

June 13, 2023

1959064 Ontario Inc.
3098 Jenn Avenue
Burlington ON L7M 0C7

Attention: Mr. Sorna Mahalingham

**Re: Proposed Stacked Townhouse Development
5809, 5821, and 5829 McLeod Road
City of Niagara Falls, the Regional Municipality of Niagara
Transportation Study**

Dear Mr. Mahalingham,

CGE Consulting is pleased to submit this Transportation Study, consisting of Traffic Impact Study (TIS) / Transportation Mobility Plan (TMP), Parking Study, On-Site Vehicle Circulation Review, and Transportation Demand Management (TDM) Plan components, for the proposed residential development located at 5809, 5821, and 5829 McLeod Road in the City of Niagara Falls, the Regional Municipality of Niagara Region. It consists of 43 residential units in a 3.5-storey stacked townhouse dwellings with underground and surface parking areas.

Our findings indicate that the proposed development can be accommodated on the surrounding road network without any improvements other than constructing the proposed access to McLeod Road. Further, the proposed auto parking supply is expected to meet the parking needs for the site based on comparable municipalities in Niagara Region. On-site circulation for the relevant design vehicles that are expected to access the site was also found acceptable. Details are provided herein.

Should you have any questions regarding this study, please do not hesitate to contact the undersigned.

Yours truly,

CGE TRANSPORTATION CONSULTING



Casey Ge, P.Eng.
President

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1.0 INTRODUCTION

CGE Consulting has been retained by 1959064 Ontario Inc. to complete a Transportation Study for proposed 43 residential units in a 3.5-storey stacked townhouse dwellings with surface parking areas at 5809, 5821, and 5829 McLeod Road, City of Niagara Falls, the Regional Municipality of Niagara. This study includes the following components and tasks:

- Assess the existing road network during the weekday morning (7:00 am – 9:00 am) and afternoon (4:00 pm – 6:00 pm) at:
 - McLeod Road and Marineland Parkway unsignalized intersection.
 - Proposed Site Access and McLeod Road unsignalized intersection.
- Assess the multi-modal performance in the future (2033) background analysis 10 years after opening the year of 2023 incorporating both traffic growth and background developments in the area.
- A review of the site context and development proposal.
- Estimate site traffic based on information published in the Trip Generation Manual, 11th Edition, by the Institute of Transportation Engineers (ITE).
- Develop mitigation measures to address any deficiencies at each stage (existing, future background and future total traffic) for key study area intersections.
- Review of the Site Plan for the functionality of the proposed site access and internal vehicular circulation, to facilitate servicing, and parking.
- Review the available parking to determine whether the proposed parking supply, including bicycle parking, is sufficient to accommodate the parking demand of the proposed site.
- Compare the parking supply to the City's Comprehensive Zoning By-Law No. 79-200.
- The Transportation Demand Management (TDM) brief includes the following activities:
 - Emphasize transit and active transportation network use.
 - identify measures that will reduce the travel demand and minimize single-occupant vehicle trips to and from the proposed development; and
- On-site circulation investigation for passenger and service vehicles.

2.0 STUDY AREA CONTEXT

2.1 Site Location

The subject site is located on the northwest quadrant of McLeod Road/Marineland Parkway and Ailanthus Avenue. It is located at 5809, 5821, and 5829 McLeod Road and is currently occupied by three (3) detached dwellings accessed via individual driveways on McLeod Road.

Most of the surrounding land uses to the west and north are residential. Residential and vacant lands to the east and south. Pre-consultation comments were received from the Regional Municipality of Niagara and the City of Niagara Falls, which have informed the general work program for the transportation study, and have been included in **Appendix A**.

The location of the proposed development is illustrated in **Figure 1**.

2.2 Development Proposal Description

Based on the site plan, prepared by Vanle Architect, dated May 25, 2023, is shown in **Figure 2**. The development proposal consists of 43 residential units in a 3.5-storey stacked townhouse dwellings with surface parking areas at 5809, 5821, and 5829 McLeod Road, City of Niagara Falls, the Regional Municipality of Niagara.

Vehicular access is provided by a 1 full-moves driveway on McLeod Road located approximately 65 metres west of the existing intersection of McLeod Road and Marineland Parkway unsignalized intersection.

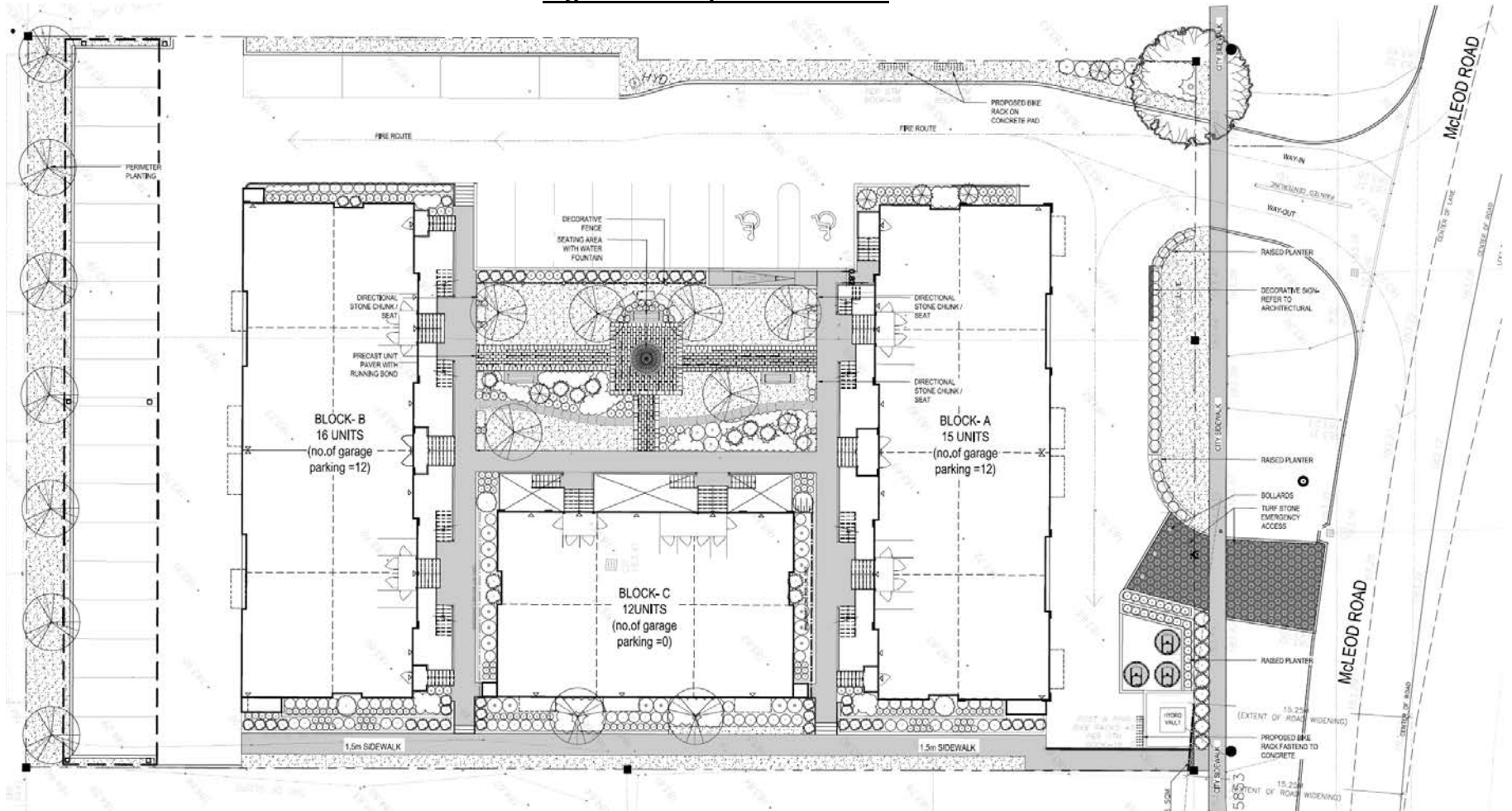
A second “out only” driveway is proposed to the west of the main access to provide an exit and prevent the backing up of the molok garbage truck. The driveway will have knock-off bollards and signage installed to avoid vehicles from entering the site. The advantage of this driveway is to provide front in and front out movement for the garbage pick-up and emergency service vehicles.

Figure 1 Site Location



Source: City of Niagara Falls Interactive Map

Figure 2 Proposed Site Plan



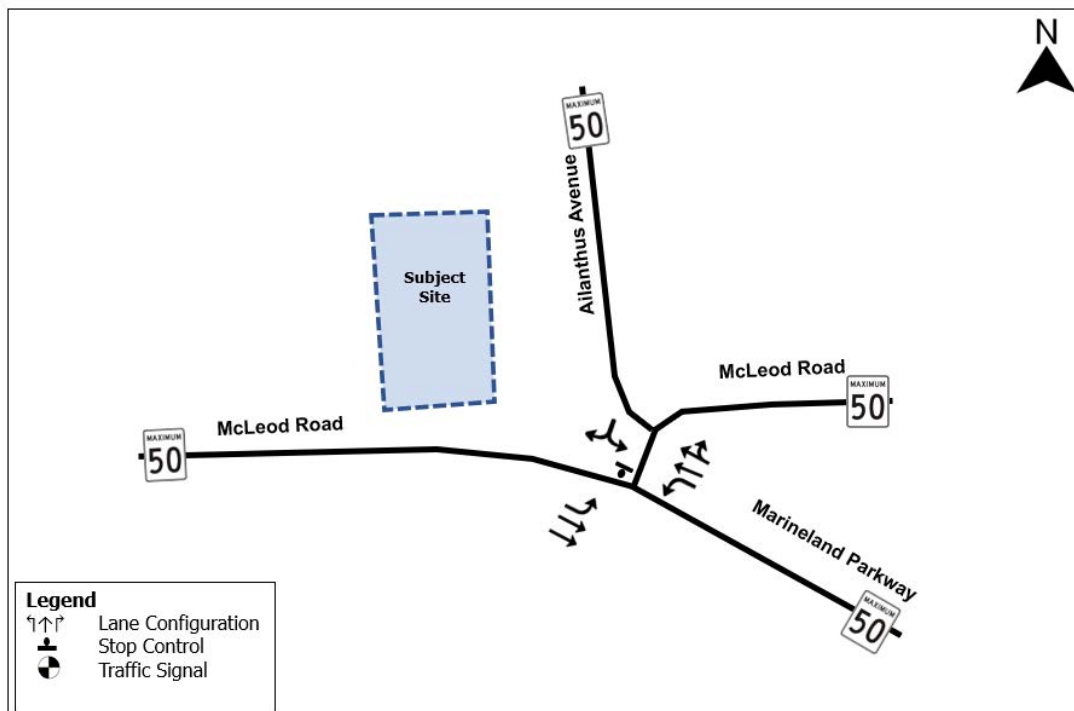
2.3 Existing Road Network

The existing road network, lane configuration and existing traffic control for the study area are shown in **Figure 3**. The details are described below:

- **McLeod Road (Regional Road 49)** is a major four lane east-west roadway under the jurisdiction of the Municipality of Niagara extending from Stanley Avenue (Regional Road 102) to Thorold Townline Road (Regional Road 70). McLeod Rd. provides direct access to north-south roadways, the QEW and major destinations. It also crosses two major barriers: the QEW and the Sir Adam Back Power Canal. There is a sidewalk along the north side and the road operates with a posted speed limit of 50 km/h in the vicinity of the site.
- **Marineland Parkway** is a major four lane roadway under the jurisdiction of the Regional Municipality of Niagara and provides a connection to McLeod Road east of the subject site. Currently there are no sidewalks on Marineland Parkway and operates with a posted speed limit of 50 km/h.
- **Ailanthus Avenue** is a collector 2-lane north-south roadway under the jurisdiction of the City of Niagara Falls. The road has an urban cross-section with sidewalks on both sides. The road operates with a posted speed limit of 50 km/h.

