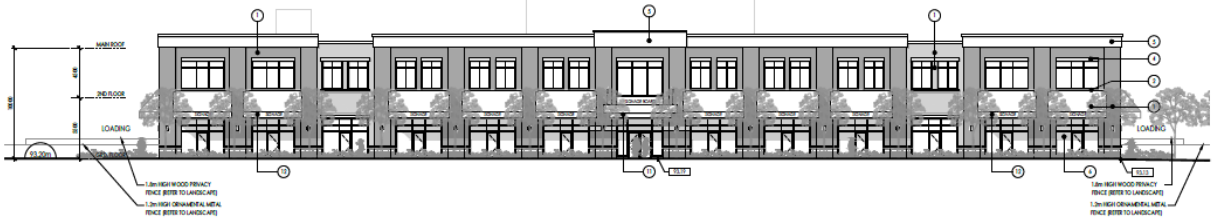


Figure 6.7 : Commercial East Elevation

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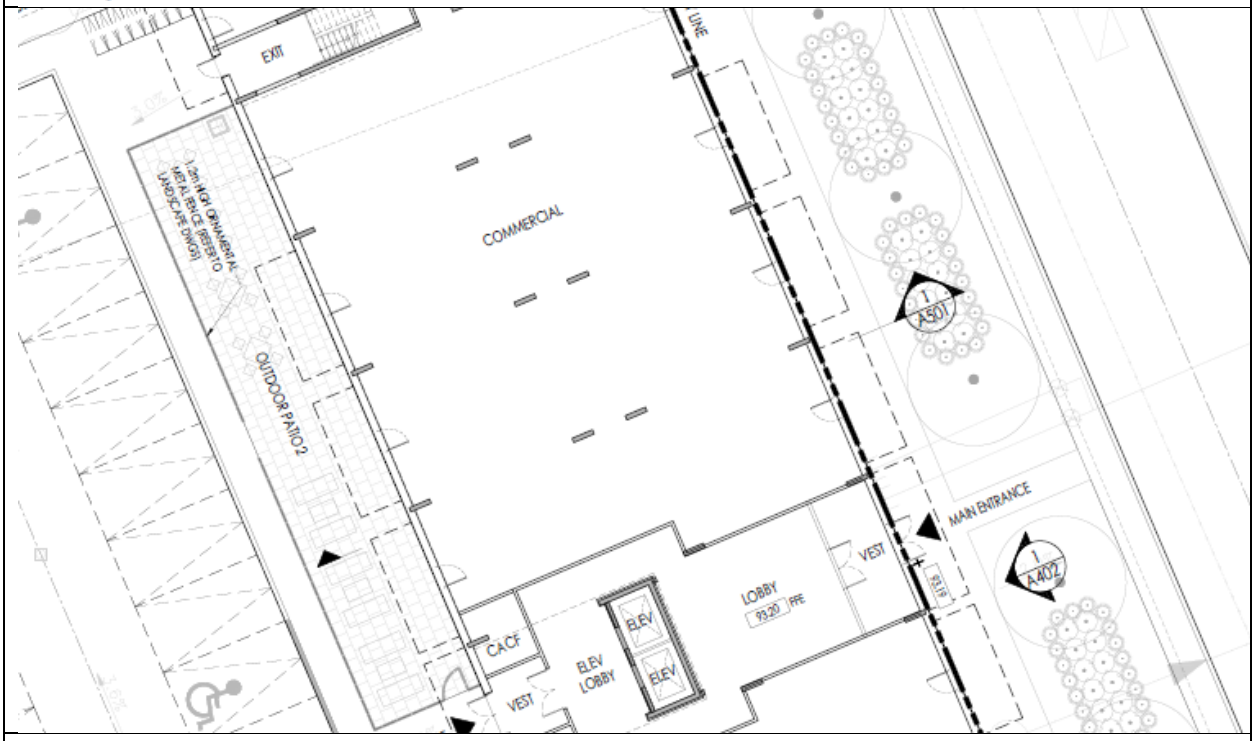


Include zoning provisions that seek to ensure that a certain percentage of the façade is glazed with vision glass and not spandrel.

	Storefronts of spandrel panels and not vision glazing. These are blank facades that do not help to animate the street. The signage is unharmonious and unattractive.
	Example of a development with vision glazing and well-designed signage.

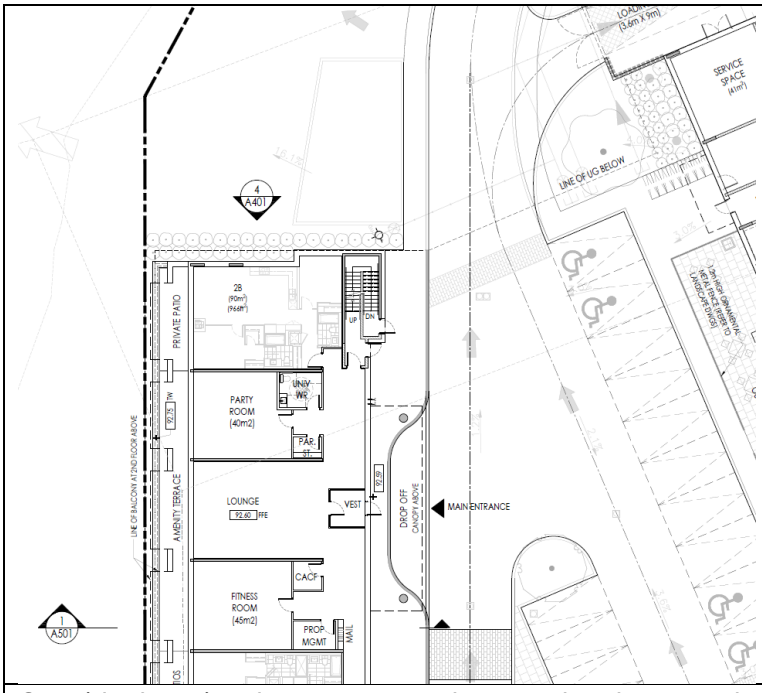
The Commercial/office building includes awnings which can contribute greatly to visual interest through colour and design. It should be noted that the proposed awnings are within the Regional ROW. The Region may not permit these. Setting the proposed building back 1.0m can provide the necessary space to keep the awnings within the private realm.

Setting the building back 1.0m will also accommodate the exterior swing of exterior doors facing the street.

The architectural design of the residential building has an elegant and classical tone that complements the design of the commercial/office building. This is a single loaded building with units on one side of a corridor. Notwithstanding, the residential building can also benefit from variation in materials and colours to help enhance the visual interest of the building and visually breakup the mass of the building. The appearance of the building can be made lighter through the use of EIFS (exterior finish system) and by limiting the use of masonry to key focal areas such as the central circulation element and the exit stair towers. Overall, the exterior design of the stair tower should include vision glazing. It is not clear from the drawings if the exterior windows along the corridor façade are vision glazing – the drawings should indicate that the windows function as vision glazing.

The interior layout of the northside of the residential building should be reconsidered so that the corner of the building has the common spaces alongside the playground. Moving the fitness space beside the party room so that these are closest to the playground will allow provide added privacy

to the residential unit. Keeping the common spaces together and the private spaces together is a best practice.



Consider locating the party room closer to the playground and the corner residential unit with the other residential units.

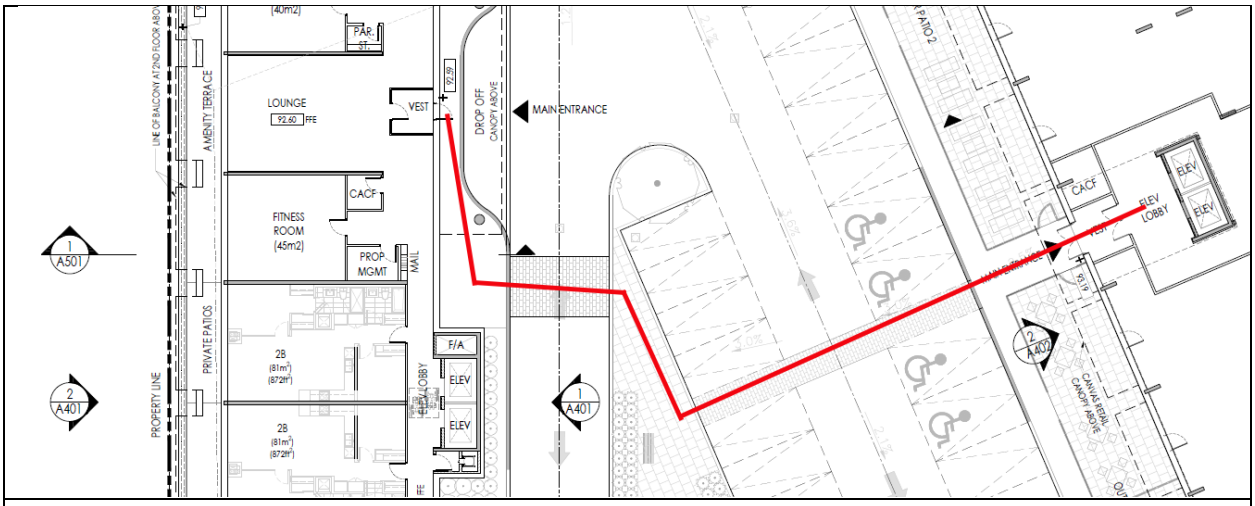
Landscape Design:

The landscape design presents a well landscaped development where the landscape complements the architectural quality of the buildings.

The location of the playground may be compromised with shade. This space will be in shade for prolonged periods. Consider locating the playground or shifting the space north to avoid building shadows.

Consider a more direct and barrier free route from the commercial/office building to the residential building. As proposed pedestrians will take direct desire lines from door to door. The design should better facilitate this and provide a direct route.

Consider additional landscaping along the south east corner of the site by shifting the masonry wall closer to the parking spaces and complementing the wall with planting of a tree and shrubs.



Proposed circulation between buildings is not direct.

The proposed screening of the loading areas is 1.8m wood fencing. As a best practice screen walls Consider masonry walls that match the architectural appearance of the building.

Regards,

Khaldoon Ahmad MRAIC, MCIP, RPP

Prepared for the Town of Niagara-on-the-Lake according to the terms of the Service Level Agreement.

Niagara Region

Public Works, Infrastructure Planning and Development
1815 Sir Isaac Brock Way, Thorold, ON L2V 4T7
905-980-6000 Toll-free:1-800-263-7215

Via Email Only

July 10, 2025

File Numbers: PLZBA202500900

Victoria Nikoltcheva, MCIP, RPP
Senior Planner
Town of Niagara-on-the-Lake
1593 Four Mile Creek Road
PO Box 100, Virgil, ON L0S 1T0

Dear Ms. Nikoltcheva:

Re: Regional Comments
Zoning By-law Amendment Application
Town File Numbers: ZBA-04-2025
Applicant: Times Group Corp. (Stephen Aghaei)
Agent: MHBC Planning (Dana Anderson)
Address: 1544 and 1546 Four Mile Creek Road (ARN: 262702001612300)
Municipality: Town of Niagara-on-the-Lake

Regional Infrastructure Planning and Development staff have reviewed the information circulated with the Zoning By-law Amendment application for the lands municipally known as 1544 and 1546 Four Mile Creek Road in the Town of Niagara-on-the-Lake.

The subject lands are currently zoned 'Village Commercial – Holding' (VC-H) under the Town's Zoning By-law. The Zoning By-law Amendment is proposed to rezone the lands to a site-specific Village Commercial (VC) zone. The amendment seeks to introduce modified provisions related to building height, setbacks, buffer strips, and yard projection encroachments to facilitate a proposed development consisting of a two-storey commercial building fronting Four Mile Creek Road, and a four-storey residential building containing 29 dwelling units located at the rear of the subject lands.

A pre-consultation meeting for the proposed development was held on April 18, 2024. The following Regional comments are offered to assist the Town in its review and consideration of the applications.

As outlined below, Regional staff are currently unable to support the application from a Regional transportation perspective. An updated Transportation Impact

Study (TIS) is required to confirm that the development, as proposed at the zoning stage, can be accommodated by the Regional road network.

Planning Act Changes

Pursuant to the *Planning Act*, as of March 31, 2025, Niagara Region no longer holds planning authority as an upper-tier municipality. As a result, the Niagara Official Plan (NOP) now functions as the official plan for all lower-tier municipalities within the Region. This plan remains in effect until a local municipality amends or revokes it. Accordingly, Town staff should ensure that the application conforms to the applicable policies of the NOP.

Under the *Planning Act*, an upper-tier municipality may provide planning advice and support to lower-tier municipalities, subject to mutual agreement. Niagara Region is in the process of entering into a Planning Service Agreement with the Town of Niagara-on-the-Lake to continue offering planning support in the following areas:

- Land Use Compatibility
- Gas and Petroleum Resources
- Water Protection Screening
- Environmental Planning
- Urban Design (on Regional Roads).

To support the Town's evaluation of land use compatibility and environmental policy considerations related to the proposed applications, the below comments regarding land use compatibility and the natural environment system are provided for the advice of Town staff.

With respect to urban design, Regional staff will coordinate separately with Town staff to provide input and support their review process.

Matters related to transportation, Regional road allowance(s) and waste collection are to be addressed in accordance with the existing Memorandum of Understanding (MOU) for Engineering Services between the Region and the Town.

Land Use Compatibility

The Provincial Planning Statement (PPS) and Niagara Official Plan (NOP) require that major facilities and sensitive land uses "be planned and developed to avoid, or if avoidance is not possible, minimize and mitigate any potential adverse effects from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term operational and economic viability of major facilities…".

To implement these policies, the Ministry of the Environment, Conservation and Parks (MECP) Land Use Planning Policy Guidelines (the Guidelines) are to be applied in the land use planning process to prevent or minimize future land use problems due to the

encroachment of sensitive land uses on industrial uses. Guideline D-1 ‘Land Use Compatibility Guidelines’ and Guideline D-6 ‘Compatibility between Industrial Facilities and Sensitive Land Uses, as well as Publication NPC-300 ‘Environmental Noise Guidelines’ (NPC-300), apply to the review of these applications.

The Guidelines indicate that industrial land uses and sensitive land uses may be incompatible due to possible adverse effects of industrial uses near sensitive land uses, and provide for potential influence areas and recommended minimum separation distances from industrial uses to more sensitive uses, as noted below:

Industrial Facility Class	Recommended Minimum Separation Distance	Potential Influence Area
Class I	20 metres	70 metres
Class II	70 metres	300 metres
Class III	300 metres	1,000 metres

The Guidelines indicate that a sensitive land use should not be permitted closer than the recommended minimum separation distance, unless impacts from industrial activities can be mitigated to the level of “trivial impact” (i.e. no adverse effects). Potential influence areas are those where adverse effects are generally expected to occur and act as a potential constraint for sensitive land uses. In the absence of studies that specify actual influence areas for a particular industrial facility, Regional staff use these potential influence areas to screen for potential incompatibilities. Appendix A of the D-6 guidelines categorizes industrial facilities into three classes according to the objectionable nature of their emissions, their physical size/scale, production volumes and/or the intensity and scheduling of operations. The potential influence area and minimum separation of an industrial facility are to be determined based on these classifications, using a predictable “worst case scenario”, and the permitted uses in the Zoning By-law.

At the pre-consultation meeting, Regional staff requested the submission of a Land Use Compatibility Study (addressing MECP Guidelines D-1 and D-6) and a Noise Study (addressing NPC-300) to evaluate potential adverse effects from nearby industrial operations and lands designated or zoned for industrial use, primarily within the adjacent Virgil Business Park, as well as from nearby transportation sources, notably Four Mile Creek Road. The following reports were submitted with the application to address land use compatibility:

- Land Use Compatibility Assessment (Air Quality and Noise), prepared by RWDI (dated February 13, 2025); and,
- Noise Impact Study, prepared by LEA Consulting Limited (dated February 11, 2025).

The submitted Land Use Compatibility Study recommends that screening-level air quality modelling be conducted to assess potential impacts from the following nearby facilities:

- Greaves Jam & Marmalade Factory (1 Walker Road);
- Shaw Festival Scenic Construction (3 Walker Road);
- Millbrook Cabinetry (15 Henegan Road); and
- Town of Niagara-on-the-Lake Municipal Works Yard (1593 Four Mile Creek Road).

However, no such assessment was included in the submission.

The Land Use Compatibility Study also recommends a screening-level noise assessment to evaluate potential impacts from:

- Millbrook Cabinetry (specifically, rooftop cooling tower)
- NOTL Municipal Works Yard (specifically, front loader and dump truck movements)

While the submitted Noise Study includes an assessment of HVAC equipment at Millbrook Cabinetry (identified as Source S28), the location assessed appears to be a standard rooftop HVAC unit, not the cooling tower located on the eastern portion of the roof. Additionally, the noise study does not assess any non-HVAC stationary sources, including the front loader and dump truck operations at the NOTL Municipal Works Yard, as identified in the Land Use Compatibility Study.

Staff also observe loading docks approximately 130 to 140 metres from the subject lands at 11 and 13 Henegan Road (Closets by Design and Peninsula Flooring), as well as outdoor storage and potential work activity at Whirlpool Jet Boat Tours (7 Henegan Road), approximately 150 metres away. All of these facilities are identified in the Land Use Compatibility Study as Class I industrial uses, which have a Potential Area of Influence of 70 metres. However, the D-Series Guidelines define Class II facilities as those with “frequent movement of products and/or heavy trucks with the majority of movements during daytime hours” and/or “outside storage,” which have a Potential Area of Influence of 300 metres. Therefore, depending on their actual operations, these facilities may meet the criteria for Class II classification. The Land Use Compatibility Study does not provide detailed justification for the Class I designation, such as documentation of site visits or consultation with facility operators. Further detail is required to confirm the appropriateness of the classifications.

Regarding Whirlpool Jet Boat Tours, the Land Use Compatibility Study states that “minimal outdoor activity (was) observed and anticipated based on type of operation”. However, the report does not specify the timing or methodology of these observations. Given the seasonal nature of the operation, it is likely that activity levels vary throughout the year. Additional information is needed to determine whether the Class I classification is appropriate on a year-round basis.

The Land Use Compatibility Study does not fully assess the potential impacts of the proposed sensitive land uses on the range of permitted industrial uses in the surrounding area, as required by the D-Series Guidelines. Lands located approximately 150 metres west of the subject lands (within the Virgil Business Park) are designated 'Employment Area' in the NOP, 'General Industrial' in the Town's Official Plan, and zoned 'Enterprise' (E) in the Town's Zoning By-law. These designations permit a broad range of industrial uses. The Land Use Compatibility Study should be updated to evaluate whether mitigation is required to ensure that these lands can continue to develop and expand in accordance with their existing planning permissions.

While the report references vacant Enterprise' (E) zoned lands, it does not clearly identify which parcels were assessed. Regional staff are aware of a vacant, unaddressed parcel approximately 200 metres southeast of the subject lands (located south of 1–15 Walker Road), which is zoned Enterprise (E) and is approximately 4.6 hectares in size. Given the size of this parcel, it is not reasonable to conclude, without further supporting analysis, that it could only accommodate smaller-scale industrial uses. Additional analysis is required to support this conclusion, including whether intervening sensitive land uses would preclude the establishment of Class III uses.

Furthermore, Section 4.4.5 of Guideline D-6 states:

"Where a sensitive land use is proposed in proximity to vacant industrial land which is designated or zoned for industrial use, the proponent of the sensitive land use must demonstrate that the proposed use will not preclude or hinder the future use of the industrial land for industrial purposes. This includes ensuring that the sensitive land use will not be adversely affected by the range of permitted industrial uses."

The Land Use Compatibility Study implies that mitigation for potential impacts from future industrial development on these lands can be deferred until such development occurs. However, Section 4.4.5 does not support this approach. Instead, any required mitigation must be identified and implemented at the time the sensitive land use is proposed. The Land Use Compatibility Study should be revised to reflect this requirement and to determine whether mitigation is necessary to support compatibility with both existing and future industrial uses.

Regarding transportation noise, the submitted Noise Study includes projections for Four Mile Creek Road and Niagara Stone Road but only to the year 2034. The Regional Road Traffic Noise Control Policy (PW5.NO1.0) requires a 20-year projection, and both roads are Regional Roads. The report should be updated to reflect this requirement.

The submitted Noise Study also excludes the proposed Outdoor Living Area (OLA) (playground) located between the proposed commercial and residential building, stating it is not directly exposed to traffic noise. However, NPC-300 requires that all OLAs be assessed if they are within the area of influence of a noise source. The playground qualifies as an OLA under NPC-300. While buildings may be considered as noise barriers, their effectiveness must be demonstrated through modelling. No such

modelling is included in the submission. The Noise Study should be updated to assess the OLA and demonstrate the effectiveness of any proposed mitigation (including the proposed building).

Given the potential implications for the overall design of the proposed development, and, by extension, the associated Zoning By-law Amendment, Regional staff recommend that updated Land Use Compatibility and Noise Studies be submitted prior to Council's consideration of the application. In addition, a detailed Air Quality Study should be provided, unless this is comprehensively addressed within the updated Land Use Compatibility Study.

Depending on the scope and complexity of the modelling included in the updated studies, Regional staff may recommend the retention of a third-party peer review, particularly for detailed air quality modelling or complex stationary noise assessments, as these areas fall outside the Region's in-house expertise. The need for peer review will be determined once the technical scope of the studies is better understood. If required, the peer review would be conducted at the applicant's expense.

Natural Environment System

The subject lands are impacted by the Natural Environment System (NES) under the NOP, consisting of Other Woodland, the Virgil Conservation Area Wetland Complex (Other Wetlands), and Permanent/Intermittent Stream.

In accordance with Policy 3.1.9.8.1 of the NOP, an Environmental Impact Study (EIS) is required when development or site alteration is proposed adjacent to natural heritage features to demonstrate that there will be no negative impact on the features or their ecological functions.

Regional Environmental Planning staff have reviewed the EIS, prepared by Terrastory Environmental Consulting Inc. (dated April 16, 2025) submitted with the application. The EIS identifies the following confirmed NES features within the study area: Other Woodland, a Permanent/Intermittent Stream associated with Four Mile Creek, Significant Valleyland and Significant Wildlife Habitat.

Regional staff conducted site visits on January 12, 2024 (leaf-off conditions), August 7, 2024 (leaf-on conditions) and February 14, 2025 (following approved site remediation works), to confirm study requirements and delineate the woodland dripline. Both Niagara Region and Niagara Peninsula Conservation Authority (NPCA) staff confirmed following these site visits that no wetlands are present within 30 metres of the subject lands.

The Other Woodland is the feature closest to the proposed development footprint. The EIS recommends a minimum average setback of 5 metres from the Other Woodland, with part of the dropline located near the building envelope. Given the site's existing hardened surfaces and the woodland's general condition, characterized as second-

growth and dominated by non-native species, the EIS concludes that the setback is appropriate. To ensure no negative impact and conformity with NOP policies, the EIS also recommends a Buffer Enhancement and Tree Replacement Plan, which includes lands located both on-site as well as on adjacent NPCA-owned lands (Virgil Conservation Area).

No additional feature-specific mitigation is recommended for the remaining NES features (Permanent/Intermittent Stream, Significant Valleyland and Significant Wildlife Habitat) beyond the measures proposed for the Other Woodland.

Regional staff are satisfied with the EIS findings and recommendations and consider them in conformity with NOP policies.

Regarding the Zoning By-law Amendment application, the delineated NES features, associated buffers, and restoration areas should be included within a restrictive environmental zoning category, **as required under Policy 3.1.4.8 of the NOP.** Staff have reviewed the zoning by-law amendment schedule provided as part of the submitted Planning Justification Report, prepared by MHBC Planning Limited (dated April 24, 2025), which does not currently propose any environmental zoning on the subject lands. **Regional staff recommend that the schedule be revised and re-circulated to appropriate agencies to confirm conformity with applicable natural heritage policies.**

The Region will recommend conditions as part of future Planning Act approvals (i.e. site plan) to secure implementation of the EIS mitigation measures and recommendations.

Transportation

Staff have reviewed the submitted Transportation Impact Study (TIS), prepared by Lea Consulting (dated April 8, 2025) and offer the following comments relative to Four Mile Creek Road (Regional Road 100), as well as Niagara Stone Road (Regional Road 55):

- The estimated modal split percentage for transit trips, as presented in Table 4-1, appears to be high for the proposed residential units and office. This is mainly because the site is only serviced by on-demand transit and lacks access to the regularly scheduled transit network provided by Niagara Regional Transit. A more conservative estimate should be assumed given current transit availability the site.
- A left-turn lane warrant analysis is required for each access to allow Regional staff to assess potential need.

A revised TIS is required prior to approval of the Zoning By-Law Amendment to confirm that the development, as proposed at the zoning stage, can be accommodated by the Regional road network.

Site Drawings

Staff have reviewed the submitted Architecture Drawing Set, prepared by Icke Brochu Architects (dated April 10, 2025) and offer the following comments:

- The building, including any items extending from / accessory to it (e.g. canopies), cannot encroach onto the Regional road allowance.
- A detailed Site Plan, Servicing Plan, and Grading Plan must be submitted for Regional review and approval during the site plan stage. These plans must clearly identify all required trenching and restoration work, and explicitly indicate any restorations within the Regional road allowance will comply with the Niagara Region Construction Encroachment Specifications: https://www.niagararegion.ca/living/roads/permits/construction-encroachment-specifications.aspx.
- Please ensure site accesses from the regional road are designed according to OPSD 350.010 standards, and that the minimum clear throat length is provided as per the Niagara Region Access Management Guidelines available at the following webpage: https://www.niagararegion.ca/business/pdf/access-management-guidelines.pdf.

Landscape Plan

Staff have reviewed the submitted Landscape Concept, prepared by MHBC (dated April 7, 2025) and note the following:

- Landscaping features and amenities including benches, bike racks, interlocking pavers and vegetation (apart from street trees) are not permitted within the Regional road allowance.
- A detailed Landscape Plan will be required for regional review and approval at the site plan stage.

Tree Replacements

Niagara Region's Tree Removal Policy requires that any trees to be removed from the Regional boulevard be replaced at a 2:1 ratio, or cash-in-lieu be provided at a cost of $600 per replacement tree (2025 amount).

Based on the Arborist Report, prepared by Terrastory (dated April 16, 2025), four trees are proposed to be removed from the Regional road allowance, which would require eight replacement trees to be planted in the Regional road allowance. There appears to be sufficient room to plant the required replacement trees plus opportunity for additional trees, as indicated on the Landscape Concept, which is encouraged.

The proposed tree locations and species will be reviewed by Regional Transportation Forestry and Road Operations staff when the detailed Landscape Plan is submitted at the site plan stage.

Regional Road Allowance

The subject lands have frontage along Regional Road 100 (Four Mile Creek Road). The existing right-of-way satisfies Regional requirements.

The applicant is responsible for obtaining any applicable regional road use permits:

- Construction encroachment permit: needed for any construction work to be completed on or below the regional road allowance.
- Entrance permit: needed for any private road entranceway, driveway, gate or facility constructed as a means of access to a regional road.
- Sign permit: needed for placing any sign, notice or advertisement within 20 metres of the centreline of a regional road.
- Road occupancy permit: needed for any item that will be installed and remain on a regional road allowance for a period of time.

Permit applications can be made through the following link:
https://www.niagararegion.ca/living/roads/permits/

Restorations within the regional right-of-way are to be to Niagara Region standards.

Regional Cycling Network

The subject lands have frontage on a roadway identified as part of the Regional cycling network. If the cycling route is currently not established and identified with signage, it is the intent to make provisions for doing so when an appropriate opportunity arises. Possible future addition or upgrade of cycling facilities could involve other changes to the road cross-section.

Protection of Survey Evidence

Survey evidence adjacent to the Regional road allowances is not to be damaged or removed during the development of the property. Any agreements entered into as part of this application should include a clause requiring for the applicant to obtain a certificate from an Ontario Land Surveyor stating that all existing and new evidence is in place at the completion of said development.

Waste Collection

Niagara Region provides curbside waste collection services for developments that satisfy its Procedure for Requirements for Waste Collection. The proposed development may be eligible to receive regional collection provided that the owners/tenants bring the waste to the curbside on their designated pick-up day, and that the following limits are not exceeded:

Multi-Residential

- Green – no limit (weekly)
- Waste – 2 bags/cans per unit to a max. of 24 bags/cans per building (bi-weekly)

Commercial

- Green – 8 green carts (weekly)
- Waste – 8 bag/can limit (bi-weekly)

Based on the nature of the development with garbage rooms shown in both buildings, and given the number of residential units proposed, it is assumed the development will be unable to satisfy the Regional waste collection requirements and meet the above curbside waste collection limits. Therefore, waste collection for the site will be the responsibility of the owner through a private contractor. Waste will be reviewed again at the site plan stage.

Regional staff note that Circular Materials Ontario is responsible for the delivery of residential Blue / Grey Box recycling collection services. The most up to date information can be found using the following link: https:\\www.circularmaterials.ca/resident-communities/niagara-region/

Conclusion

In conclusion, Regional staff cannot support the Zoning By-law Amendment application at this time due to concerns with the submitted Transportation Impact Study (TIS), including unjustified transit modal split assumptions and the lack of a left-turn lane warrant analysis. A revised TIS is required to confirm the proposed development can be accommodated by the Regional road network and to ensure any necessary site design changes are reflected in the approved zoning by-law amendment.

Regional staff request that the updated report, and associated supplementary materials (if applicable), be forwarded to Regional staff for review and additional comment prior to the application being presented to Town Council.

In accordance with the Planning Services Agreement with the Town, Regional staff recommend that the Town require updated Land Use Compatibility and Noise Studies prior to Council’s consideration of the application. A detailed Air Quality Study should also be submitted, unless these matters are comprehensively addressed within the revised Land Use Compatibility Study. These updates are necessary to address deficiencies in the original submissions and to assess potential land use compatibility implications for the overall site design and the associated Zoning By-law Amendment.

Furthermore, Regional staff recommend that the Town require an updated Zoning By-law Amendment schedule that zones all Natural Environment System (NES) features, associated buffers, and restoration areas within a restrictive environmental zoning

category. This will ensure conformity with the Niagara Official Plan and appropriately reflect the environmental considerations associated with the proposed development.

Implementation of these recommendations are at the discretion of the Town.

If you have any questions related to the above comments, please contact me at amy.shanks@niagararegion.ca.

Kind regards,

Amy Shanks, MCIP, RPP
Senior Development Planner

cc: Phillipe Biba, Development Approvals Technician, Niagara Region
Josh Wilson, P.Eng., Manager of Development Engineering, Niagara Region
Adam Boudens, Senior Environmental Planner / Ecologist, Niagara Region
Pat Busnello, MCIP, RPP, Manager of Development Planning, Niagara Region

Niagara Peninsula CONSERVATION nature for all

3350 Merrittville Hwy. Unit 9
Thorold Ontario L2V 4Y6
905.788.3135 | info@npca.ca | npca.ca

July 10, 2025

Via Email Only

Victoria Nikoltcheva
Senior Planner
Town of Niagara-on-the-Lake
1593 Four Mile Creek Road P.O. Box 100
Virgil ON, L0S 1T0

NPCA File No.: PLZBLA202500877

Dear Ms. Nikoltcheva,

Re: Niagara Peninsula Conservation Authority (NPCA) Comments
Application for Zoning Bylaw Amendment
Town of Niagara-on-the-Lake: 1544-1546 Four Mile Creek Road
Municipal File No.: ZBA-04-2025

The NPCA has received a request to review the complete application in relation to a proposed commercial and residential use on the property noted above. The proposal is inclusive of a two-storey commercial/office building as well as a four-storey residential building with 29 units. Surface and underground parking spaces are also incorporated within the design. In response to this request, we offer the following comments.

The NPCA regulates watercourses, flood plains (up to the 100-year flood level), Great Lakes shorelines, hazardous land, valleylands, and wetlands under *Ontario Regulation 41/24* of the *Conservation Authorities Act*. The NPCA's *Policies for Planning and Development in the Watersheds of the Niagara Peninsula Conservation Authority* (NPCA policies) provides direction for managing NPCA regulated features. The subject lands are impacted by a valleyland slope along the northwestern portion of the site. A Provincially Significant Wetland associated with the Virgil Conservation Area Wetland Complex, and its 30-metre regulatory buffer are found on the neighbouring lands. Furthermore, a 100-year floodplain associated with Four Mile Creek is also contained on the abutting lands.

The NPCA is the owner of the neighbouring property, being the Virgil Dam and Reservoir Conservation Area.

Zoning Bylaw Amendment

A Zoning Bylaw Amendment is required to facilitate a rezoning of the lands from Village Commercial Holding Zone (VC-H) to a Village Commercial Site-Specific Zone (VC) to remove the holding provision and to incorporate site-specific provisions for setbacks, encroachments, height, and buffering for the development.

The NPCA attended a site visit on August 7th, 2024 with the proponents' consultants. A staking exercise was undertaken for the Provincially Significant Wetland. It was noted and approved by NPCA Staff that wetland vegetation is contained to the watercourse channel itself and that there are no wetlands present within 30 metres of the subject property. As such, the NPCA does not offer concerns respecting the surrounding wetlands.

3350 Merrittville Hwy. Unit 9
Thorold Ontario L2V 4Y6
905.788.3135 | info@npca.ca | npca.ca

Furthermore, the NPCA also flagged the valleyland slope on site. The NPCA has now reviewed the Geotechnical Report as completed by EXP (dated April 21, 2025) and offers the following comments on this report for the application:

- The NPCA does not offer objection to the 5m toe erosion allowance.
- The NPCA does not offer objection to the location of stable top of slope, being 7.2m and 6.4m landward of physical top of slope.
- The NPCA is supportive of the 7.5m erosion allowance.
- In principle, the NPCA cand support the internal road within the erosion access setback.
- However, the NPCA notes that the playground extends past stable top of slope. Development and/or site alterations are not permitted beyond physical or stable tops of slope, whichever is more restrictive. This area will need to be removed or revised on future plans to be landward of the tops of slope.
- The stable top of slope will need to be indicated on the Grading Plans.

The NPCA does require lands past stable or physical top of slope (whichever is more restrictive) to be Zone an appropriate Hazard Zoning (or similar protective Zone) that will appropriately protect the hazard. As such, the NPCA will require a change to the proposed Zone boundaries. Upon review of the Geotechnical Report, the NPCA is satisfied that the valley slope does not extend into the building footprint as that area will not meet the threshold for valleyland under our Policies. As such, the NPCA would be satisfied with the reduction of the physical top of slope limit to the 'orange flag' immediately north of the residential building. The drawings shall be revised to reflect this. All lands past stable top of slope shall therefore be rezoned to protect the feature.

The NPCA has reviewed the Stormwater Management Report, as completed by EXP (dated April 21, 2025) and offers the following information:

- The NPCA notes that the Report identifies that 'Approximate Regional NPCA Flood Line'. Our Agency notes that that Regulatory Floodplain is the 100-year storm. Please revise.
- The NPCA notes that all minor flows are to be captured, attenuated and directed to the municipal storm sewer. The NPCA does not offer objections. We do recognize that some major overland flows will spill into the NPCA Conservation Lands but will not exceed existing conditions. The NPCA does not offer objections. Further, we do not offer objections to the natural area draining uncontrolled, which matches existing conditions.

As such, the NPCA has reviewed the Draft Zoning Bylaw Amendment and notes that our Agency will require amendments to the Zoning Boundaries.

Virgil Dam and Reservoir Conservation Lands

As indicated, the NPCA is the owner of the neighbouring parcel. The NPCA presently accesses the Lower Virgil Dam parking area via the existing granular driveway for land maintenance operations as well as Dam monitoring. For future applications and detailed design, the NPCA will require the following be addressed:

- The NPCA will require that the location of the existing NPCA Access Gate be noted on the drawing, and that a driveway be included to ensure a means of unimpeded access is provided to our property.

- It appears that a curb is proposed around the perimeter of the parking lot. This would serve as a barrier to NPCA vehicles. Please revise.
- As currently designed, it appears there is nothing to prevent tenants from parking on the Town Access Easement. This space shall be reconfigured into a 5m minimum wide dedicated driveway to allow the NPCA to access our property. The NPCA asks that the Easement Agreement also be in favour of the NPCA as well as the Town.

Conclusion

In summary, the NPCA will require amendments to the Zoning By-law application at this time to address the valleyland slope. Our Agency is not yet in a position to support this application. While we understand certain elements can be addressed through detailed design, the appropriate Hazard Zoning shall be reflected for the valley at this stage.

I trust the above will be of assistance to you. Should you have any further questions or require further information in this matter, please do not hesitate to call. For administrative purposes, please forward any decisions and resolutions of your Council. In the event of an appeal to the Ontario Land Tribunal (OLT) please send notice of any Case Management Conference.

Please send a copy of any Staff Reports and/or Council recommendations once they are available. If you have any questions, please let me know.

Thank you,

Taran Lennard
Watershed Planner II
(905) 788-3135 ext. 277
tlennard@npca.ca

Watson & Associates Economists Ltd.
2233 Argentia Road, Suite 301
Mississauga, Ontario, L5N 2X7
Tel: 905.272.3600
watsonecon.ca

Provided on behalf of the Niagara Catholic District School Board

July 20, 2025

Electronic Copy

Attention:
Victoria Nikoltcheva
Niagara-on-the-Lake
1593 Four Mile Creek Road
P.O. BOX 100, Virgil, ON L0S 1T0
Email: victoria.nikoltcheva@notl.com

Re: **COMMENT LETTER**
Application for Zoning By-Law Amendment
Location: 1544-1546 Four Mile Creek Road
File No.: ZBA-04-2025

Dear Victoria Nikoltcheva,

On behalf of the Niagara Catholic District School Board, we confirm receipt of the Zoning By-law Amendment application, ZBA-04-2025, dated June 20, 2025. A total of 29 units is proposed for this development. With respect to this application, the following comments are submitted:

Location:

This development falls within the attendance boundaries of:

- St Michael Catholic Elementary School
- Holy Cross Catholic Secondary School

At this time, sufficient space exists within the local elementary and secondary schools to accommodate additional students from the development as proposed. As there's substantial new development proposed, future interim accommodation measures such as portables may be required to accommodate students from new proposed development within the current school catchment areas.

Comments:

Under the Education Development Charges (EDC) By-law, 2020 (Former Welland County), the NCDSB is eligible to collect EDCs from this development to support the acquisition of land required for new school sites and related future school construction needs. These charges are to be collected on behalf of the NCDSB prior to the issuance of building permits.

In reviewing the proposed development within the context of local school capacity and the cumulative impact of residential growth on enrolment, the Niagara Catholic District School Board has identified potential implications for both local school capacity and infrastructure. To ensure

that future residents are fully informed of these potential impacts and that adequate arrangements are made for student accommodation, the Board respectfully recommends the inclusion of the following conditions of plan approval:

Conditions:

That the owner(s) agree to future agreements with the municipality to include in all Offers of Purchase and Sale, the following statements advising prospective purchasers that:

1. "Accommodation within a Catholic school operated by the Niagara Catholic District School Board may include temporary facilities; including but not limited to accommodation in a portable classroom or directing students to an alternative attendance boundary."

2. "Student busing is at discretion of the Niagara Student Transportation Services."

3. "If school buses are required within the Subdivision in accordance with Board Transportation policies, as may be amended from time to time, school bus pick up points will generally be located on the through street at a location as determined by Niagara Student Transportation Services."

We will continue to monitor development growth in the municipality on behalf of the NCDSB as it relates to the cumulative impact on local schools. The NCDSB also requests notification of any modifications, community consultations, appeals, or notices of decision related to this application.

Please note that further to the comments provided, the NCDSB reserves the right to revise their position as needed without further notice. Should you require additional information regarding these comments, please contact planning@ncdsb.com.

Sincerely,

Jordan Cook,
Consultant
Watson & Associates Economists Ltd.
vw@watsonecon.ca
Office: 905-272-3600
Fax: 905-272-3602

cc: Alexsandria Pasquini-Smith, Niagara Catholic District School Board
David Wilson, Niagara Catholic District School Board

Department of Community and Development Services
1593 Four Mile Creek Road
P.O. Box 100, Virgil, ON L0S 1T0
905-468-3266 • Fax: 905-468-0301

www.notl.com

August 15, 2025

VIA EMAIL ONLY

Dana Anderson
MHBC Planning
12 James Street North, Unit 301
Hamilton, ON L8R 2J9

Re: Application for Zoning By-law Amendment
File No. ZBA-04-2025
1544-1546 Four Mile Creek Road, Niagara-on-the-Lake, ON
First Round of Comments from Town & External Agency Staff

Town Staff have conducted a review of the submitted application materials and provide the following comments: should team meet with Town and our team to discuss best course of action regarding spatial separation (Don't want this to be an issue down the road).

1. Building	a) No concerns with the application. b) It should be noted that the Ontario Building Code requirements for spatial separation, particularly with regards to the West elevation of the residential building, will need to be confirmed. This can be included, along with the OBC matrix, as part of the SPA stage.
2. Finance	No objections.
3. Fire and Emergency	Fire has no comments with the ZBA proposal. The comments below are SPA related: nice of them to provide comments in advance a) Site plan drawing to show all fire routes, including width, turning radius and location for fire route signs. b) A building matrix is requested for each proposed building, including showing any proposed fire protection systems. c) Drawings to show the location of standpipe connections within the buildings and parking garage. d) Site plan drawing to show the location and distances from the hydrant to the fire department connections. e) Site plan to show the principal firefighter's entrance for all proposed structures, including hydrant distances from principal firefighter entrances. f) Is a private fire hydrant proposed for the 2-storey commercial building?
4. Heritage	a) The subject lands are not mapped as having archaeological potential. b) The property is not a heritage resource in the Municipal Heritage Register, nor is it adjacent to one. c) There are no heritage related concerns for this proposal.

5. Operations	Please refer to the attached Operations Review Commenting Letter, dated July 25, 2025, for detailed comments. As such, the following reports require updates: • Functional Servicing Brief • Stormwater Management Report • Hydrogeological Report Please note that Staff have provided the applicant's legal opinion to the Town's legal counsel regarding the road allowance (Line 2 Road), and are waiting to hear back.
6. Irrigation	Access is required to the Line 2 Road dam for management purposes. There is a private pumphouse and an irrigation pipe buried across the property. The Town requires access to these utilities and would need to cross the property to serve lands east of Virgil.
7. Parks	The comments below are limited to the information provided, as the Landscape Plan is currently conceptual. The comments below should be considered at the detailed stage of the process (SPA). a) Kentucky Coffeetree Gymnocladus dioicus – it is suggested that a seedless cultivar such as 'Espresso' be considered. b) Red maple Acer rubrum – due to the relatively high pH of local soils, and the associated inconsistent performance of red maples, it is suggested that a higher pH tolerant cultivar or alternative tree be considered. c) Acer saccharum – sugar maple – As the straight species of this tree does not tolerate stressful growing conditions, it is suggested that a drought tolerant and leaf scorch resistant cultivar, or alternative tree be considered. d) Buxus x 'Green Mountain' Green mountain boxwood – though this cultivar is reportedly less susceptible to box tree moth than other boxwood species and cultivars, alternative plants may be considered.
8. Climate Change	As it relates to the long-term stability and protection of the community in order to increase resilience to climate change, the applicant will be required to implement all recommendations of the supporting studies (i.e. Arborist Report and Stormwater Management Report).
9. Urban Forestry	Staff note that a number of regulated trees were removed. Staff inquired with the applicant on August 8, 2025, via email regarding the removals, in which Staff also noted that the trees may have been a part of the Other Woodland feature.

Scott to follow up.

Further details in their letter.

it is imperative that we meet with irrigation to obtain mapping data and maintainace requirements to draft the agreement between the Town and us.

Nick to follow up Type text here

Inquire a reply with Tristan

	10. Planning	**General Comments/Questions** a) The development's proposed residential net density exceeds the Town's maximum prescribed residential net density of 30 units per hectare. The development would facilitate a residential net density of approximately 50 units per hectare. This is calculated by dividing the number of residential units with the total area of development lands (in hectares) which excludes roads, parkland, and environmental areas. As a result, the proposed density does not conform to the Town Official Plan. b) The proposed parking arrangement, primarily at the southern limits of the property, are not situated behind the building. Pursuant to Section 6A(4.4) subsection (f) under Built-Up Area Intensification Policies, parking for all new mixed-use development will be located at the rear of the building. Staff's understanding of the intent of this policy is to provide parking at the rear of buildings as to not overwhelm the streetscape with parking. As a result, the proposed parking arrangement does not conform with the built-up area intensification directives of the Town Official Plan. c) The lots are required to merge in title prior to the implementation of the proposal. d) Please review the Town's Fence By-law (By-law No. 4778-14) to ensure that the proposed fencing around the property is in compliance with the maximum permitted heights as prescribed in the fence by-law. e) Staff recommend implementing visitor parking spaces to support the residential use on the property, given the lack of parking on Four Mile Creek Road. f) Staff recommend adding bike storage for the residential uses. g) Please ensure that all supporting studies/materials/drawings are updated to reflect any changes resulting from the comments received. **ZBA Application Form** h) Section 7: please check off the correct box for storm drainage. i) Section 10: "No" is checked off regarding the application being consistent with policy statements. Please correct and explain how the application conforms to the applicable provincial legislation in the text box of the section. j) Section 11: Staff are of the opinion that the proposal does not conform to the Town Official Plan, as per the previously stated comments. i. This section also asks if the lands have a predetermined maximum height or density. "No" is checked off. However, they do as per the applicable zoning provisions and maximum residential density in the Town OP. At a minimum, this subsection should be updated. **Planning Justification Report**

Same storie as we heard upon submission. we need to ~~redefine;~~ Total Area of Dev. Lands. ~~should we~~ gather Tristan, MHBC, Andre/Pam and Raj and recalculate that area?

they are now merged.

2m fence ris req. revise site plan.

we will expand P1 to cover all of the commercial building to provide extra parking.

okay

okay

one only.	k) Section 2.1 of the PJR states that the subject lands contain two residential dwellings. Please clarify, as only one dwelling is visible through available aerial imagery and site visit.
minor	l) Section 3.1 of the PJR states "A 238 m^2 outdoor patio area, internal to the Subject Lands, is also proposed for the commercial building." Further along on the same page, the report states "outdoor patio spaces are proposed for the commercial building totalling 390 square metres of amenity space." The two sentences appear to conflict with each other. Since the site plan drawing demonstrates a total patio area of 390 m^2 for the four (4) outdoor patios associated with the commercial building, where is the 238m^2 area allocated?
minor	m) Section 5.0 of the PJR references 1544 and 1546 Maitland Street.
	n) Please provide a discussion and analysis on Section 6.4 of the Town OP (Building Height Restrictions).
	Site Plan Drawing (A102)
minor	o) Please include a site statistics table to reference applicable setbacks and show building setbacks to lot lines on the drawing itself.
minor	p) The building height site statistics table should also reference height in metres, rather than only the number of storeys.
minor	q) The lot coverage site statistics table should reference the coverage of each individual building, rather than only the total building coverage.
	r) The density provided in the site statistics table is not accurately representing the density of the development, as per the definition of "Residential Net Density" in the applicable zoning by-law. Density is calculated by dividing the number of residential units with the total development area (minus roads/driveways/laneways and environmental areas) in hectares.
minor	s) The supporting materials and site statistics state that there will be 29 residential units, but the labelling on the residential building states 30 units. Please clarify.
minor	t) Outdoor patio 4 is labelled to be 41m^2 on the drawing, but the site statistics table states 44m^2. Please revise to align with the intended size of the patio.
need meeting with irrigation	u) As per the comments from Town Staff regarding Irrigation, please delineate the location and size of the irrigation pipe traversing the lands on the site plan drawing.
yes, will provide	v) Are there any preliminary images/renderings of the proposed sculpture? The site plan drawing labelling states to refer back to the landscape drawing, but the submitted landscape concept plan does not provide that detail.
Nick	w) Similar to the previous comment, the site plan drawing states to refer back to the landscape drawing for details on the 1.2m garden wall and 1.8m wood privacy fence, but such details are not shown on the landscape concept plan.

minor	**Underground P1 Plan (A201)** x) Please show the direction in which cars will travel within the underground parking garage. y) Staff recommend moving the office bike rack closer to the stairs connecting to the commercial building for easier and more convenient access.	
Amanda to follow up For your info: Remediation has been completed and the RSC has been submitted and we are on the 2nd round of review.	**Phase 1 & 2 Environmental Site Assessment** z) Based on the conclusions of the Phase 2 assessment, has there been re-sampling of the elevated pH values and/or any remediation works done to-date? aa) A non-potable request was provided to Niagara Region Staff and a letter of no objection was provided to the applicant's environmental consultant on May 16, 2025. bb) What is the timing of filing a Record of Site Condition for the property?	
	Retail Market Study cc) The Town does not have the in-house expertise to review and provide comments on the submitted study. As such, Staff will provide this study to a peer-reviewer for a more detailed review of the findings and to provide feedback on the analysis. The peer review will be at the applicant's expense. dd) Page 7 of the document references that the site can accommodate 3,500 square feet of commercial space. Is this meant to be square metres? In addition, the supporting drawings show that the commercial component is approximately 3,718 square metres. Please update accordingly. ee) The end of the analysis for Section 10.2.6 of the Town OP (on page 8) is missing from the document.	
okay	**Shadow Analysis** Town Staff use the Region's Sun/Shadow Study Terms of Reference (TOR) to review shadow analysis/studies. The comments below are based on the TOR. ff) With respect to outdoor amenity spaces on adjacent residential properties (Section 4.2.1 of the TOR), the shadowing of the proposed development does not appear to cast on such private amenity spaces. During September at 4pm, shadows will be cast on the front yards of the dwellings directly across the subject lands on Four Mile Creek, south of Arena Road. However, these front yards will receive full sunlight for the majority of the day prior to 4pm. There are also limited shadowing impacts to the Lower Virgil Reservoir, as the shadows appear to not cast on those lands between 11am-4pm. gg) Private realm amenity spaces on the subject property (Section 4.2.2) should receive at least 4 hours of sun between 10am-6pm, April 21-September 21 of each year. The playground supporting the	

	residential building may experience fewer shadowing impacts in June, demonstrating that at least 4 hours of sunlight can occur, but may be primarily casted by shadows during the month of September. Please show the extent of the playground area on the shadow analysis to demonstrate shadows in that amenity space.
okay	hh) The remaining amenity spaces (i.e. plaza, patios) within the proposed development appear to receive sunlight for at least 4 hours between the hours of 10am-6pm during the months of April 21-September 21.
okay	ii) Section 4.3.1 suggests full sun for at least 5 hours between 10am-6pm on April 21 for public outdoor amenity spaces. Further, Section 4.3.3 states that shadowing on surrounding parks and open space should not exceed 3 hours between 10am-6pm on April 21 and September 21. In reviewing the shadow impacts for March 21, June 21, and September 21, the trail of the Lower Virgil Reservoir and environmental conservation area do not appear to be affected for an extended period of time.
okay	jj) Section 4.3.2 advises that sidewalk and boulevards along the frontage of the development should receive at least 4 hours of sun between 10am-6pm on April 21. The analysis demonstrates that the frontage will receive approximately 3-4 hours on March 21 and June 21, which is an acceptable amount of sun in that area.
	Urban Design Brief & Streetscape Study
	kk) Section 4.1 of the brief states that there will be 30 units in the residential building, but then further states that 29 residential units will be provided at a rate of one per unit. Please clarify, as other materials state 29 units.
	ll) Section 6.1 specifies that the residential building is set back 3.1 metres from the western property line, but the site plan and draft zoning amendment shows this setback at approximately 1.6 metres. Figure 6.1 in the brief also does not accurately represent the rear yard setback. Please clarify this in the brief.
we can demonstrate on a model to what extent it will be visible. It will not be visible for more than 1 second while driving due to the buffering fence designed along Four Mile Creek (see landscaping).	mm) Staff are of the opinion that the brief lacks justification for the parking arrangement on the south side of the lands. This row of parking will be visible from the street, creating a parking-dominant appearance off Four Mile Creek Road, and could result in compatibility impacts to the southern neighbour (motor sounds, headlights, etc.). While the requested zoning amendment proposes a 1-metre-wide buffer strip along the southern interior side yard, Staff recommend incorporating additional landscaping and larger buffers between the street and southern property line to mitigate any potential impacts that the parking arrangement may pose to the streetscape and neighbouring residential property.
	nn) Section 7 (Streetscape Study) should make reference to the policies of the 2024 Provincial Planning Statement, rather than the 2020

does this help us? I think it does :)	Provincial Policy Statement. The 2024 PPS also replaced the Growth Plan. oo) Staff note that, although Table 7.1 (Attributes Table) demonstrates that the majority of the parking orientation in the block face is along the front of the properties, most of these lots support single-detached dwellings where parking in the front yard is not typically restricted through any local policy framework. The proposed built-form of the proposed development versus the usage of single-detached dwelling lots is not a fair comparison. **Property Index Maps & Parcel Registers** pp) The PIN Map and parcel register document for PIN 46383-0086 (LT) (the larger parcel) is outdated from October 2024. Please submit new documents that are dated within the last 30 days.
okay	
11. Urban Design	As the subject lands are on a Regional Road, the Town has engaged with a Regional Urban Design Specialist to review urban design considerations with respect to the proposed development. Please refer to the attached Urban Design Review Letter, dated August 6, 2025, for detailed comments.
12. Zoning	**Parking** a) Staff have provided minimum parking standards based on the full extent of the requested uses with the following parking rates: i. Restaurant – 1 per 9m^2 GFLA ii. Medical Office – 1 per 15m^2 GFLA iii. Outdoor Patio Restaurant – 1 per 30m^2 GFLA iv. Apartment Building – 1 per unit b) Based on the provided ground floor plan of the commercial building, Staff calculated the leasable floor area (minus the lobby, vestibule and stairways) to be approximately 1,466m^2. However, Staff note that the final leasable floor area of the commercial uses will be lesser than this, given that there will be additional circulation spaces, storage areas, and washrooms. If using the parking rate for a restaurant for the entire ground floor area, this would necessitate 163 required parking spaces. c) Similarly, Staff calculated the leasable floor area for the second storey office spaces to be approximately 1,495m^2, necessitating 100 required parking spaces for medical office uses. d) Based on 387m^2 of restaurant patio space, the required parking spaces is 13. e) Based on 29 residential units, the required parking spaces for the residential component is 29. f) In total, the requirement for parking spaces based on the full extent of the requested uses is 305. Based on this number, the site is deficient 105 parking spaces. g) Staff recognize that it is unlikely that the restaurant use will occupy the entire ground floor, and that the medical office use would not occupy the entire second floor of the commercial building. To ensure this, Staff

part of the restriction will be: No Restaurant, and Medical Office.

recommend implementing restrictions on the number of restaurants and medical office uses and their gross leasable floor areas that can be accommodated on-site. Staff also note that there are four (4) outdoor patios, so it is assumed that there would be more than one restaurant.

h) Staff also note that a Parking Impact Analysis was requested to address a shortfall of required parking. Given that there will be a shortfall of required parking based on the future commercial uses as noted above, Staff require the submission of a Parking Impact Analysis to address this issue.

let's inquire with Craig if shoring is required. If Not we can extend P1 to the property line.

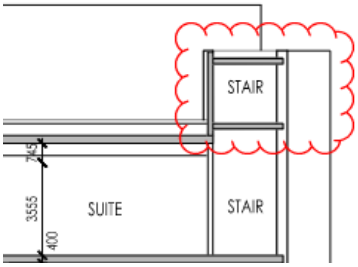
Other

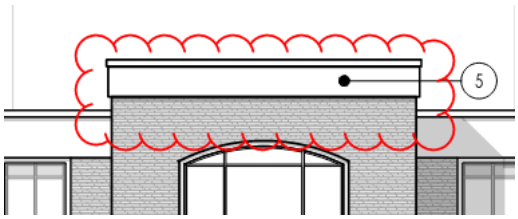
i) The conservation area shall be rezoned as "Open Space" to allow for its continued protection and preservation. Please revise the zoning schedule to reflect this additional zone boundary.

j) While the draft ZBA requests a 0-metre setback to the underground garage, the drawings demonstrate the setback to be 0.6 metres. Staff will be implementing this setback in a future ZBA.

k) There are no minimum amenity space requirements for stand-alone residential buildings, except for the requirement for a children's play area at the rate of 2.5m^2 per unit. Based on 29 units, the minimum required playground area is 72.5m^2, which the proposal aligns with as it provides 77m^2.

l) The elevator/stair structure in the middle of the façade of the residential building shall be included in the overall height, as per the definition of height in the Zoning By-law (see markups and definition below).





"BUILDING HEIGHT when used in reference to a building or structure, means the vertical distance measured from the average finished grade around the structure to the peak, except:
(c) Where an exterior wall other than a required fire wall extends above the top of the roof of a building, the topmost part of such exterior wall."

m) As per Section 6.37(d), no outdoor storage shall be visible from any street or abutting lot, and any open storage area shall be screened by a fence or wall of at least 2 metres in height. Staff note that there is a label near the southern loading space of the commercial building of the site plan drawing stating "10m^2 bulk storage" – please ensure that this outdoor storage area complies with the applicable provisions. Pursuant to subsection (g), please also confirm that the usage of the outdoor storage will not impede with the required loading space.

minor	n) Staff recommend prohibiting the following permitted uses under the Village Commercial (VC) Zone to ensure compatibility with the residential use and other surrounding commercial uses on the property, including, but not limited to: automobile sales & service establishment, automobile service station, gas bar. o) Please ensure that the building coverage noted in the site statistics of the site plan drawing include all covered areas, including the various canopies on both buildings.

Agency Staff have conducted a review of the submitted application materials and provide the following comments:

12. Niagara Region	Please refer to the attached letter from Niagara Region Staff dated July 10, 2025, for detailed comments. The Town and Region have entered into a Service Level Agreement for the Region to continue providing comments and recommendations on matters associated with land use compatibility and the environmental system on behalf of the Town. The recommendations in the Region's letter are considered requirements under the Town's review. The points below summarize the comments and requirements in the letter: **Land Use Compatibility** a) The submitted Land Use Compatibility Study (LUCS) recommends that screening-level air quality modelling be conducted to assess potential impacts to nearby facilities; however, no such assessment was included with the application submission. b) The LUCS also recommends screening-level noise assessment to evaluate impacts from a rooftop cooling tower and municipal works yard in the surrounding area. The submitted Noise Study assesses HVAC equipment at Millbrook Cabinetry, but the location assessed appears to be a standard rooftop HVAC unit, rather than the cooling tower located on the eastern portion of the roof. The Noise Study also does not assess any non-HVAC stationary sources as identified in the LUCS, including the front loader and dump truck operations at the municipal works yard. c) A number of loading docks are approximately 130-140 metres from the subject property at 11 and 13 Henegan Road (Closets by Design and Peninsula Flooring), as well as outdoor storage and potential work activity at Whirlpool Jet Boat Tours (7 Henegan Road) approximately 150 metres away. The LUCS identifies these facilities as Class I industrial uses, having a Potential Area of Influence of 70 metres. However, the D-Series Guidelines define Class II facilities as those with "frequent movement of products and/or heavy trucks with the majority of movements during daytime hours" and/or "outdoor storage," having a

Really! We did that?

Really?

	Potential Area of Influence of 300 metres. Depending on the actual operations, these facilities may meet the criteria for Class II justification. The LUCS does not provide sufficient justification for the Class I designation, such as any documentation of site visits or consultation with the facility operators. Further details are required. d) The LUCS does not specify the timing or methodology of the observations stated regarding the Whirlpool Jet Boat Tours operation. Additional information is needed to determine whether the Class I classification is appropriate on a year-round basis, given the seasonal nature of the operation. e) The LUCS must be updated to evaluate whether mitigation is required to ensure that the lands within the Virgil Business Park can continue to develop and expand in accordance with their existing planning permissions. f) Additional analysis is required in the LUCS to support the conclusion for the vacant Enterprise (E) zoned lands, as it is not reasonable to conclude that the parcel could only accommodate smaller-scale industrial uses given its size. g) The LUCS must be revised to reflect the requirement of Section 4.4.5 of Guideline D-6 and to determine whether mitigation is necessary to support compatibility with both existing and future industrial uses. h) The Noise Study includes projections for Four Mile Creek Road and Niagara Stone Road but only to the year 2034. Regional Road Traffic Noise Control Policy PW5.NO1.0 requires a 20-year projection for both Regional Roads. The Noise Study must be updated to reflect this requirement. i) The Noise Study excludes the proposed playground (outdoor living area – OLA), stating that it is not directly exposed to traffic noise. NPC-300 requires that all OLAs be assessed if they are within the area of influence of a noise source. While buildings may be considered as noise barriers, their effectiveness must be demonstrated through modelling, which was not included in the submission. The Noise Study must be updated to assess the OLA and demonstrate the effectiveness of any proposed mitigation. j) Town Staff require updates to the LUCS and Noise Study to reflect the comments/requirements noted above and in the Region's commenting letter. A detailed Air Quality Study shall be provided as a standalone document, or comprehensively addressed within the updated LUCS. Due to the scope of the modelling included in the updated documents, a third-party peer review may be required. **Transportation**

	k) A more conservative estimate of the modal split percentage for transit trips should be assumed given current transit availability on the site. l) A left-turn lane warrant analysis is required. m) A revised TIS is required. **Natural Environment System** n) Regional Staff are satisfied with the findings and recommendations of the Environmental Impact Study (EIS) and consider them in conformity with NOP policies. Regional and Town Staff are continuing to investigate the recent tree removals and its compliance with applicable environmental policies and regulated tree requirements. o) The delineated NES features, associated buffers, and restoration areas shall be included within a restrictive environmental zoning category, as required under Policy 3.1.4.8 of the NOP. The draft zoning by-law shall be revised to confirm conformity with applicable natural heritage policies. p) The Region will recommend conditions as part of future Planning Act approvals to secure implementation of the EIS mitigation measures and recommendations. **Urban Design** q) Comments with respect to urban design are referenced in section 10 of the Town commenting table and attached to this letter.
13. Niagara Peninsula Conservation Authority	Please refer to the attached letter from Niagara Peninsula Conservation Authority Staff dated July 10, 2025, for detailed comments. The points below summarize the comments and requirements in the letter: a) The proposed playground extends past the stable top of slope. This area will need to be removed or revised on future plans to be landward of the tops of the slope. b) The stable top of slope needs to be indicated on the Grading Plans. c) Lands past stable or physical top of slope (whichever is more restrictive) are to be zoned in an appropriate category to protect the hazard. The zone boundaries must be revised to reflect this. d) The associated drawings shall be revised to reflect the reduction of the physical top of slope limit to the 'orange flag' immediately north of the residential building. e) The Stormwater Management Report must be revised to reflect the 100-year storm regulatory floodplain. f) Regarding access to the Virgil Dam and Reservoir lands, the following is required:

not sure where

minor	i. Location of the existing NPCA Access Gate be noted on the drawings, and that a driveway be included to ensure a means of unimpeded access is provided. ii. The curb proposed around the perimeter of the parking lot would serve as a barrier to NPCA vehicles. This must be revised. iii. As currently designed, it does not appear that anything would prevent tenants from parking on the Town Access Easement. This space shall be reconfigured into a 5-metre minimum wide dedicated driveway to allow the NPCA to access the Virgil Dam lands. The NPCA requests that the Easement Agreement also be in favour of the NPCA, including the Town.
14. Niagara Catholic District School Board	Please refer to the attached letter from Watson & Associates on behalf of the Niagara Catholic District School Board (NCDSB), dated July 20, 2025, for detailed comments. The points below summarize the comments and requirements in the letter: a) The NCDSB is eligible to collect Education Development Charges (EDCs) from this development to support the acquisition of land required for new school sites and related future school construction needs. These chargers are to be collected on behalf of the NCDSB prior to the issuance of building permits. b) To ensure that future residents are fully informed of potential impacts and that adequate arrangements are made for student accommodation, the Board recommends the inclusion of the following conditions in the future site plan approval: i. Accommodation within a Catholic school operated by the Niagara Catholic District School Board may include temporary facilities; including but not limited to accommodation in a portable classroom or directing students to an alternative attendance boundary. ii. Student busing is at discretion of the Niagara Student Transportation Services. iii. If school buses are required within the [development] in accordance with Board Transportation policies, as may be amended from time to time, school bus pick up points will generally be located on the through street at a location as determined by Niagara Student Transportation Services.
15. Enbridge Gas	No objections to the proposed application; however, Enbridge Gas reserves the right to amend or remove development conditions.
16. Joint Accessibility Advisory Committee	There are no accessibility-related comments on this application.

In accordance with *Planning Act* requirements, the 90-day timeline for a decision on the application is on September 18, 2025. In lieu of this, Staff are committed to continue to work with your team on the processing of this proposal to bring forward a future recommendation to Town Council. Please provide further information in the form of a response table and resubmission of revised materials based on the comments above by September 12, 2025. If you have any questions or comments, please do not hesitate to contact me by telephone at (905) 468-6451 or by email at victoria.nikoltcheva@notl.com.

Respectfully,

Victoria Nikoltcheva, MCIP, RPP
Senior Planner
Town of Niagara-on-the-Lake

Operations Department - Public Works Division
1593 Four Mile Creek Road
P.O. Box 100, Virgil, ON L0S 1T0
905-468-3266 • Fax: 905-468-1722
www.notl.org

MEMORANDUM

TO:	VICTORIA NIKOLTCHEVA, MCIP, RPP COMMUNITY & DEVELOPMENT SERVICES
FROM:	KIEFER PATON C.TECH. ENGINEERING TECHNOLOGIST
DATE:	JULY 25, 2025
SUBJECT:	1544-1546 FOUR MILE CREEK ROAD - ZONING BYLAW AMENDMENT
LOCATION:	1544-1546 FOUR MILE CREEK ROAD, NIAGARA-ON-THE-LAKE

We have reviewed the above noted submission and supporting documents provided by the applicant's agent and will provide further detailed comments once a comprehensive Site Plan application has been submitted.

The following is a summary of our review, comments, and recommendations for the proposed Zoning By-Law Amendment application.

EXISTING SERVICES

Four Mile Creek Road

Water	250mm PVC (1996)
Sanitary Sewer	250mm AC (1976)
Storm Sewer	525mm CP (2000) (partial frontage) 1050mm CP (2000) (partial frontage)
Sidewalks	1.25m/1.5m (east side)
Road Allowance	22.6m/30.44m (varies)
Road Surface	Asphalt
Road Authority	RMN

Department of Public Works
1593 Four Mile Creek Road
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905-468-3266 • Fax: 905-468-1722
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WATER

The submitted Functional Servicing Brief (FSB) proposes to utilize the existing 250mm municipal watermain on Four Mile Creek Road to provide domestic water supply and fire protection to the proposed development proposal. The FSR notes that maximum day domestic water demands for the site are estimated to be 0.23 L/s, with 0.04L/s attributed to the proposed commercial building and 0.19 L/s attributed to the proposed residential building.

The FSB also discusses minimum fire flow requirements for the proposed development and uses the maximum demands of the commercial building as the governing factor for the site. The theoretical demands expressed in the Brief show that minimum fire flow requirements for the site are approximately 250 L/s. The brief includes fire hydrant flow testing results that verify that these water demands can be accommodated via the existing municipal watermain network.

Staff note that the existing water service to the subject lands is shown and noted on the submitted documents as being slated for decommissioning. Please note that the Town will require that all decommissioned water services be capped at the respective main.

Further detailed review of the proposed service connections, metering, and other water appurtenances will be carried out once a detailed comprehensive site plan application has been circulated.

SANITARY

The submitted Functional Servicing Brief (FSB) proposes to utilize the existing 250mm municipal sanitary sewer on Four Mile Creek Road to receive sanitary flows from the proposed development. The FSB indicates that the proposed development is estimated to discharge a total peak flow rate of 2.03L/s to the existing sanitary sewer system, representing an estimated population of 123 persons. The Brief also includes a downstream sanitary capacity analysis that assesses available capacity in the existing municipal sewer system to a point located at the Niagara Stone Road/Four Mile Creek Road intersection. In summary, the analysis shows that available capacity does exist, and that the most critical section of sewer within the study area is currently flowing at approx. 58% full. Under proposed sanitary flow conditions the sewer's available capacity is anticipated to decrease by approx. 5% to flow at approx. 63% full.

Staff note that the existing sanitary service to the subject lands are shown and noted on the submitted documents as being slated for decommissioning. Please note that the Town will require that all decommissioned sanitary services be capped at the respective main.

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1593 Four Mile Creek Road
P.O. Box 100, Virgil, ON L0S 1T0
905-468-3266 • Fax: 905-468-1722
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Further detailed review of the proposed sanitary sewer system will be carried out once a detailed comprehensive site application has been circulated.

SIDEWALKS and ROADS

As part of this proposed development, the Town will require that the owner install new sidewalk across the site's full Four Mile Creek Road frontage. The submitted preliminary plans show a proposed curb-face sidewalk along Four Mile Creek Road, however the submitted materials do not appear to show how the proposed development will provide for connectivity to the existing sidewalk network in proximity to the site. Town Staff note that a proposed curb-face sidewalk may require that further buffer strip be implemented to shift the sidewalk away from the curb, which may impact the proposed width of installed sidewalk. Further dialogue with Regional Staff may be necessary to determine the most appropriate location and alignment of proposed sidewalk along Four Mile Creek Road to ensure future sidewalk extensions are appropriately located.

Four Mile Creek Road is under the ownership and jurisdiction of the Niagara Region and Town Staff will defer further road-related comments to Regional Staff.

The applicant has provided a written legal opinion as part of this ZBA application package, which discusses the ownership and use of the Line 2 Road road allowance. Town staff were not afforded the opportunity to review this opinion prior to this application and as such do not have a response from Town Legal Counsel to provide at this time. Until such time as the Town can verify ownership of this road allowance via Town Legal Counsel, the Town cannot support the proposed development of the road allowance lands. Given that the applicant's proposed use of the road allowance includes a paved driveway access to Four Mile Creek Road, extensive parking areas, as well as buried stormwater management infrastructure, the determination of ownership and future desired use of the road allowance has the potential to affect the scale of the overall proposal.

can we get a timeline from staff as to when the legal opinion will be reviewed?

The Town cannot provide further detailed comments, nor support the proposed use of the Line 2 Road allowance until such time as ownership of those lands can be verified.

LOT GRADING AND STORMWATER MANAGEMENT

The submitted Functional Servicing Brief (FSB) proposes to utilize the existing 525mm municipal storm sewer on Four Mile Creek Road to receive storm flows from the proposed development. The report also indicates that the proposed SWM strategy will attenuate post-development flows up to and including the 100-year storm to the pre-development 5-

year flows. This proposed stormwater management approach meets the Town's overall municipal design criteria.

Further detailed review of the proposed storm sewer system and associated SWM controls will be carried out once a detailed comprehensive site application has been circulated.

Staff have also carried out a preliminary review of the submitted hydrogeological report to determine any impacts the proposed development may have from a stormwater perspective. The report discusses post-development dewatering of the site, consisting of directing approximately 71,000 L/day of groundwater to the municipal sanitary sewer network. The Town's sewer use bylaw prohibits stormwater (including groundwater) connections to the Town's sanitary sewer infrastructure, and as such the Town does not support outletting groundwater flows in any capacity to the municipal sanitary sewer. If long term de-watering is deemed necessary to achieve the proposed build-out of the site, and if an outlet is required to accommodate that de-watering Town Staff will require that those flows be integrated into the overall SWM strategy for the site and directed to the appropriate outlet.

Is long term dewatering req'd?

GENERAL

All infrastructure works shall be constructed to current Town specifications, as per industry best practices, and per all relevant legislation. All submitted plans, reports, and supporting documents shall be subject to a peer review at the owner's expense. All proposed works shall be subject to inspection and all necessary testing at the owner's expense.

CONCLUSION

The Operations Department has reviewed the information submitted by the applicant with respect to the Zoning By-law Amendment applications for 1544-1546 Four Mile Creek Road. Operations Staff cannot support the proposed application in its current form due to the items noted in the comments above. Considering the potential ramifications of the road allowance lands remaining under Town ownership the extent of comments Staff can provide at this time is limited. Please note that submitted documents will be subject to peer review as part of subsequent re-submissions.

Operations Staff will reserve further comments with respect to the ZBA submission until such time as the supporting information is received. The above noted analysis does not preclude further detailed comments or requirements being brought forward by this department upon future review of submitted plans, reports and supporting documents for the current applications or a future Site Plan application submission.

Department of Public Works
1593 Four Mile Creek Road
P.O. Box 100, Virgil, ON L0S 1T0
905-468-3266 • Fax: 905-468-1722
www.notl.org

Please advise should you have any questions or require additional information.