Currently, there are no designated bike lanes in the vicinity of the site; however, McLeod Road is designated as part of the Regional Niagara Bicycling Network.

Figure 3 Existing Road Network



2.4 Existing Transit Service

The site is served by Niagara Region Transit. The route details are as follows:

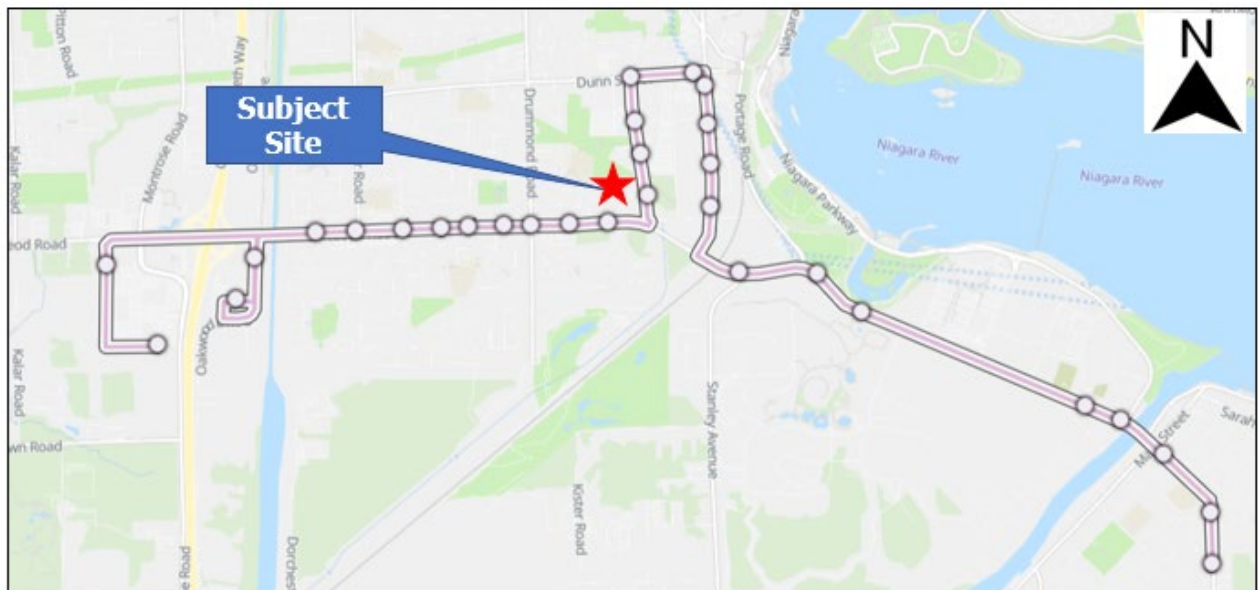
- **Bus Route 112 (McLeod – Chippawa):** operates Monday to Saturday between 6:45 and 4:45 pm, making stops along McLeod Road at Alex Avenue.
- **Bus Route 206 (Stanley Industrial Park – Chippawa):** operates seven days a week between the hours:
 - 7:36 am – 8:06 pm on Sunday
 - 7:36 am – 10:36 pm on Monday and Friday
 - 6 pm – 10:36 pm on Tuesday, Wednesday, Thursday, and Saturday

The existing transit stops for Bus Route 112 are located on McLeod Road and Alex Avenue intersection approximately 170 metres from the subject. The transit stops for the bus route 206 is located on Ailanthus Avenue just east of the subject site. All transit stops are less than 5-minute walk.

Additional transit service that is in proximity of the subject site is offered by WEGO Niagara Falls during the summer season.

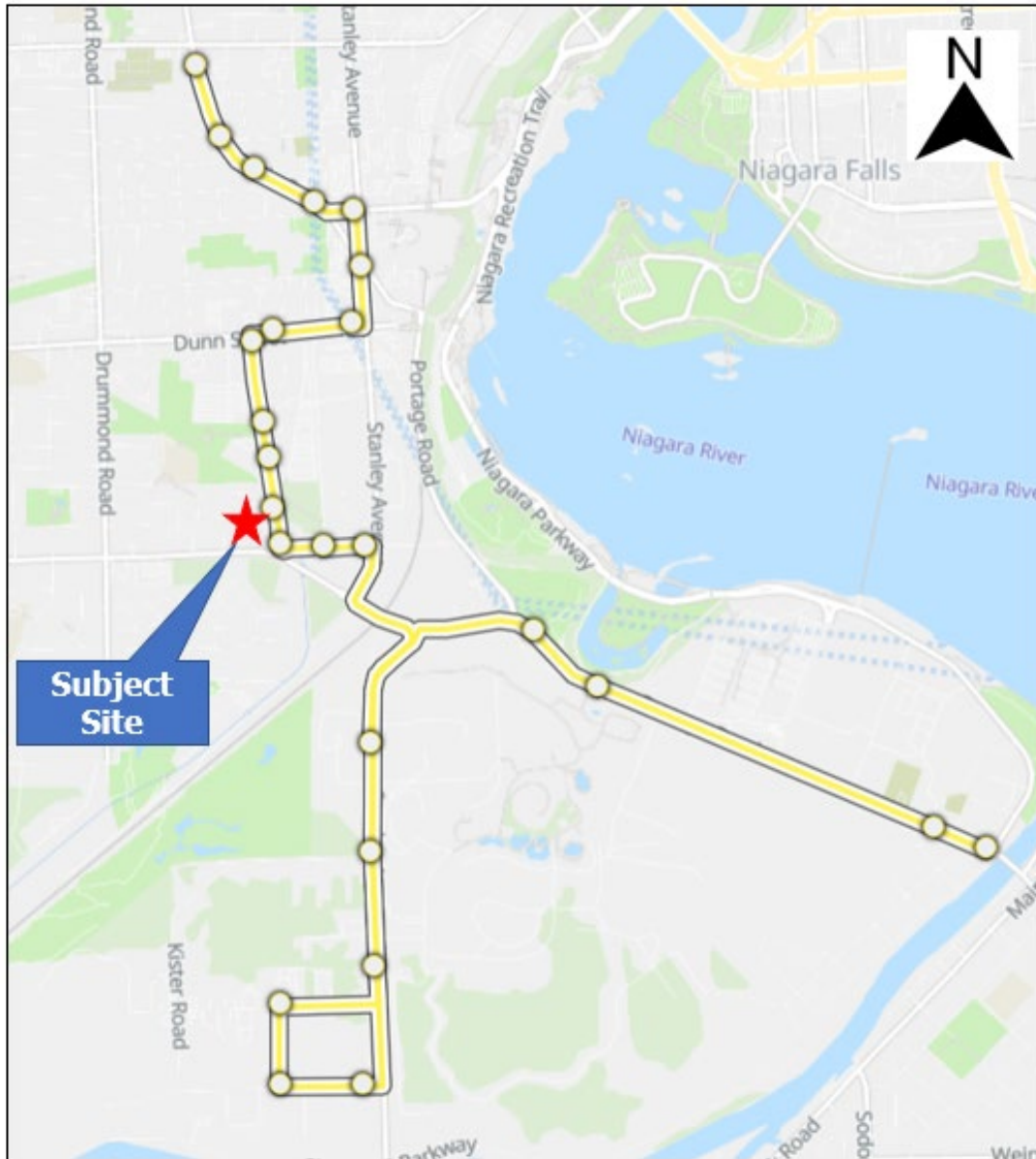
The transit map for the study area is shown in **Figure 4** and **Figure 5**.