Sincerely,

Kiefer Paton, C.Tech.
Engineering Technologist
905-468-3061 ext. 319
kiefer.paton@notl.com

1544-1546 Four Mile Creek Road August 6, 2025

Urban Design Review

The Proposal:

The proposal is a mixed use development with commercial, office, and residential uses. The proposal consists of two buildings with commercial and office uses in one building that addresses the street with a 2 storey form and another 4 storey residential only building. Both buildings will sit atop 1 level of underground parking. Surface parking is also provided along with various outdoor amenity spaces.

The following comments are a review of the proposal from an Official Plan policy perspective and best practices.

Existing Context:

The existing site is located along Four Mile Creek Road RR100 at the south end of Virgil. The site is approximately 2.64 acres with a varied surrounding context of typical detached houses across the Regional Road and a drinking water reservoir abutting the site. The proposal seeks to create a mixed-use development through a zoning amendment that would complement site's proximity to the Virgil village core.

Planned Context:

The Niagara-on-the-Lake Official Plan provides urban design policy directions that seeks to achieve intensification of core areas including Virgil, ensure compatibility with residential uses, the consolidation of commercial development along primary corridors. These policies are supplemented by urban design policies that seek high quality urban design that includes well designed buildings and spaces that respond to enhance streetscapes.

Site Design:

The proposal consists of 2 buildings with commercial and office uses in one building that addresses the street with a 2 storey form and another 4 storey residential only building.

The overall design of the site demonstrates best practices and implementation of the urban design policies of the Town. The commercial building is located along the frontage which establishes a street line and with vision glass proposed and direct doorway access will contribute to animation and activation of the street. The proposed commercial/office building is complemented by various landscape spaces and patios to contribute to a rewarding experience of the development. Parking is located behind and to the side of the commercial/office building which is a best practice. Load and service areas are screened from view with landscaping and board fencing.

The residential building is proposed at 4 storeys. Placement of the taller building at the rear is a best practice that allows the street facing building to provide a compatible built form and allows the residential building to maximize the visual amenity of the reservoir to the residents of the building. The bulk of the 4 storey building will be visually diminished and will not impact the quality of the streetscape.

Surface Parking:

The site design attempts to limit the street exposure of surface parking through the placement of the commercial/office building, use of low screen walls, and landscaping. Notwithstanding, a significant portion of the surface parking remains exposed and the poor interface of the surface parking with the adjacent land use to the south of the site is an urban design concern that should be addressed by the proposal and the supporting urban design brief. The quantum of parking provided is the result of the intensity and proposed uses which include medical uses. Having a smaller commercial/office building footprint would result in a poorer urban design solution with less built frontage.

P1 has been extended

The design should explore means of extending the underground parking so as to lessen the impact of surface parking and ensure that the site interface along the south boundary of the site is able to provide a more robust landscape buffer to set away the parking from the property line and comprising board fencing, trees, and shrubs. Alternatively, if the proposed parking along the south boundary is acceptable it should be accompanied by a masonry wall that is able to buffer the parking ensuring vehicle headlights and noise is mitigated. This is a best practice approach where commercial/mixed uses abut sensitive residential uses.

Nick, let's follow the idea of masonry wall to the south and to follow suit should we do the same for the low wall on the four mile creek road.

Underground Parking:

okay

Consider extension of the underground parking limits to create more parking below grade. Consider approaches such as tandem parking arrangements that do not require another aisle. Along the east limits of the below grade parking tandem configurations could yield 22 more spaces. This could support to lessen the impact of surface parking and ensure the site fits in and is able to interface with adjacent land uses in a best practice approach.

Building Design:

The commercial and office building is a relatively large building to this context and is designed to include large windows and doors that appear to open to the street. The ground floor comprises commercial uses while the upper floor is for office uses. The provision of commercial uses and office together is a powerful and important element of any core or downtown. With the residential uses, the commercial and office uses together create complementary and symbiotic relationship that generates economic and social activity that is fundamental to the success of core areas. This is a best practice approach.

To ensure that the proposal genuinely creates activity, the design of the commercial units should welcome patrons from both the surface parking areas and from the street. The St. Davids example below shows the importance of providing vision glazing that enlivens the street with views of the interiors – especially at evening or nighttime. That is a best practice that should be required and implemented through the zoning provisions. It is not clear from the plans if the glazing along Four Mile Creek will be vision glazing. This should be labeled on plans and elevations.

While the overall architectural design approach represents good practice, a further contextual nuance can be added to the architectural design that would help break up the long façade. This can be done simply by variation of exterior materials and colours, variation of the cornicing element,

window sizes etc. This level of variation will enhance visual interest and complement the visual plurality of the streetscape.

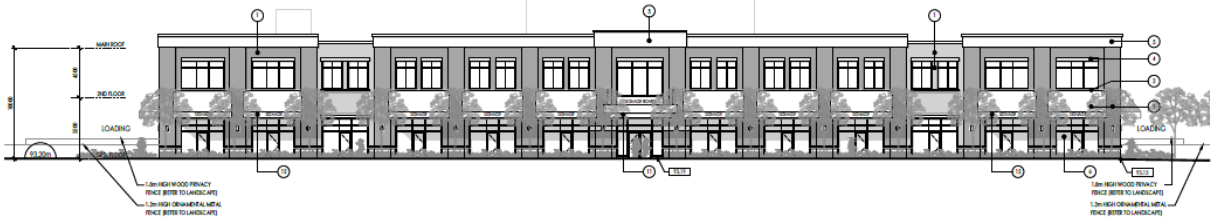
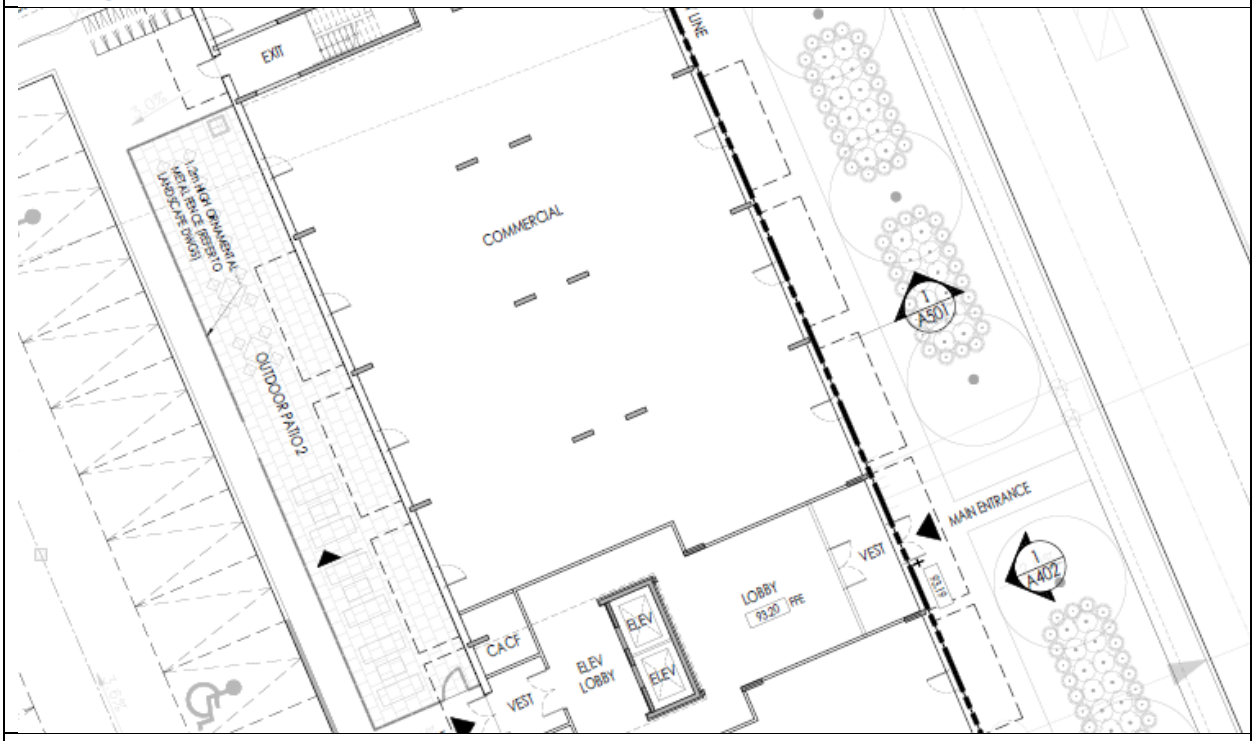


Figure 6.7 : Commercial East Elevation

Figure 6.7 : Commercial East Elevation



Include zoning provisions that seek to ensure that a certain percentage of the façade is glazed with vision glass and not spandrel.

	Storefronts of spandrel panels and not vision glazing. These are blank facades that do not help to animate the street. The signage is unharmonious and unattractive.
	Example of a development with vision glazing and well-designed signage.

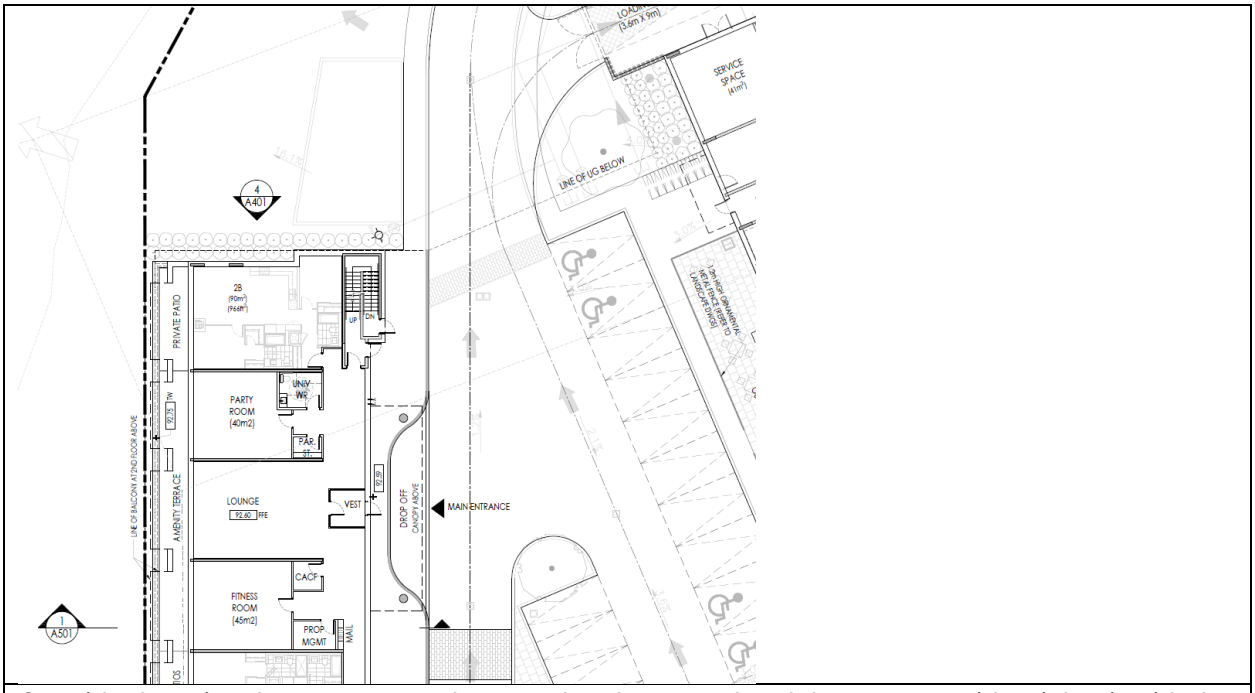
The Commercial/office building includes awnings which can contribute greatly to visual interest through colour and design. It should be noted that the proposed awnings are within the Regional ROW. The Region may not permit these. Setting the proposed building back 1.0m can provide the necessary space to keep the awnings within the private realm.

Setting the building back 1.0m will also accommodate the exterior swing of exterior doors facing the street.

The architectural design of the residential building has an elegant and classical tone that complements the design of the commercial/office building. This is a single loaded building with units on one side of a corridor. Notwithstanding, the residential building can also benefit from variation in materials and colours to help enhance the visual interest of the building and visually breakup the mass of the building. The appearance of the building can be made lighter through the use of EIFS (exterior finish system) and by limiting the use of masonry to key focal areas such as the central circulation element and the exit stair towers. Overall, the exterior design of the stair tower should include vision glazing. It is not clear from the drawings if the exterior windows along the corridor façade are vision glazing – the drawings should indicate that the windows function as vision glazing.

The interior layout of the northside of the residential building should be reconsidered so that the corner of the building has the common spaces alongside the playground. Moving the fitness space beside the party room so that these are closest to the playground will allow provide added privacy

to the residential unit. Keeping the common spaces together and the private spaces together is a best practice.



Consider locating the party room closer to the playground and the corner residential unit with the other residential units.

no

Landscape Design:

The landscape design presents a well landscaped development where the landscape complements the architectural quality of the buildings.

The location of the playground may be compromised with shade. This space will be in shade for prolonged periods. Consider locating the playground or shifting the space north to avoid building shadows.

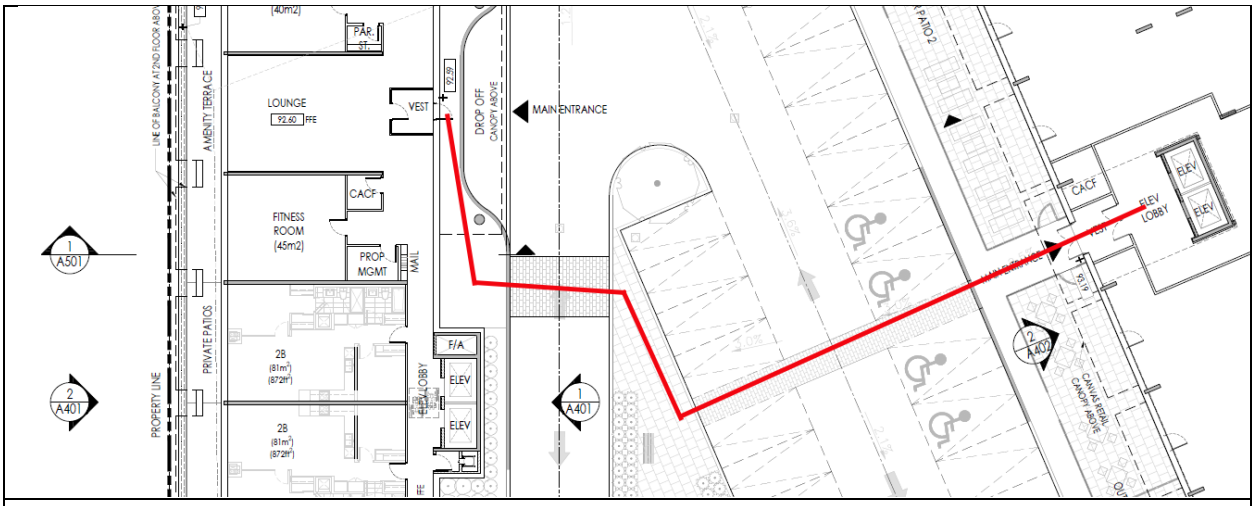
should Region allow it we would be happy to do so.

Consider a more direct and barrier free route from the commercial/office building to the residential building. As proposed pedestrians will take direct desire lines from door to door. The design should better facilitate this and provide a direct route.

it is not about the destiantion but the journey.
The idea is to enjoy your travel to your destination.

Consider additional landscaping along the south east corner of the site by shifting the masonry wall closer to the parking spaces and complementing the wall with planting of a tree and shrubs.

Nick, let us know what you think.



Proposed circulation between buildings is not direct.

The proposed screening of the loading areas is 1.8m wood fencing. As a best practice screen walls Consider masonry walls that match the architectural appearance of the building.

agreed.

Regards,

Khaldoon Ahmad MRAIC, MCIP, RPP

Prepared for the Town of Niagara-on-the-Lake according to the terms of the Service Level Agreement.

Niagara Region

Public Works, Infrastructure Planning and Development
1815 Sir Isaac Brock Way, Thorold, ON L2V 4T7
905-980-6000 Toll-free:1-800-263-7215

Via Email Only

July 10, 2025

File Numbers: PLZBA202500900

Victoria Nikoltcheva, MCIP, RPP
Senior Planner
Town of Niagara-on-the-Lake
1593 Four Mile Creek Road
PO Box 100, Virgil, ON L0S 1T0

Dear Ms. Nikoltcheva:

Re: Regional Comments
Zoning By-law Amendment Application
Town File Numbers: ZBA-04-2025
Applicant: Times Group Corp. (Stephen Aghaei)
Agent: MHBC Planning (Dana Anderson)
Address: 1544 and 1546 Four Mile Creek Road (ARN: 262702001612300)
Municipality: Town of Niagara-on-the-Lake

Regional Infrastructure Planning and Development staff have reviewed the information circulated with the Zoning By-law Amendment application for the lands municipally known as 1544 and 1546 Four Mile Creek Road in the Town of Niagara-on-the-Lake.

The subject lands are currently zoned 'Village Commercial – Holding' (VC-H) under the Town's Zoning By-law. The Zoning By-law Amendment is proposed to rezone the lands to a site-specific Village Commercial (VC) zone. The amendment seeks to introduce modified provisions related to building height, setbacks, buffer strips, and yard projection encroachments to facilitate a proposed development consisting of a two-storey commercial building fronting Four Mile Creek Road, and a four-storey residential building containing 29 dwelling units located at the rear of the subject lands.

A pre-consultation meeting for the proposed development was held on April 18, 2024. The following Regional comments are offered to assist the Town in its review and consideration of the applications.

As outlined below, Regional staff are currently unable to support the application from a Regional transportation perspective. An updated Transportation Impact

Study (TIS) is required to confirm that the development, as proposed at the zoning stage, can be accommodated by the Regional road network.

Planning Act Changes

Pursuant to the *Planning Act*, as of March 31, 2025, Niagara Region no longer holds planning authority as an upper-tier municipality. As a result, the Niagara Official Plan (NOP) now functions as the official plan for all lower-tier municipalities within the Region. This plan remains in effect until a local municipality amends or revokes it. Accordingly, Town staff should ensure that the application conforms to the applicable policies of the NOP.

Under the *Planning Act*, an upper-tier municipality may provide planning advice and support to lower-tier municipalities, subject to mutual agreement. Niagara Region is in the process of entering into a Planning Service Agreement with the Town of Niagara-on-the-Lake to continue offering planning support in the following areas:

- Land Use Compatibility
- Gas and Petroleum Resources
- Water Protection Screening
- Environmental Planning
- Urban Design (on Regional Roads).

To support the Town's evaluation of land use compatibility and environmental policy considerations related to the proposed applications, the below comments regarding land use compatibility and the natural environment system are provided for the advice of Town staff.

With respect to urban design, Regional staff will coordinate separately with Town staff to provide input and support their review process.

Matters related to transportation, Regional road allowance(s) and waste collection are to be addressed in accordance with the existing Memorandum of Understanding (MOU) for Engineering Services between the Region and the Town.

Land Use Compatibility

The Provincial Planning Statement (PPS) and Niagara Official Plan (NOP) require that major facilities and sensitive land uses "be planned and developed to avoid, or if avoidance is not possible, minimize and mitigate any potential adverse effects from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term operational and economic viability of major facilities…".

To implement these policies, the Ministry of the Environment, Conservation and Parks (MECP) Land Use Planning Policy Guidelines (the Guidelines) are to be applied in the land use planning process to prevent or minimize future land use problems due to the

encroachment of sensitive land uses on industrial uses. Guideline D-1 ‘Land Use Compatibility Guidelines’ and Guideline D-6 ‘Compatibility between Industrial Facilities and Sensitive Land Uses, as well as Publication NPC-300 ‘Environmental Noise Guidelines’ (NPC-300), apply to the review of these applications.

The Guidelines indicate that industrial land uses and sensitive land uses may be incompatible due to possible adverse effects of industrial uses near sensitive land uses, and provide for potential influence areas and recommended minimum separation distances from industrial uses to more sensitive uses, as noted below:

Industrial Facility Class	Recommended Minimum Separation Distance	Potential Influence Area
Class I	20 metres	70 metres
Class II	70 metres	300 metres
Class III	300 metres	1,000 metres

The Guidelines indicate that a sensitive land use should not be permitted closer than the recommended minimum separation distance, unless impacts from industrial activities can be mitigated to the level of “trivial impact” (i.e. no adverse effects). Potential influence areas are those where adverse effects are generally expected to occur and act as a potential constraint for sensitive land uses. In the absence of studies that specify actual influence areas for a particular industrial facility, Regional staff use these potential influence areas to screen for potential incompatibilities. Appendix A of the D-6 guidelines categorizes industrial facilities into three classes according to the objectionable nature of their emissions, their physical size/scale, production volumes and/or the intensity and scheduling of operations. The potential influence area and minimum separation of an industrial facility are to be determined based on these classifications, using a predictable “worst case scenario”, and the permitted uses in the Zoning By-law.

At the pre-consultation meeting, Regional staff requested the submission of a Land Use Compatibility Study (addressing MECP Guidelines D-1 and D-6) and a Noise Study (addressing NPC-300) to evaluate potential adverse effects from nearby industrial operations and lands designated or zoned for industrial use, primarily within the adjacent Virgil Business Park, as well as from nearby transportation sources, notably Four Mile Creek Road. The following reports were submitted with the application to address land use compatibility:

- Land Use Compatibility Assessment (Air Quality and Noise), prepared by RWDI (dated February 13, 2025); and,
- Noise Impact Study, prepared by LEA Consulting Limited (dated February 11, 2025).

The submitted Land Use Compatibility Study recommends that screening-level air quality modelling be conducted to assess potential impacts from the following nearby facilities:

- Greaves Jam & Marmalade Factory (1 Walker Road);
- Shaw Festival Scenic Construction (3 Walker Road);
- Millbrook Cabinetry (15 Henegan Road); and
- Town of Niagara-on-the-Lake Municipal Works Yard (1593 Four Mile Creek Road).

However, no such assessment was included in the submission.

The Land Use Compatibility Study also recommends a screening-level noise assessment to evaluate potential impacts from:

- Millbrook Cabinetry (specifically, rooftop cooling tower)
- NOTL Municipal Works Yard (specifically, front loader and dump truck movements)

While the submitted Noise Study includes an assessment of HVAC equipment at Millbrook Cabinetry (identified as Source S28), the location assessed appears to be a standard rooftop HVAC unit, not the cooling tower located on the eastern portion of the roof. Additionally, the noise study does not assess any non-HVAC stationary sources, including the front loader and dump truck operations at the NOTL Municipal Works Yard, as identified in the Land Use Compatibility Study.

Staff also observe loading docks approximately 130 to 140 metres from the subject lands at 11 and 13 Henegan Road (Closets by Design and Peninsula Flooring), as well as outdoor storage and potential work activity at Whirlpool Jet Boat Tours (7 Henegan Road), approximately 150 metres away. All of these facilities are identified in the Land Use Compatibility Study as Class I industrial uses, which have a Potential Area of Influence of 70 metres. However, the D-Series Guidelines define Class II facilities as those with “frequent movement of products and/or heavy trucks with the majority of movements during daytime hours” and/or “outside storage,” which have a Potential Area of Influence of 300 metres. Therefore, depending on their actual operations, these facilities may meet the criteria for Class II classification. The Land Use Compatibility Study does not provide detailed justification for the Class I designation, such as documentation of site visits or consultation with facility operators. Further detail is required to confirm the appropriateness of the classifications.

Regarding Whirlpool Jet Boat Tours, the Land Use Compatibility Study states that “minimal outdoor activity (was) observed and anticipated based on type of operation”. However, the report does not specify the timing or methodology of these observations. Given the seasonal nature of the operation, it is likely that activity levels vary throughout the year. Additional information is needed to determine whether the Class I classification is appropriate on a year-round basis.

The Land Use Compatibility Study does not fully assess the potential impacts of the proposed sensitive land uses on the range of permitted industrial uses in the surrounding area, as required by the D-Series Guidelines. Lands located approximately 150 metres west of the subject lands (within the Virgil Business Park) are designated 'Employment Area' in the NOP, 'General Industrial' in the Town's Official Plan, and zoned 'Enterprise' (E) in the Town's Zoning By-law. These designations permit a broad range of industrial uses. The Land Use Compatibility Study should be updated to evaluate whether mitigation is required to ensure that these lands can continue to develop and expand in accordance with their existing planning permissions.

While the report references vacant Enterprise' (E) zoned lands, it does not clearly identify which parcels were assessed. Regional staff are aware of a vacant, unaddressed parcel approximately 200 metres southeast of the subject lands (located south of 1–15 Walker Road), which is zoned Enterprise (E) and is approximately 4.6 hectares in size. Given the size of this parcel, it is not reasonable to conclude, without further supporting analysis, that it could only accommodate smaller-scale industrial uses. Additional analysis is required to support this conclusion, including whether intervening sensitive land uses would preclude the establishment of Class III uses.

Furthermore, Section 4.4.5 of Guideline D-6 states:

"Where a sensitive land use is proposed in proximity to vacant industrial land which is designated or zoned for industrial use, the proponent of the sensitive land use must demonstrate that the proposed use will not preclude or hinder the future use of the industrial land for industrial purposes. This includes ensuring that the sensitive land use will not be adversely affected by the range of permitted industrial uses."

The Land Use Compatibility Study implies that mitigation for potential impacts from future industrial development on these lands can be deferred until such development occurs. However, Section 4.4.5 does not support this approach. Instead, any required mitigation must be identified and implemented at the time the sensitive land use is proposed. The Land Use Compatibility Study should be revised to reflect this requirement and to determine whether mitigation is necessary to support compatibility with both existing and future industrial uses.

Regarding transportation noise, the submitted Noise Study includes projections for Four Mile Creek Road and Niagara Stone Road but only to the year 2034. The Regional Road Traffic Noise Control Policy (PW5.NO1.0) requires a 20-year projection, and both roads are Regional Roads. The report should be updated to reflect this requirement.

The submitted Noise Study also excludes the proposed Outdoor Living Area (OLA) (playground) located between the proposed commercial and residential building, stating it is not directly exposed to traffic noise. However, NPC-300 requires that all OLAs be assessed if they are within the area of influence of a noise source. The playground qualifies as an OLA under NPC-300. While buildings may be considered as noise barriers, their effectiveness must be demonstrated through modelling. No such

modelling is included in the submission. The Noise Study should be updated to assess the OLA and demonstrate the effectiveness of any proposed mitigation (including the proposed building).

Given the potential implications for the overall design of the proposed development, and, by extension, the associated Zoning By-law Amendment, Regional staff recommend that updated Land Use Compatibility and Noise Studies be submitted prior to Council's consideration of the application. In addition, a detailed Air Quality Study should be provided, unless this is comprehensively addressed within the updated Land Use Compatibility Study.

Depending on the scope and complexity of the modelling included in the updated studies, Regional staff may recommend the retention of a third-party peer review, particularly for detailed air quality modelling or complex stationary noise assessments, as these areas fall outside the Region's in-house expertise. The need for peer review will be determined once the technical scope of the studies is better understood. If required, the peer review would be conducted at the applicant's expense.

Natural Environment System

The subject lands are impacted by the Natural Environment System (NES) under the NOP, consisting of Other Woodland, the Virgil Conservation Area Wetland Complex (Other Wetlands), and Permanent/Intermittent Stream.

In accordance with Policy 3.1.9.8.1 of the NOP, an Environmental Impact Study (EIS) is required when development or site alteration is proposed adjacent to natural heritage features to demonstrate that there will be no negative impact on the features or their ecological functions.

Regional Environmental Planning staff have reviewed the EIS, prepared by Terrastory Environmental Consulting Inc. (dated April 16, 2025) submitted with the application. The EIS identifies the following confirmed NES features within the study area: Other Woodland, a Permanent/Intermittent Stream associated with Four Mile Creek, Significant Valleyland and Significant Wildlife Habitat.

Regional staff conducted site visits on January 12, 2024 (leaf-off conditions), August 7, 2024 (leaf-on conditions) and February 14, 2025 (following approved site remediation works), to confirm study requirements and delineate the woodland dripline. Both Niagara Region and Niagara Peninsula Conservation Authority (NPCA) staff confirmed following these site visits that no wetlands are present within 30 metres of the subject lands.

The Other Woodland is the feature closest to the proposed development footprint. The EIS recommends a minimum average setback of 5 metres from the Other Woodland, with part of the dropline located near the building envelope. Given the site's existing hardened surfaces and the woodland's general condition, characterized as second-

growth and dominated by non-native species, the EIS concludes that the setback is appropriate. To ensure no negative impact and conformity with NOP policies, the EIS also recommends a Buffer Enhancement and Tree Replacement Plan, which includes lands located both on-site as well as on adjacent NPCA-owned lands (Virgil Conservation Area).

No additional feature-specific mitigation is recommended for the remaining NES features (Permanent/Intermittent Stream, Significant Valleyland and Significant Wildlife Habitat) beyond the measures proposed for the Other Woodland.

Regional staff are satisfied with the EIS findings and recommendations and consider them in conformity with NOP policies.

Regarding the Zoning By-law Amendment application, the delineated NES features, associated buffers, and restoration areas should be included within a restrictive environmental zoning category, **as required under Policy 3.1.4.8 of the NOP.** Staff have reviewed the zoning by-law amendment schedule provided as part of the submitted Planning Justification Report, prepared by MHBC Planning Limited (dated April 24, 2025), which does not currently propose any environmental zoning on the subject lands. **Regional staff recommend that the schedule be revised and re-circulated to appropriate agencies to confirm conformity with applicable natural heritage policies.**

The Region will recommend conditions as part of future Planning Act approvals (i.e. site plan) to secure implementation of the EIS mitigation measures and recommendations.

Transportation

Staff have reviewed the submitted Transportation Impact Study (TIS), prepared by Lea Consulting (dated April 8, 2025) and offer the following comments relative to Four Mile Creek Road (Regional Road 100), as well as Niagara Stone Road (Regional Road 55):

- The estimated modal split percentage for transit trips, as presented in Table 4-1, appears to be high for the proposed residential units and office. This is mainly because the site is only serviced by on-demand transit and lacks access to the regularly scheduled transit network provided by Niagara Regional Transit. A more conservative estimate should be assumed given current transit availability the site.
- A left-turn lane warrant analysis is required for each access to allow Regional staff to assess potential need.

A revised TIS is required prior to approval of the Zoning By-Law Amendment to confirm that the development, as proposed at the zoning stage, can be accommodated by the Regional road network.

Site Drawings

Staff have reviewed the submitted Architecture Drawing Set, prepared by Icke Brochu Architects (dated April 10, 2025) and offer the following comments:

- The building, including any items extending from / accessory to it (e.g. canopies), cannot encroach onto the Regional road allowance.
- A detailed Site Plan, Servicing Plan, and Grading Plan must be submitted for Regional review and approval during the site plan stage. These plans must clearly identify all required trenching and restoration work, and explicitly indicate any restorations within the Regional road allowance will comply with the Niagara Region Construction Encroachment Specifications: https://www.niagararegion.ca/living/roads/permits/construction-encroachment-specifications.aspx.
- Please ensure site accesses from the regional road are designed according to OPSD 350.010 standards, and that the minimum clear throat length is provided as per the Niagara Region Access Management Guidelines available at the following webpage: https://www.niagararegion.ca/business/pdf/access-management-guidelines.pdf.

Landscape Plan

Staff have reviewed the submitted Landscape Concept, prepared by MHBC (dated April 7, 2025) and note the following:

- Landscaping features and amenities including benches, bike racks, interlocking pavers and vegetation (apart from street trees) are not permitted within the Regional road allowance.
- A detailed Landscape Plan will be required for regional review and approval at the site plan stage.

Tree Replacements

Niagara Region's Tree Removal Policy requires that any trees to be removed from the Regional boulevard be replaced at a 2:1 ratio, or cash-in-lieu be provided at a cost of $600 per replacement tree (2025 amount).

Based on the Arborist Report, prepared by Terrastory (dated April 16, 2025), four trees are proposed to be removed from the Regional road allowance, which would require eight replacement trees to be planted in the Regional road allowance. There appears to be sufficient room to plant the required replacement trees plus opportunity for additional trees, as indicated on the Landscape Concept, which is encouraged.

The proposed tree locations and species will be reviewed by Regional Transportation Forestry and Road Operations staff when the detailed Landscape Plan is submitted at the site plan stage.

Regional Road Allowance

The subject lands have frontage along Regional Road 100 (Four Mile Creek Road). The existing right-of-way satisfies Regional requirements.

The applicant is responsible for obtaining any applicable regional road use permits:

- Construction encroachment permit: needed for any construction work to be completed on or below the regional road allowance.
- Entrance permit: needed for any private road entranceway, driveway, gate or facility constructed as a means of access to a regional road.
- Sign permit: needed for placing any sign, notice or advertisement within 20 metres of the centreline of a regional road.
- Road occupancy permit: needed for any item that will be installed and remain on a regional road allowance for a period of time.

Permit applications can be made through the following link:
https://www.niagararegion.ca/living/roads/permits/

Restorations within the regional right-of-way are to be to Niagara Region standards.

Regional Cycling Network

The subject lands have frontage on a roadway identified as part of the Regional cycling network. If the cycling route is currently not established and identified with signage, it is the intent to make provisions for doing so when an appropriate opportunity arises. Possible future addition or upgrade of cycling facilities could involve other changes to the road cross-section.

Protection of Survey Evidence

Survey evidence adjacent to the Regional road allowances is not to be damaged or removed during the development of the property. Any agreements entered into as part of this application should include a clause requiring for the applicant to obtain a certificate from an Ontario Land Surveyor stating that all existing and new evidence is in place at the completion of said development.

Waste Collection

Niagara Region provides curbside waste collection services for developments that satisfy its Procedure for Requirements for Waste Collection. The proposed development may be eligible to receive regional collection provided that the owners/tenants bring the waste to the curbside on their designated pick-up day, and that the following limits are not exceeded:

Multi-Residential

- Green – no limit (weekly)
- Waste – 2 bags/cans per unit to a max. of 24 bags/cans per building (bi-weekly)

Commercial

- Green – 8 green carts (weekly)
- Waste – 8 bag/can limit (bi-weekly)

Based on the nature of the development with garbage rooms shown in both buildings, and given the number of residential units proposed, it is assumed the development will be unable to satisfy the Regional waste collection requirements and meet the above curbside waste collection limits. Therefore, waste collection for the site will be the responsibility of the owner through a private contractor. Waste will be reviewed again at the site plan stage.

Regional staff note that Circular Materials Ontario is responsible for the delivery of residential Blue / Grey Box recycling collection services. The most up to date information can be found using the following link: https:\\www.circularmaterials.ca/resident-communities/niagara-region/

Conclusion

In conclusion, Regional staff cannot support the Zoning By-law Amendment application at this time due to concerns with the submitted Transportation Impact Study (TIS), including unjustified transit modal split assumptions and the lack of a left-turn lane warrant analysis. A revised TIS is required to confirm the proposed development can be accommodated by the Regional road network and to ensure any necessary site design changes are reflected in the approved zoning by-law amendment.

Regional staff request that the updated report, and associated supplementary materials (if applicable), be forwarded to Regional staff for review and additional comment prior to the application being presented to Town Council.

In accordance with the Planning Services Agreement with the Town, Regional staff recommend that the Town require updated Land Use Compatibility and Noise Studies prior to Council’s consideration of the application. A detailed Air Quality Study should also be submitted, unless these matters are comprehensively addressed within the revised Land Use Compatibility Study. These updates are necessary to address deficiencies in the original submissions and to assess potential land use compatibility implications for the overall site design and the associated Zoning By-law Amendment.

Furthermore, Regional staff recommend that the Town require an updated Zoning By-law Amendment schedule that zones all Natural Environment System (NES) features, associated buffers, and restoration areas within a restrictive environmental zoning

category. This will ensure conformity with the Niagara Official Plan and appropriately reflect the environmental considerations associated with the proposed development.

Implementation of these recommendations are at the discretion of the Town.

If you have any questions related to the above comments, please contact me at amy.shanks@niagararegion.ca.