Figure 4 Existing Transit Route 112



Source: City of Niagara Falls Transit Maps

Figure 5 Existing Transit Route 206



Source: City of Niagara Falls Transit Maps

3.0 TRAFFIC VOLUMES

3.1 Study Area Intersections and Driveways

The study area intersections and driveways reviewed in this study analysis are:

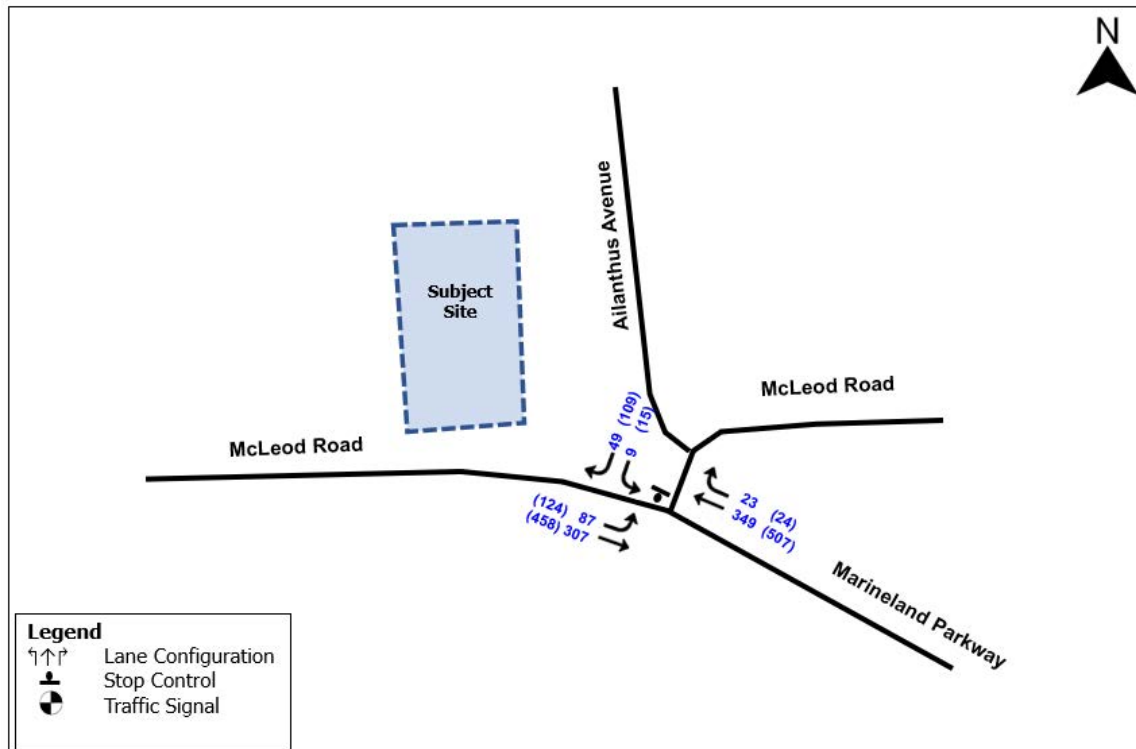
- McLeod Road and Marineland Parkway unsignalized intersection.
- Proposed Site Access and McLeod Road unsignalized intersection.

3.2 Existing Traffic Volumes

To determine the existing traffic volumes in the study area. Intersection traffic movement counts (TMC) were undertaken by Ontario Traffic Inc. on Thursday May 25, 2023, during the weekday AM (7:00 am – 9:00 am) and PM (4:00 pm – 6:00 pm) peak periods.

Existing traffic volumes are illustrated in **Figure 6** and detailed TMC data is provided in **Appendix B**.

Figure 6 Existing Traffic Volumes



4.0 FUTURE BACKGROUND TRAFFIC VOLUMES

4.1 Background Development

Background traffic is defined as all traffic within the study area that is not related to the proposed site. Typically, there are two components that impact the traffic growth of the adjacent road network. The natural traffic growth on the road network and approved developments in proximity of the development will have direct impact on the study intersections.

Based on the review of the City’s current planning applications, there is one notable background development near the subject site:

- **Townhouse and Stacked Townhouse development will include a total of 143 residential units (55 townhouses and 88 stacked townhouses)** – this development is located at 5600 McLeod Rod.
- **The “Mist” Townhouse Development will include a total of 43 residential dwelling units** – this development is located across of the subject site. The site plans and generated trip calculations are provided in **Appendix C**.

Both developments are still in the early stages of construction and there are no occupants currently. Therefore, the traffic generated by the developments was fully included in the background traffic.

4.2 Analysis Horizon Year

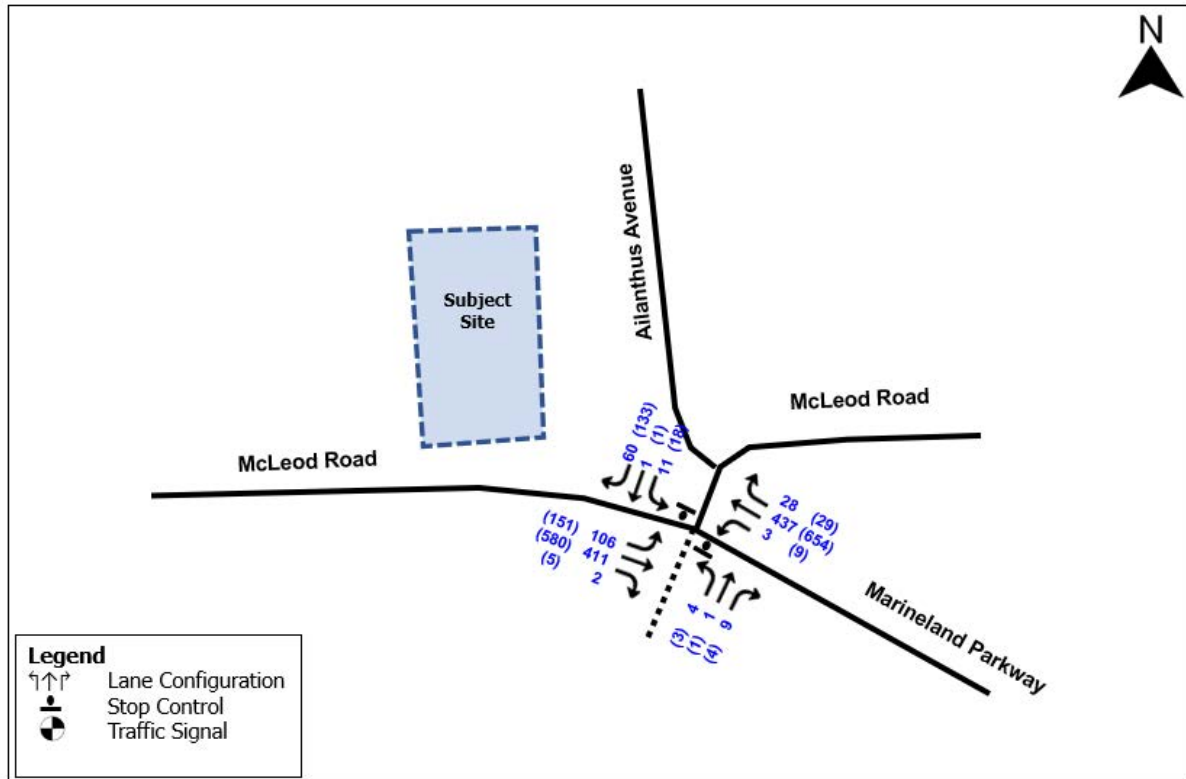
A 10-year planning horizon 2033, was selected as per the City’s Transportation Impact Study Guidelines, which represents the full build-out of the proposed development plus the normalization of traffic patterns.

4.3 Corridor Growth

To be conservative, a growth rate of two percent (2%) compounded per annum was applied to the boundary road network. The two percent growth rate is usually consistent with expected population growth in the area.

Future background traffic volumes are illustrated in **Figure 7**.

Figure 7 2033 Background Traffic Volumes



4.4 Planned Roadway Improvement

Based on the comments provided by the Region there are future capital projects planned for the reconstruction of McLeod Road. The section of McLeod Road between Wilson Crescent and Stanley Avenue (where the subject site is located) is expected to begin its design phase in 2024, with construction anticipated in 2027. The timing of this construction is pending budget and Council approval.

5.0 SITE TRAFFIC PROJECTIONS

5.1 Auto Trip Generation

The projection of new additional traffic volumes generated by the development proposal is estimated based on the *Trip Generation Manual, 11th Edition* published by the Institute of Transportation Engineers (ITE).

Land use code (LUC) 220 for Multifamily Housing (Low-Rise) was used to estimate the auto trip volumes generated by the site. As calculated below in **Table 1**, the site is expected to generate approximately 36 (9 in and 27 out) and 39 (25 in and 14 out) two-way trips during the weekday AM and PM peak hours, respectively.

Table 1 Auto Site Trip Generation

Land Use		Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Low-Rise (ITES Code 220) 43 Units	Rates	0.10	0.30	0.40	0.32	0.19	0.51
	Distribution	24%	76%	100%	63%	37%	100%
	Fitted Curve	T = 0.31 (X) + 22.85			T = 0.43(X) + 20.55		
	Trips	9	27	36	25	14	39

5.2 Vehicle Trip Distribution

The site trips for the proposed development were distributed to / from the subject site and the boundary roadways by considering the existing travel patterns at the study area intersections.

Table 2 and **Table 3** summarize the applied trip distribution pattern based on the traffic movement counts and travel pattern during the AM and PM peak hours, respectively.

Table 2 Site Trip Distribution – AM Peak Hour

Direction		Trips				
		In	Out	Total	In	Out
East	McLeod Road/Marineland Pkwy	35%	55%	3	15	18
West		55%	35%	5	10	14
North	Ailanthus Avenue	5%	5%	0	1	2
		5%	5%	0	1	2
Total		100%	100%	9	27	36

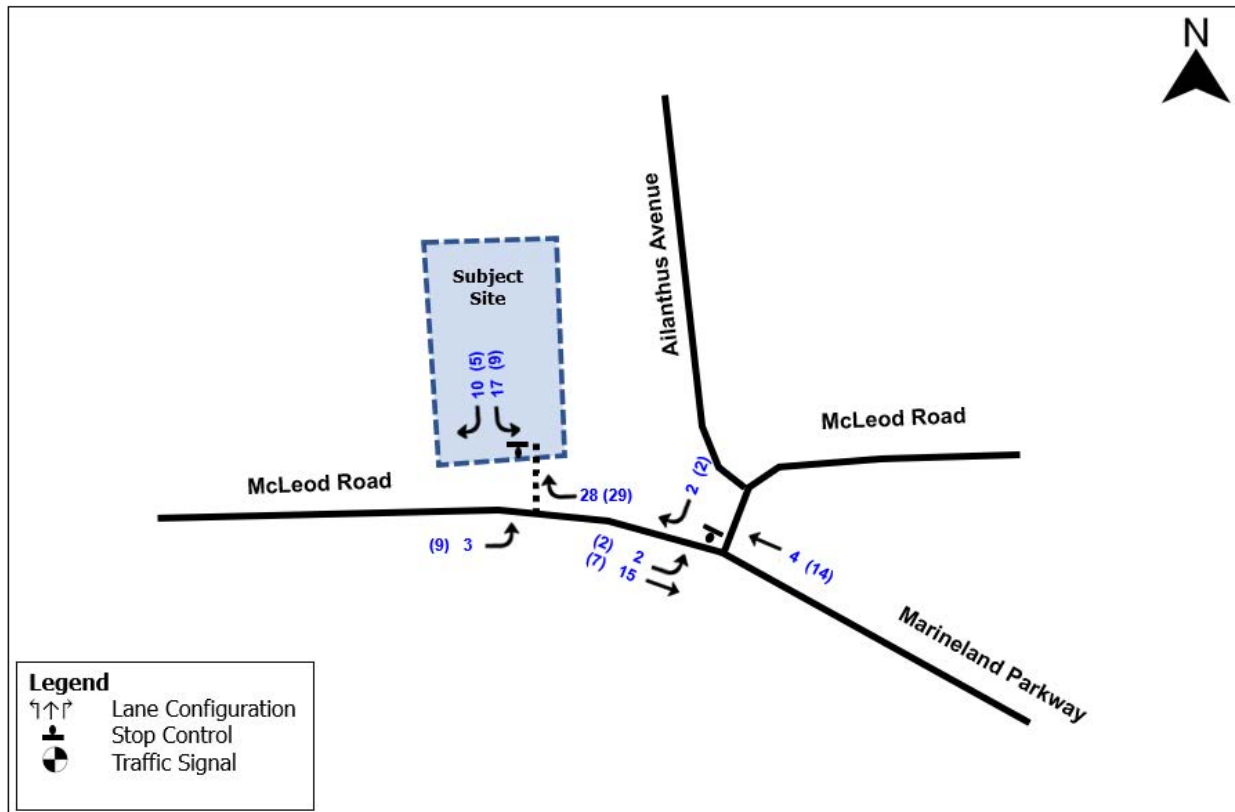
Table 3 Site Trip Distribution – PM Peak Hour

Direction		Trips				
		In	Out	Total	In	Out
East	McLeod Road/Marineland Pkwy	35%	55%	9	8	17
West		55%	35%	14	5	19
North	Ailanthus Avenue	5%	5%	1	1	2
		5%	5%	1	1	2
Total		100%	100%	25	14	39

5.3 Vehicle Trip Assignment

Based on the proposed access configuration and engineering judgement, the trips have been assigned to the road network for the proposed development accordingly. New site traffic volumes are illustrated in **Figure 8**.

Figure 8 New Site Traffic Volumes

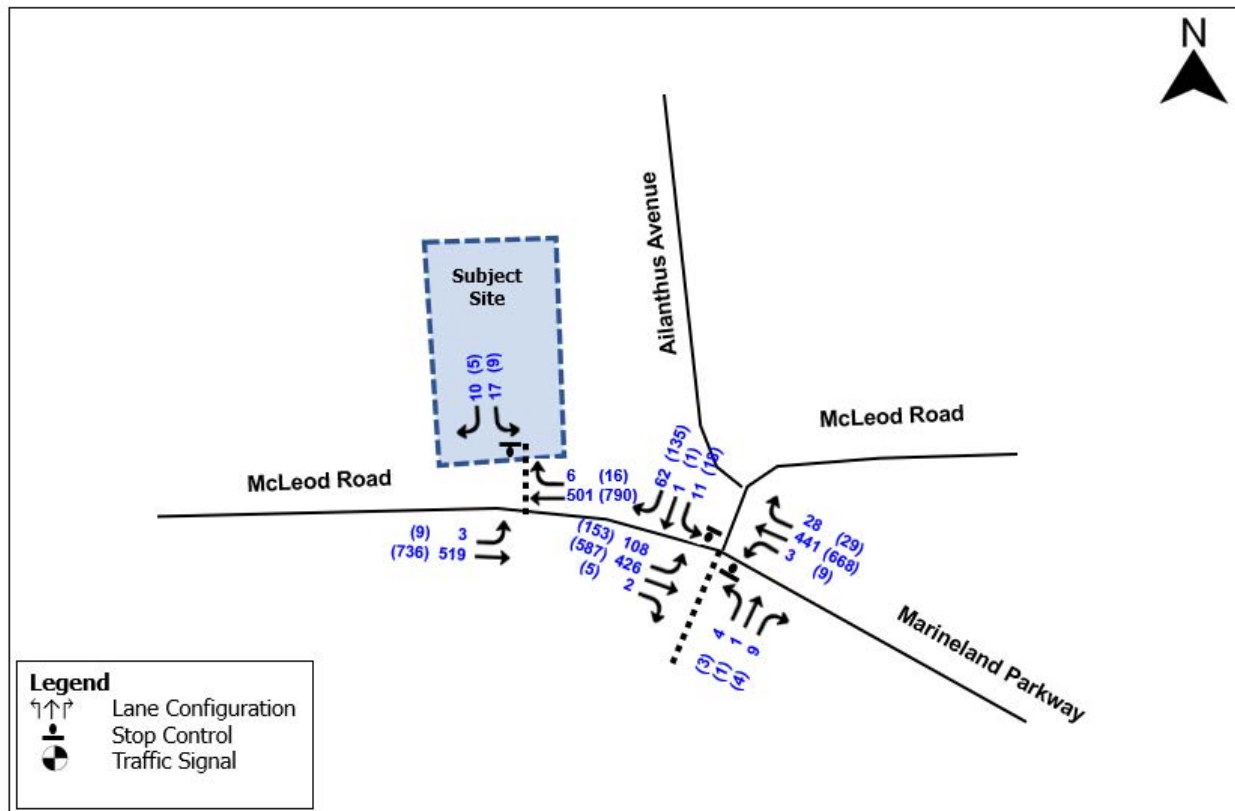


6.0 FUTURE TOTAL CONDITIONS

6.1 Future Total Traffic Volumes

Future total traffic volumes were established by adding site generated traffic to the future background traffic, and they are illustrated in **Figure 9**.

Figure 9 Future Total Traffic Volumes



7.0 OPERATION ANALYSIS

7.1 Analysis Methodology

Intersection capacity analyses contained in this study were undertaken using the Synchro software (Version 10), which is based on the methodologies and procedures outlined in the Highway Capacity Manual (HCM) 2000 published by the Transportation Research Board.

7.2 Analysis Summary

Table 4 and **Table 5** summarize the analysis results for existing, 2033 future background and 2033 future total traffic conditions. Detailed Synchro Analyses are provided in **Appendix D**. The Level of Service (LOS) definitions are provided in **Appendix E**.

Under all analysis scenarios, the study intersections are operating with acceptable delays and sufficient capacity. Under PM future total traffic conditions, the LOS is F and E for the NBL and SBL, respectively. However, the V/C ratios are low as well as the traffic volume.

Table 4 Intersection Analysis Summary – Weekday AM Peak Hour

Intersection	Movement	Existing Traffic Conditions				2033 Future Background Conditions				2033 Future Total Conditions			
		AM Peak Hour				AM Peak Hour				AM Peak Hour			
		V/C	Delays	Queue 95th (m)	LOS	V/C	Delays	Queue 95th (m)	LOS	V/C	Delays	Queue 95th (m)	LOS
McLeod Road & Marineland Parkway	NBL					0.028	28.7	0.1	D	0.029	29.9	0.1	D
	NBTR					0.021	12.0	0.1	B	0.021	12.1	0.1	B
	EBL	0.101	8.8	0.3	A	0.137	9.4	0.5	A	0.140	8.3	0.0	A
	WBLR					0.003	8.3	0.0	A	0.003	8.3	0.0	A
	SBL	0.147	12.8	0.5	B	0.256	17.5	1.0	C	0.264	17.7	1.0	C
McLeod Road & Proposed Site Driveway	EBL									0.003	8.6	0.0	A
	SBLR									0.056	12.3	0.2	B

Table 5 Intersection Analysis Summary – Weekday PM Peak Hour

Intersection	Movement	Existing Traffic Conditions				2033 Future Background Conditions				2033 Future Total Conditions			
		PM Peak Hour				PM Peak Hour				PM Peak Hour			
		V/C	Delays	Queue 95th (m)	LOS	V/C	Delays	Queue 95th (m)	LOS	V/C	Delays	Queue 95th (m)	LOS
McLeod Road & Marineland Parkway	NBL					0.060	75.9	0.2	F	0.064	80.4	0.2	F
	NBTR					0.027	23.5	0.1	C	0.028	24.2	0.1	C
	EBL	0.171	9.7	0.6	A	0.247	11.2	1.0	B	0.253	11.3	1.0	B
	WBLR					0.010	8.8	0.0	A	0.010	8.8	0.0	A
	SBL	0.397	20.1	1.9	C	0.642	38.7	4.0	E	0.670	41.9	4.4	E
McLeod Road & Proposed Site Driveway	EBL									0.013	9.8	0.0	A
	SBLR									0.073	23.7	0.2	C

8.0 SITE PARKING ASSESSMENT

This section reviews the parking requirement for vehicle users as outlined in the City’s Zoning By-law No. 79-200. The parking for the townhouses is proposed 29 surface parking spaces and 24 garage parking spaces. A total of 53 parking spaces allocated for the site.

8.1 Vehicle Parking Requirements

The proposed vehicle parking supply is compared with parking requirement as outlined in Town’s Zoning By-law No. 79-200, is shown below in **Table 6**.

Table 6 The City’s Zoning Vehicle Parking Requirement Summary

Land Use	Required Number of Parking Spaces			Provided Number of Parking Spaces
	By-law No. 79-200			
	Number of Units	Rate (spaces/unit)	Total	
Dwelling containing 3 or more dwelling units	43	1.40	60	53
Visitor Parking		N/A	0	0
Bicycle Parking	43	0.5	22	22
Total Vehicle Parking Spaces			60	53

The proposed vehicle parking supply of 53 parking spaces is less than the Town’s Zoning By-law requirements by 7 parking spaces, which represents a 1.23 parking spaces/unit.

The proposed bicycle parking supply has been provided near the site entrance and meet the Zoning By-law Requirements.

8.2 Justification for Parking Requirements

To assess whether the site can function with a reduced parking supply provided at rate 1.23 spaces per dwelling unit, the dwelling unit rates required by the City’s Zoning By-law of comparable municipalities in terms of auto reliance. The following Zoning B-laws listed below were reviewed, and their required parking rates for residents are shown below in **Table 7**.

- City of St. Catherines Zoning By-law 2013-283, as amended February 25, 2019.

- City of Welland New Comprehensive Zoning By-law 2017-17, as amended November 2, 2021.

Based on the above Zoning By-laws, we find the proposed parking supply for the subject site would meet or exceed the By-law requirements for these municipalities.

For example, the City of St. Catharines requires parking to be provided at a rate of 1.0 spaces per dwelling unit, which would be met by the proposed supply for Townhouse use but falls short by less than one (1) parking space for its requirements for Apartment use.

Similarly, the Zoning By-law requirements of the City of Welland would be met since the total supply of 1.0 spaces/unit is required.