Kind regards,

Amy Shanks, MCIP, RPP
Senior Development Planner

cc: Phillipe Biba, Development Approvals Technician, Niagara Region
Josh Wilson, P.Eng., Manager of Development Engineering, Niagara Region
Adam Boudens, Senior Environmental Planner / Ecologist, Niagara Region
Pat Busnello, MCIP, RPP, Manager of Development Planning, Niagara Region

Niagara Peninsula CONSERVATION nature for all

3350 Merrittville Hwy. Unit 9
Thorold Ontario L2V 4Y6
905.788.3135 | info@npca.ca | npca.ca

July 10, 2025

Via Email Only

Victoria Nikoltcheva
Senior Planner
Town of Niagara-on-the-Lake
1593 Four Mile Creek Road P.O. Box 100
Virgil ON, L0S 1T0

NPCA File No.: PLZBLA202500877

Dear Ms. Nikoltcheva,

Re: Niagara Peninsula Conservation Authority (NPCA) Comments
Application for Zoning Bylaw Amendment
Town of Niagara-on-the-Lake: 1544-1546 Four Mile Creek Road
Municipal File No.: ZBA-04-2025

The NPCA has received a request to review the complete application in relation to a proposed commercial and residential use on the property noted above. The proposal is inclusive of a two-storey commercial/office building as well as a four-storey residential building with 29 units. Surface and underground parking spaces are also incorporated within the design. In response to this request, we offer the following comments.

The NPCA regulates watercourses, flood plains (up to the 100-year flood level), Great Lakes shorelines, hazardous land, valleylands, and wetlands under *Ontario Regulation 41/24* of the *Conservation Authorities Act*. The NPCA's *Policies for Planning and Development in the Watersheds of the Niagara Peninsula Conservation Authority* (NPCA policies) provides direction for managing NPCA regulated features. The subject lands are impacted by a valleyland slope along the northwestern portion of the site. A Provincially Significant Wetland associated with the Virgil Conservation Area Wetland Complex, and its 30-metre regulatory buffer are found on the neighbouring lands. Furthermore, a 100-year floodplain associated with Four Mile Creek is also contained on the abutting lands.

The NPCA is the owner of the neighbouring property, being the Virgil Dam and Reservoir Conservation Area.

Zoning Bylaw Amendment

A Zoning Bylaw Amendment is required to facilitate a rezoning of the lands from Village Commercial Holding Zone (VC-H) to a Village Commercial Site-Specific Zone (VC) to remove the holding provision and to incorporate site-specific provisions for setbacks, encroachments, height, and buffering for the development.

The NPCA attended a site visit on August 7th, 2024 with the proponents' consultants. A staking exercise was undertaken for the Provincially Significant Wetland. It was noted and approved by NPCA Staff that wetland vegetation is contained to the watercourse channel itself and that there are no wetlands present within 30 metres of the subject property. As such, the NPCA does not offer concerns respecting the surrounding wetlands.

3350 Merrittville Hwy. Unit 9
Thorold Ontario L2V 4Y6
905.788.3135 | info@npca.ca | npca.ca

Furthermore, the NPCA also flagged the valleyland slope on site. The NPCA has now reviewed the Geotechnical Report as completed by EXP (dated April 21, 2025) and offers the following comments on this report for the application:

- The NPCA does not offer objection to the 5m toe erosion allowance.
- The NPCA does not offer objection to the location of stable top of slope, being 7.2m and 6.4m landward of physical top of slope.
- The NPCA is supportive of the 7.5m erosion allowance.
- In principle, the NPCA cand support the internal road within the erosion access setback.
- However, the NPCA notes that the playground extends past stable top of slope. Development and/or site alterations are not permitted beyond physical or stable tops of slope, whichever is more restrictive. This area will need to be removed or revised on future plans to be landward of the tops of slope.
- The stable top of slope will need to be indicated on the Grading Plans.

The NPCA does require lands past stable or physical top of slope (whichever is more restrictive) to be Zone an appropriate Hazard Zoning (or similar protective Zone) that will appropriately protect the hazard. As such, the NPCA will require a change to the proposed Zone boundaries. Upon review of the Geotechnical Report, the NPCA is satisfied that the valley slope does not extend into the building footprint as that area will not meet the threshold for valleyland under our Policies. As such, the NPCA would be satisfied with the reduction of the physical top of slope limit to the 'orange flag' immediately north of the residential building. The drawings shall be revised to reflect this. All lands past stable top of slope shall therefore be rezoned to protect the feature.

The NPCA has reviewed the Stormwater Management Report, as completed by EXP (dated April 21, 2025) and offers the following information:

- The NPCA notes that the Report identifies that 'Approximate Regional NPCA Flood Line'. Our Agency notes that that Regulatory Floodplain is the 100-year storm. Please revise.
- The NPCA notes that all minor flows are to be captured, attenuated and directed to the municipal storm sewer. The NPCA does not offer objections. We do recognize that some major overland flows will spill into the NPCA Conservation Lands but will not exceed existing conditions. The NPCA does not offer objections. Further, we do not offer objections to the natural area draining uncontrolled, which matches existing conditions.

As such, the NPCA has reviewed the Draft Zoning Bylaw Amendment and notes that our Agency will require amendments to the Zoning Boundaries.

Virgil Dam and Reservoir Conservation Lands

As indicated, the NPCA is the owner of the neighbouring parcel. The NPCA presently accesses the Lower Virgil Dam parking area via the existing granular driveway for land maintenance operations as well as Dam monitoring. For future applications and detailed design, the NPCA will require the following be addressed:

- The NPCA will require that the location of the existing NPCA Access Gate be noted on the drawing, and that a driveway be included to ensure a means of unimpeded access is provided to our property.

- It appears that a curb is proposed around the perimeter of the parking lot. This would serve as a barrier to NPCA vehicles. Please revise.
- As currently designed, it appears there is nothing to prevent tenants from parking on the Town Access Easement. This space shall be reconfigured into a 5m minimum wide dedicated driveway to allow the NPCA to access our property. The NPCA asks that the Easement Agreement also be in favour of the NPCA as well as the Town.

Conclusion

In summary, the NPCA will require amendments to the Zoning By-law application at this time to address the valleyland slope. Our Agency is not yet in a position to support this application. While we understand certain elements can be addressed through detailed design, the appropriate Hazard Zoning shall be reflected for the valley at this stage.

I trust the above will be of assistance to you. Should you have any further questions or require further information in this matter, please do not hesitate to call. For administrative purposes, please forward any decisions and resolutions of your Council. In the event of an appeal to the Ontario Land Tribunal (OLT) please send notice of any Case Management Conference.

Please send a copy of any Staff Reports and/or Council recommendations once they are available. If you have any questions, please let me know.

Thank you,

Taran Lennard
Watershed Planner II
(905) 788-3135 ext. 277
tlennard@npca.ca

Watson & Associates Economists Ltd.
2233 Argentia Road, Suite 301
Mississauga, Ontario, L5N 2X7
Tel: 905.272.3600
watsonecon.ca

Provided on behalf of the Niagara Catholic District School Board

July 20, 2025

Electronic Copy

Attention:
Victoria Nikoltcheva
Niagara-on-the-Lake
1593 Four Mile Creek Road
P.O. BOX 100, Virgil, ON L0S 1T0
Email: victoria.nikoltcheva@notl.com

Re: **COMMENT LETTER**
Application for Zoning By-Law Amendment
Location: 1544-1546 Four Mile Creek Road
File No.: ZBA-04-2025

Dear Victoria Nikoltcheva,

On behalf of the Niagara Catholic District School Board, we confirm receipt of the Zoning By-law Amendment application, ZBA-04-2025, dated June 20, 2025. A total of 29 units is proposed for this development. With respect to this application, the following comments are submitted:

Location:

This development falls within the attendance boundaries of:

- St Michael Catholic Elementary School
- Holy Cross Catholic Secondary School

At this time, sufficient space exists within the local elementary and secondary schools to accommodate additional students from the development as proposed. As there's substantial new development proposed, future interim accommodation measures such as portables may be required to accommodate students from new proposed development within the current school catchment areas.

Comments:

Under the Education Development Charges (EDC) By-law, 2020 (Former Welland County), the NCDSB is eligible to collect EDCs from this development to support the acquisition of land required for new school sites and related future school construction needs. These charges are to be collected on behalf of the NCDSB prior to the issuance of building permits.

In reviewing the proposed development within the context of local school capacity and the cumulative impact of residential growth on enrolment, the Niagara Catholic District School Board has identified potential implications for both local school capacity and infrastructure. To ensure

that future residents are fully informed of these potential impacts and that adequate arrangements are made for student accommodation, the Board respectfully recommends the inclusion of the following conditions of plan approval:

Conditions:

That the owner(s) agree to future agreements with the municipality to include in all Offers of Purchase and Sale, the following statements advising prospective purchasers that:

1. "Accommodation within a Catholic school operated by the Niagara Catholic District School Board may include temporary facilities; including but not limited to accommodation in a portable classroom or directing students to an alternative attendance boundary."

2. "Student busing is at discretion of the Niagara Student Transportation Services."

3. "If school buses are required within the Subdivision in accordance with Board Transportation policies, as may be amended from time to time, school bus pick up points will generally be located on the through street at a location as determined by Niagara Student Transportation Services."

We will continue to monitor development growth in the municipality on behalf of the NCDSB as it relates to the cumulative impact on local schools. The NCDSB also requests notification of any modifications, community consultations, appeals, or notices of decision related to this application.

Please note that further to the comments provided, the NCDSB reserves the right to revise their position as needed without further notice. Should you require additional information regarding these comments, please contact planning@ncdsb.com.

Sincerely,

Jordan Cook,
Consultant
Watson & Associates Economists Ltd.
vw@watsonecon.ca
Office: 905-272-3600
Fax: 905-272-3602

cc: Alexsandria Pasquini-Smith, Niagara Catholic District School Board
David Wilson, Niagara Catholic District School Board

Outlook

RE: New Application - ZBA-04-2025 - 1544-1546 Four Mile Creek Road, NOTL

From Municipal Planning <MunicipalPlanning@enbridge.com>
Date Thu 6/26/2025 3:54 PM
To Victoria Nikoltcheva, MCIP, RPP <Victoria.Nikoltcheva@notl.com>

Thank you for your circulation.

Enbridge Gas does not object to the proposed application(s) however, we reserve the right to amend or remove development conditions.

Please continue to forward all municipal circulations and clearance letter requests electronically to MunicipalPlanning@Enbridge.com.

Thank you,

Casey O'Neil (she/her)
Advisor Municipal Planning
Engineering

ENBRIDGE
TEL: 416-495-5180
500 Consumers Rd, North York, ON M2J1P8

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Safety. Integrity. Respect. Inclusion. High Performance.

Watson & Associates Economists Ltd.
2233 Argentia Road, Suite 301
Mississauga, Ontario, L5N 2X7
Tel: 905.272.3600
watsonecon.ca

Provided on behalf of the Niagara Catholic District School Board

July 20, 2025

Electronic Copy

Attention:
Victoria Nikoltcheva
Niagara-on-the-Lake
1593 Four Mile Creek Road
P.O. BOX 100, Virgil, ON L0S 1T0
Email: victoria.nikoltcheva@notl.com

Re: **COMMENT LETTER**
Application for Zoning By-Law Amendment
Location: 1544-1546 Four Mile Creek Road
File No.: ZBA-04-2025

Dear Victoria Nikoltcheva,

On behalf of the Niagara Catholic District School Board, we confirm receipt of the Zoning By-law Amendment application, ZBA-04-2025, dated June 20, 2025. A total of 29 units is proposed for this development. With respect to this application, the following comments are submitted:

Location:

This development falls within the attendance boundaries of:

- St Michael Catholic Elementary School
- Holy Cross Catholic Secondary School

At this time, sufficient space exists within the local elementary and secondary schools to accommodate additional students from the development as proposed. As there's substantial new development proposed, future interim accommodation measures such as portables may be required to accommodate students from new proposed development within the current school catchment areas.

Comments:

Under the Education Development Charges (EDC) By-law, 2020 (Former Welland County), the NCDSB is eligible to collect EDCs from this development to support the acquisition of land required for new school sites and related future school construction needs. These charges are to be collected on behalf of the NCDSB prior to the issuance of building permits.

In reviewing the proposed development within the context of local school capacity and the cumulative impact of residential growth on enrolment, the Niagara Catholic District School Board has identified potential implications for both local school capacity and infrastructure. To ensure

that future residents are fully informed of these potential impacts and that adequate arrangements are made for student accommodation, the Board respectfully recommends the inclusion of the following conditions of plan approval:

Conditions:

That the owner(s) agree to future agreements with the municipality to include in all Offers of Purchase and Sale, the following statements advising prospective purchasers that:

1. "Accommodation within a Catholic school operated by the Niagara Catholic District School Board may include temporary facilities; including but not limited to accommodation in a portable classroom or directing students to an alternative attendance boundary."

2. "Student busing is at discretion of the Niagara Student Transportation Services."

3. "If school buses are required within the Subdivision in accordance with Board Transportation policies, as may be amended from time to time, school bus pick up points will generally be located on the through street at a location as determined by Niagara Student Transportation Services."

We will continue to monitor development growth in the municipality on behalf of the NCDSB as it relates to the cumulative impact on local schools. The NCDSB also requests notification of any modifications, community consultations, appeals, or notices of decision related to this application.

Please note that further to the comments provided, the NCDSB reserves the right to revise their position as needed without further notice. Should you require additional information regarding these comments, please contact planning@ncdsb.com.

Sincerely,

Jordan Cook,
Consultant
Watson & Associates Economists Ltd.
vw@watsonecon.ca
Office: 905-272-3600
Fax: 905-272-3602

cc: Alexsandria Pasquini-Smith, Niagara Catholic District School Board
David Wilson, Niagara Catholic District School Board

Niagara Peninsula CONSERVATION nature for all

3350 Merrittville Hwy. Unit 9
Thorold Ontario L2V 4Y6
905.788.3135 | info@npca.ca | npca.ca

July 10, 2025

Via Email Only

Victoria Nikoltcheva
Senior Planner
Town of Niagara-on-the-Lake
1593 Four Mile Creek Road P.O. Box 100
Virgil ON, L0S 1T0

NPCA File No.: PLZBLA202500877

Dear Ms. Nikoltcheva,

Re: Niagara Peninsula Conservation Authority (NPCA) Comments
Application for Zoning Bylaw Amendment
Town of Niagara-on-the-Lake: 1544-1546 Four Mile Creek Road
Municipal File No.: ZBA-04-2025

The NPCA has received a request to review the complete application in relation to a proposed commercial and residential use on the property noted above. The proposal is inclusive of a two-storey commercial/office building as well as a four-storey residential building with 29 units. Surface and underground parking spaces are also incorporated within the design. In response to this request, we offer the following comments.

The NPCA regulates watercourses, flood plains (up to the 100-year flood level), Great Lakes shorelines, hazardous land, valleylands, and wetlands under *Ontario Regulation 41/24* of the *Conservation Authorities Act*. The NPCA's *Policies for Planning and Development in the Watersheds of the Niagara Peninsula Conservation Authority* (NPCA policies) provides direction for managing NPCA regulated features. The subject lands are impacted by a valleyland slope along the northwestern portion of the site. A Provincially Significant Wetland associated with the Virgil Conservation Area Wetland Complex, and its 30-metre regulatory buffer are found on the neighbouring lands. Furthermore, a 100-year floodplain associated with Four Mile Creek is also contained on the abutting lands.

The NPCA is the owner of the neighbouring property, being the Virgil Dam and Reservoir Conservation Area.

Zoning Bylaw Amendment

A Zoning Bylaw Amendment is required to facilitate a rezoning of the lands from Village Commercial Holding Zone (VC-H) to a Village Commercial Site-Specific Zone (VC) to remove the holding provision and to incorporate site-specific provisions for setbacks, encroachments, height, and buffering for the development.

The NPCA attended a site visit on August 7th, 2024 with the proponents' consultants. A staking exercise was undertaken for the Provincially Significant Wetland. It was noted and approved by NPCA Staff that wetland vegetation is contained to the watercourse channel itself and that there are no wetlands present within 30 metres of the subject property. As such, the NPCA does not offer concerns respecting the surrounding wetlands.

3350 Merrittville Hwy. Unit 9
Thorold Ontario L2V 4Y6
905.788.3135 | info@npca.ca | npca.ca

Furthermore, the NPCA also flagged the valleyland slope on site. The NPCA has now reviewed the Geotechnical Report as completed by EXP (dated April 21, 2025) and offers the following comments on this report for the application:

- The NPCA does not offer objection to the 5m toe erosion allowance.
- The NPCA does not offer objection to the location of stable top of slope, being 7.2m and 6.4m landward of physical top of slope.
- The NPCA is supportive of the 7.5m erosion allowance.
- In principle, the NPCA cand support the internal road within the erosion access setback.
- However, the NPCA notes that the playground extends past stable top of slope. Development and/or site alterations are not permitted beyond physical or stable tops of slope, whichever is more restrictive. This area will need to be removed or revised on future plans to be landward of the tops of slope.
- The stable top of slope will need to be indicated on the Grading Plans.

The NPCA does require lands past stable or physical top of slope (whichever is more restrictive) to be Zone an appropriate Hazard Zoning (or similar protective Zone) that will appropriately protect the hazard. As such, the NPCA will require a change to the proposed Zone boundaries. Upon review of the Geotechnical Report, the NPCA is satisfied that the valley slope does not extend into the building footprint as that area will not meet the threshold for valleyland under our Policies. As such, the NPCA would be satisfied with the reduction of the physical top of slope limit to the 'orange flag' immediately north of the residential building. The drawings shall be revised to reflect this. All lands past stable top of slope shall therefore be rezoned to protect the feature.

The NPCA has reviewed the Stormwater Management Report, as completed by EXP (dated April 21, 2025) and offers the following information:

- The NPCA notes that the Report identifies that 'Approximate Regional NPCA Flood Line'. Our Agency notes that that Regulatory Floodplain is the 100-year storm. Please revise.
- The NPCA notes that all minor flows are to be captured, attenuated and directed to the municipal storm sewer. The NPCA does not offer objections. We do recognize that some major overland flows will spill into the NPCA Conservation Lands but will not exceed existing conditions. The NPCA does not offer objections. Further, we do not offer objections to the natural area draining uncontrolled, which matches existing conditions.

As such, the NPCA has reviewed the Draft Zoning Bylaw Amendment and notes that our Agency will require amendments to the Zoning Boundaries.

Virgil Dam and Reservoir Conservation Lands

As indicated, the NPCA is the owner of the neighbouring parcel. The NPCA presently accesses the Lower Virgil Dam parking area via the existing granular driveway for land maintenance operations as well as Dam monitoring. For future applications and detailed design, the NPCA will require the following be addressed:

- The NPCA will require that the location of the existing NPCA Access Gate be noted on the drawing, and that a driveway be included to ensure a means of unimpeded access is provided to our property.

- It appears that a curb is proposed around the perimeter of the parking lot. This would serve as a barrier to NPCA vehicles. Please revise.
- As currently designed, it appears there is nothing to prevent tenants from parking on the Town Access Easement. This space shall be reconfigured into a 5m minimum wide dedicated driveway to allow the NPCA to access our property. The NPCA asks that the Easement Agreement also be in favour of the NPCA as well as the Town.

Conclusion

In summary, the NPCA will require amendments to the Zoning By-law application at this time to address the valleyland slope. Our Agency is not yet in a position to support this application. While we understand certain elements can be addressed through detailed design, the appropriate Hazard Zoning shall be reflected for the valley at this stage.

I trust the above will be of assistance to you. Should you have any further questions or require further information in this matter, please do not hesitate to call. For administrative purposes, please forward any decisions and resolutions of your Council. In the event of an appeal to the Ontario Land Tribunal (OLT) please send notice of any Case Management Conference.

Please send a copy of any Staff Reports and/or Council recommendations once they are available. If you have any questions, please let me know.

Thank you,

Taran Lennard
Watershed Planner II
(905) 788-3135 ext. 277
tlennard@npca.ca

Niagara Region

Public Works, Infrastructure Planning and Development
1815 Sir Isaac Brock Way, Thorold, ON L2V 4T7
905-980-6000 Toll-free:1-800-263-7215

Via Email Only

July 10, 2025

File Numbers: PLZBA202500900

Victoria Nikoltcheva, MCIP, RPP
Senior Planner
Town of Niagara-on-the-Lake
1593 Four Mile Creek Road
PO Box 100, Virgil, ON L0S 1T0

Dear Ms. Nikoltcheva:

Re: Regional Comments
Zoning By-law Amendment Application
Town File Numbers: ZBA-04-2025
Applicant: Times Group Corp. (Stephen Aghaei)
Agent: MHBC Planning (Dana Anderson)
Address: 1544 and 1546 Four Mile Creek Road (ARN: 262702001612300)
Municipality: Town of Niagara-on-the-Lake

Regional Infrastructure Planning and Development staff have reviewed the information circulated with the Zoning By-law Amendment application for the lands municipally known as 1544 and 1546 Four Mile Creek Road in the Town of Niagara-on-the-Lake.

The subject lands are currently zoned 'Village Commercial – Holding' (VC-H) under the Town's Zoning By-law. The Zoning By-law Amendment is proposed to rezone the lands to a site-specific Village Commercial (VC) zone. The amendment seeks to introduce modified provisions related to building height, setbacks, buffer strips, and yard projection encroachments to facilitate a proposed development consisting of a two-storey commercial building fronting Four Mile Creek Road, and a four-storey residential building containing 29 dwelling units located at the rear of the subject lands.

A pre-consultation meeting for the proposed development was held on April 18, 2024. The following Regional comments are offered to assist the Town in its review and consideration of the applications.

As outlined below, Regional staff are currently unable to support the application from a Regional transportation perspective. An updated Transportation Impact

Study (TIS) is required to confirm that the development, as proposed at the zoning stage, can be accommodated by the Regional road network.

Planning Act Changes

Pursuant to the *Planning Act*, as of March 31, 2025, Niagara Region no longer holds planning authority as an upper-tier municipality. As a result, the Niagara Official Plan (NOP) now functions as the official plan for all lower-tier municipalities within the Region. This plan remains in effect until a local municipality amends or revokes it. Accordingly, Town staff should ensure that the application conforms to the applicable policies of the NOP.

Under the *Planning Act*, an upper-tier municipality may provide planning advice and support to lower-tier municipalities, subject to mutual agreement. Niagara Region is in the process of entering into a Planning Service Agreement with the Town of Niagara-on-the-Lake to continue offering planning support in the following areas:

- Land Use Compatibility
- Gas and Petroleum Resources
- Water Protection Screening
- Environmental Planning
- Urban Design (on Regional Roads).

To support the Town's evaluation of land use compatibility and environmental policy considerations related to the proposed applications, the below comments regarding land use compatibility and the natural environment system are provided for the advice of Town staff.

With respect to urban design, Regional staff will coordinate separately with Town staff to provide input and support their review process.

Matters related to transportation, Regional road allowance(s) and waste collection are to be addressed in accordance with the existing Memorandum of Understanding (MOU) for Engineering Services between the Region and the Town.

Land Use Compatibility

The Provincial Planning Statement (PPS) and Niagara Official Plan (NOP) require that major facilities and sensitive land uses "be planned and developed to avoid, or if avoidance is not possible, minimize and mitigate any potential adverse effects from odour, noise and other contaminants, minimize risk to public health and safety, and to ensure the long-term operational and economic viability of major facilities…".

To implement these policies, the Ministry of the Environment, Conservation and Parks (MECP) Land Use Planning Policy Guidelines (the Guidelines) are to be applied in the land use planning process to prevent or minimize future land use problems due to the

encroachment of sensitive land uses on industrial uses. Guideline D-1 ‘Land Use Compatibility Guidelines’ and Guideline D-6 ‘Compatibility between Industrial Facilities and Sensitive Land Uses, as well as Publication NPC-300 ‘Environmental Noise Guidelines’ (NPC-300), apply to the review of these applications.

The Guidelines indicate that industrial land uses and sensitive land uses may be incompatible due to possible adverse effects of industrial uses near sensitive land uses, and provide for potential influence areas and recommended minimum separation distances from industrial uses to more sensitive uses, as noted below:

Industrial Facility Class	Recommended Minimum Separation Distance	Potential Influence Area
Class I	20 metres	70 metres
Class II	70 metres	300 metres
Class III	300 metres	1,000 metres

The Guidelines indicate that a sensitive land use should not be permitted closer than the recommended minimum separation distance, unless impacts from industrial activities can be mitigated to the level of “trivial impact” (i.e. no adverse effects). Potential influence areas are those where adverse effects are generally expected to occur and act as a potential constraint for sensitive land uses. In the absence of studies that specify actual influence areas for a particular industrial facility, Regional staff use these potential influence areas to screen for potential incompatibilities. Appendix A of the D-6 guidelines categorizes industrial facilities into three classes according to the objectionable nature of their emissions, their physical size/scale, production volumes and/or the intensity and scheduling of operations. The potential influence area and minimum separation of an industrial facility are to be determined based on these classifications, using a predictable “worst case scenario”, and the permitted uses in the Zoning By-law.

At the pre-consultation meeting, Regional staff requested the submission of a Land Use Compatibility Study (addressing MECP Guidelines D-1 and D-6) and a Noise Study (addressing NPC-300) to evaluate potential adverse effects from nearby industrial operations and lands designated or zoned for industrial use, primarily within the adjacent Virgil Business Park, as well as from nearby transportation sources, notably Four Mile Creek Road. The following reports were submitted with the application to address land use compatibility:

- Land Use Compatibility Assessment (Air Quality and Noise), prepared by RWDI (dated February 13, 2025); and,
- Noise Impact Study, prepared by LEA Consulting Limited (dated February 11, 2025).

The submitted Land Use Compatibility Study recommends that screening-level air quality modelling be conducted to assess potential impacts from the following nearby facilities:

- Greaves Jam & Marmalade Factory (1 Walker Road);
- Shaw Festival Scenic Construction (3 Walker Road);
- Millbrook Cabinetry (15 Henegan Road); and
- Town of Niagara-on-the-Lake Municipal Works Yard (1593 Four Mile Creek Road).

However, no such assessment was included in the submission.

The Land Use Compatibility Study also recommends a screening-level noise assessment to evaluate potential impacts from:

- Millbrook Cabinetry (specifically, rooftop cooling tower)
- NOTL Municipal Works Yard (specifically, front loader and dump truck movements)

While the submitted Noise Study includes an assessment of HVAC equipment at Millbrook Cabinetry (identified as Source S28), the location assessed appears to be a standard rooftop HVAC unit, not the cooling tower located on the eastern portion of the roof. Additionally, the noise study does not assess any non-HVAC stationary sources, including the front loader and dump truck operations at the NOTL Municipal Works Yard, as identified in the Land Use Compatibility Study.

Staff also observe loading docks approximately 130 to 140 metres from the subject lands at 11 and 13 Henegan Road (Closets by Design and Peninsula Flooring), as well as outdoor storage and potential work activity at Whirlpool Jet Boat Tours (7 Henegan Road), approximately 150 metres away. All of these facilities are identified in the Land Use Compatibility Study as Class I industrial uses, which have a Potential Area of Influence of 70 metres. However, the D-Series Guidelines define Class II facilities as those with “frequent movement of products and/or heavy trucks with the majority of movements during daytime hours” and/or “outside storage,” which have a Potential Area of Influence of 300 metres. Therefore, depending on their actual operations, these facilities may meet the criteria for Class II classification. The Land Use Compatibility Study does not provide detailed justification for the Class I designation, such as documentation of site visits or consultation with facility operators. Further detail is required to confirm the appropriateness of the classifications.

Regarding Whirlpool Jet Boat Tours, the Land Use Compatibility Study states that “minimal outdoor activity (was) observed and anticipated based on type of operation”. However, the report does not specify the timing or methodology of these observations. Given the seasonal nature of the operation, it is likely that activity levels vary throughout the year. Additional information is needed to determine whether the Class I classification is appropriate on a year-round basis.

The Land Use Compatibility Study does not fully assess the potential impacts of the proposed sensitive land uses on the range of permitted industrial uses in the surrounding area, as required by the D-Series Guidelines. Lands located approximately 150 metres west of the subject lands (within the Virgil Business Park) are designated 'Employment Area' in the NOP, 'General Industrial' in the Town's Official Plan, and zoned 'Enterprise' (E) in the Town's Zoning By-law. These designations permit a broad range of industrial uses. The Land Use Compatibility Study should be updated to evaluate whether mitigation is required to ensure that these lands can continue to develop and expand in accordance with their existing planning permissions.

While the report references vacant Enterprise' (E) zoned lands, it does not clearly identify which parcels were assessed. Regional staff are aware of a vacant, unaddressed parcel approximately 200 metres southeast of the subject lands (located south of 1–15 Walker Road), which is zoned Enterprise (E) and is approximately 4.6 hectares in size. Given the size of this parcel, it is not reasonable to conclude, without further supporting analysis, that it could only accommodate smaller-scale industrial uses. Additional analysis is required to support this conclusion, including whether intervening sensitive land uses would preclude the establishment of Class III uses.

Furthermore, Section 4.4.5 of Guideline D-6 states:

"Where a sensitive land use is proposed in proximity to vacant industrial land which is designated or zoned for industrial use, the proponent of the sensitive land use must demonstrate that the proposed use will not preclude or hinder the future use of the industrial land for industrial purposes. This includes ensuring that the sensitive land use will not be adversely affected by the range of permitted industrial uses."

The Land Use Compatibility Study implies that mitigation for potential impacts from future industrial development on these lands can be deferred until such development occurs. However, Section 4.4.5 does not support this approach. Instead, any required mitigation must be identified and implemented at the time the sensitive land use is proposed. The Land Use Compatibility Study should be revised to reflect this requirement and to determine whether mitigation is necessary to support compatibility with both existing and future industrial uses.

Regarding transportation noise, the submitted Noise Study includes projections for Four Mile Creek Road and Niagara Stone Road but only to the year 2034. The Regional Road Traffic Noise Control Policy (PW5.NO1.0) requires a 20-year projection, and both roads are Regional Roads. The report should be updated to reflect this requirement.

The submitted Noise Study also excludes the proposed Outdoor Living Area (OLA) (playground) located between the proposed commercial and residential building, stating it is not directly exposed to traffic noise. However, NPC-300 requires that all OLAs be assessed if they are within the area of influence of a noise source. The playground qualifies as an OLA under NPC-300. While buildings may be considered as noise barriers, their effectiveness must be demonstrated through modelling. No such

modelling is included in the submission. The Noise Study should be updated to assess the OLA and demonstrate the effectiveness of any proposed mitigation (including the proposed building).

Given the potential implications for the overall design of the proposed development, and, by extension, the associated Zoning By-law Amendment, Regional staff recommend that updated Land Use Compatibility and Noise Studies be submitted prior to Council's consideration of the application. In addition, a detailed Air Quality Study should be provided, unless this is comprehensively addressed within the updated Land Use Compatibility Study.

Depending on the scope and complexity of the modelling included in the updated studies, Regional staff may recommend the retention of a third-party peer review, particularly for detailed air quality modelling or complex stationary noise assessments, as these areas fall outside the Region's in-house expertise. The need for peer review will be determined once the technical scope of the studies is better understood. If required, the peer review would be conducted at the applicant's expense.

Natural Environment System

The subject lands are impacted by the Natural Environment System (NES) under the NOP, consisting of Other Woodland, the Virgil Conservation Area Wetland Complex (Other Wetlands), and Permanent/Intermittent Stream.

In accordance with Policy 3.1.9.8.1 of the NOP, an Environmental Impact Study (EIS) is required when development or site alteration is proposed adjacent to natural heritage features to demonstrate that there will be no negative impact on the features or their ecological functions.

Regional Environmental Planning staff have reviewed the EIS, prepared by Terrastory Environmental Consulting Inc. (dated April 16, 2025) submitted with the application. The EIS identifies the following confirmed NES features within the study area: Other Woodland, a Permanent/Intermittent Stream associated with Four Mile Creek, Significant Valleyland and Significant Wildlife Habitat.

Regional staff conducted site visits on January 12, 2024 (leaf-off conditions), August 7, 2024 (leaf-on conditions) and February 14, 2025 (following approved site remediation works), to confirm study requirements and delineate the woodland dripline. Both Niagara Region and Niagara Peninsula Conservation Authority (NPCA) staff confirmed following these site visits that no wetlands are present within 30 metres of the subject lands.

The Other Woodland is the feature closest to the proposed development footprint. The EIS recommends a minimum average setback of 5 metres from the Other Woodland, with part of the dropline located near the building envelope. Given the site's existing hardened surfaces and the woodland's general condition, characterized as second-

growth and dominated by non-native species, the EIS concludes that the setback is appropriate. To ensure no negative impact and conformity with NOP policies, the EIS also recommends a Buffer Enhancement and Tree Replacement Plan, which includes lands located both on-site as well as on adjacent NPCA-owned lands (Virgil Conservation Area).

No additional feature-specific mitigation is recommended for the remaining NES features (Permanent/Intermittent Stream, Significant Valleyland and Significant Wildlife Habitat) beyond the measures proposed for the Other Woodland.

Regional staff are satisfied with the EIS findings and recommendations and consider them in conformity with NOP policies.

Regarding the Zoning By-law Amendment application, the delineated NES features, associated buffers, and restoration areas should be included within a restrictive environmental zoning category, **as required under Policy 3.1.4.8 of the NOP.** Staff have reviewed the zoning by-law amendment schedule provided as part of the submitted Planning Justification Report, prepared by MHBC Planning Limited (dated April 24, 2025), which does not currently propose any environmental zoning on the subject lands. **Regional staff recommend that the schedule be revised and re-circulated to appropriate agencies to confirm conformity with applicable natural heritage policies.**

The Region will recommend conditions as part of future Planning Act approvals (i.e. site plan) to secure implementation of the EIS mitigation measures and recommendations.

Transportation

Staff have reviewed the submitted Transportation Impact Study (TIS), prepared by Lea Consulting (dated April 8, 2025) and offer the following comments relative to Four Mile Creek Road (Regional Road 100), as well as Niagara Stone Road (Regional Road 55):

- The estimated modal split percentage for transit trips, as presented in Table 4-1, appears to be high for the proposed residential units and office. This is mainly because the site is only serviced by on-demand transit and lacks access to the regularly scheduled transit network provided by Niagara Regional Transit. A more conservative estimate should be assumed given current transit availability the site.
- A left-turn lane warrant analysis is required for each access to allow Regional staff to assess potential need.

A revised TIS is required prior to approval of the Zoning By-Law Amendment to confirm that the development, as proposed at the zoning stage, can be accommodated by the Regional road network.

Site Drawings

Staff have reviewed the submitted Architecture Drawing Set, prepared by Icke Brochu Architects (dated April 10, 2025) and offer the following comments:

- The building, including any items extending from / accessory to it (e.g. canopies), cannot encroach onto the Regional road allowance.
- A detailed Site Plan, Servicing Plan, and Grading Plan must be submitted for Regional review and approval during the site plan stage. These plans must clearly identify all required trenching and restoration work, and explicitly indicate any restorations within the Regional road allowance will comply with the Niagara Region Construction Encroachment Specifications: https://www.niagararegion.ca/living/roads/permits/construction-encroachment-specifications.aspx.
- Please ensure site accesses from the regional road are designed according to OPSD 350.010 standards, and that the minimum clear throat length is provided as per the Niagara Region Access Management Guidelines available at the following webpage: https://www.niagararegion.ca/business/pdf/access-management-guidelines.pdf.

Landscape Plan

Staff have reviewed the submitted Landscape Concept, prepared by MHBC (dated April 7, 2025) and note the following:

- Landscaping features and amenities including benches, bike racks, interlocking pavers and vegetation (apart from street trees) are not permitted within the Regional road allowance.
- A detailed Landscape Plan will be required for regional review and approval at the site plan stage.

Tree Replacements

Niagara Region's Tree Removal Policy requires that any trees to be removed from the Regional boulevard be replaced at a 2:1 ratio, or cash-in-lieu be provided at a cost of $600 per replacement tree (2025 amount).

Based on the Arborist Report, prepared by Terrastory (dated April 16, 2025), four trees are proposed to be removed from the Regional road allowance, which would require eight replacement trees to be planted in the Regional road allowance. There appears to be sufficient room to plant the required replacement trees plus opportunity for additional trees, as indicated on the Landscape Concept, which is encouraged.

The proposed tree locations and species will be reviewed by Regional Transportation Forestry and Road Operations staff when the detailed Landscape Plan is submitted at the site plan stage.

Regional Road Allowance

The subject lands have frontage along Regional Road 100 (Four Mile Creek Road). The existing right-of-way satisfies Regional requirements.

The applicant is responsible for obtaining any applicable regional road use permits:

- Construction encroachment permit: needed for any construction work to be completed on or below the regional road allowance.
- Entrance permit: needed for any private road entranceway, driveway, gate or facility constructed as a means of access to a regional road.
- Sign permit: needed for placing any sign, notice or advertisement within 20 metres of the centreline of a regional road.
- Road occupancy permit: needed for any item that will be installed and remain on a regional road allowance for a period of time.

Permit applications can be made through the following link:
https://www.niagararegion.ca/living/roads/permits/

Restorations within the regional right-of-way are to be to Niagara Region standards.

Regional Cycling Network

The subject lands have frontage on a roadway identified as part of the Regional cycling network. If the cycling route is currently not established and identified with signage, it is the intent to make provisions for doing so when an appropriate opportunity arises. Possible future addition or upgrade of cycling facilities could involve other changes to the road cross-section.

Protection of Survey Evidence

Survey evidence adjacent to the Regional road allowances is not to be damaged or removed during the development of the property. Any agreements entered into as part of this application should include a clause requiring for the applicant to obtain a certificate from an Ontario Land Surveyor stating that all existing and new evidence is in place at the completion of said development.

Waste Collection

Niagara Region provides curbside waste collection services for developments that satisfy its Procedure for Requirements for Waste Collection. The proposed development may be eligible to receive regional collection provided that the owners/tenants bring the waste to the curbside on their designated pick-up day, and that the following limits are not exceeded:

Multi-Residential

- Green – no limit (weekly)
- Waste – 2 bags/cans per unit to a max. of 24 bags/cans per building (bi-weekly)

Commercial

- Green – 8 green carts (weekly)
- Waste – 8 bag/can limit (bi-weekly)

Based on the nature of the development with garbage rooms shown in both buildings, and given the number of residential units proposed, it is assumed the development will be unable to satisfy the Regional waste collection requirements and meet the above curbside waste collection limits. Therefore, waste collection for the site will be the responsibility of the owner through a private contractor. Waste will be reviewed again at the site plan stage.

Regional staff note that Circular Materials Ontario is responsible for the delivery of residential Blue / Grey Box recycling collection services. The most up to date information can be found using the following link: https:\\www.circularmaterials.ca/resident-communities/niagara-region/

Conclusion

In conclusion, Regional staff cannot support the Zoning By-law Amendment application at this time due to concerns with the submitted Transportation Impact Study (TIS), including unjustified transit modal split assumptions and the lack of a left-turn lane warrant analysis. A revised TIS is required to confirm the proposed development can be accommodated by the Regional road network and to ensure any necessary site design changes are reflected in the approved zoning by-law amendment.

Regional staff request that the updated report, and associated supplementary materials (if applicable), be forwarded to Regional staff for review and additional comment prior to the application being presented to Town Council.

In accordance with the Planning Services Agreement with the Town, Regional staff recommend that the Town require updated Land Use Compatibility and Noise Studies prior to Council’s consideration of the application. A detailed Air Quality Study should also be submitted, unless these matters are comprehensively addressed within the revised Land Use Compatibility Study. These updates are necessary to address deficiencies in the original submissions and to assess potential land use compatibility implications for the overall site design and the associated Zoning By-law Amendment.

Furthermore, Regional staff recommend that the Town require an updated Zoning By-law Amendment schedule that zones all Natural Environment System (NES) features, associated buffers, and restoration areas within a restrictive environmental zoning

category. This will ensure conformity with the Niagara Official Plan and appropriately reflect the environmental considerations associated with the proposed development.

Implementation of these recommendations are at the discretion of the Town.

If you have any questions related to the above comments, please contact me at amy.shanks@niagararegion.ca.

Kind regards,

Amy Shanks, MCIP, RPP
Senior Development Planner

cc: Phillipe Biba, Development Approvals Technician, Niagara Region
Josh Wilson, P.Eng., Manager of Development Engineering, Niagara Region
Adam Boudens, Senior Environmental Planner / Ecologist, Niagara Region
Pat Busnello, MCIP, RPP, Manager of Development Planning, Niagara Region

EXHIBIT B

Trip Generation Rates

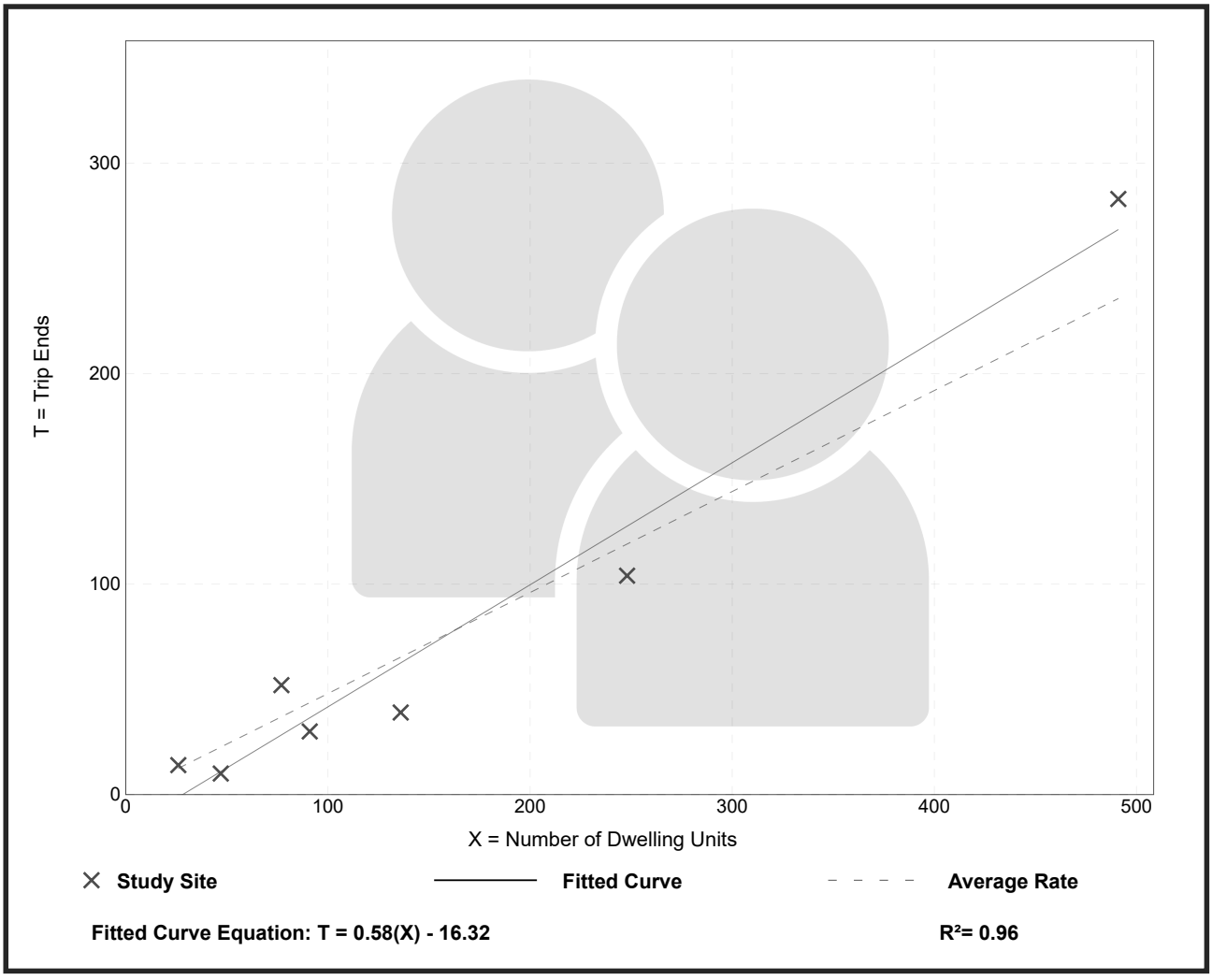
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Person Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 7
Avg. Num. of Dwelling Units: 159
Directional Distribution: 23% entering, 77% exiting

Person Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.21 - 0.68	0.14

Data Plot and Equation



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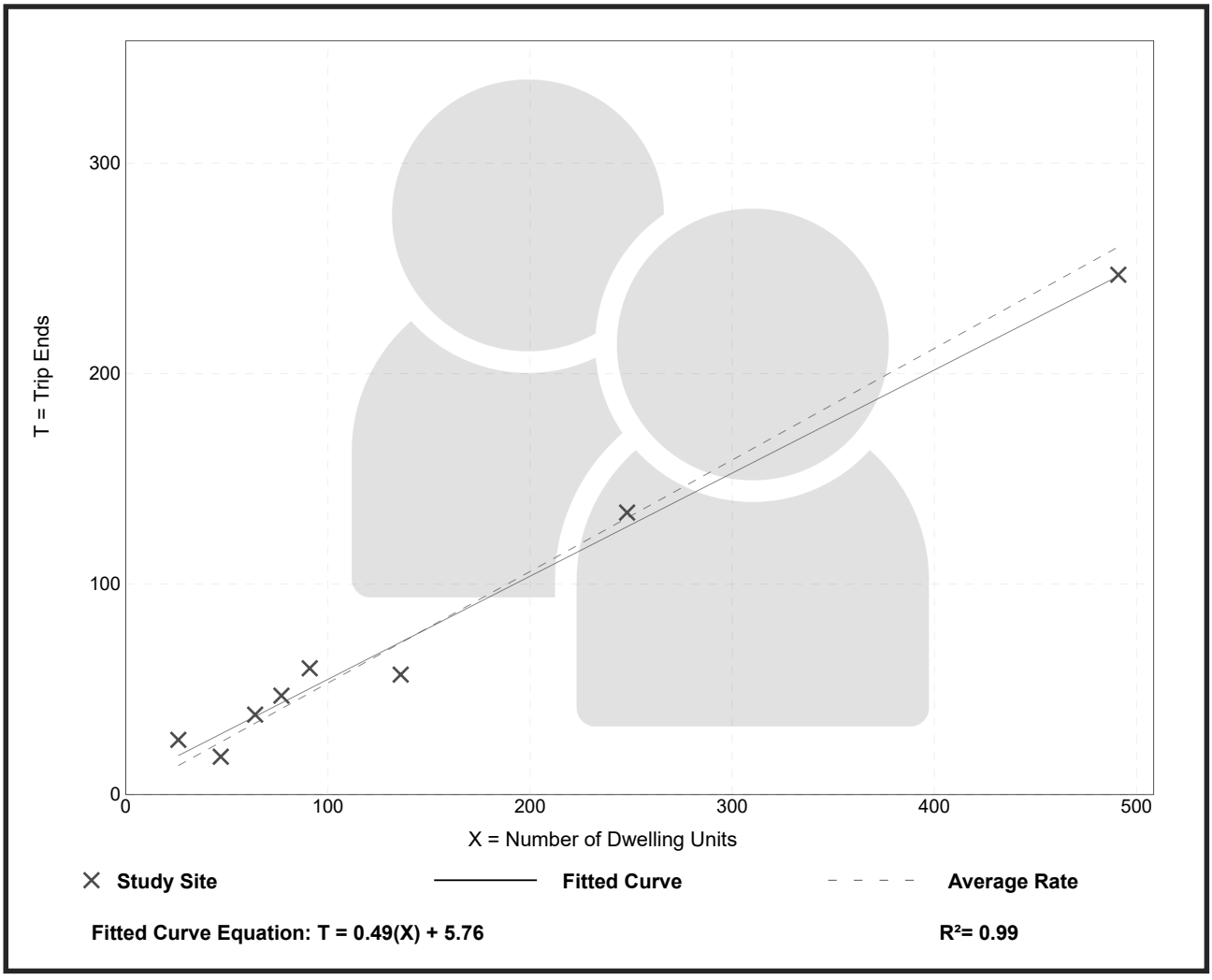
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Person Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 8
Avg. Num. of Dwelling Units: 148
Directional Distribution: 59% entering, 41% exiting

Person Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.53	0.38 - 1.00	0.10

Data Plot and Equation



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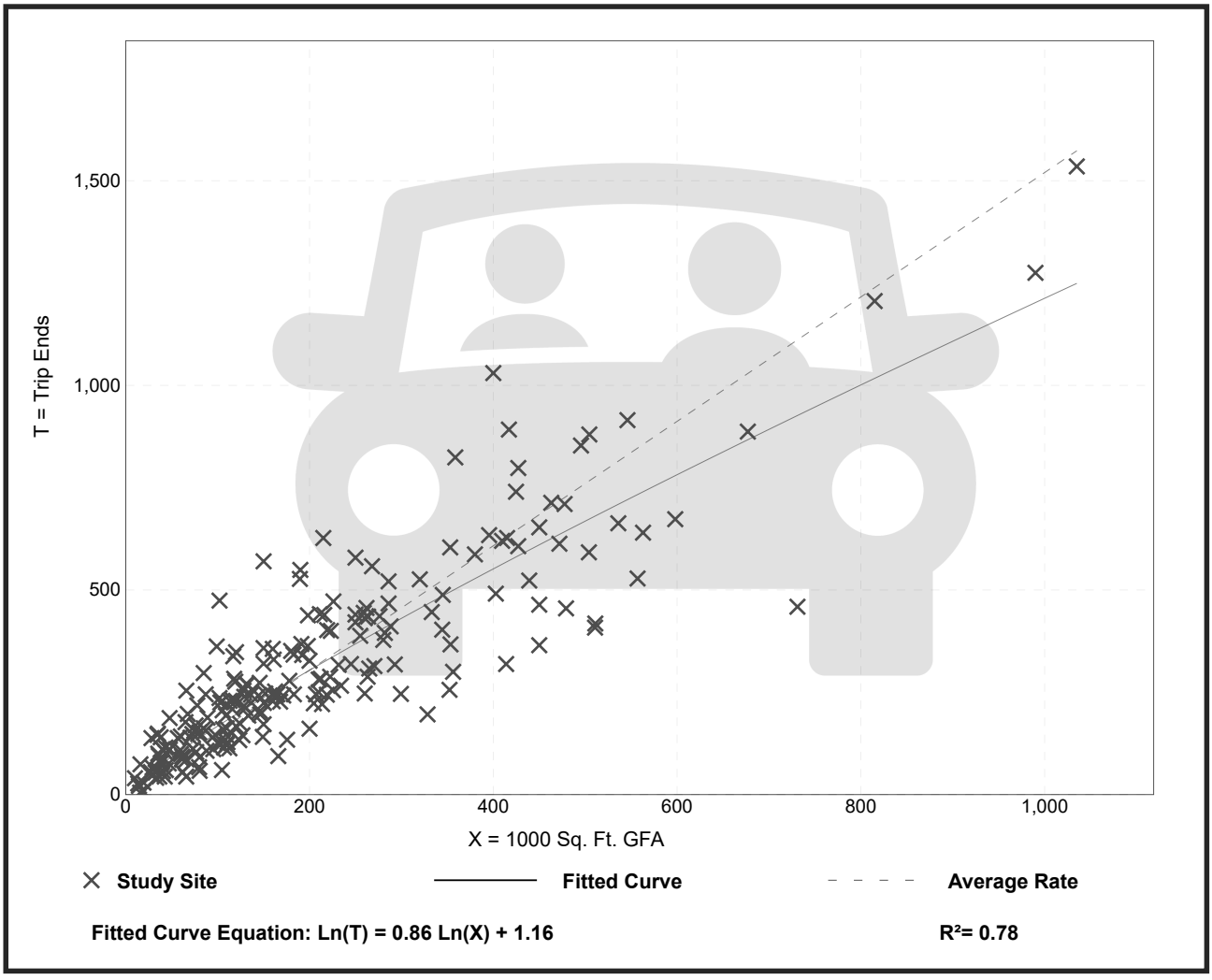
General Office Building
(710)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 221
Avg. 1000 Sq. Ft. GFA: 201
Directional Distribution: 88% entering, 12% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.52	0.32 - 4.93	0.58

Data Plot and Equation



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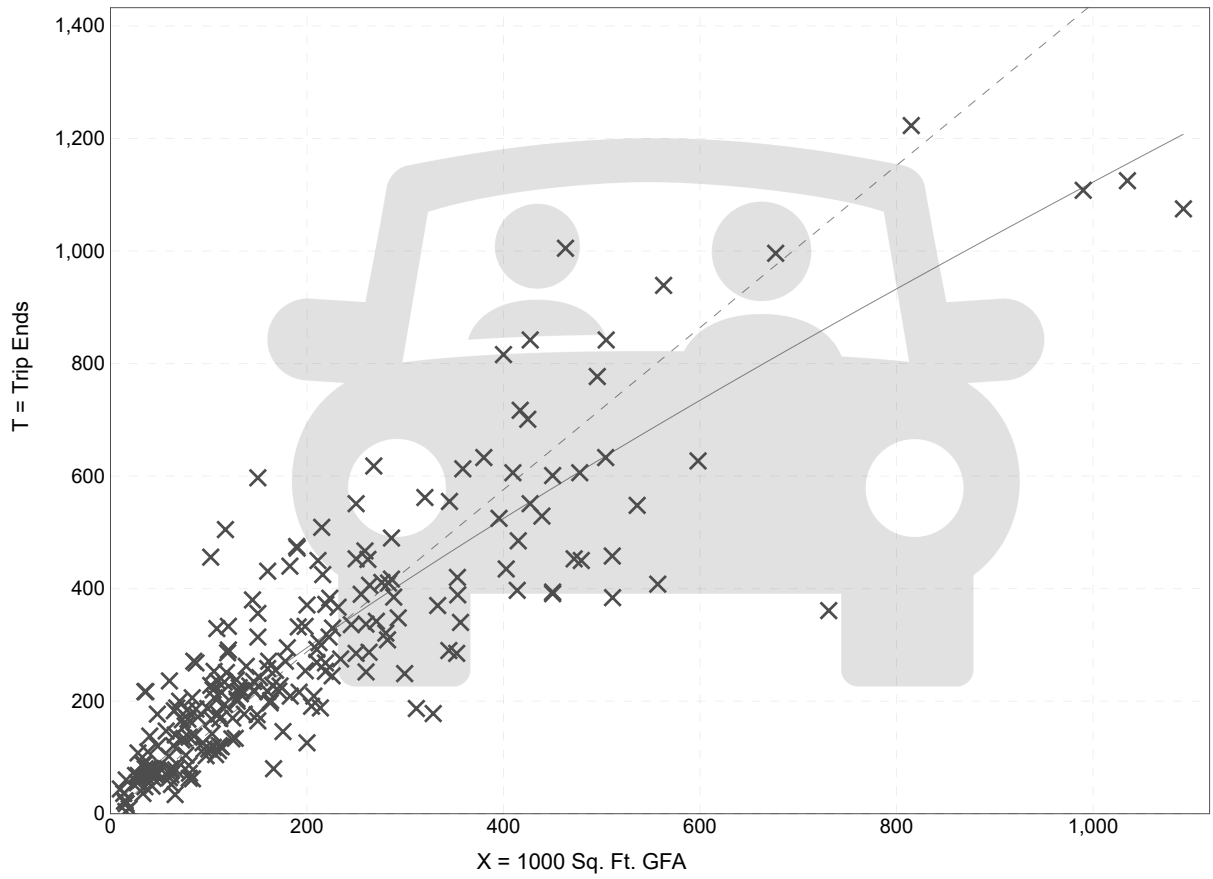
General Office Building
(710)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 232
Avg. 1000 Sq. Ft. GFA: 199
Directional Distribution: 17% entering, 83% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.44	0.26 - 6.20	0.60

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.83 Ln(X) + 1.29 **R^2= 0.77**

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Strip Retail Plaza (<40k)
(822)

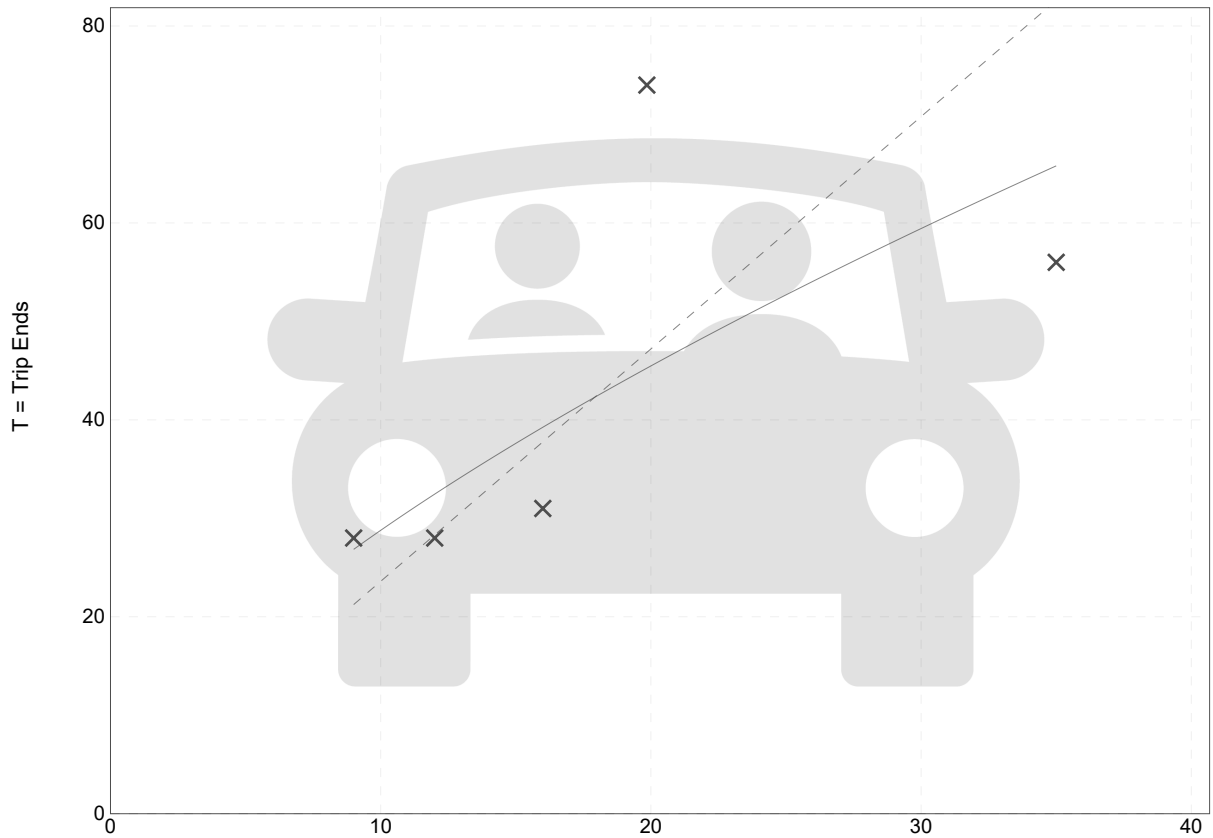
Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 5
Avg. 1000 Sq. Ft. GLA: 18
Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
2.36	1.60 - 3.73	0.94

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Ln(T) = 0.66 Ln(X) + 1.84

R^2= 0.57

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Strip Retail Plaza (<40k)
(822)

Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 25
Avg. 1000 Sq. Ft. GLA: 21
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
6.59	2.81 - 15.20	2.94

Data Plot and Equation

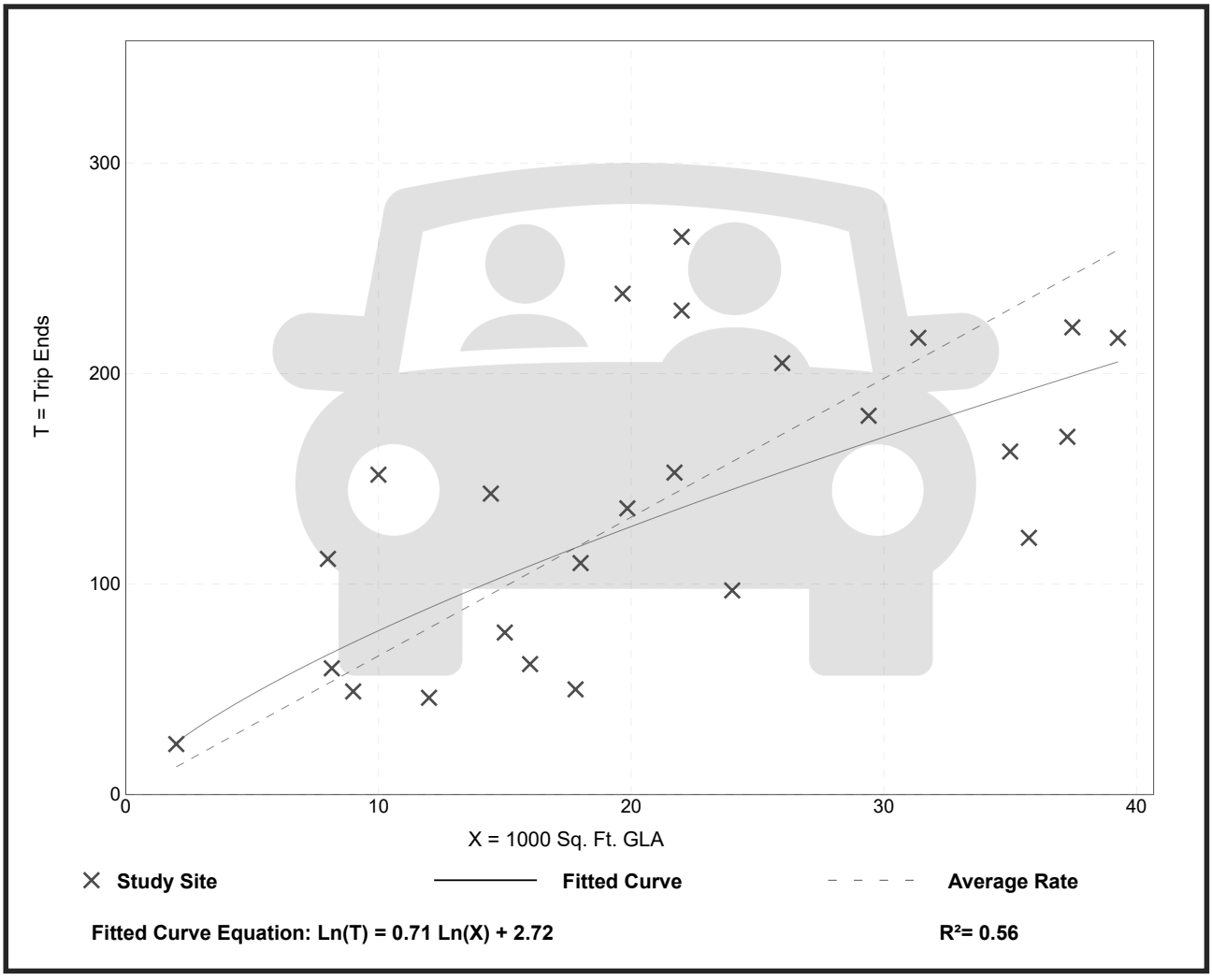

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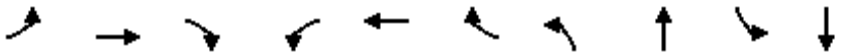
EXHIBIT C

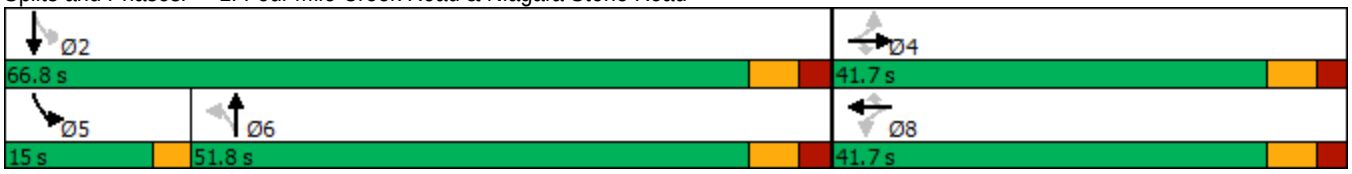
Intersection Capacity Analysis – 2026 Synchro Results



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	28	343	56	88	292	6	59	43	21	51
Future Volume (vph)	28	343	56	88	292	6	59	43	21	51
Lane Group Flow (vph)	30	365	60	94	311	6	63	206	22	95
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		4			8			6	5	2
Permitted Phases	4		4	8		8	6		2	
Detector Phase	4	4	4	8	8	8	6	6	5	2
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0	6.0	10.0
Minimum Split (s)	24.7	24.7	24.7	25.7	25.7	25.7	26.8	26.8	10.5	26.8
Total Split (s)	41.7	41.7	41.7	41.7	41.7	41.7	51.8	51.8	15.0	66.8
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	38.4%	47.7%	47.7%	13.8%	61.6%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	3.0	4.1
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	0.0	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	3.0	6.8
Lead/Lag							Lag	Lag	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Min	None	Min
Act Effct Green (s)	13.9	13.9	13.9	13.9	13.9	13.9	11.2	11.2	16.6	12.6
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34	0.34	0.28	0.28	0.41	0.31
v/c Ratio	0.09	0.59	0.11	0.31	0.50	0.01	0.20	0.38	0.05	0.18
Control Delay	10.9	16.1	3.8	14.0	14.3	0.0	16.3	7.7	8.7	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	16.1	3.8	14.0	14.3	0.0	16.3	7.7	8.7	8.2
LOS	B	B	A	B	B	A	B	A	A	A
Approach Delay		14.1			14.0			9.7		8.3
Approach LOS		B			B			A		A
Queue Length 50th (m)	1.2	17.8	0.0	4.1	14.6	0.0	2.9	2.1	0.8	2.5
Queue Length 95th (m)	7.1	55.5	5.6	17.8	46.2	0.0	15.1	19.2	4.5	11.4
Internal Link Dist (m)		277.9			212.2			272.8		146.6
Turn Bay Length (m)	60.0			70.0			40.0		25.0	
Base Capacity (vph)	818	1597	1289	776	1612	1305	1084	1473	542	1626
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.23	0.05	0.12	0.19	0.00	0.06	0.14	0.04	0.06

Intersection Summary			
Cycle Length: 108.5			
Actuated Cycle Length: 40.7			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 12.6		Intersection LOS: B	
Intersection Capacity Utilization 59.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Four Mile Creek Road & Niagara Stone Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	343	56	88	292	6	59	43	150	21	51	39
Future Volume (vph)	28	343	56	88	292	6	59	43	150	21	51	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1543	1807	1449	1604	1824	1474	1560	1547		1503	1626	
Flt Permitted	0.57	1.00	1.00	0.52	1.00	1.00	0.70	1.00		0.50	1.00	
Satd. Flow (perm)	928	1807	1449	879	1824	1474	1142	1547		785	1626	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	30	365	60	94	311	6	63	46	160	22	54	41
RTOR Reduction (vph)	0	0	40	0	0	4	0	118	0	0	26	0
Lane Group Flow (vph)	30	365	20	94	311	2	63	88	0	22	69	0
Confl. Peds. (#/hr)	2					2			2	2		
Heavy Vehicles (%)	9%	4%	4%	5%	3%	0%	8%	14%	3%	12%	2%	16%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		4			8			6		5	2	
Permitted Phases	4		4	8		8	6			2		
Actuated Green, G (s)	13.9	13.9	13.9	13.9	13.9	13.9	11.2	11.2		15.2	15.2	
Effective Green, g (s)	13.9	13.9	13.9	13.9	13.9	13.9	11.2	11.2		15.2	15.2	
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.26	0.26		0.36	0.36	
Clearance Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0		2.5	4.0	
Lane Grp Cap (vph)	302	589	472	286	595	480	300	406		296	580	
v/s Ratio Prot		c0.20			0.17			c0.06		0.00	c0.04	
v/s Ratio Perm	0.03		0.01	0.11		0.00	0.06			0.02		
v/c Ratio	0.10	0.62	0.04	0.33	0.52	0.00	0.21	0.22		0.07	0.12	
Uniform Delay, d1	10.0	12.1	9.8	10.8	11.7	9.7	12.2	12.3		9.1	9.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.9	0.0	0.7	0.8	0.0	0.5	0.4		0.1	0.1	
Delay (s)	10.1	14.1	9.8	11.5	12.5	9.7	12.7	12.6		9.1	9.3	
Level of Service	B	B	A	B	B	A	B	B		A	A	
Approach Delay (s)		13.3			12.2			12.7			9.3	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	42.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	0	4	0	1	0	267	5	1	163	0
Future Vol, veh/h	0	0	0	4	0	1	0	267	5	1	163	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	50	0	0	0	6	25	0	6	0
Mvmt Flow	0	0	0	5	0	1	0	310	6	1	190	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	506	510	190	507	507	315	190	0	0	318	0	0
Stage 1	192	192	-	315	315	-	-	-	-	-	-	-
Stage 2	314	318	-	192	192	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.6	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.6	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.6	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.95	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	480	469	857	407	471	730	1396	-	-	1253	-	-
Stage 1	814	745	-	605	659	-	-	-	-	-	-	-
Stage 2	701	657	-	711	745	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	479	468	857	406	470	729	1396	-	-	1251	-	-
Mov Cap-2 Maneuver	479	468	-	406	470	-	-	-	-	-	-	-
Stage 1	814	744	-	604	658	-	-	-	-	-	-	-
Stage 2	700	656	-	710	744	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	13.2	0	0
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1396	-	-	-	445	1251	-	-
HCM Lane V/C Ratio	-	-	-	-	0.013	0.001	-	-
HCM Control Delay (s)	0	-	-	0	13.2	7.9	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0	0	-	-

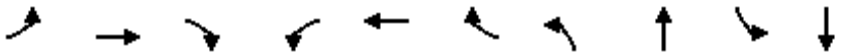
Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	1	0	0	26	1	61	1	201	10	31	136	0
Future Vol, veh/h	1	0	0	26	1	61	1	201	10	31	136	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	3	0	5	0	4	6	0
Mvmt Flow	1	0	0	29	1	67	1	221	11	34	149	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	480	453	149	448	448	229	149	0	0	234	0	0
Stage 1	217	217	-	231	231	-	-	-	-	-	-	-
Stage 2	263	236	-	217	217	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.23	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.327	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	499	506	903	524	509	808	1445	-	-	1322	-	-
Stage 1	790	727	-	776	717	-	-	-	-	-	-	-
Stage 2	747	713	-	790	727	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	447	490	903	511	493	807	1445	-	-	1320	-	-
Mov Cap-2 Maneuver	447	490	-	511	493	-	-	-	-	-	-	-
Stage 1	789	707	-	774	715	-	-	-	-	-	-	-
Stage 2	683	711	-	768	707	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.1	11.1	0	1.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1445	-	-	447	685	1320	-	-
HCM Lane V/C Ratio	0.001	-	-	0.002	0.141	0.026	-	-
HCM Control Delay (s)	7.5	0	-	13.1	11.1	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.5	0.1	-	-

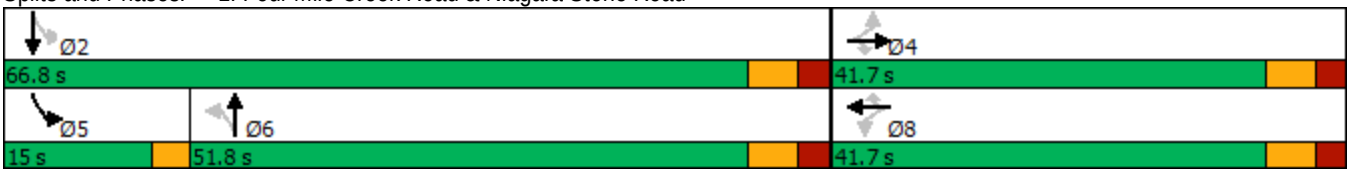


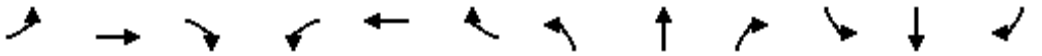
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	30	382	82	136	577	17	89	98	32	63
Future Volume (vph)	30	382	82	136	577	17	89	98	32	63
Lane Group Flow (vph)	32	411	88	146	620	18	96	264	34	113
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		4			8			6	5	2
Permitted Phases	4		4	8		8	6		2	
Detector Phase	4	4	4	8	8	8	6	6	5	2
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0	6.0	10.0
Minimum Split (s)	24.7	24.7	24.7	25.7	25.7	25.7	26.8	26.8	10.5	26.8
Total Split (s)	41.7	41.7	41.7	41.7	41.7	41.7	51.8	51.8	15.0	66.8
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	38.4%	47.7%	47.7%	13.8%	61.6%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	3.0	4.1
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	0.0	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	3.0	6.8
Lead/Lag							Lag	Lag	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Min	None	Min
Act Effct Green (s)	34.9	34.9	34.9	34.9	34.9	34.9	14.4	14.4	21.9	18.0
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.52	0.52	0.22	0.22	0.33	0.27
v/c Ratio	0.12	0.42	0.11	0.33	0.64	0.02	0.37	0.62	0.10	0.23
Control Delay	13.2	13.5	3.8	14.9	18.0	0.1	27.8	23.1	14.5	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	13.5	3.8	14.9	18.0	0.1	27.8	23.1	14.5	12.3
LOS	B	B	A	B	B	A	C	C	B	B
Approach Delay		11.9			17.0			24.4		12.8
Approach LOS		B			B			C		B
Queue Length 50th (m)	1.6	25.3	0.0	8.5	45.0	0.0	9.9	18.8	3.0	6.7
Queue Length 95th (m)	9.2	73.5	8.0	32.0	#131.1	0.0	25.7	47.4	8.0	16.8
Internal Link Dist (m)		277.9			212.2			272.8		146.6
Turn Bay Length (m)	60.0			70.0			40.0		25.0	
Base Capacity (vph)	279	1006	785	448	986	820	825	1168	414	1540
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.41	0.11	0.33	0.63	0.02	0.12	0.23	0.08	0.07

Intersection Summary		
Cycle Length: 108.5		
Actuated Cycle Length: 66.7		
Natural Cycle: 70		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.64		
Intersection Signal Delay: 16.6	Intersection LOS: B	
Intersection Capacity Utilization 76.5%	ICU Level of Service D	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		

Queue shown is maximum after two cycles.