Table 7 Parking Spaces Requirements in Comparable Municipalities

Municipality	Land Use (As defined in Municipality Zoning By-law)	Parking Requirements		Proposed Parking Supply
		Rate	Spaces	Spaces
City of St. Catharines	Townhouse (visitor parking is not required)	1.0	43	53
	Apartment (visitor parking is not required)	1.25	54	
City of Welland	Multiple Dwelling (visitor parking is not required)	1.0	43	

To confirm that these municipalities are in fact comparable in terms of auto reliance, the modal split data from the 2016 Transportation Tomorrow Survey (TTS) of these municipalities are similar as they all fall within the Regional Municipality of Niagara. These splits are shown in **Table 8**.

Table 8 Modal Split 2016 TTS Data

Municipality	Time Period	Driver	Passenger	Transit	GO Train	Walk & Cycle	Other	Total
Regional Municipality of Niagara (Niagara Falls, St. Catharines, Welland etc.)	6-9 am	74%	11%	2%	0%	5%	8%	100%
	24 hrs	76%	14%	2%	0%	4%	4%	100%

8.3 Potential Parking Strategy

Although the parking supply is found to be adequate for the subject site needs, additional parking strategies can be implemented, such as unbundled residential parking may also be implemented to further reduce the required parking supply. By proposing unbundled parking, residents have the option of renting a parking space for an additional fee or rendering a parking space if not needed.

Rather than providing each unit with a space, unbundled parking ensures that only those residents requiring a space have access to one; whereas residents who do not require a space save on their monthly rental costs.

Unbundled parking is considered a fair approach as only those requiring parking will pay for the space, rather than having the cost of parking shared to all residents regardless of use. This can reduce the total amount of parking required to support the needs of the development.

9.0 ON-SITE CIRCULATION

The assessment of operations and safety of the site accesses and drive aisles was reviewed using maneuvering diagrams. Access routes were assessed using AutoTURN 10.0 analysis depicting the swept path of vehicles in relation to the proposed driveway system utilizing the Transportation Association of Canada's (TAC) design vehicles.

The maneuvering diagrams showing the assessment for the molok garbage truck and passenger design vehicle is provided in **Appendix F**. As illustrated in the diagrams, adequate space is available for the molok garbage truck and passenger vehicle to circulate in the site and access egress to/from the proposed site access.

The subject site parking areas are well laid out for passenger vehicles to use the parking spaces at ease.

10.0 TRANSPORTATION DEMAND MANAGEMENT REVIEW

Transportation Demand Management (TDM) refers to a variety of strategies to reduce congestion, minimize the number of single-occupant vehicles, encourage non-auto modes of travel, and reduce vehicle dependency to create a sustainable transportation system. TDM strategies have multiple benefits including the following:

- Reduced auto-related emissions to improve air quality;
- Decreased traffic congestion to reduce travel time;
- Increased travel options for businesses and commuters; and
- Reduced personal transportation costs and energy consumptions.

The combined benefits listed above will assist in creating a more active and livable community through improvements to overall active transportation facilities for local businesses and the surrounding community.

Typical TDM measures include:

- Carpool/vanpool ride sharing, with emergency ride home;

- High-occupancy vehicle (HOV) lanes in existing rights-of-way for bus, taxis, and cars with three or more occupants.
- Bicycle and pedestrian programs.
- Promotion of public transit, including employer transit fare incentives.
- Parking supply and management strategies.
- Use of “smart card” technology and other advances in the pricing and marketing of transportation services.
- Establishment of Transportation Management Associations (TMAs) in employment areas and car-sharing organizations in residential areas.
- Programs to promote flexible working hours and telecommuting; and,
- Application of incident management systems and Intelligent Transportation System (ITS) innovations.

Development of site-specific TDM measures for the proposed site is based on a 2033 planning horizon. There, in the context that the primary objective is to reduce single-occupancy vehicle use, the plan will review opportunities to set realistic targets for increased use of carpooling, transit, cycling, and walking trips.

The Niagara Region Transit Bus Routes 112 and 206 current transit stops are located less than a 5-minute walk away from the subject site on McLeod Road and Ailanthus Avenue.

11.0 SUMMARY AND CONCLUSIONS

This Transportation Study, prepared for the proposed residential development at 5809, 5821, and 5829 McLeod, City of Niagara Falls, the Regional Municipality of Niagara, is summarized as follows:

- Based on the site plan prepared by Vanle Architect, dated May 25, 2023, the development proposal consists of 43 residential units in a 3.5-storey stacked townhouse dwellings located at 5809, 5821, and 5829 McLeod Road, City of Niagara Falls, the Regional Municipality of Niagara.
- The site is located on the north side of McLeod Road and access will be provided through full-moves access to McLeod Road.
- A second “out only” driveway is proposed to provide an exit for molok garbage truck. This driveway will be equipped with knock-off bollards and the necessary signage. The advantage of this driveway is to provide front in and front out movement for garbage pickup.

- Based on the Institute of Transportation Engineer (ITE) Trip Generation Manual, 11th Edition, the site is expected to generate approximately 36 (9 in and 27 out) and 39 (25 in and 14 out) two-way trips during the weekday AM and PM peak hours, respectively.
- The capacity analysis indicates that:
 - The proposed site access on McLeod Road is expected to operate acceptably with LOS's of C or better during the weekday AM and PM peak hours under future traffic conditions in horizon year 2033.
 - Site traffic is expected to have minimal impact to the nearby intersections. No road improvements or signal timing adjustments were identified as necessary.
 - The surrounding road network within the study area is expected to have sufficient traffic capacity up to the horizon of the year 2033 to accommodate the new traffic generated by the site.
 - The existing active transportation and transit levels of service are satisfactory.
- Based on the City of Niagara Zoning By-law No. 79-200, the site is required to provide a total of 60 auto parking spaces. The proposed parking supply is 53 parking spaces, which is a shortfall of 7 parking spaces required by the Zoning By-law.
- Our review of the Zoning By-law parking requirements of comparable municipalities indicates that the proposed parking supply of 53 parking spaces is expected to be sufficient in accommodating future parking demands at the subject site.
- Based on the City of Niagara Falls Zoning By-law, a total supply of 22 bicycle parking spaces is required for the site. The proposed bicycle parking supply has been provided near the site entrance and meet the Zoning By-law Requirements.
- The vehicle turning template analysis indicates that the design vehicles, such as molok garbage truck, and passenger vehicles, can properly ingress and egress from their respective areas at the site.
- Several TDM measure have been recommended to reduce single-occupant vehicle trips and encourage multi-modal travel options.

Based on the traffic analysis presented in this report, it is concluded that the existing road network has sufficient capacity to accommodate both the roadway growth and new traffic generated from the proposed development throughout the study horizon periods and no physical improvement s to the study intersections is required.

Appendix A

Pre-Consultation Comments

Planning and Development Services

1815 Sir Isaac Brock Way, Thorold, ON L2V 4T7
(905) 980-6000 Toll-free: 1-800-263-7215

Via Email

January 12, 2023

Region File: D.18.04.ZA-22-0106

Alexa Cooper
Planner 2
Planning, Building and Development
City of Niagara Falls
4310 Queen Street
Niagara Falls, ON, L2E 6X5

Dear Ms. Cooper:

**Re: Regional and Provincial Review Comments
Zoning By-law Amendment
City File: AM-2022-030
Owner / Applicant: Pathmanarhan Rajasingam
5809, 5821, and 5829 McLeod Road
City of Niagara Falls**

Regional Planning and Development Services staff has reviewed the submitted materials as they relate to the above noted Zoning By-law Amendment Application. The Region received its circulation from the City of Niagara Falls on December 22, 2022. The Application will facilitate the development the construction of 43 residential units in a mix of 3- and 4-storey stacked townhouse dwellings with a split between underground and surface parking area.

The subject lands are zoned 'Residential Low Density, Grouped Multiple Dwellings (R4) Zone' under the City's Comprehensive Zoning By-law No. 79-200. An Amendment to the City's Zoning By-law is required to rezone the lands as 'Residential Apartment 5C Density (R5C) Zone', with site-specific provisions to address deficiencies to lot area, side yard width, landscaped open space, maximum number of dwellings on one lot, and parking regulations, in order to permit the proposed development.

Regional staff has reviewed the proposed applications and is unable to confirm if the proposal is consistent with Provincial and Regional growth management policies until the time that revised materials are provided for review. Please see more detailed comments below.

A virtual pre-consultation meeting for this proposal occurred on July 13, 2021. The following comments are offered from a Provincial and Regional perspective to assist the City in its consideration of this Application.

Provincial and Regional Policies

The property is designated ‘Settlement Area’ under the *Provincial Policy Statement, 2020* (“PPS”), and designated ‘Delineated Built-up Area’ under *A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2020 Consolidation* (“Growth Plan”) and *Niagara Official Plan, 2022* (“NOP”).

Provincial and Regional policies support the intensification of land uses in urban areas where appropriate servicing and infrastructure exist and support the achievement of complete communities. PPS Policies 1.1.1 and 1.1.3.2 promote efficient development and land use patterns that sustain the financial well-being of municipalities over the long-term through minimizing servicing costs by ensuring that infrastructure is planned and available to meet current and projected needs. Additionally, Growth Plan Section 3.2.1 “Integrated Planning” sets out policy direction for coordinated and responsible infrastructure investment for long-range scenario-based land use planning, including the full life cycle costs of infrastructure and strategies to pay for these costs over the long-term.

The NOP promotes higher density development and development that contributes to the overall goal of providing a sufficient supply of housing that is affordable, accessible, and suited to the needs of a variety of households and income groups in Niagara. The proposed applications will assist the City in achieving its intensification target (50%) as set out in the NOP and would contribute to the diversification of housing supply (stacked townhouse dwellings) in Niagara.

Regional staff has reviewed the “*Planning Justification Report*” prepared by Vanle Architect Inc. (dated December 7, 2022) and observe that the Report omits a policy analysis of the NOP. Staff requires that the PJR be revised to include this analysis in order to demonstrate that all Provincial and Regional policies are met. Further, staff requests that the PJR be updated to include a summary of each of the supporting studies that were completed for the Application, as well as how the recommendations of these studies have been incorporated into the development concept design. Staff also requires that the updated PJR be signed by a Registered Professional Planner.

As the interface with surrounding land uses is primarily a local planning responsibility, the City should be satisfied that the proposed development is compatible with the surrounding local context and its built-form provides for a transition that is in harmony with nearby existing and planned land uses.

Land Use Compatibility

The subject lands are in proximity to several known stationary and transportation-related facilities that could pose the risk for adverse impacts to the proposed development. Staff acknowledge that the existing land use permissions for the property already allow for sensitive (residential) uses to occur as-of-right, and that the proposed Application will not introduce a new sensitive use to the site.

At the pre-consultation meeting, staff required the submission of a Noise Impact Study, as well as a Land Use Compatibility Analysis for review and to be completed in accordance with the Ministry of the Environment, Conservation and Parks' ("MECP") NPC-300 and D-6 Series Guidelines. These studies are necessary to assess potential adverse impacts from nearby transportation-related and stationary sources on the development, as well as to recommend any necessary mitigation measures through site / building design. Staff note that a Draft Noise Impact Study was received with the Application; however, a Land Use Compatibility Analysis was not provided.

Staff requires the submission of the outstanding Land Use Compatibility Analysis in order to demonstrate that the proposed development considers and addresses potential adverse impacts experienced from these nearby sources. The following considerations are requested as part of the analysis:

- A review of the Province's 'D-6 Compatibility between Industrial Facilities' Guideline, including justification as to how the proposed development meets the D-6 Guidelines with respect minimum separation distance requirements, or alternatively, the appropriateness of a reduced setback for the development, if applicable.
- An evaluation of existing and planned land use permissions within 1,000 m of the site, including the identification and classification any nearby Class I, Class II, and Class III facilities (i.e., Myer Salit Ltd., and Washington Mills Electro Minerals Corp.) and their associated operations and certificates. Please note that the above mentioned facilities are known to be Class III facilities in accordance with the D-6 Guidelines and will need to be evaluated as such within the analysis.
- The inclusion of any recommendations to address site / building design mitigation measures and/or warning clauses for future Agreements of Purchase and Sale or Lease or Rental.

Staff note that the Land Use Compatibility Analysis can be provided as part of the updated PJR or as a separate Study submission. It is requested that the analysis be submitted for review prior to City Council's decision on the Application.

Noise Impact Study

Regional staff have reviewed the "*Draft Road Traffic and Stationary Noise Impact Study*" prepared by Acoustic Engineering Ltd. (dated September 1, 2022). The Study's methodology provides an assessment of potential environmental noise impacts experienced from McLeod Road and nearby commercial uses. The Study concludes that mitigative measures, such as warning clauses and the requirement for central air conditioning in all dwelling units are necessary in order for the development to meet the MECP's sound level thresholds.

Regional staff generally concur with the recommendations of the Study; however upon review of its contents, requires that an updated Study be provided in order to address the following matters:

- That the methodology for the Study's Road Traffic Data Methodology be revised to utilize a 20-year forecast, instead of a 10-year forecast.
- That the Study provide for an assessment of potential adverse impacts from nearby Class III facilities, including Myer Salit Ltd. and Washington Mills Electro Minerals Corp., and that its recommendations be updated accordingly. Alternatively, that justification is provided as to why the potential impacts from these facilities were not included in the Study's assessment.
- In addition to 'Attachment A', that a separate Attachment be provided that indicates the Points of Reception ("PORs") that were assessed for each development block.
- That the Study and/or 'Attachment D' clarify the reference dates and time periods that stationary sources were assessed.
- That the re-submitted Study be marked as 'Final' and stamped by a Qualified Professional.

Staff request that the Study be revised to address the above listed matters and re-submitted for review prior to City Council's decision on the Application. A Peer Review at the Applicant's cost may be requested for the updated Study, which will be determined upon its resubmission.

Urban Design

Regional Urban Design staff have reviewed the PJR and Landscape Plan and offer no feedback at this time. The Applicant is advised that staff will request for a more detailed information with regards to the proposed landscape design and interface of the development with the McLeod Road at the time of future Site Plan stage. A minor urban design review fee will be required at the time of the Site Plan Application submission.

Regional Road

Regional Engineering staff have reviewed the Engineering Plans that were provided with the Application and offer detailed comments on the Plans in Appendix 1. Further, future submissions of the Plans will also need to show all abutting entrances, as well as any entrances across the street. The detailed comments that are provided in Appendix 1 can be addressed at the time of the future Site Plan Application.

For information, the Applicant is advised that there are future capital projects planned for the reconstruction of McLeod Road (Regional Road 49). This section of McLeod Road (from Wilson Crescent to Stanley Avenue [Regional Road 102]) is expected to begin its design phase in 2024, with construction anticipated in 2027. The timing of this project may be subject to change until the applicable annual budget is approved.

Regional Road Allowance

Be advised that the current Regional Road width at this section of McLeod Road meets the policy requirement as set out in the NOP. Therefore, no road widening is required for the proposed development.

Regional Permit Requirements

The proposed development will necessitate future construction works within the Regional Road Allowance consisting of site servicing and entrance construction. Prior to any construction taking place within the Regional Road Allowance, the Applicant will be required to obtain the necessary Regional Construction Encroachment and Entrance Permits from Niagara Region's Transportation Services Division, Public Works Department. Construction specifications and restoration requirements will be outlined through the Regional Road Permit process. Further, any signage proposed within 20 m of the centreline of the Regional Road Allowance will require a Regional Sign Permit.

Permit Applications can be submitted online through the Region's website at: <http://niagararegion.ca/living/roads/permits/default.aspx>.

General Servicing

The municipal servicing for this site is under the jurisdiction of the City of Niagara Falls.

Regional Sewage Pumping Station

The proposed development is captured within the South Side High Lift Sewage Pumping Station ("SPS") sewershed. The Regional staff has reviewed the Region's *Master Servicing Plan, 2016* ("MSP") and offers the following comments:

- The South Side High Lift SPS sewershed has been allocated growth to 2041 in consultation and collaboration with the City of Niagara Falls. The MSP was completed at a high-level and did not allocate capacities to individual properties.
- The current operational firm capacity of the South Side High Lift SPS is 760 L/s. The MSP has identified that the existing design peak wet weather is close to the capacity of the station, and the projected 2041 design peak wet weather flow will exceed the current capacity.
- The MSP identified that the sanitary sewer sheds for the South Side High Lift SPS, which services South Niagara Falls, will develop constraints for wet weather flows. Therefore, there is limited wet weather servicing capacity available. The MSP has identified the need for a new South Niagara Falls Wastewater Treatment Plant ("WWTP") to accommodate anticipated future growth in South Niagara Falls, which is estimated to be under construction by 2024 pending budget approval. The Environmental Assessment for this new WWTP commenced in 2018. A wet weather flow reduction program for South Niagara Falls was identified in the MSP. The Region and City are working together on a servicing strategy and wet weather, inflow and infiltration reduction

program to identify some mitigation measures in order to accommodate some development in the interim before the new South Niagara Falls WWTP is in service.

- The MSP is available online at: <http://www.niagararegion.ca/2041/master-servicing-plan/default.aspx>.

The Region's MSP identified required upgrades to the south Niagara Falls wastewater infrastructure, which included the planned decommissioning of the existing Southside High Lift SPS, with flows to be conveyed directly to the new WWTP via new gravity trunk sewer. The Environmental Assessment for the new South Niagara Falls WWTP and servicing solutions is expected to be complete by mid-2022.

More information on the future South Niagara Falls Wastewater projects is online at: <https://www.niagararegion.ca/projects/south-niagara-falls-treatment-plant/default.aspx>.

Stormwater Management

At the time of future Site Plan Application, the Region will require the submission of a Stormwater Management Brief (with review fee) that indicates in detail how the development's stormwater will be accommodated without negative water quality and quantity impacts on McLeod Road (Regional Road 49).

Waste Collection

The Region provides curbside waste and recycling collection for developments that meet the requirements of Niagara Region's Corporate Waste Collection Policy. The proposed development is eligible to receive Regional curbside waste and recycling collection provided that the Owners bring the waste and recycling to the curbside on the designated pick up day, and that the following curbside limits are met:

Residential - Stacked Townhouse Dwellings:

- Recycling blue / grey containers – no limit (collected weekly).
- Organics green containers – no limit (collected weekly).
- Garbage bags / cans – 2 maximum per unit to maximum of 24 (collected every-other-week).

Regional staff have reviewed the Concept Plan for the proposed development and note that Molocks are proposed as the waste collection method on-site. The Applicant is advised that Molock collection is currently not provided through the Region. If the site is unable to comply with the requirements of Niagara Region's Corporate Waste Collection Policy, then waste collection services would be the responsibility of the Owner through a private waste collection contractor and not the Niagara Region. Notwithstanding the above comments the site remains eligible for Regional curbside recycling and green bin collection.

Regional Bicycle Network

The subject property has frontage on McLeod Road, which is designated as part of the Regional Niagara Bicycling Network. If the bicycle routes are currently not established and identified with signage, it is the intent of the Region to make provisions for doing so when an appropriate opportunity arises. This may involve additional pavement width, elimination of on-street parking, as well as other modifications.

Protection of Survey Evidence

The Applicant is advised that survey evidence adjacent to Regional Road Allowances shall not to be damaged or removed during the future development of the property.

Conclusion

Regional Planning and Development Services staff is unable to confirm at this time whether the proposed Zoning By-law Amendment Application is consistent with the PPS and conforms to Provincial and Regional growth management policies until the required revised materials have been provided for review as outlined above. Specifically, these materials include an updated Planning Justification Report, the submission of a Land Use Compatibility Analysis, and a revised Noise Impact Study.

City staff should also be satisfied that the proposed development aligns with the existing and planned local urban fabric, and that the development can be feasibly accommodated within local municipal infrastructure servicing capacities. Should City Council proceed with considering these applications as provided, it is recommended that a Holding provision be utilized on the amending by-law to ensure that outstanding matters with respect to land use compatibility are adequately considered and addressed prior to the development proceeding.

Should you have any questions related to the above comments, please contact the undersigned at Alexander.Morrison@niagararegion.ca, or Manager of Development Planning, Pat Busnello, at Pat.Busnello@niagararegion.ca.

Respectfully,



Alexander Morrison, MCIP, RPP
Senior Development Planner, Niagara Region

cc: Pat Busnello, Manager, Development Planning, Niagara Region
Khaldoon Ahmad, Manager, Urban Design, Niagara Region
Susan Dunsmore, Manager, Development Engineering, Niagara Region
Maggie Ding, Stormwater Management Engineer, Niagara Region

Appendix 1: Regional Transportation Engineering Staff – Detailed Comments on Servicing Plan
(Provided as a separate attachment to email)

City of Niagara Falls Pre-Consultation Checklist

(Revised: February 2014)

Persons intending to make an application for a proposed development are required to consult with planning staff prior to submitting an application. A pre-consultation meeting will identify what is required to be submitted for a complete application and will provide the opportunity to discuss:

Please sign page 4 when submitting formal application and date it.