Splits and Phases: 1: Four Mile Creek Road & Niagara Stone Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	382	82	136	577	17	89	98	148	32	63	42
Future Volume (vph)	30	382	82	136	577	17	89	98	148	32	63	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1684	1879	1391	1683	1842	1474	1666	1656		1685	1710	
Flt Permitted	0.30	1.00	1.00	0.47	1.00	1.00	0.68	1.00		0.41	1.00	
Satd. Flow (perm)	524	1879	1391	838	1842	1474	1200	1656		724	1710	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	32	411	88	146	620	18	96	105	159	34	68	45
RTOR Reduction (vph)	0	0	43	0	0	9	0	68	0	0	32	0
Lane Group Flow (vph)	32	411	45	146	620	9	96	196	0	34	81	0
Confl. Peds. (#/hr)	1		1	1		1	1					1
Heavy Vehicles (%)	0%	0%	6%	0%	2%	0%	1%	8%	0%	0%	4%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		4			8			6		5	2	
Permitted Phases	4		4	8		8	6			2		
Actuated Green, G (s)	34.9	34.9	34.9	34.9	34.9	34.9	14.4	14.4		20.0	20.0	
Effective Green, g (s)	34.9	34.9	34.9	34.9	34.9	34.9	14.4	14.4		20.0	20.0	
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51	0.51	0.21	0.21		0.29	0.29	
Clearance Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0		2.5	4.0	
Lane Grp Cap (vph)	267	958	709	427	939	752	252	348		248	500	
v/s Ratio Prot		0.22			c0.34			c0.12		0.01	c0.05	
v/s Ratio Perm	0.06		0.03	0.17		0.01	0.08			0.03		
v/c Ratio	0.12	0.43	0.06	0.34	0.66	0.01	0.38	0.56		0.14	0.16	
Uniform Delay, d1	8.7	10.5	8.5	9.9	12.4	8.3	23.2	24.2		17.7	18.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.3	0.0	0.5	1.8	0.0	1.3	2.5		0.2	0.2	
Delay (s)	8.9	10.8	8.5	10.4	14.1	8.3	24.5	26.7		17.9	18.2	
Level of Service	A	B	A	B	B	A	C	C		B	B	
Approach Delay (s)		10.3			13.3			26.1			18.1	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	68.4	Sum of lost time (s)	16.5
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	0	15	0	36	0	214	13	14	279	0
Future Vol, veh/h	0	0	0	15	0	36	0	214	13	14	279	0
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0	0	3	9	0	2	0
Mvmt Flow	0	0	0	19	0	45	0	268	16	18	349	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	684	674	350	667	666	281	349	0	0	289	0	0
Stage 1	385	385	-	281	281	-	-	-	-	-	-	-
Stage 2	299	289	-	386	385	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	365	379	698	375	383	763	1221	-	-	1284	-	-
Stage 1	642	614	-	730	682	-	-	-	-	-	-	-
Stage 2	714	677	-	641	614	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	339	371	697	368	375	760	1221	-	-	1279	-	-
Mov Cap-2 Maneuver	339	371	-	368	375	-	-	-	-	-	-	-
Stage 1	642	604	-	727	679	-	-	-	-	-	-	-
Stage 2	672	674	-	630	604	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	12	0	0.4
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1221	-	-	-	579	1279	-	-
HCM Lane V/C Ratio	-	-	-	-	0.11	0.014	-	-
HCM Control Delay (s)	0	-	-	0	12	7.9	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0	-	-

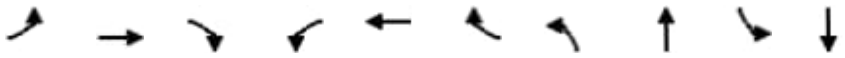
Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	0	0	15	1	46	0	188	22	61	233	0
Future Vol, veh/h	2	0	0	15	1	46	0	188	22	61	233	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0	0	3	0	0	3	0
Mvmt Flow	2	0	0	17	1	53	0	216	25	70	268	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	664	650	268	638	638	230	268	0	0	242	0	0
Stage 1	408	408	-	230	230	-	-	-	-	-	-	-
Stage 2	256	242	-	408	408	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	377	391	776	392	397	814	1307	-	-	1336	-	-
Stage 1	624	600	-	777	718	-	-	-	-	-	-	-
Stage 2	753	709	-	624	600	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	335	366	776	373	372	813	1307	-	-	1335	-	-
Mov Cap-2 Maneuver	335	366	-	373	372	-	-	-	-	-	-	-
Stage 1	624	563	-	776	717	-	-	-	-	-	-	-
Stage 2	703	708	-	585	563	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.8	11.5	0	1.6
HCM LOS	C	B		

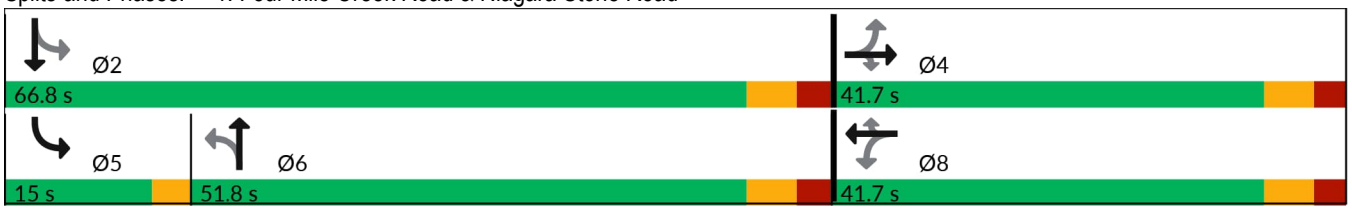
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1307	-	-	335	623	1335	-	-
HCM Lane V/C Ratio	-	-	-	0.007	0.114	0.053	-	-
HCM Control Delay (s)	0	-	-	15.8	11.5	7.8	0	-
HCM Lane LOS	A	-	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.4	0.2	-	-

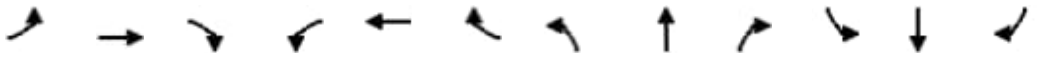


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	28	343	94	91	292	6	81	42	21	52
Future Volume (vph)	28	343	94	91	292	6	81	42	21	52
Lane Group Flow (vph)	30	365	100	97	311	6	86	207	22	96
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		4			8			6	5	2
Permitted Phases	4		4	8		8	6		2	
Detector Phase	4	4	4	8	8	8	6	6	5	2
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0	6.0	10.0
Minimum Split (s)	24.7	24.7	24.7	25.7	25.7	25.7	26.8	26.8	10.5	26.8
Total Split (s)	41.7	41.7	41.7	41.7	41.7	41.7	51.8	51.8	15.0	66.8
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	38.4%	47.7%	47.7%	13.8%	61.6%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	3.0	4.1
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	0.0	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	3.0	6.8
Lead/Lag							Lag	Lag	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Min	None	Min
Act Effct Green (s)	13.7	13.7	13.7	13.7	13.7	13.7	11.5	11.5	16.9	12.9
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34	0.34	0.28	0.28	0.41	0.32
v/c Ratio	0.09	0.58	0.17	0.31	0.49	0.01	0.25	0.36	0.04	0.16
Control Delay (s/veh)	11.1	15.9	4.1	14.2	14.4	0.0	16.2	7.2	8.4	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	11.1	15.9	4.1	14.2	14.4	0.0	16.2	7.2	8.4	7.8
LOS	B	B	A	B	B	A	B	A	A	A
Approach Delay (s/veh)		13.3			14.2			9.8		7.9
Approach LOS		B			B			A		A
Queue Length 50th (m)	1.2	17.6	0.0	4.2	14.5	0.0	4.1	2.0	0.8	2.5
Queue Length 95th (m)	7.2	55.9	8.1	18.5	46.9	0.0	18.9	18.6	4.4	11.3
Internal Link Dist (m)		277.9			212.2			272.8		146.6
Turn Bay Length (m)	60.0			70.0			40.0		25.0	
Base Capacity (vph)	889	1654	1339	809	1654	1300	1170	1552	613	1758
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.22	0.07	0.12	0.19	0.00	0.07	0.13	0.04	0.05

Intersection Summary			
Cycle Length: 108.5			
Actuated Cycle Length: 40.8			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay (s/veh): 12.3		Intersection LOS: B	
Intersection Capacity Utilization 59.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Four Mile Creek Road & Niagara Stone Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	343	94	91	292	6	81	42	152	21	52	39
Future Volume (vph)	28	343	94	91	292	6	81	42	152	21	52	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1682	1879	1507	1685	1879	1474	1685	1630		1683	1759	
Flt Permitted	0.57	1.00	1.00	0.52	1.00	1.00	0.69	1.00		0.50	1.00	
Satd. Flow (perm)	1011	1879	1507	918	1879	1474	1232	1630		883	1759	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	30	365	100	97	311	6	86	45	162	22	55	41
RTOR Reduction (vph)	0	0	68	0	0	4	0	118	0	0	26	0
Lane Group Flow (vph)	30	365	32	97	311	2	86	89	0	22	70	0
Confl. Peds. (#/hr)	2					2			2	2		
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		4			8			6		5	2	
Permitted Phases	4		4	8		8	6			2		
Actuated Green, G (s)	13.7	13.7	13.7	13.7	13.7	13.7	11.5	11.5		15.4	15.4	
Effective Green, g (s)	13.7	13.7	13.7	13.7	13.7	13.7	11.5	11.5		15.4	15.4	
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.32	0.27	0.27		0.36	0.36	
Clearance Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0		2.5	4.0	
Lane Grp Cap (vph)	325	604	484	295	604	474	332	440		336	635	
v/s Ratio Prot		c0.19			0.17			0.05		0.00	c0.04	
v/s Ratio Perm	0.03		0.02	0.11		0.00	c0.07			0.02		
v/c Ratio	0.09	0.60	0.07	0.33	0.51	0.00	0.26	0.20		0.07	0.11	
Uniform Delay, d1	10.1	12.2	10.0	11.0	11.7	9.8	12.2	12.0		8.9	9.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.7	0.1	0.7	0.7	0.0	0.6	0.3		0.1	0.1	
Delay (s)	10.2	13.9	10.1	11.6	12.5	9.8	12.8	12.3		9.0	9.1	
Level of Service	B	B	B	B	B	A	B	B		A	A	
Approach Delay (s/veh)		12.9			12.2			12.4			9.1	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	42.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	0	0	4	0	1	0	277	5	1	183	21
Future Vol, veh/h	13	0	0	4	0	1	0	277	5	1	183	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	15	0	0	5	0	1	0	322	6	1	213	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	553	557	225	554	566	327	237	0	0	330	0	0
Stage 1	227	227	-	327	327	-	-	-	-	-	-	-
Stage 2	326	330	-	227	239	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	447	442	819	446	436	719	1342	-	-	1241	-	-
Stage 1	780	720	-	690	651	-	-	-	-	-	-	-
Stage 2	691	649	-	780	711	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	446	441	819	445	435	718	1342	-	-	1239	-	-
Mov Cap-2 Maneuver	446	441	-	445	435	-	-	-	-	-	-	-
Stage 1	780	719	-	689	650	-	-	-	-	-	-	-
Stage 2	690	648	-	779	710	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	13.4	12.6	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1342	-	-	446	482	1239	-	-
HCM Lane V/C Ratio	-	-	-	0.034	0.012	0.001	-	-
HCM Ctrl Dly (s/v)	0	-	-	13.4	12.6	7.9	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q (veh)	0	-	-	0.1	0	0	-	-

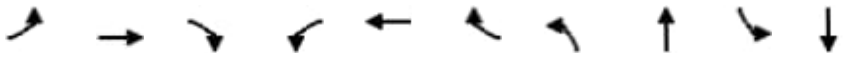
Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	0	1	26	0	61	3	200	10	31	136	20
Future Vol, veh/h	12	0	1	26	0	61	3	200	10	31	136	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	13	0	1	29	0	67	3	220	11	34	149	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	493	467	160	463	473	228	171	0	0	233	0	0
Stage 1	228	228	-	234	234	-	-	-	-	-	-	-
Stage 2	265	239	-	229	239	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	490	496	890	513	493	816	1418	-	-	1346	-	-
Stage 1	779	719	-	774	715	-	-	-	-	-	-	-
Stage 2	745	711	-	778	711	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	440	480	890	500	477	815	1418	-	-	1344	-	-
Mov Cap-2 Maneuver	440	480	-	500	477	-	-	-	-	-	-	-
Stage 1	777	699	-	771	712	-	-	-	-	-	-	-
Stage 2	682	708	-	755	691	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	13.1	11.1	0.1	1.3
HCM LOS	B	B		

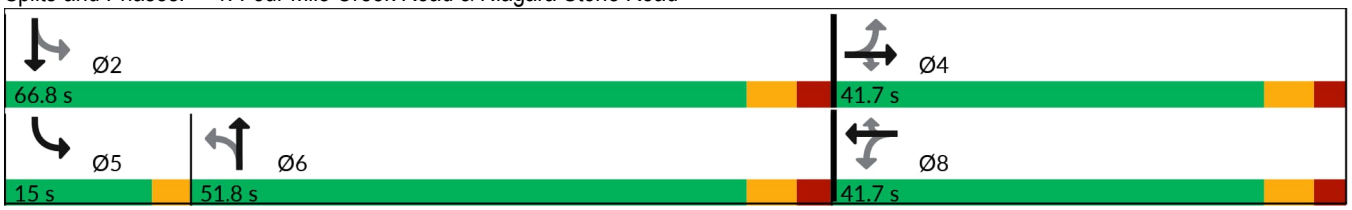
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1418	-	-	458	686	1344	-	-
HCM Lane V/C Ratio	0.002	-	-	0.031	0.139	0.025	-	-
HCM Ctrl Dly (s/v)	7.5	0	-	13.1	11.1	7.7	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q (veh)	0	-	-	0.1	0.5	0.1	-	-

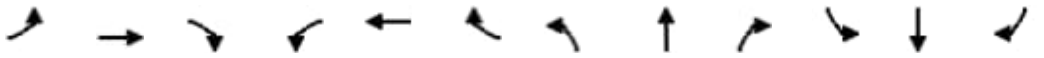


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	30	382	116	139	577	17	131	98	32	63
Future Volume (vph)	30	382	116	139	577	17	131	98	32	63
Lane Group Flow (vph)	32	411	125	149	620	18	141	267	34	113
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		4			8			6	5	2
Permitted Phases	4		4	8		8	6		2	
Detector Phase	4	4	4	8	8	8	6	6	5	2
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0	6.0	10.0
Minimum Split (s)	24.7	24.7	24.7	25.7	25.7	25.7	26.8	26.8	10.5	26.8
Total Split (s)	41.7	41.7	41.7	41.7	41.7	41.7	51.8	51.8	15.0	66.8
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	38.4%	47.7%	47.7%	13.8%	61.6%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	3.0	4.1
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	0.0	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	3.0	6.8
Lead/Lag							Lag	Lag	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Min	None	Min
Act Effct Green (s)	33.6	33.6	33.6	33.6	33.6	33.6	14.6	14.6	22.0	18.1
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51	0.51	0.22	0.22	0.34	0.28
v/c Ratio	0.12	0.43	0.15	0.35	0.64	0.02	0.52	0.60	0.10	0.22
Control Delay (s/veh)	13.3	13.8	3.4	15.3	17.9	0.1	31.5	22.0	14.4	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	13.3	13.8	3.4	15.3	17.9	0.1	31.5	22.0	14.4	12.1
LOS	B	B	A	B	B	A	C	C	B	B
Approach Delay (s/veh)		11.5			17.0			25.3		12.6
Approach LOS		B			B			C		B
Queue Length 50th (m)	1.7	25.6	0.0	8.8	45.1	0.0	14.9	18.8	3.0	6.6
Queue Length 95th (m)	9.1	73.3	9.3	32.9	125.9	0.0	36.4	47.4	8.0	16.8
Internal Link Dist (m)		277.9			212.2			272.8		146.6
Turn Bay Length (m)	60.0			70.0			40.0		25.0	
Base Capacity (vph)	281	1029	863	457	1029	837	852	1229	424	1578
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.40	0.14	0.33	0.60	0.02	0.17	0.22	0.08	0.07

Intersection Summary			
Cycle Length: 108.5			
Actuated Cycle Length: 65.6			
Natural Cycle: 70			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay (s/veh): 16.8		Intersection LOS: B	
Intersection Capacity Utilization 76.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Four Mile Creek Road & Niagara Stone Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	382	116	139	577	17	131	98	151	32	63	42
Future Volume (vph)	30	382	116	139	577	17	131	98	151	32	63	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1684	1879	1474	1683	1879	1474	1682	1708		1685	1751	
Flt Permitted	0.29	1.00	1.00	0.47	1.00	1.00	0.68	1.00		0.41	1.00	
Satd. Flow (perm)	513	1879	1474	834	1879	1474	1212	1708		733	1751	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	32	411	125	149	620	18	141	105	162	34	68	45
RTOR Reduction (vph)	0	0	63	0	0	9	0	68	0	0	32	0
Lane Group Flow (vph)	32	411	63	149	620	9	141	199	0	34	81	0
Confl. Peds. (#/hr)	1		1	1		1	1					1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		4			8			6		5	2	
Permitted Phases	4		4	8		8	6			2		
Actuated Green, G (s)	33.6	33.6	33.6	33.6	33.6	33.6	14.6	14.6		20.1	20.1	
Effective Green, g (s)	33.6	33.6	33.6	33.6	33.6	33.6	14.6	14.6		20.1	20.1	
Actuated g/C Ratio	0.50	0.50	0.50	0.50	0.50	0.50	0.22	0.22		0.30	0.30	
Clearance Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0		2.5	4.0	
Lane Grp Cap (vph)	256	939	737	417	939	737	263	371		254	523	
v/s Ratio Prot		0.22			c0.33			c0.12		0.00	c0.05	
v/s Ratio Perm	0.06		0.04	0.18		0.01	0.12			0.03		
v/c Ratio	0.13	0.44	0.08	0.36	0.66	0.01	0.54	0.54		0.13	0.16	
Uniform Delay, d1	9.0	10.8	8.8	10.2	12.5	8.5	23.3	23.3		17.1	17.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.3	0.0	0.5	1.8	0.0	2.7	1.9		0.2	0.2	
Delay (s)	9.2	11.1	8.8	10.8	14.3	8.5	26.0	25.2		17.2	17.5	
Level of Service	A	B	A	B	B	A	C	C		B	B	
Approach Delay (s/veh)		10.5			13.5			25.5			17.4	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	67.2	Sum of lost time (s)	16.5
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	0	6	15	0	36	6	228	13	14	290	26
Future Vol, veh/h	29	0	6	15	0	36	6	228	13	14	290	26
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	36	0	8	19	0	45	8	285	16	18	363	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	748	738	381	735	746	298	396	0	0	306	0	0
Stage 1	416	416	-	314	314	-	-	-	-	-	-	-
Stage 2	332	322	-	421	432	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	331	348	671	338	344	746	1174	-	-	1266	-	-
Stage 1	618	595	-	701	660	-	-	-	-	-	-	-
Stage 2	686	655	-	614	586	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	305	338	670	326	334	743	1174	-	-	1261	-	-
Mov Cap-2 Maneuver	305	338	-	326	334	-	-	-	-	-	-	-
Stage 1	613	584	-	693	652	-	-	-	-	-	-	-
Stage 2	639	647	-	596	575	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	17.3	12.6	0.2	0.3
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1174	-	-	336	540	1261	-	-
HCM Lane V/C Ratio	0.006	-	-	0.13	0.118	0.014	-	-
HCM Ctrl Dly (s/v)	8.1	0	-	17.3	12.6	7.9	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q (veh)	0	-	-	0.4	0.4	0	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	0	8	15	0	46	7	183	22	61	228	23
Future Vol, veh/h	26	0	8	15	0	46	7	183	22	61	228	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	30	0	9	17	0	53	8	210	25	70	262	26

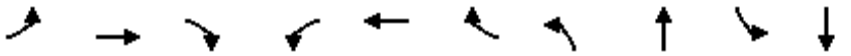
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	680	667	275	660	668	224	288	0	0	236	0	0
Stage 1	415	415	-	240	240	-	-	-	-	-	-	-
Stage 2	265	252	-	420	428	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	368	382	769	379	382	820	1286	-	-	1343	-	-
Stage 1	619	596	-	768	711	-	-	-	-	-	-	-
Stage 2	745	702	-	615	588	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	326	356	769	355	356	819	1286	-	-	1342	-	-
Mov Cap-2 Maneuver	326	356	-	355	356	-	-	-	-	-	-	-
Stage 1	615	559	-	762	705	-	-	-	-	-	-	-
Stage 2	692	696	-	570	552	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	15.7	11.5	0.3	1.5
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1286	-	-	377	620	1342	-	-
HCM Lane V/C Ratio	0.006	-	-	0.104	0.113	0.052	-	-
HCM Ctrl Dly (s/v)	7.8	0	-	15.7	11.5	7.8	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q (veh)	0	-	-	0.3	0.4	0.2	-	-

APPENDIX D

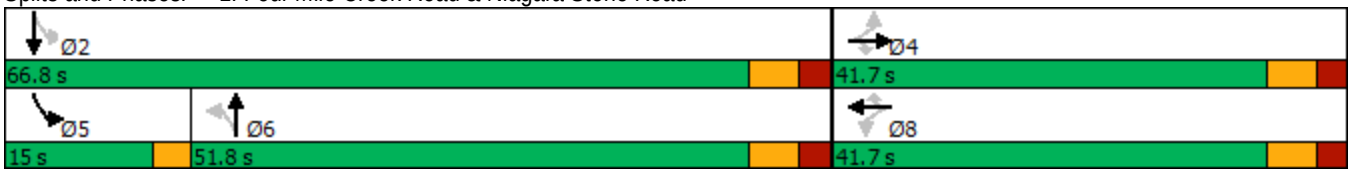
Intersection Capacity Analysis – 2031 Synchro Results

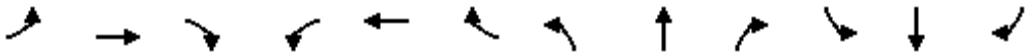


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	28	379	56	88	322	6	59	47	21	56
Future Volume (vph)	28	379	56	88	322	6	59	47	21	56
Lane Group Flow (vph)	30	403	60	94	343	6	63	210	22	101
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		4			8			6	5	2
Permitted Phases	4		4	8		8	6		2	
Detector Phase	4	4	4	8	8	8	6	6	5	2
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0	6.0	10.0
Minimum Split (s)	24.7	24.7	24.7	25.7	25.7	25.7	26.8	26.8	10.5	26.8
Total Split (s)	41.7	41.7	41.7	41.7	41.7	41.7	51.8	51.8	15.0	66.8
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	38.4%	47.7%	47.7%	13.8%	61.6%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	3.0	4.1
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	0.0	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	3.0	6.8
Lead/Lag							Lag	Lag	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Min	None	Min
Act Effct Green (s)	15.1	15.1	15.1	15.1	15.1	15.1	11.3	11.3	16.7	12.7
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.36	0.27	0.27	0.40	0.30
v/c Ratio	0.09	0.62	0.11	0.33	0.52	0.01	0.21	0.39	0.05	0.19
Control Delay	10.6	16.4	3.6	14.3	14.4	0.0	17.2	8.3	9.5	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	16.4	3.6	14.3	14.4	0.0	17.2	8.3	9.5	9.0
LOS	B	B	A	B	B	A	B	A	A	A
Approach Delay		14.5			14.2			10.3		9.1
Approach LOS		B			B			B		A
Queue Length 50th (m)	1.2	20.2	0.0	4.2	16.4	0.0	3.1	2.4	0.8	2.8
Queue Length 95th (m)	6.9	62.0	5.5	18.2	51.2	0.0	15.8	20.7	4.8	12.9
Internal Link Dist (m)		277.9			212.2			272.8		146.6
Turn Bay Length (m)	60.0			70.0			40.0		25.0	
Base Capacity (vph)	777	1566	1265	686	1581	1282	1072	1468	528	1625
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.26	0.05	0.14	0.22	0.00	0.06	0.14	0.04	0.06

Intersection Summary			
Cycle Length: 108.5			
Actuated Cycle Length: 42			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 13.0		Intersection LOS: B	
Intersection Capacity Utilization 60.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Four Mile Creek Road & Niagara Stone Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	379	56	88	322	6	59	47	150	21	56	39
Future Volume (vph)	28	379	56	88	322	6	59	47	150	21	56	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1543	1807	1449	1604	1824	1474	1560	1549		1503	1639	
Flt Permitted	0.55	1.00	1.00	0.47	1.00	1.00	0.69	1.00		0.50	1.00	
Satd. Flow (perm)	896	1807	1449	792	1824	1474	1136	1549		783	1639	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	30	403	60	94	343	6	63	50	160	22	60	41
RTOR Reduction (vph)	0	0	39	0	0	4	0	119	0	0	27	0
Lane Group Flow (vph)	30	403	21	94	343	2	63	91	0	22	74	0
Confl. Peds. (#/hr)	2					2			2	2		
Heavy Vehicles (%)	9%	4%	4%	5%	3%	0%	8%	14%	3%	12%	2%	16%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		4			8			6		5	2	
Permitted Phases	4		4	8		8	6			2		
Actuated Green, G (s)	15.1	15.1	15.1	15.1	15.1	15.1	11.3	11.3		15.3	15.3	
Effective Green, g (s)	15.1	15.1	15.1	15.1	15.1	15.1	11.3	11.3		15.3	15.3	
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34	0.34	0.26	0.26		0.35	0.35	
Clearance Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0		2.5	4.0	
Lane Grp Cap (vph)	308	621	498	272	627	507	292	398		289	571	
v/s Ratio Prot		c0.22			0.19			c0.06		0.00	c0.05	
v/s Ratio Perm	0.03		0.01	0.12		0.00	0.06			0.02		
v/c Ratio	0.10	0.65	0.04	0.35	0.55	0.00	0.22	0.23		0.08	0.13	
Uniform Delay, d1	9.8	12.2	9.6	10.7	11.6	9.5	12.8	12.9		9.6	9.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	2.3	0.0	0.8	1.0	0.0	0.5	0.4		0.1	0.1	
Delay (s)	9.9	14.5	9.6	11.5	12.6	9.5	13.3	13.3		9.6	9.9	
Level of Service	A	B	A	B	B	A	B	B		A	A	
Approach Delay (s)		13.6			12.3			13.3			9.9	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	12.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	43.9	Sum of lost time (s)	16.5
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	0	4	0	1	0	295	5	1	180	0
Future Vol, veh/h	0	0	0	4	0	1	0	295	5	1	180	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	50	0	0	0	6	25	0	6	0
Mvmt Flow	0	0	0	5	0	1	0	343	6	1	209	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	558	562	209	559	559	348	209	0	0	351	0	0
Stage 1	211	211	-	348	348	-	-	-	-	-	-	-
Stage 2	347	351	-	211	211	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.6	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.6	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.6	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.95	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	443	439	836	375	440	700	1374	-	-	1219	-	-
Stage 1	796	731	-	579	638	-	-	-	-	-	-	-
Stage 2	673	636	-	693	731	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	442	438	836	374	439	699	1374	-	-	1217	-	-
Mov Cap-2 Maneuver	442	438	-	374	439	-	-	-	-	-	-	-
Stage 1	796	730	-	578	637	-	-	-	-	-	-	-
Stage 2	672	635	-	692	730	-	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1374	-	-	-	412	1217	-	-
HCM Lane V/C Ratio	-	-	-	-	0.014	0.001	-	-
HCM Control Delay (s)	0	-	-	0	13.9	8	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0	0	-	-

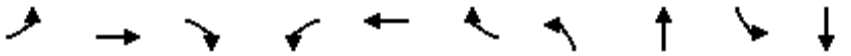
Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	0	0	26	1	61	1	222	10	31	150	0
Future Vol, veh/h	1	0	0	26	1	61	1	222	10	31	150	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	3	0	5	0	4	6	0
Mvmt Flow	1	0	0	29	1	67	1	244	11	34	165	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	519	492	165	487	487	252	165	0	0	257	0	0
Stage 1	233	233	-	254	254	-	-	-	-	-	-	-
Stage 2	286	259	-	233	233	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.23	4.1	-	-	4.14	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.327	2.2	-	-	2.236	-	-
Pot Cap-1 Maneuver	471	481	885	494	484	784	1426	-	-	1296	-	-
Stage 1	775	716	-	755	701	-	-	-	-	-	-	-
Stage 2	726	697	-	775	716	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	420	466	885	482	469	783	1426	-	-	1294	-	-
Mov Cap-2 Maneuver	420	466	-	482	469	-	-	-	-	-	-	-
Stage 1	774	695	-	753	699	-	-	-	-	-	-	-
Stage 2	662	695	-	753	695	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.6	11.4	0	1.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1426	-	-	420	657	1294	-	-
HCM Lane V/C Ratio	0.001	-	-	0.003	0.147	0.026	-	-
HCM Control Delay (s)	7.5	0	-	13.6	11.4	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.5	0.1	-	-

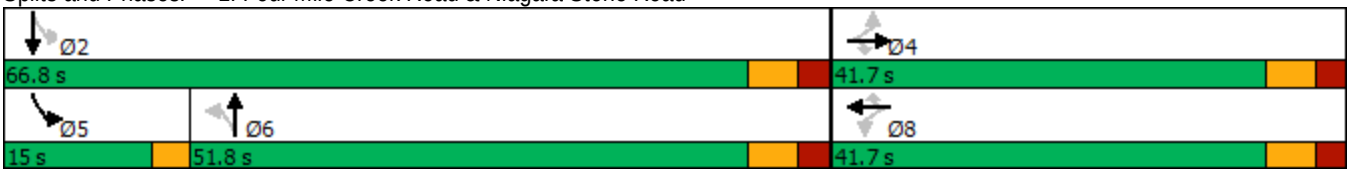


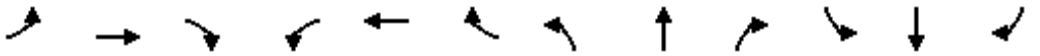
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	30	421	82	136	637	17	89	108	32	70
Future Volume (vph)	30	421	82	136	637	17	89	108	32	70
Lane Group Flow (vph)	32	453	88	146	685	18	96	275	34	120
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		4			8			6	5	2
Permitted Phases	4		4	8		8	6		2	
Detector Phase	4	4	4	8	8	8	6	6	5	2
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0	6.0	10.0
Minimum Split (s)	24.7	24.7	24.7	25.7	25.7	25.7	26.8	26.8	10.5	26.8
Total Split (s)	41.7	41.7	41.7	41.7	41.7	41.7	51.8	51.8	15.0	66.8
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	38.4%	47.7%	47.7%	13.8%	61.6%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	3.0	4.1
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	0.0	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	3.0	6.8
Lead/Lag							Lag	Lag	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Min	None	Min
Act Effct Green (s)	35.7	35.7	35.7	35.7	35.7	35.7	15.1	15.1	22.6	18.8
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.52	0.52	0.22	0.22	0.33	0.28
v/c Ratio	0.14	0.46	0.11	0.36	0.71	0.02	0.36	0.64	0.10	0.24
Control Delay	14.5	14.5	3.9	16.2	20.8	0.1	27.5	24.8	14.5	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	14.5	3.9	16.2	20.8	0.1	27.5	24.8	14.5	12.6
LOS	B	B	A	B	C	A	C	C	B	B
Approach Delay		12.9			19.6			25.5		13.0
Approach LOS		B			B			C		B
Queue Length 50th (m)	1.7	29.9	0.0	9.0	54.6	0.0	9.9	21.1	3.0	7.4
Queue Length 95th (m)	9.7	84.8	8.2	34.0	#168.4	0.0	25.6	51.2	7.9	17.8
Internal Link Dist (m)		277.9			212.2			272.8		146.6
Turn Bay Length (m)	60.0			70.0			40.0		25.0	
Base Capacity (vph)	224	982	768	402	963	802	801	1141	408	1534
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.46	0.11	0.36	0.71	0.02	0.12	0.24	0.08	0.08

Intersection Summary		
Cycle Length: 108.5		
Actuated Cycle Length: 68.2		
Natural Cycle: 75		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.71		
Intersection Signal Delay: 18.2	Intersection LOS: B	
Intersection Capacity Utilization 80.1%	ICU Level of Service D	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		

Queue shown is maximum after two cycles.

Splits and Phases: 1: Four Mile Creek Road & Niagara Stone Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	421	82	136	637	17	89	108	148	32	70	42
Future Volume (vph)	30	421	82	136	637	17	89	108	148	32	70	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1684	1879	1391	1683	1842	1474	1666	1660		1685	1716	
Flt Permitted	0.24	1.00	1.00	0.43	1.00	1.00	0.68	1.00		0.39	1.00	
Satd. Flow (perm)	429	1879	1391	769	1842	1474	1192	1660		696	1716	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	32	453	88	146	685	18	96	116	159	34	75	45
RTOR Reduction (vph)	0	0	43	0	0	9	0	61	0	0	32	0
Lane Group Flow (vph)	32	453	45	146	685	9	96	214	0	34	88	0
Confl. Peds. (#/hr)	1		1	1		1	1					1
Heavy Vehicles (%)	0%	0%	6%	0%	2%	0%	1%	8%	0%	0%	4%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		4			8			6		5	2	
Permitted Phases	4		4	8		8	6			2		
Actuated Green, G (s)	35.6	35.6	35.6	35.6	35.6	35.6	15.1	15.1		20.7	20.7	
Effective Green, g (s)	35.6	35.6	35.6	35.6	35.6	35.6	15.1	15.1		20.7	20.7	
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51	0.51	0.22	0.22		0.30	0.30	
Clearance Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0		2.5	4.0	
Lane Grp Cap (vph)	218	958	709	392	939	751	257	359		243	508	
v/s Ratio Prot		0.24			c0.37			c0.13		0.01	c0.05	
v/s Ratio Perm	0.07		0.03	0.19		0.01	0.08			0.04		
v/c Ratio	0.15	0.47	0.06	0.37	0.73	0.01	0.37	0.60		0.14	0.17	
Uniform Delay, d1	9.1	11.0	8.7	10.3	13.3	8.4	23.3	24.6		17.9	18.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.4	0.0	0.6	2.9	0.0	1.2	3.1		0.2	0.2	
Delay (s)	9.4	11.4	8.7	10.9	16.2	8.4	24.6	27.7		18.1	18.4	
Level of Service	A	B	A	B	B	A	C	C		B	B	
Approach Delay (s)		10.9			15.1			26.9			18.4	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	69.8	Sum of lost time (s)	16.5
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	0	0	15	0	36	0	236	13	14	308	0
Future Vol, veh/h	0	0	0	15	0	36	0	236	13	14	308	0
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0	0	3	9	0	2	0
Mvmt Flow	0	0	0	19	0	45	0	295	16	18	385	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	747	737	386	730	729	308	385	0	0	316	0	0
Stage 1	421	421	-	308	308	-	-	-	-	-	-	-
Stage 2	326	316	-	422	421	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	332	348	666	340	352	737	1185	-	-	1256	-	-
Stage 1	614	592	-	706	664	-	-	-	-	-	-	-
Stage 2	691	659	-	613	592	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	307	340	665	334	344	734	1185	-	-	1251	-	-
Mov Cap-2 Maneuver	307	340	-	334	344	-	-	-	-	-	-	-
Stage 1	614	581	-	703	661	-	-	-	-	-	-	-
Stage 2	649	656	-	601	581	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	12.5	0	0.3
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1185	-	-	-	543	1251	-	-
HCM Lane V/C Ratio	-	-	-	-	0.117	0.014	-	-
HCM Control Delay (s)	0	-	-	0	12.5	7.9	0	-
HCM Lane LOS	A	-	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0	-	-

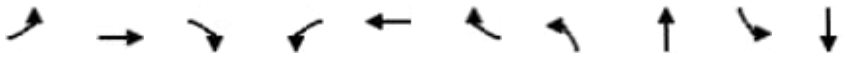
Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	0	0	15	1	46	0	208	22	61	257	0
Future Vol, veh/h	2	0	0	15	1	46	0	208	22	61	257	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0	0	3	0	0	3	0
Mvmt Flow	2	0	0	17	1	53	0	239	25	70	295	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	714	700	295	688	688	253	295	0	0	265	0	0
Stage 1	435	435	-	253	253	-	-	-	-	-	-	-
Stage 2	279	265	-	435	435	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	349	366	749	363	372	791	1278	-	-	1311	-	-
Stage 1	604	584	-	756	701	-	-	-	-	-	-	-
Stage 2	732	693	-	604	584	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	309	342	749	345	348	790	1278	-	-	1310	-	-
Mov Cap-2 Maneuver	309	342	-	345	348	-	-	-	-	-	-	-
Stage 1	604	547	-	755	700	-	-	-	-	-	-	-
Stage 2	682	692	-	565	547	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	11.9	0	1.5
HCM LOS	C	B		

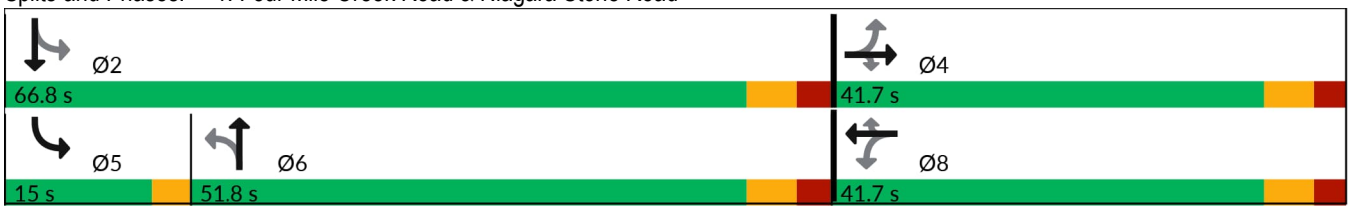
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1278	-	-	309	593	1310	-	-
HCM Lane V/C Ratio	-	-	-	0.007	0.12	0.054	-	-
HCM Control Delay (s)	0	-	-	16.7	11.9	7.9	0	-
HCM Lane LOS	A	-	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.4	0.2	-	-

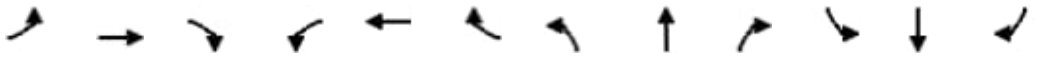


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	28	379	94	91	322	6	81	46	21	57
Future Volume (vph)	28	379	94	91	322	6	81	46	21	57
Lane Group Flow (vph)	30	403	100	97	343	6	86	211	22	102
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		4			8			6	5	2
Permitted Phases	4		4	8		8	6		2	
Detector Phase	4	4	4	8	8	8	6	6	5	2
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0	6.0	10.0
Minimum Split (s)	24.7	24.7	24.7	25.7	25.7	25.7	26.8	26.8	10.5	26.8
Total Split (s)	41.7	41.7	41.7	41.7	41.7	41.7	51.8	51.8	15.0	66.8
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	38.4%	47.7%	47.7%	13.8%	61.6%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	3.0	4.1
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	0.0	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	3.0	6.8
Lead/Lag							Lag	Lag	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Min	None	Min
Act Effct Green (s)	15.0	15.0	15.0	15.0	15.0	15.0	11.7	11.7	17.0	13.0
Actuated g/C Ratio	0.35	0.35	0.35	0.35	0.35	0.35	0.28	0.28	0.40	0.31
v/c Ratio	0.09	0.61	0.17	0.33	0.52	0.01	0.25	0.37	0.05	0.18
Control Delay (s/veh)	10.8	16.0	3.8	14.4	14.3	0.0	17.4	7.8	9.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	10.8	16.0	3.8	14.4	14.3	0.0	17.4	7.8	9.4	8.8
LOS	B	B	A	B	B	A	B	A	A	A
Approach Delay (s/veh)		13.4			14.2			10.5		8.9
Approach LOS		B			B			B		A
Queue Length 50th (m)	1.2	20.0	0.0	4.3	16.4	0.0	4.2	2.3	0.8	2.9
Queue Length 95th (m)	7.0	61.7	7.8	18.8	51.5	0.0	20.2	20.4	4.8	13.1
Internal Link Dist (m)		277.9			212.2			272.8		146.6
Turn Bay Length (m)	60.0			70.0			40.0		25.0	
Base Capacity (vph)	837	1620	1313	712	1620	1275	1152	1543	596	1745
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.25	0.08	0.14	0.21	0.00	0.07	0.14	0.04	0.06

Intersection Summary			
Cycle Length: 108.5			
Actuated Cycle Length: 42.3			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay (s/veh): 12.6		Intersection LOS: B	
Intersection Capacity Utilization 60.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Four Mile Creek Road & Niagara Stone Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	379	94	91	322	6	81	46	152	21	57	39
Future Volume (vph)	28	379	94	91	322	6	81	46	152	21	57	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.98	1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1682	1879	1507	1685	1879	1474	1685	1634		1683	1766	
Flt Permitted	0.55	1.00	1.00	0.47	1.00	1.00	0.69	1.00		0.50	1.00	
Satd. Flow (perm)	972	1879	1507	826	1879	1474	1226	1634		883	1766	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	30	403	100	97	343	6	86	49	162	22	61	41
RTOR Reduction (vph)	0	0	66	0	0	4	0	119	0	0	26	0
Lane Group Flow (vph)	30	403	34	97	343	2	86	92	0	22	76	0
Confl. Peds. (#/hr)	2					2			2	2		
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		4			8			6		5	2	
Permitted Phases	4		4	8		8	6			2		
Actuated Green, G (s)	15.0	15.0	15.0	15.0	15.0	15.0	11.7	11.7		15.6	15.6	
Effective Green, g (s)	15.0	15.0	15.0	15.0	15.0	15.0	11.7	11.7		15.6	15.6	
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34	0.34	0.27	0.27		0.35	0.35	
Clearance Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0		2.5	4.0	
Lane Grp Cap (vph)	330	639	512	280	639	501	325	433		328	624	
v/s Ratio Prot		c0.21			0.18			0.06		0.00	c0.04	
v/s Ratio Perm	0.03		0.02	0.12		0.00	c0.07			0.02		
v/c Ratio	0.09	0.63	0.07	0.35	0.54	0.00	0.26	0.21		0.07	0.12	
Uniform Delay, d1	9.9	12.2	9.8	10.9	11.7	9.6	12.8	12.6		9.4	9.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	2.0	0.1	0.7	0.9	0.0	0.6	0.3		0.1	0.1	
Delay (s)	10.0	14.3	9.9	11.6	12.6	9.6	13.4	12.9		9.5	9.7	
Level of Service	B	B	A	B	B	A	B	B		A	A	
Approach Delay (s/veh)		13.2			12.4			13.1			9.7	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	44.1	Sum of lost time (s)	16.5
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	0	0	4	0	1	0	305	5	1	200	21
Future Vol, veh/h	13	0	0	4	0	1	0	305	5	1	200	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	15	0	0	5	0	1	0	355	6	1	233	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	606	610	245	607	619	360	257	0	0	363	0	0
Stage 1	247	247	-	360	360	-	-	-	-	-	-	-
Stage 2	359	363	-	247	259	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	412	412	799	411	407	689	1320	-	-	1207	-	-
Stage 1	761	706	-	662	630	-	-	-	-	-	-	-
Stage 2	663	628	-	761	697	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	411	411	799	410	406	688	1320	-	-	1205	-	-
Mov Cap-2 Maneuver	411	411	-	410	406	-	-	-	-	-	-	-
Stage 1	761	705	-	661	629	-	-	-	-	-	-	-
Stage 2	662	627	-	760	696	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	14.1	13.2	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1320	-	-	411	446	1205	-	-
HCM Lane V/C Ratio	-	-	-	0.037	0.013	0.001	-	-
HCM Ctrl Dly (s/v)	0	-	-	14.1	13.2	8	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q (veh)	0	-	-	0.1	0	0	-	-

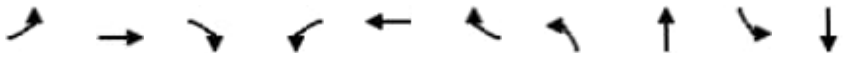
Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	0	1	26	0	61	3	221	10	31	150	20
Future Vol, veh/h	12	0	1	26	0	61	3	221	10	31	150	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	13	0	1	29	0	67	3	243	11	34	165	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	532	506	176	502	512	251	187	0	0	256	0	0
Stage 1	244	244	-	257	257	-	-	-	-	-	-	-
Stage 2	288	262	-	245	255	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	461	472	872	483	468	793	1399	-	-	1321	-	-
Stage 1	764	708	-	752	699	-	-	-	-	-	-	-
Stage 2	724	695	-	763	700	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	412	456	872	470	452	792	1399	-	-	1319	-	-
Mov Cap-2 Maneuver	412	456	-	470	452	-	-	-	-	-	-	-
Stage 1	762	687	-	748	696	-	-	-	-	-	-	-
Stage 2	661	692	-	740	680	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	13.7	11.4	0.1	1.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1399	-	-	429	657	1319	-	-
HCM Lane V/C Ratio	0.002	-	-	0.033	0.146	0.026	-	-
HCM Ctrl Dly (s/v)	7.6	0	-	13.7	11.4	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q (veh)	0	-	-	0.1	0.5	0.1	-	-

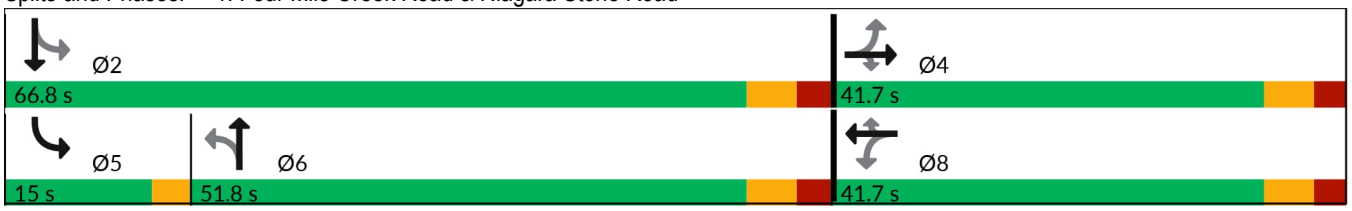


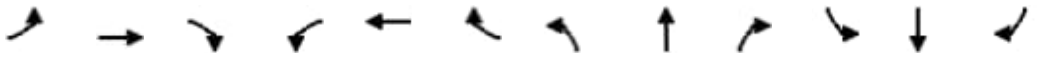
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	30	421	116	139	637	17	131	108	32	70
Future Volume (vph)	30	421	116	139	637	17	131	108	32	70
Lane Group Flow (vph)	32	453	125	149	685	18	141	278	34	120
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	pm+pt	NA
Protected Phases		4			8			6	5	2
Permitted Phases	4		4	8		8	6		2	
Detector Phase	4	4	4	8	8	8	6	6	5	2
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	8.0	10.0	10.0	6.0	10.0
Minimum Split (s)	24.7	24.7	24.7	25.7	25.7	25.7	26.8	26.8	10.5	26.8
Total Split (s)	41.7	41.7	41.7	41.7	41.7	41.7	51.8	51.8	15.0	66.8
Total Split (%)	38.4%	38.4%	38.4%	38.4%	38.4%	38.4%	47.7%	47.7%	13.8%	61.6%
Yellow Time (s)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	3.0	4.1
All-Red Time (s)	2.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	0.0	2.7
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8	3.0	6.8
Lead/Lag							Lag	Lag	Lead	
Lead-Lag Optimize?							Yes	Yes	Yes	
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Min	None	Min
Act Effct Green (s)	35.6	35.6	35.6	35.6	35.6	35.6	14.9	14.9	22.4	18.5
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.52	0.52	0.22	0.22	0.33	0.27
v/c Ratio	0.14	0.46	0.15	0.37	0.70	0.02	0.53	0.63	0.11	0.23
Control Delay (s/veh)	14.2	14.3	3.4	16.1	19.9	0.1	32.2	24.5	14.5	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	14.2	14.3	3.4	16.1	19.9	0.1	32.2	24.5	14.5	12.5
LOS	B	B	A	B	B	A	C	C	B	B
Approach Delay (s/veh)		12.1			18.8			27.1		13.0
Approach LOS		B			B			C		B
Queue Length 50th (m)	1.7	29.6	0.0	9.2	53.5	0.0	15.1	21.3	3.0	7.4
Queue Length 95th (m)	9.6	83.7	9.5	34.5	#163.7	0.0	36.3	51.2	8.0	17.8
Internal Link Dist (m)		277.9			212.2			272.8		146.6
Turn Bay Length (m)	60.0			70.0			40.0		25.0	
Base Capacity (vph)	225	985	832	404	985	804	811	1182	405	1577
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.46	0.15	0.37	0.70	0.02	0.17	0.24	0.08	0.08

Intersection Summary		
Cycle Length: 108.5		
Actuated Cycle Length: 67.9		
Natural Cycle: 75		
Control Type: Actuated-Uncoordinated		
Maximum v/c Ratio: 0.70		
Intersection Signal Delay (s/veh): 18.1	Intersection LOS: B	
Intersection Capacity Utilization 80.3%	ICU Level of Service D	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		

Queue shown is maximum after two cycles.

Splits and Phases: 1: Four Mile Creek Road & Niagara Stone Road





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	421	116	139	637	17	131	108	151	32	70	42
Future Volume (vph)	30	421	116	139	637	17	131	108	151	32	70	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0	3.0	3.5	3.0
Total Lost time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1684	1879	1474	1683	1879	1474	1682	1715		1685	1759	
Flt Permitted	0.24	1.00	1.00	0.43	1.00	1.00	0.68	1.00		0.39	1.00	
Satd. Flow (perm)	431	1879	1474	770	1879	1474	1204	1715		683	1759	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	32	453	125	149	685	18	141	116	162	34	75	45
RTOR Reduction (vph)	0	0	61	0	0	9	0	62	0	0	32	0
Lane Group Flow (vph)	32	453	64	149	685	9	141	216	0	34	88	0
Confl. Peds. (#/hr)	1		1	1		1	1					1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		pm+pt	NA	
Protected Phases		4			8			6		5	2	
Permitted Phases	4		4	8		8	6			2		
Actuated Green, G (s)	35.6	35.6	35.6	35.6	35.6	35.6	14.9	14.9		20.5	20.5	
Effective Green, g (s)	35.6	35.6	35.6	35.6	35.6	35.6	14.9	14.9		20.5	20.5	
Actuated g/C Ratio	0.51	0.51	0.51	0.51	0.51	0.51	0.21	0.21		0.29	0.29	
Clearance Time (s)	6.7	6.7	6.7	6.7	6.7	6.7	6.8	6.8		3.0	6.8	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	4.0	4.0		2.5	4.0	
Lane Grp Cap (vph)	220	961	753	393	961	753	257	367		238	518	
v/s Ratio Prot		0.24			c0.36			c0.13		0.01	c0.05	
v/s Ratio Perm	0.07		0.04	0.19		0.01	0.12			0.04		
v/c Ratio	0.15	0.47	0.08	0.38	0.71	0.01	0.55	0.59		0.14	0.17	
Uniform Delay, d1	9.0	10.9	8.7	10.3	13.1	8.4	24.4	24.6		18.0	18.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.4	0.0	0.6	2.5	0.0	3.0	2.8		0.2	0.2	
Delay (s)	9.3	11.3	8.7	10.9	15.6	8.4	27.3	27.4		18.2	18.4	
Level of Service	A	B	A	B	B	A	C	C		B	B	
Approach Delay (s/veh)		10.7			14.6			27.4			18.4	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	69.6	Sum of lost time (s)	16.5
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	0	6	15	0	36	6	250	13	14	319	26
Future Vol, veh/h	29	0	6	15	0	36	6	250	13	14	319	26
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	36	0	8	19	0	45	8	313	16	18	399	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	812	802	417	799	810	326	432	0	0	334	0	0
Stage 1	452	452	-	342	342	-	-	-	-	-	-	-
Stage 2	360	350	-	457	468	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	300	320	640	306	316	720	1138	-	-	1237	-	-
Stage 1	591	574	-	677	642	-	-	-	-	-	-	-
Stage 2	662	636	-	587	565	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	275	310	640	295	306	717	1138	-	-	1232	-	-
Mov Cap-2 Maneuver	275	310	-	295	306	-	-	-	-	-	-	-
Stage 1	586	563	-	668	634	-	-	-	-	-	-	-
Stage 2	615	628	-	569	554	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	18.8	13.2	0.2	0.3
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1138	-	-	305	505	1232	-	-
HCM Lane V/C Ratio	0.007	-	-	0.143	0.126	0.014	-	-
HCM Ctrl Dly (s/v)	8.2	0	-	18.8	13.2	8	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q (veh)	0	-	-	0.5	0.4	0	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	0	8	15	0	46	7	203	22	61	252	23
Future Vol, veh/h	26	0	8	15	0	46	7	203	22	61	252	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	30	0	9	17	0	53	8	233	25	70	290	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	731	718	303	711	719	247	316	0	0	259	0	0
Stage 1	443	443	-	263	263	-	-	-	-	-	-	-
Stage 2	288	275	-	448	456	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	340	357	741	351	357	797	1256	-	-	1317	-	-
Stage 1	598	579	-	747	694	-	-	-	-	-	-	-
Stage 2	724	686	-	594	572	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	300	331	741	327	331	796	1256	-	-	1316	-	-
Mov Cap-2 Maneuver	300	331	-	327	331	-	-	-	-	-	-	-
Stage 1	594	541	-	741	688	-	-	-	-	-	-	-
Stage 2	671	681	-	548	535	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Ctrl Dly, s/v	16.6	12	0.2	1.4
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1256	-	-	349	588	1316	-	-
HCM Lane V/C Ratio	0.006	-	-	0.112	0.119	0.053	-	-
HCM Ctrl Dly (s/v)	7.9	0	-	16.6	12	7.9	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q (veh)	0	-	-	0.4	0.4	0.2	-	-

APPENDIX E

Left Turn Lane Warrant Analysis

LEFT TURN WARRANT

INTERSECTION: Four Mile Creek Road & Line 2 Road/North Site Access

HORIZON / DESCRIPTION: Future Total (2031)

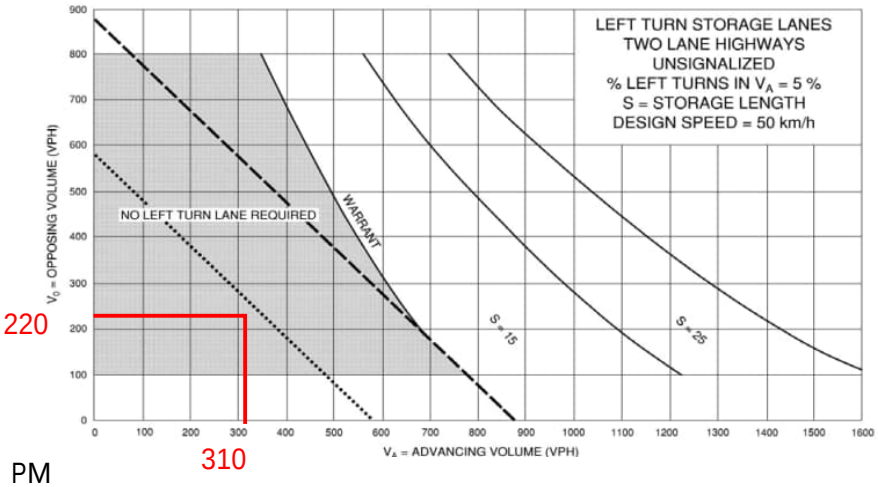
	Volumes	
	AM	PM
NBL	0	6
NBT	305	249
NBR	5	13
SBL	1	14
SBT	199	318
SBR	20	24
EBL	12	28
EBT	0	0
EBR	0	6
WBL	4	15
WBT	0	0
WBR	1	36

Major Direction: North-South

Turning Lane: Northbound

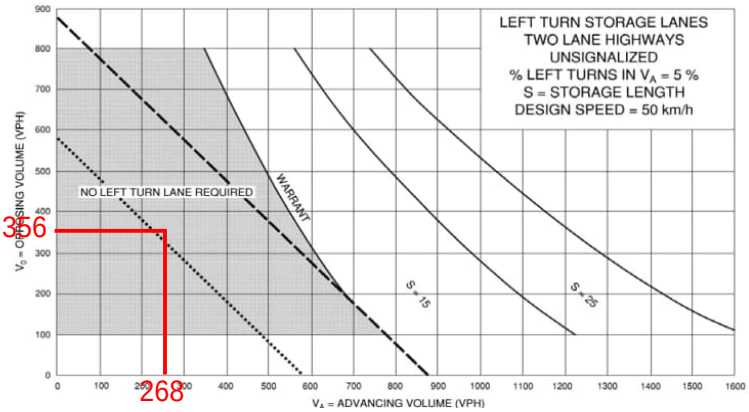
Criteria / Value	AM	PM
Design Speed (km/h)	50	
Advance Volume (vph) (VA)	310	268
Left Turning Volume (vph) (VL)	0	6
% of Left Turning Volume	0%	0
Opposing Volume (vph) (VO)	220	356
Warrant Met?	no	no
Storage Lane (m)	n/a	n/a

AM



PM

Insert figure from Appendix 9A.



LEFT TURN WARRANT

INTERSECTION: Four Mile Creek Road & Line 2 Road/South Site Access

HORIZON / DESCRIPTION: Future Total (2031)

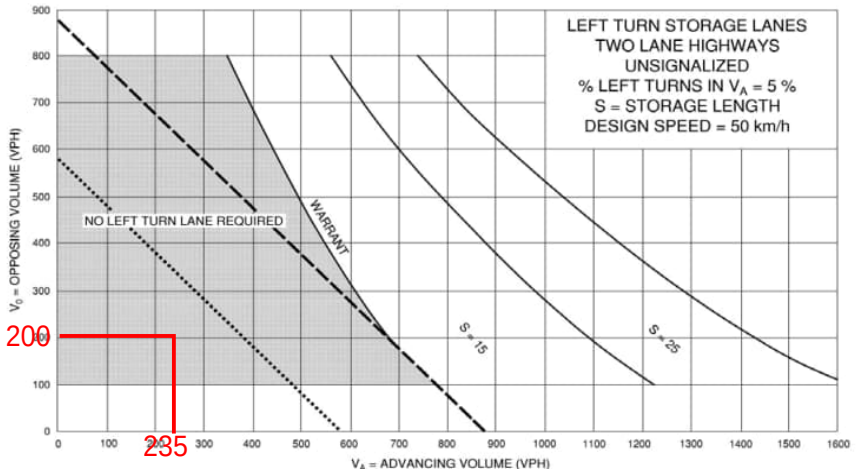
	Volumes	
	AM	PM
NBL	3	7
NBT	222	204
NBR	10	22
SBL	31	61
SBT	150	252
SBR	19	21
EBL	11	25
EBT	0	0
EBR	1	8
WBL	26	15
WBT	0	0
WBR	61	46

Major Direction: North-South

Turning Lane: Northbound

Criteria / Value	AM	PM
Design Speed (km/h)	50	
Advance Volume (vph) (VA)	235	233
Left Turning Volume (vph) (VL)	3	7
% of Left Turning Volume	1%	0
Opposing Volume (vph) (VO)	200	334
Warrant Met?	no	no
Storage Lane (m)	n/a	n/a

AM



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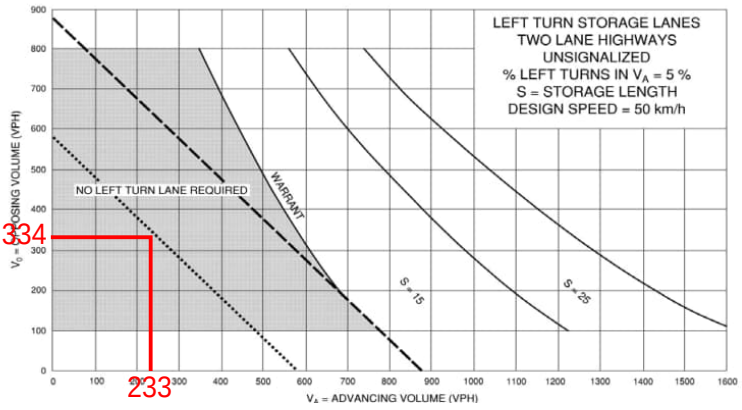


Methodology from Appendix 9A of *MTO Design Supplement For TAC Geometric Design Guide (GDG) for Canadian Roads*

APPENDIX F

Functional Design Review

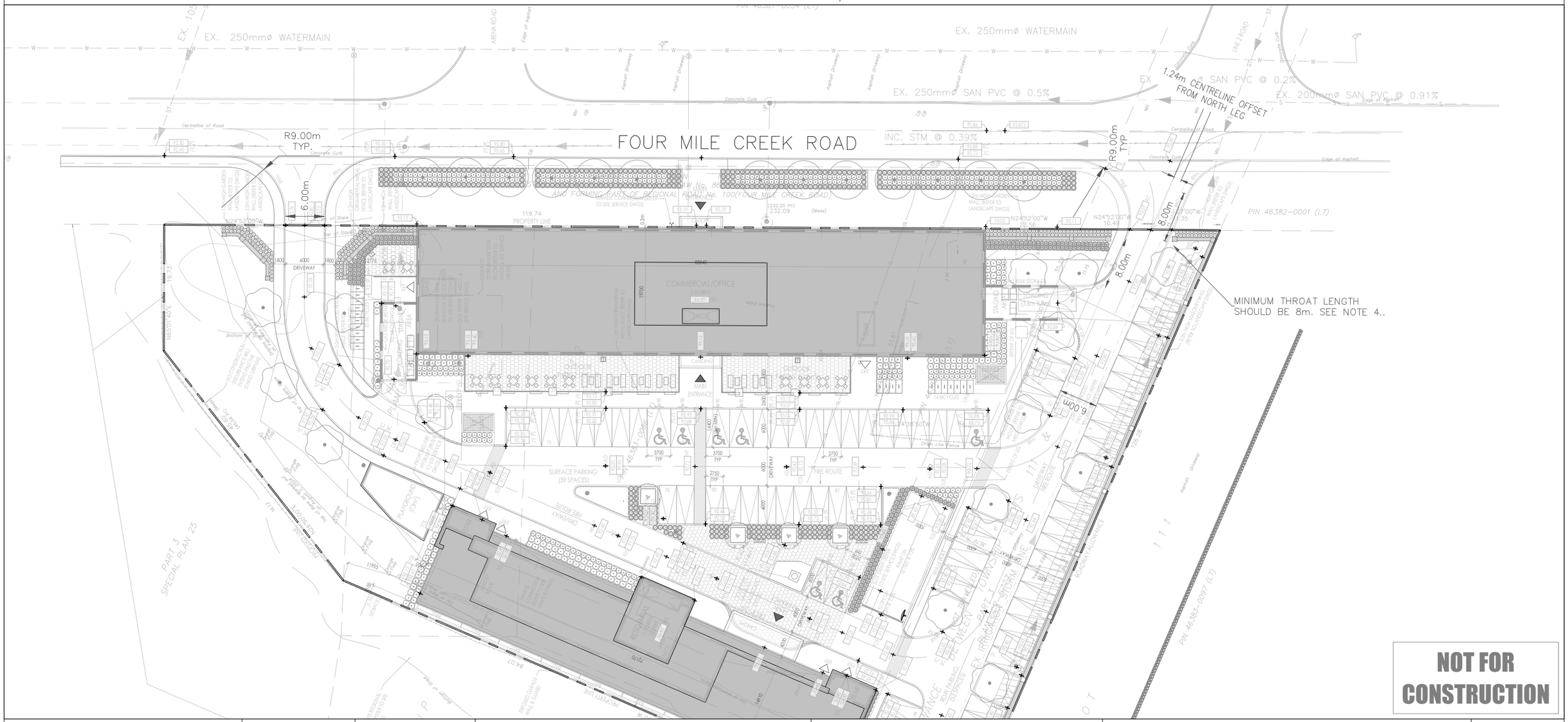
NOTES:

1. AS PER THE NIAGARA-ON-THE-LAKE MUNICIPAL ENGINEERING STANDARDS JAN 2018 SECTION 3.11, REFER TO OPSD 350.010 FOR ACCESS DESIGN REQUIREMENTS

2. OPSD 350.010 STATES:
a. CURB RADIUS MUST BE BETWEEN 4.5m-12.0m FOR COMMERCIAL AND APARTMENT LAND USE
b. WIDTH OF DRIVEWAY MUST BE BETWEEN 7.2m-12.0m FOR COMMERCIAL AND APARTMENT LAND USE

3. AS PER TOWN OF NIAGARA-ON-THE-LAKE ZONING BY-LAW SECTION 6.38, AISLE WIDTH SHOULD BE 6m

4. AS PER TAC TABLE 8.9.3. MINIMUM CLEAR THROAT LENGTH FROM COLLECTOR ROAD FOR OFFICE BUILDING AREA LESS THAN 10000 sqm AND APARTMENTS LESS THAN 100 UNITS SHOULD BE 8m



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DRAWN BY: JDORAN PLOT DATE: December 17, 2025

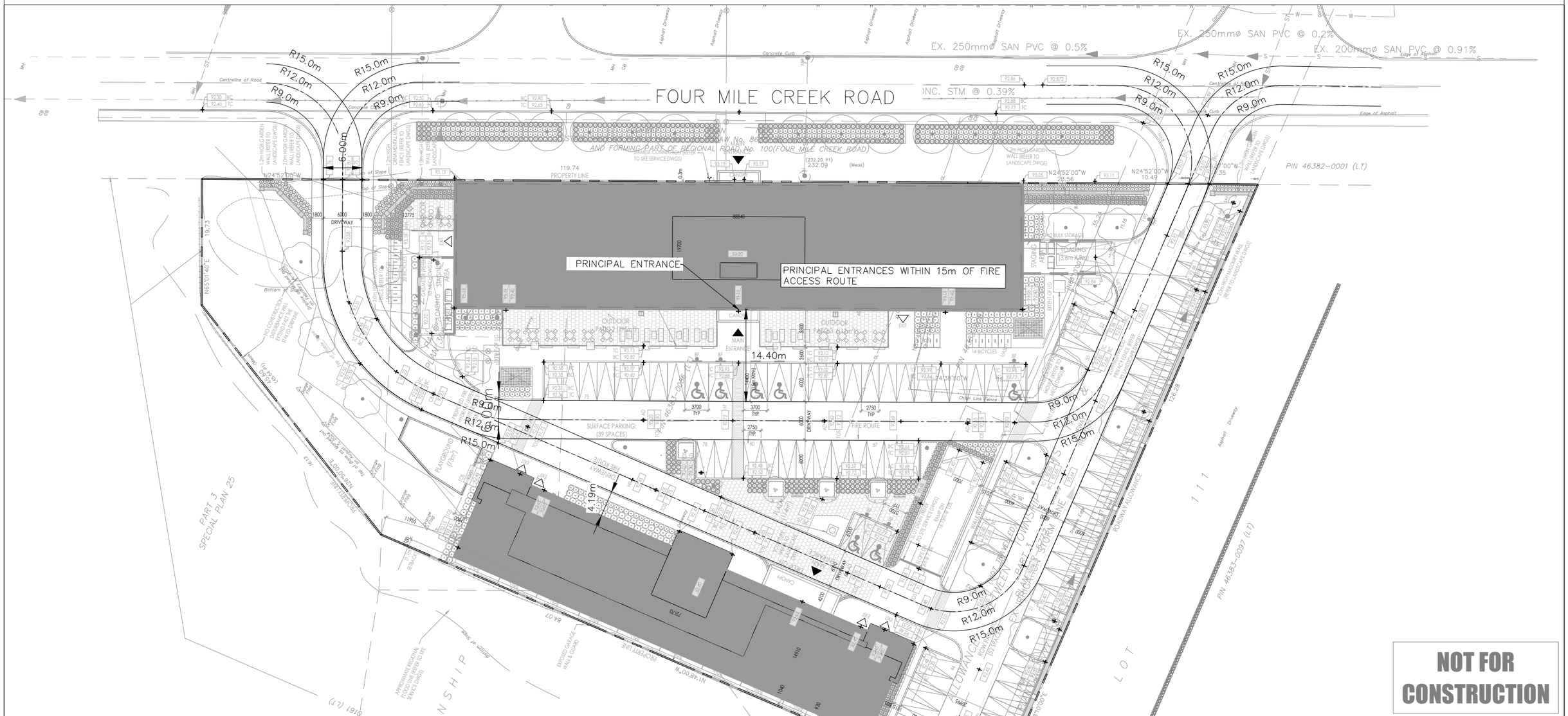
LEA Consulting Ltd. Consulting Engineers and Planners **www.LEA.ca**	N	Project No. 25253 Date DEC. 17, 2025		1544-1546 FOUR MILE CREEK RD NIAGARA-ON-THE-LAKE ONTARIO 6 0 6 12 18m 1:600	ACCESS DESIGN REVIEW Drawing No. 001

DRAWING NAME: F:\25253.01 Transportation\Drafting\25253WF015.dwg

NOTES:

AS PER THE ONTARIO BUILDING CODE 3.2.5

1. 5.1 LOCATION OF ACCESS ROUTES – ACCESS ROUTES SHALL BE LOCATED SO THAT THE PRINCIPAL ENTRANCE AND EVERY ACCESS OPENING ARE LOCATED NOT LESS THAN 3m AND NOT MORE THAN 15m FROM THE CLOSEST PORTION OF THE ACCESS ROUTE
2. 6.1 ACCESS ROUTE DESIGN – A PORTION OF A ROADWAY PROVIDED AS A REQUIRED ACCESS ROUTE FOR FIRE DEPARTMENT USE SHALL:
   - 2.1. 6.1.a HAVE A CLEAR WIDTH NOT LESS THAN 6m
   - 2.2. 6.1.b HAVE A CENTRELINE RADIUS NOT LESS THAN 12m
   - 2.3. 6.1.c HAVE AN OH CLEARANCE OF NOT LESS THAN 5m
   - 2.4. 6.1.g BE CONNECTED WITH A PUBLIC THOROUGHFARE



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LEA Consulting Ltd. Consulting Engineers and Planners **www.LEA.ca**	N	Project No. 25253 Date DEC. 17, 2025		1544–1546 FOUR MILE CREEK RD NIAGARA-ON-THE-LAKE ONTARIO 6 0 6 12 18m 1:600	FIRE ROUTE REVIEW	Drawing No. 002

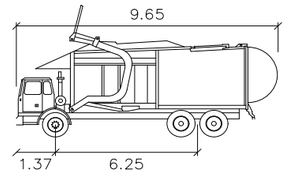
DRAWING NAME: F:\25253.01 Transportation\Drafting\25253WF015.dwg

AS PER REGION OF NIAGARA PROCEDURE FOR REQUIREMENTS FOR WASTE COLLECTION

1. WASTE COLLECTION VEHICLES SHALL NOT REVERSE IN EXCESS OF 15m
2. ROADWAYS MUST HAVE A MINIMUM WIDTH OF PAVEMENT OF 6 METRES
3. VERTICAL/OVERHEAD CLEARANCE OF 4.4 METRES MUST BE MAINTAINED ON ALL ACCESS ROUTES. COLLECTION AREA MUST HAVE 6.1m VERTICAL CLEARANCE.
4. SUFFICIENT SPACE IS NEEDED TO HOUSE ALL CURRENT AND ANY FUTURE WASTE STREAMS (REQUIRED MINIMUM 2.5 SQUARE METRES PER UNIT, FOR PLACEMENT OF MATERIAL BASED ON INDUSTRY BEST PRACTICES)
5. THERE MUST BE AN APPROPRIATE STORAGE AREA FOR CONTAINERS. THE STORAGE AREA SHOULD BE SIZED APPROPRIATELY TO CONTAIN AND ALLOW FOR EASY MOVEMENT OF ALL REQUIRED RECYCLING CARTS. IT IS RECOMMENDED THAT THERE IS ONE (1) BLUE CART FOR EVERY TWENTY (20) UNITS AND ONE (1) GREY CART FOR EVERY ELEVEN (11) UNITS. THE RECOMMENDATIONS FOR ORGANIC CARTS ARE AS FOLLOWS: IT IS RECOMMENDED THAT THERE IS ONE (1) ORGANIC CART FOR EVERY THIRTY (30) UNITS.
6. FLASHING WARNING SYSTEM
   - 6.1. FLASHING WARNING LIGHT TO BE ACTIVATED WHEN TRUCKS ENTER AND EXIT THE SITE. THE SYSTEM TO REMAIN ACTIVATED DURING THE CITY GARBAGE COLLECTION ACTIVITY AND UNTIL THE TRUCK EXITS THE SITE.