- the nature of the application;
- development and planning issues;
- fees;
- the need for information and/or reports to be submitted with the application;
- the planning approval process;
- other matters, as determined.

Pre-consultation Meeting		
Date: <u>may 19, 2022</u>	Time: <u>3pm</u>	
Attendance:		
Municipal Staff	Owner/Agent/Other	Phone #/E-mail
<u>Danaha - Is, John-transportation</u>	<u>Tom Vanle - Agent</u>	
<u>Justin Smith - Building</u>	<u>416-467-4667</u>	
<u>Eric Lehtinen - Eng.</u>	<u>info@vanle.ca</u>	
<u>Josiah Jordan - Eng.</u>		<u>416-509-0981 or</u>
<u>Cheryl Selig - Region</u>	<u>owner - 1959064 ON, Inc.</u>	<u>647-938-9424</u>
<u>Anthony LaSelva - Region</u> <u>mich</u>		
<p>Pursuant to Section 4 of By-law No. 2009-170 being a by-law to require pre-consultation for certain applications under the Planning Act, the Director of Planning, Building & Development may waive the requirement for a formal consultation meeting. I hereby waive the requirement for a formal consultation meeting on the proposal detailed herein.</p> <p>Date: _____</p> <p>Signature: _____</p>		

Property Details	
Location of property:	(address) <u>5809/5821/5829 McLeod Road</u>
	(legal description) <u>Lot 27 Part lot 26, Registered Plan 67</u>
Area (ha): <u>0.42 ha</u>	Frontage (m): <u>50.31m</u>
Site Drawing Attached <input checked="" type="checkbox"/>	
Municipal land involved: No <input type="checkbox"/> Yes <input type="checkbox"/> (legal description)	

Proposal			
Brief description of proposal: <u>Applicant to rezone R4 to R5C to permit a proposed 44 unit stacked</u>			
	1 st Phase	2 nd Phase	Other
gross floor area			
building height			
# of dwelling/hotel/commercial units	<u>44 units</u>		

Location				
<input type="checkbox"/> Brownfield	<input type="checkbox"/> Greenfield	<input checked="" type="checkbox"/> Built-up	<input type="checkbox"/> NEP	<input type="checkbox"/> Outside Urban Boundary

Designations		Conformity
Regional Policy Plan	Urban Area (Built Up)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Niagara Escarpment Plan		<input type="checkbox"/> Yes <input type="checkbox"/> No
Official Plan Designation	Residential	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Secondary Plan		<input type="checkbox"/> Yes <input type="checkbox"/> No
Zoning	Rezone - R4 to R5C	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Proposed Application(s) (check all applicable)		
<input type="checkbox"/> Regional Policy Plan Amendment	<input checked="" type="checkbox"/> Zoning By-law Amendment	<input type="checkbox"/> Land Division
<input type="checkbox"/> Niagara Escarpment Commission o Amendment o Development Permit	<input type="checkbox"/> Subdivision Approval	<input type="checkbox"/> Condominium Approval o Vacant Land o Common Element o Conversion
<input type="checkbox"/> Official Plan Amendment	<input type="checkbox"/> Site Plan Approval	

Required Information and Studies to be submitted with the Application(s). Studies identified with an asterisk* will likely require a peer review at the cost of the developer.

Local	Region	NPCA	Reports, Studies, Plans (See Notes for additional details)	Number of		Notes
				Elect Digital	Paper	
			Agricultural Impact Assessment			
			Air Quality			
			Archaeology Assessment			
			Conceptual Site Plan, Subdivision Plan			
			Cultural Heritage Impact Analysis			
			Draft Local Official Plan Amendment			
			Draft Regional Policy Plan Amendment			
			Environmental Impact Study			
			Environmental Planning Study/Sub-Watershed Study			
			Environmental Site Assessment/Record of Site Condition			
			Farm Operation and Ownership			
			Financial Impact Assessment			
			Floodplain and Hazard Lands Boundary Plan			
			Gas Well Study/Gas Migration Study			
			Geotechnical			
			Hydrogeological Study and Private Servicing Plans			
			Land Use/Market Needs*			
			Mineral Aggregate Resources			
			Minimum Distance Separation 1 & 11			
			Municipal Servicing Study			
X	X		Noise & Vibration Study			
X	X		Other - Functional Servicing Plan - showing turning radius for garbage collection - meters			
X	X		Phasing Plan			
X	X		Planning Justification Report			
			Risk Management Study			
			Road Widenings			

			Sensitive Land Use Report			
			Shadow Analysis			
			Shoreline Study			
			Slope Stability Report			
			Soil Report			
X	X		Stormwater Management Plan			(brief-swmm.)
			Transportation Impact Study/Parking Impact Analysis			
			Tree inventory Preservation Plan			
			Urban Design Brief/Architectural Brief			
			Urban Design/Landscape Plans			
			Wind Study			

Public Consultation

Is a neighbourhood pre-consultation meeting planned?

(Note: One is required to be held by the City prior to the public meeting required by the Planning Act for subdivisions, condo conversions, official plan amendments and zoning by-law amendments.)

- Yes
 No
 Unknown

Other Issues

- John-molek identify - parking - justification - turning radius for molek.
- Justin- Geotechnical, spatial separation - OBC matrix - Part 9 or Part 3. - Reviewed project under Part 9 - under 3 storey - 600 sq.m. - less than 1.8m (average grade).
- Josiah - city's Eng-FSR - Swm brief - adequate to service site
- Danaka - demo permits - site plan stage brief to registering.
- Niagara Region - urban design - Block-Regional Road, units facing the road - increasing landscape - 2 metres in the front
- Noise Impact Study - with proper warning clauses

Site Visit

Is a site visit necessary to assess the proposal?

- Yes
 No

Does the owner consent to a site visit?

- Yes
 No

Incentive Program

Are there any incentive programs?

- Yes
 No

What are the details?

Summary of Issues

- Entrances to be reinstated with curb. Transportation site line analysis.
- serving - local services - FSR Report - dry/wet weather flows Swm Brief - no negative import quantity - quantity
- waste collection - curb site 2 bags - maximum 24. No Niagara Region for molek.

* Note comments based on pre-con meeting. Revised plan that was reviewed after the meeting should be provided formal subm 3/15/17

Additional Agencies to be contacted

- HYDRO PIPELINES NEC OTHER _____
- MTO NPC NPCA CN

Notes

1. The purpose of the pre-consultation is to identify the information required to commence processing of this development application. Pre-consultation does not imply or suggest any decision whatsoever on behalf of City staff or the City of Niagara Falls to either support or refuse the application. This checklist should not be construed as a complete list of information required as further assessment may reveal the need for more information.
2. This pre-consultation form expires within (180) days from the date of signing or at the discretion of the Director of Planning & Development
3. An application submitted without the information identified through the pre-consultation process may not be sufficient to properly assess the application and may be deemed by staff to be an incomplete application.
4. The applicant should be aware that the information provided is accurate as of the date of the pre-consultation meeting. Should an application not be submitted in the near future, and should other policies, by-laws or procedures be approved by the Province, City, Region or other agencies prior to the submission of a formal application, the applicant will be subject to any new policies, by-laws or procedures that are in effect at the time of the submission of a formal application.
5. The applicant acknowledges that the City and Region considers the application forms and all supporting materials including studies and drawings, filed with any application to be public information and to form part of the public record. With the filing of an application, the applicant consents and hereby confirms that the consent of the authors of all supporting reports have been obtained, to permit the City and Region to release the application and any supporting materials either for its own use in processing the application, or at the request of a third party, without further notification to, or permission from, the applicant.
6. It is hereby understood that during the review of the application additional studies or information may be required as a result of issues arising during the processing of the application or the review of the submitted studies.
7. If the City or Region does not have sufficient expertise to review and determine that a study is acceptable, the City may require a peer review. The Terms of Reference for a peer review is determined by the City or Region and paid for by the applicant.
8. Some studies may require NPCA review and clearance/approval. In this instance the NPCA review fee shall be paid by the applicant.
9. All plans and statistics must be submitted in metric.
10. By signing this document the Owner/Agent/Applicant acknowledges that they have been informed of the application process, anticipated timing, public notification and steps to be followed for the development discussed at this meeting.
11. A copy of this pre-consultation checklist has been provided to the applicant/agent Yes

Note: Upon submission, the City will review all submitted plans, studies, etc. to ensure the information is sufficient before declaring the application complete. This will occur within 30 days.

Signatures

Name (print)	Signature	Date
Planning Staff <i>NDeBenedetti</i>	<i>NDeBenedetti</i>	<i>May 20, 2022</i>
Regional Public Works Staff		
Regional Planning Staff		
NPCA Staff		
Agent		
Agent		
Owner		
Owner		
Other		

Pursuant to Section 1 of By-law No. 2008-189, being a by-law to require pre-consultation for certain applications under the Planning Act, I hereby verify that a pre-consultation meeting has been held for the proposed detailed herein.