AS PER TOWN OF NIAGARA-ON-THE-LAKE ZONING BY-LAW SECTION 6.27

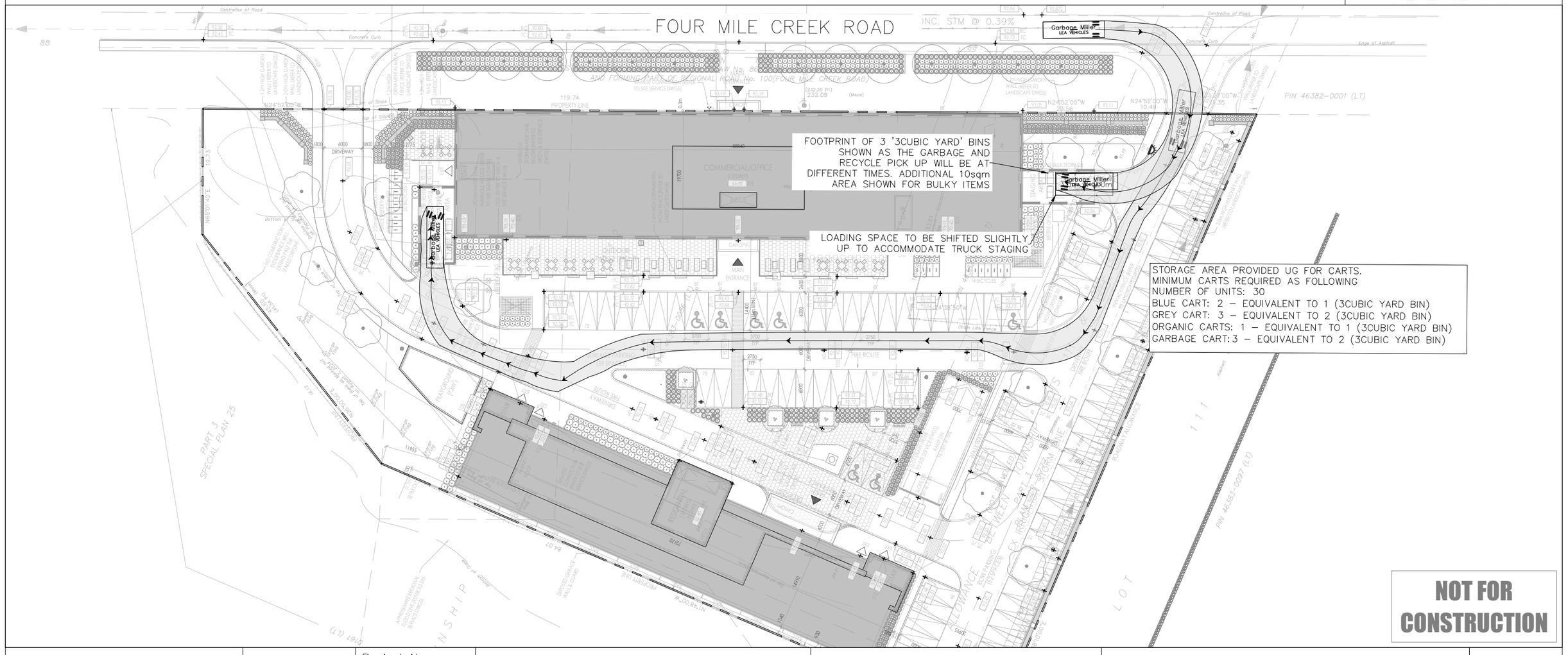
4. REQUIRED LOADING SPACES SHALL HAVE MINIMUM HORIZONTAL DIMENSIONS OF 3.6 M (11.81 FT) BY 9.0 M (29.53 FT) AND A MINIMUM VERTICAL CLEARANCE OF 4.2 M (13.78 FT);



Garbage Miller meters

Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 30.0°

FORWARD IN
REVERSE OUT



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1544-1546 FOUR MILE CREEK RD
NIAGARA-ON-THE-LAKE ONTARIO

6 0 6 12 18m
1:600

LOADING REVIEW
PRIVATE GARBAGE PICKUP TRUCK
(MILLER)
ENTRY PATHS

Drawing No. 003

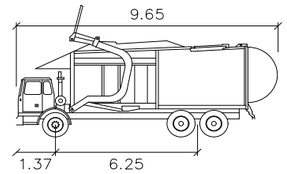
DRAWING NAME: F:\25253.01 Transportation\Drafting\25253WF015.dwg

AS PER REGION OF NIAGARA PROCEDURE FOR REQUIREMENTS FOR WASTE COLLECTION

1. WASTE COLLECTION VEHICLES SHALL NOT REVERSE IN EXCESS OF 15m
2. ROADWAYS MUST HAVE A MINIMUM WIDTH OF PAVEMENT OF 6 METRES
3. VERTICAL/OVERHEAD CLEARANCE OF 4.4 METRES MUST BE MAINTAINED ON ALL ACCESS ROUTES. COLLECTION AREA MUST HAVE 6.1m VERTICAL CLEARANCE.
4. SUFFICIENT SPACE IS NEEDED TO HOUSE ALL CURRENT AND ANY FUTURE WASTE STREAMS (REQUIRED MINIMUM 2.5 SQUARE METRES PER UNIT, FOR PLACEMENT OF MATERIAL BASED ON INDUSTRY BEST PRACTICES)
5. THERE MUST BE AN APPROPRIATE STORAGE AREA FOR CONTAINERS. THE STORAGE AREA SHOULD BE SIZED APPROPRIATELY TO CONTAIN AND ALLOW FOR EASY MOVEMENT OF ALL REQUIRED RECYCLING CARTS. IT IS RECOMMENDED THAT THERE IS ONE (1) BLUE CART FOR EVERY TWENTY (20) UNITS AND ONE (1) GREY CART FOR EVERY ELEVEN (11) UNITS. THE RECOMMENDATIONS FOR ORGANIC CARTS ARE AS FOLLOWS: IT IS RECOMMENDED THAT THERE IS ONE (1) ORGANIC CART FOR EVERY THIRTY (30) UNITS.
6. FLASHING WARNING SYSTEM
   6.1. FLASHING WARNING LIGHT TO BE ACTIVATED WHEN TRUCKS ENTER AND EXIT THE SITE. THE SYSTEM TO REMAIN ACTIVATED DURING THE CITY GARBAGE COLLECTION ACTIVITY AND UNTIL THE TRUCK EXITS THE SITE.

AS PER TOWN OF NIAGARA-ON-THE-LAKE ZONING BY-LAW SECTION 6.27

4. REQUIRED LOADING SPACES SHALL HAVE MINIMUM HORIZONTAL DIMENSIONS OF 3.6 M (11.81 FT) BY 9.0 M (29.53 FT) AND A MINIMUM VERTICAL CLEARANCE OF 4.2 M (13.78 FT);



Garbage Miller meters

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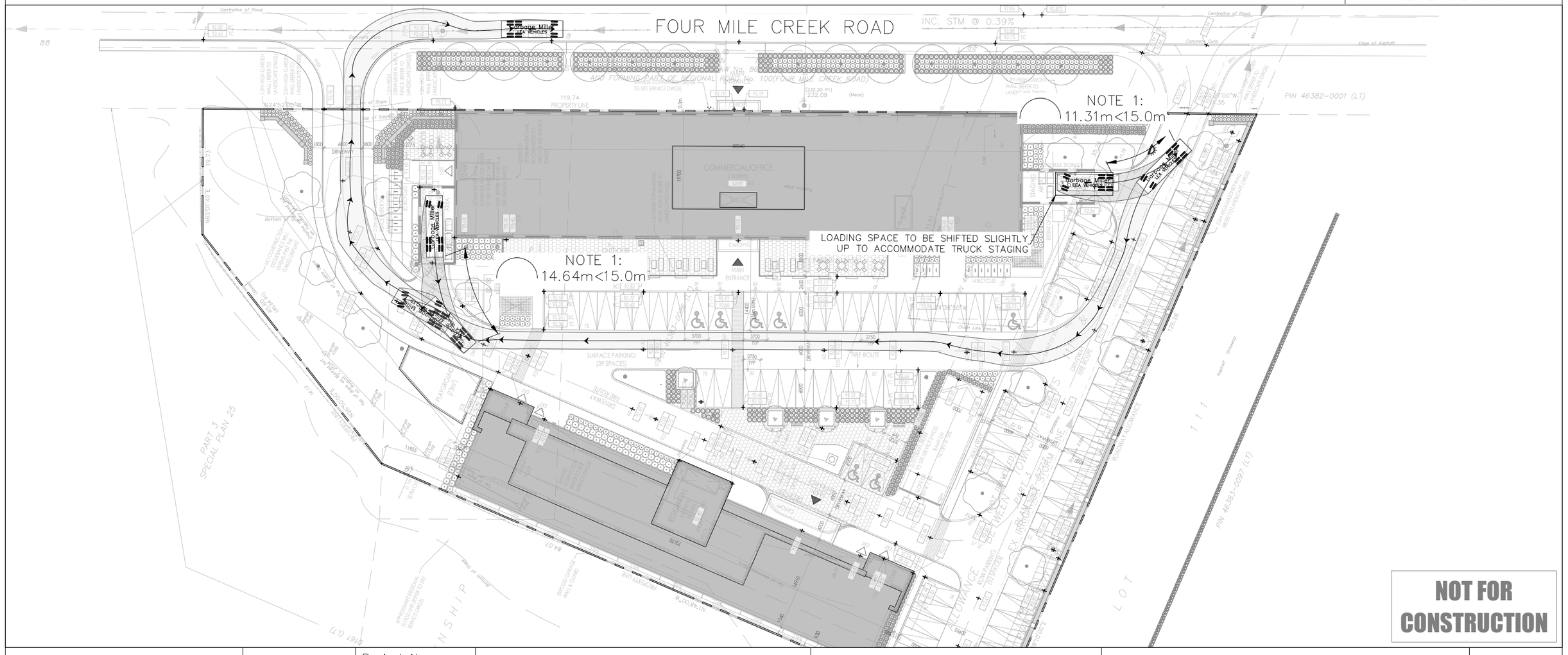
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 30.0°

FORWARD IN
REVERSE OUT



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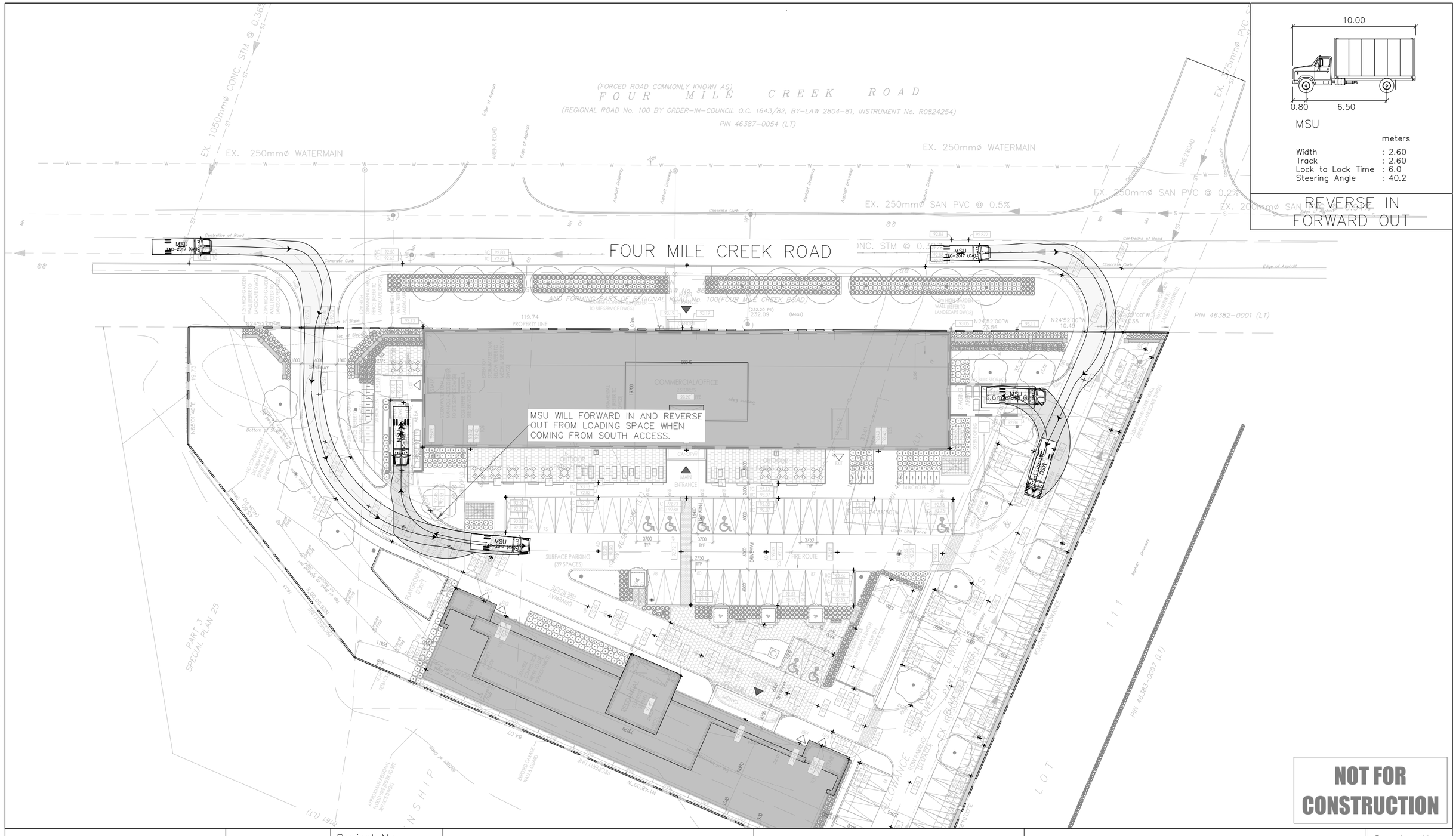
NIAGARA-ON-THE-LAKE ONTARIO

6 0 6 12 18m
1:600

LOADING REVIEW
PRIVATE GARBAGE PICKUP TRUCK
(MILLER)
EXIT PATHS

Drawing No. 004

DRAWING NAME: F:\25253.01 Transportation\Drafting\25253WF015.dwg



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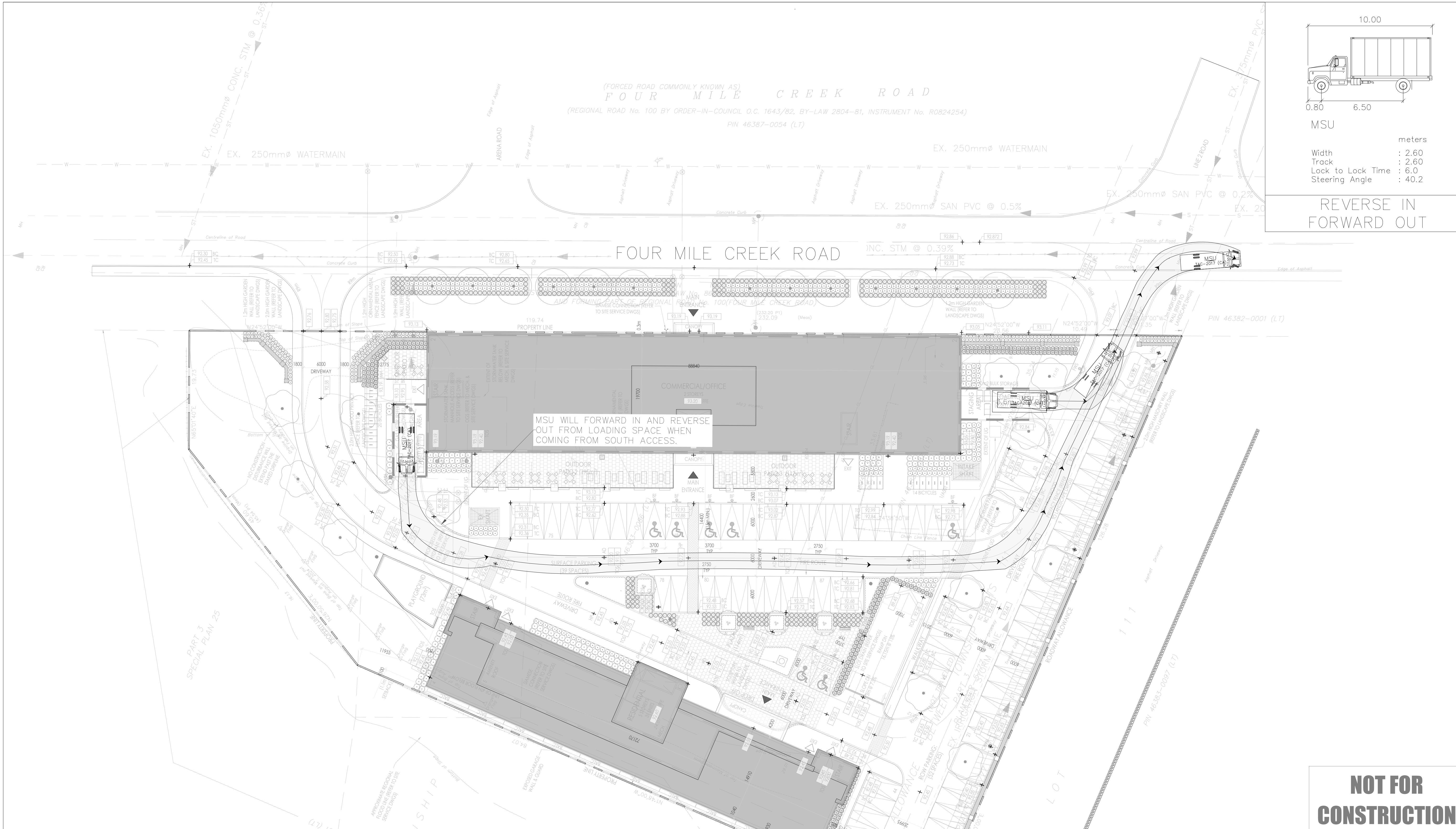
NIAGARA-ON-THE-LAKE ONTARIO

6 0 6 12 18m
1:600

LOADING REVIEW
MOVING/DELIVERY TRUCK (MSU)
ENTRY PATHS

Drawing No. 005

DRAWING NAME: F:\25253.01 Transportation\Drafting\25253WF015.dwg



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6 0 6 12 18m
1:600

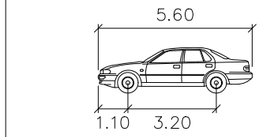
LOADING REVIEW
MOVING/DELIVERY TRUCK (MSU)
EXIT PATHS

Drawing No. 006

DRAWING NAME: F:\25253.01 Transportation\Drafting\25253WF015.dwg

AS PER TOWN OF NIAGARA-ON-THE-LAKE ZONING BY-LAW SECTION 6.38 AND 6.42

1. MINIMUM PARKING SPACE DIMENSION FOR 90^0 PARKING ALIGNMENT IS 2.75X6.0m. FOR 0^0 PARKING ALIGNMENT IS 2.75X6.7m.
2. MINIMUM DRIVEWAYS AND AISLE WIDTH IS 6.0M
3. THE ACCESSIBLE PARKING SPACES SHALL HAVE MINIMUM RECTANGULAR DIMENSIONS OF 3.7 M (12.11 FT) WIDTH BY 6.0 M (19.69 FT) IN LENGTH, AND IF TWO (2) ADJACENT SPACES ARE DESIGNATED FOR THE DISABLED, THEN THE TOTAL WIDTH OF BOTH SPACES TOGETHER MAY BE 6.4 M (21 FT) IF A 1.5 M (5 FT) WIDE ACCESS AISLE SEPARATES THE TWO (2) SPACES. IF NO ACCESS AISLE SEPARATES THE SPACES, THE TOTAL WIDTH OF THE TWO (2) SPACES SHALL BE 7.4 M (24.28 FT)
4. A MINIMUM VERTICAL CLEARANCE OF 2.9 M (9.51 FT) SHALL BE PROVIDED AT ACCESSIBLE PARKING SPACES, PASSENGER LOADING ZONES, AND ALONG ACCESS ROUTES



P

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Lock to Lock Time	: 6.0
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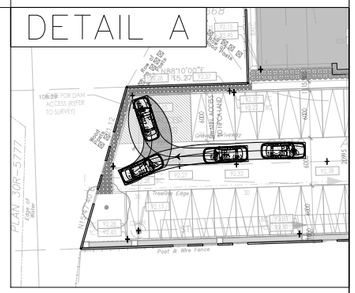

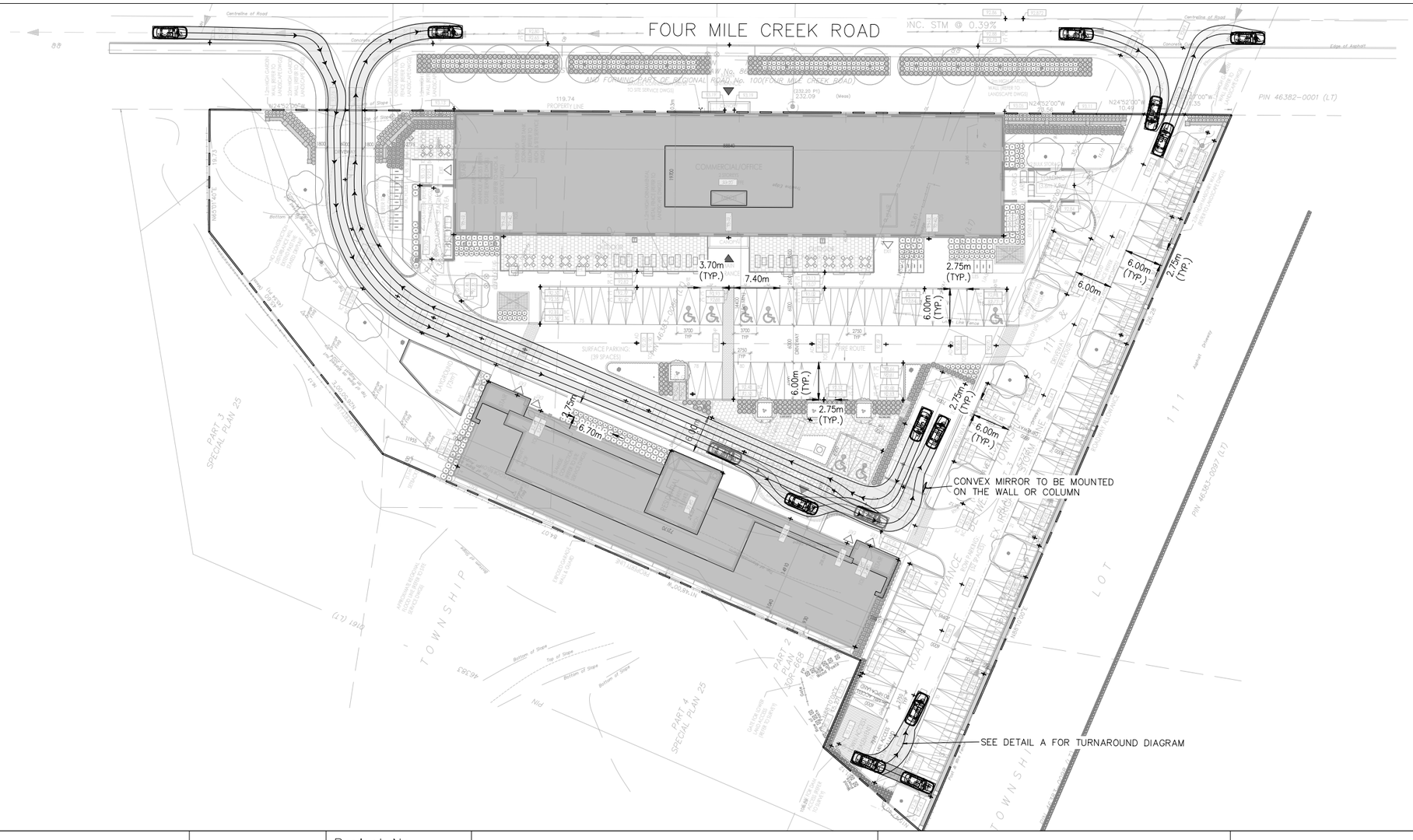

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NIAGARA-ON-THE-LAKE ONTARIO

7.5 0 7.5 15 22.5m
1:750

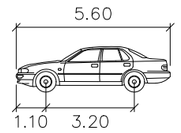
PARKING REVIEW
GROUND FLOOR

Drawing No. 007

DRAWING NAME: F:\25253.01 Transportation\Drafting\25253WF015.dwg

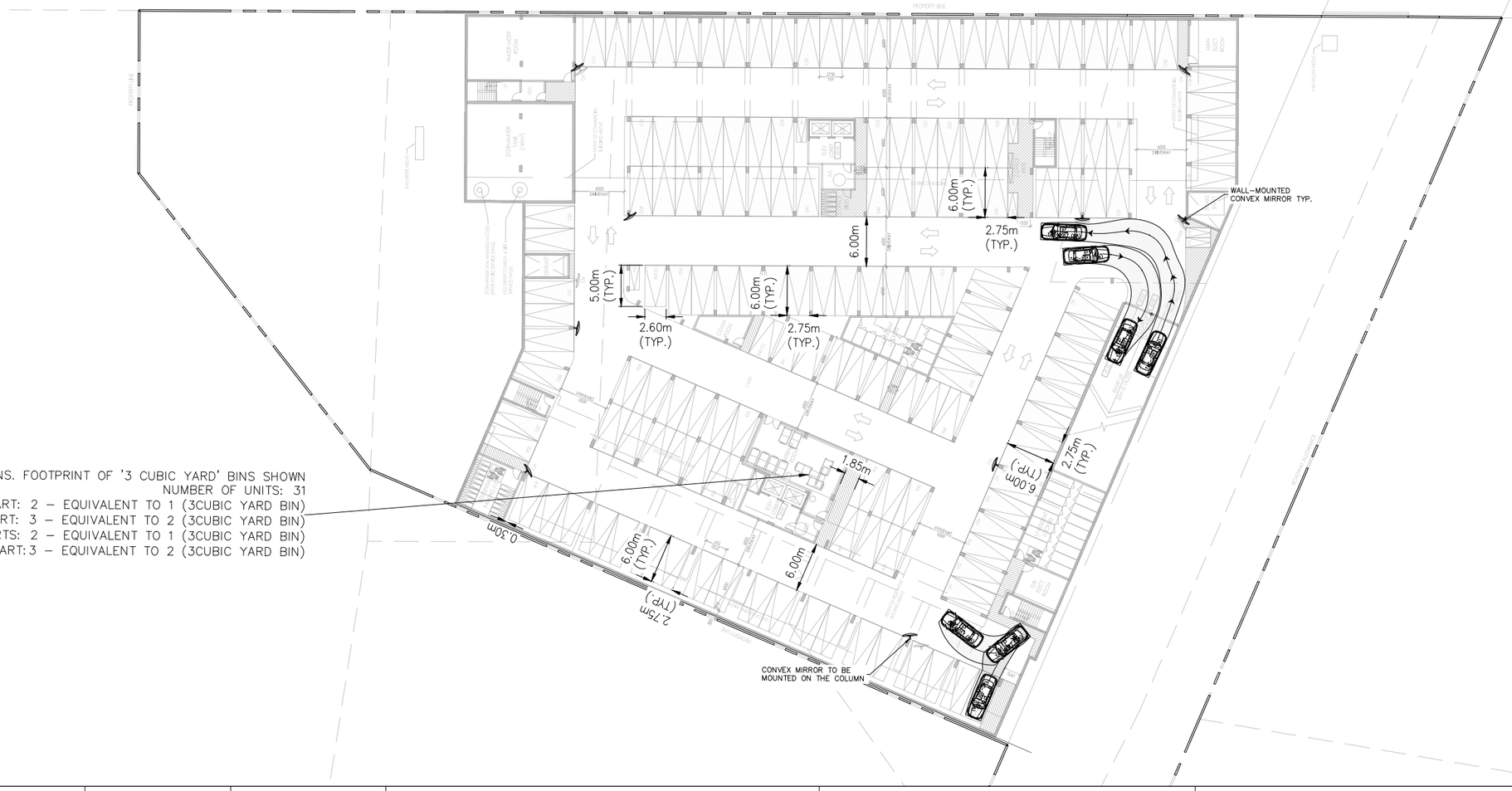
AS PER TOWN OF NIAGARA-ON-THE-LAKE ZONING BY-LAW SECTION 6.38 AND 6.42

1. MINIMUM PARKING SPACE DIMENSION FOR 90^0 PARKING ALIGNMENT IS 2.75X6.0m. FOR 0^0 PARKING ALIGNMENT IS 2.75X6.7m.
2. MINIMUM DRIVEWAYS AND AISLE WIDTH IS 6.0M
3. THE ACCESSIBLE PARKING SPACES SHALL HAVE MINIMUM RECTANGULAR DIMENSIONS OF 3.7 M (12.11 FT) WIDTH BY 6.0 M (19.69 FT) IN LENGTH, AND IF TWO (2) ADJACENT SPACES ARE DESIGNATED FOR THE DISABLED, THEN THE TOTAL WIDTH OF BOTH SPACES TOGETHER MAY BE 6.4 M (21 FT) IF A 1.5 M (5 FT) WIDE ACCESS AISLE SEPARATES THE TWO (2) SPACES. IF NO ACCESS AISLE SEPARATES THE SPACES, THE TOTAL WIDTH OF THE TWO (2) SPACES SHALL BE 7.4 M (24.28 FT)
4. A MINIMUM VERTICAL CLEARANCE OF 2.9 M (9.51 FT) SHALL BE PROVIDED AT ACCESSIBLE PARKING SPACES, PASSENGER LOADING ZONES, AND ALONG ACCESS ROUTES



P

	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9



STORAGE AREA FOR BINS. FOOTPRINT OF '3 CUBIC YARD' BINS SHOWN
NUMBER OF UNITS: 31
BLUE CART: 2 – EQUIVALENT TO 1 (3CUBIC YARD BIN)
GREY CART: 3 – EQUIVALENT TO 2 (3CUBIC YARD BIN)
ORGANIC CARTS: 2 – EQUIVALENT TO 1 (3CUBIC YARD BIN)
GARBAGE CART: 3 – EQUIVALENT TO 2 (3CUBIC YARD BIN)

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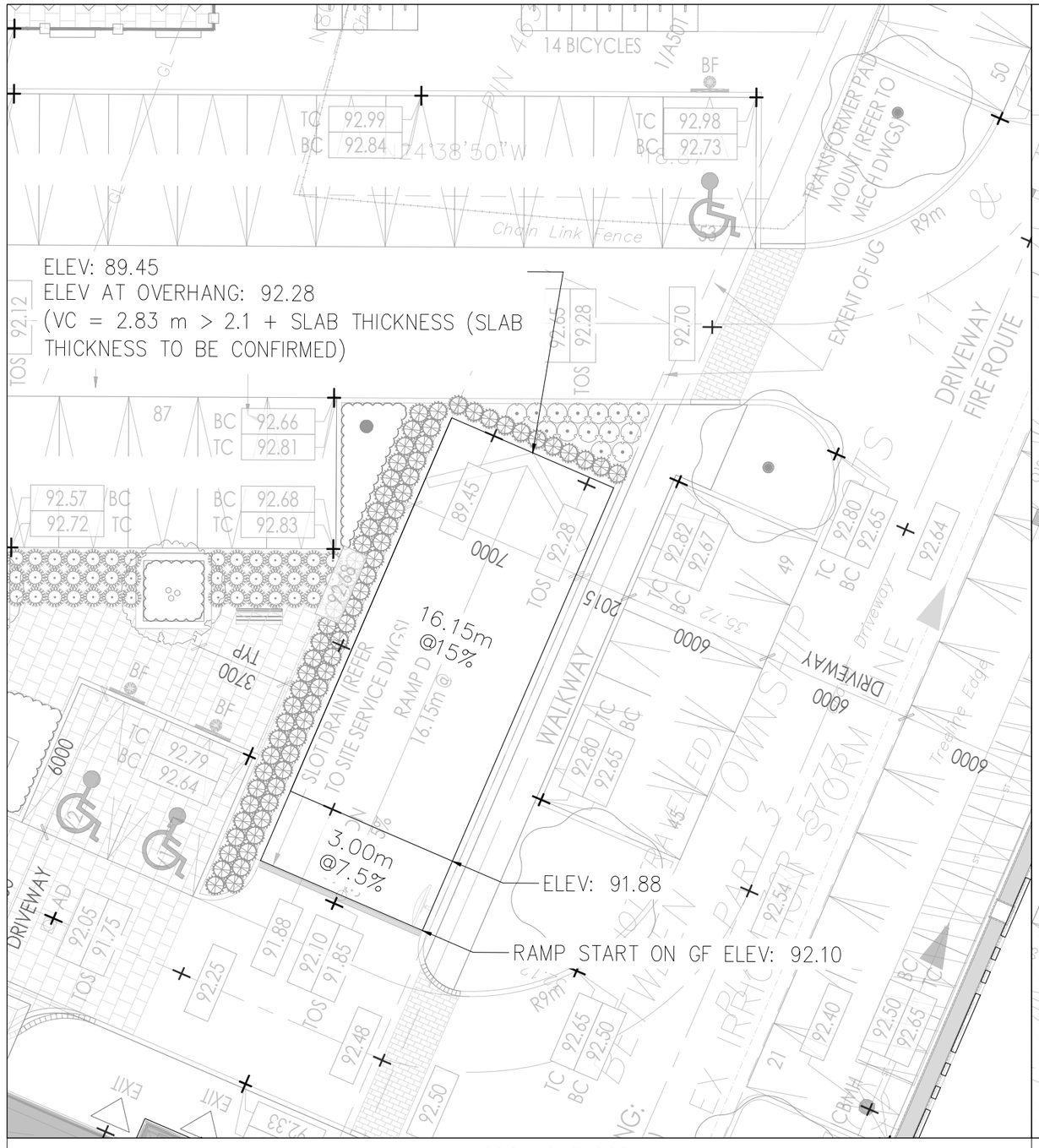
NIAGARA-ON-THE-LAKE ONTARIO

6 0 6 12 18m
1:600

PARKING REVIEW
LEVEL P1

Drawing No. 008

DRAWING NAME: F:\25253.01 Transportation\Drafting\25253WF015.dwg



GROUND FLOOR

P1 LEVEL

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Project No. 25253

Date DEC. 17, 2025

1544-1546 FOUR MILE CREEK RD
NIAGARA-ON-THE-LAKE ONTARIO

2 0 2 4 6m
1:200

RAMP GRADING REVIEW
GROUND FLOOR AND P1 LEVEL

Drawing No. 009

DRAWING NAME: F:\25253.01 Transportation\Drafting\25253WF015.dwg