Signature



**PLANNING & DEVELOPMENT DIVISION
APPLICABLE FEES**

CHECK APPLICABLE BOX	APPLICATION	FEES
<input type="checkbox"/>	Official Plan Amendment Application:	12,200.00
	Zoning Amendment Application:	
<input type="checkbox"/>	• for high-rise hotels	14,500.00
<input type="checkbox"/>	• complex	12,200.00
<input checked="" type="checkbox"/>	• standard	5,600.00
	<i>\$5,800.00 - \$500.00 = Total \$5,300.00</i>	<i>5,800.00</i>
	Official Plan and Zoning Amendment Application (combined):	
<input type="checkbox"/>	• for high-rise hotels	16,200.00
<input type="checkbox"/>	• all other lands	13,500.00
	<i>cheque made to City of Niagara Falls</i>	
	Site Plan Application:	
<input type="checkbox"/>	• for high-rise hotels	6,000.00
<input type="checkbox"/>	• all other lands (including Testamentary Devise)	4,000.00
<input type="checkbox"/>	• Amendment to Site Plan Agreement	1,500.00
	Plan of Subdivision Application:	
<input type="checkbox"/>	• Residential Plan	13,500.00
<input type="checkbox"/>	• Modifications to Draft Plan Approval	2,500.00
<input type="checkbox"/>	• Extension to Draft Plan Approval	1,000.00
	Plan of Condominium:	
<input type="checkbox"/>	• Vacant Land	10,000.00
<input type="checkbox"/>	• Conversion	2,500.00
<input type="checkbox"/>	• Standard	1,500.00
<input type="checkbox"/>	• Extension of Draft Plan	1,000.00
<input type="checkbox"/>	• Modification of Draft Plan - Vacant Land Condo	2,500.00
<input type="checkbox"/>	• Modification of Draft Plan - Standard/Conversion	1,225.00
	Removal of Part Lot Control:	
<input type="checkbox"/>	• Separation of Semi-detached/On-street Townhouse Units	1,500.00
<input type="checkbox"/>	• Deeming By-law	1,500.00
<input type="checkbox"/>	• Property Relotting	3,400.00
	Public Renotification:	
<input type="checkbox"/>	• Mailing Renotification	300.00
<input type="checkbox"/>	• Reassessment Requiring a further report	400.00
<input type="checkbox"/>	• Newspaper Renotification (\$600 deposit payable with application)	Actual Cost
	Committee of Adjustment:	
<input type="checkbox"/>	• Severance/Consent Application	3,400.00
<input type="checkbox"/>	• Change of Conditions	200.00
<input type="checkbox"/>	• Minor Variance Application	2,100.00
<input type="checkbox"/>	• Renotification/Rescheduling (Consent/Minor Variance)	200.00

ADDITIONAL FEES:

City Fees (cheque payable to the City of Niagara Falls):

- Peer Review \$ _____
- Legal Fees \$ _____ (Agreements & Registration of by-law)

Agency Fees (cheques payable to applicable agency):

- Regional Fees \$ *1,345.00 - cheque made to Niagara Region*
- NPCA Fees \$ _____
- Regional Health \$ _____
- Other (describe) \$ _____

Nick DeBenedetti

From: Selig, Cheryl <Cheryl.Selig@niagararegion.ca>
Sent: Friday, May 20, 2022 10:24 AM
To: Alexa Cooper; Nick DeBenedetti; Julie Hannah
Cc: LaSelva, Anthony; Alguire, Robert
Subject: [EXTERNAL]-Niagara Region Pre-Consultation Notes_May 19th
Attachments: 1. Regional Preconsultation Notes - Kalar and Pin Oak.docx; 2. Regional Preconsultation Notes - 6313 Montrose Road.docx; 3. Regional Preconsultation Notes -5809-5829 McLeod Road.docx; 4. Regional Preconsultation Notes - 7085 Morrison Street.docx; 5. Regional Preconsultation Notes - 2440 Miller Rd (Written Only).docx

Hi All,

Please see attached the pre-consultation notes from yesterday. Let me know if you have any questions or concerns about any of the information in the attached.

Thanks and have a great long weekend,
Cheryl

Cheryl Selig, MCIP, RPP

Acting Manager
Development Planning
Niagara Region
Cell: 289-241-8345
www.niagararegion.ca

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**5809-5829 McLeod Road
Niagara Region Pre-consultation Comments**

Meeting Date:	May 19, 2022
Name of Applicant(s):	1959064 Ontario Inc
Consultant(s):	Tom Vanle (Agent), Nathan (Architect), Sornalingam (Owner)
Local/Regional Staff:	Nick DeBenedetti (City), Josiah Jordan (City), John Grubich (City), Justin Smith (City), Danaka Kimber (City), Michael Warchala (City), Cheryl Selig (Region), Anthony LaSelva (Region)
Proposed Development:	Proposed zoning by-law amendment to facilitate the development of 44 stacked townhouse units.

Regional Review Fees

Zoning By-law Amendment	\$1,345
Site Plan Review	\$1,345
Stormwater Management Review	\$650
Major Urban Design Review	\$640

Reports/Studies Required for Regional Review:

Noise Impact Study Stormwater Management Brief Planning Justification Report
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Site Designation:

Provincial Policy Statement (PPS):	Settlement Area
Greenbelt Plan:	NA
Growth Plan:	Delineated Built-Up Area
Niagara Escarpment Plan (NEP):	NA
Regional Official Plan (ROP):	Urban Area (Built-Up)

Planning

- Regional staff do not object to the proposal in principle, as intensification is encouraged within Provincial and Regional urban area policies.
- The proposal will contribute to the City's intensification target as set out within the ROP, as well as will make better use of existing serviced urban lands.

Urban Design

The proposed site configuration of town houses around an amenity space is good practice. It is suggested that the block of units nearest to the Regional Road should be oriented to address the Regional road. Consider placement of the block closer to the Regional Road with the surface parking area located to the side or rear of the development. The at grade garages that face the regional road replaced with units that face the road. Alternatively, if surface parking spaces are to remain, consider shifting these to create a landscape area of at least 2.0m to provide room for a low decorative walls and planting of shrubs and trees so as to provide sufficient visual screening of the parking area.

- Landscape plan demonstrating an enhance landscape interface between the proposal and the Regional Road
- Architectural facades facing the Regional Road.

Land Use Compatibility

- The proposal will establish multiple residential units that are located in close proximity to a Regional Road. As such, a Noise Impact Study is required for the applications that should provide recommendations for site / building mitigation measures (if any) as well as any warning clauses that are necessary for the proposed development.

Engineering

Roads

- Regional- McLeod Road (RR 49)
- Current road width at this section of McLeod Road meets the recommended requirement therefore no road widening is required.
- The future Site Plan will need to show the entire boulevard along McLeod Road.
- The plan will need to show all abutting entrances as well as any entrances across the street. Any existing entrances not being used are to be reinstated with curb and boulevard and identified on the future plans. Plan should also show the future lane configuration provided in the McLeod road EA documents.
- Entrance width is to meet OPSD, TAC or City Standards.
- Sight line analysis is to be completed for the proposed entrance location due to the curvature in McLeod Road.
- Region staff wish to advise the applicant that there are future capital projects planned for the reconstruction of Regional Road 49 (McLeod Road). This section of Regional Road 49 (McLeod Road), from Wilson Crescent to Regional Road

102 (Stanley Avenue), is currently expected to begin design in 2024 with construction anticipated in 2027. Please note that timing of the project is not guaranteed until that year's annual budget is approved.

Servicing

- Local water, sanitary and storm services available from McLeod Road.
- No nearby Regional infrastructure.
- A Functional Servicing Report should be submitted outlining the expected dry and wet weather flows for the proposed development.
- The proposed development falls within the South Side High Lift Sewage Pumping Station (SPS) sewershed. Based on the 2016 Master Servicing Plan (MSP) the Region provides the following comments:
 - This site falls within the South Side High Lift SPS sewershed. This sewershed has been allocated growth out to 2041 in consultation and collaboration with the City of Niagara Falls. The study was completed at a high level and did not allocate capacities to individual properties.
 - The current operational firm capacity of the South Side High Lift SPS is 760.0 L/s. The MSP has identified the existing design peak wet weather is close to the capacity of the station and the projected 2041 design peak wet weather flow will exceed the current capacity.
 - The MSP did note that the combination of this sewershed and the other SPS sewersheds contributing to the South Side High Lift SPS will develop constraints during wet weather events.
 - The MSP has identified the need for a new South Niagara Falls Wastewater Treatment Plant (WWTP) to accommodate anticipated future growth in South Niagara Falls which is anticipated to be in service by 2028.
 - Therefore, no upgrades were planned for the South Side High Lift SPS; however, a wet weather flow reduction program for South Niagara Falls was identified in the MSP. The Region and City are working together on a South NFLS Servicing Strategy and wet weather/Inflow & Infiltration reduction program to accommodate some development in the interim before the new South Niagara Falls WWTP is in service.
 - The MSP can be found at the following link:
 - <http://www.niagararegion.ca/2041/master-servicing-plan/default.aspx>

Stormwater Management

- a) Niagara Region will require that a stormwater management brief be submitted to this office indicating in details McLeod Road (Regional Road 49) will not be negatively impacted as a result of the development in terms of stormwater quality and quantity.
- b) The Region normally requires post-development flows be controlled to pre-development level for all storms (2-year up to and including the 100-year storm) if a development will discharge onto a Regional Road.
- c) Stormwater runoff from paved areas should be captured and treated to a Normal standard prior to discharge from the site.

- d) Prior to construction, Niagara Region will require that detailed grading, storm servicing, stormwater management, and construction sediment control drawings be submitted to this office for review and approval.

Waste Collection

- Recycling: No Limit Blue/Grey Carts Collected Weekly;
- Organics: No Limit Green Carts Collected Weekly (by request only);
- Garbage: 2 Bags/Cans per Unit to Maximum of 24 Bags/Cans Collected Every-Other-Week.
- Curbside collection only
- Region staff note that the proposed Molok waste bins shown on the concept plan would require collection from a private waste collection contractor and not the Niagara Region.

Zoning
Comments

Nick DeBenedetti

From: Sue Scerbo
Sent: Thursday, May 19, 2022 12:50 PM
To: Nick DeBenedetti
Subject: 5809-5829 McLeod Road Preconsultation Zoning Comments
Attachments: Zoning Comments.pdf

Hi Nick,

Please find my zoning comments attached.

*Susan Scerbo
Senior Zoning Administrator
City of Niagara Falls
Planning, Building & Development
4310 Queen Street
Niagara Falls, ON L2E 6X5
905-356-7521 ext. 4296*

Inter-Departmental Memo

To: Nick DeBenedetti, Planner 2
From: Sue Scerbo, Senior Zoning Administrator
Date: May 19, 2022
Re: **Proposed Zoning By-law Amendment**
5829, 5821 and 5809 McLeod Road
Proposed 44 unit stacked townhouse development

Summary:

The applicant is proposing to construct three stacked townhouse dwellings (apartment dwellings), containing a total of 44 dwelling units.

The subject property is currently zoned Residential Low Density Grouped Multiple Dwellings (R4), in accordance with Zoning By-law 79-200, as amended. The applicant is proposing to rezone the property to a site specific Residential Apartment 5C Density Zone (R5C) Zone to facilitate the proposed development.

The following table compares the regulations of the R5C zone with what is proposed:

Provision	Requirement	Proposal	Comply
Minimum lot area	100 square metres for each dwelling unit 100 sq.m. x 44 units = 4400 square metres	96.32 square metres for each dwelling unit 96.32 sq.m. x 44 = 4238.2 square metres	No Please confirm if this is after the road widening
Minimum lot frontage	30 metres	50.31 metres	Yes
Minimum front yard depth	7.5 metres + 15.25 metres from the original centerline of McLeod Road	12.59 metres + 14.89 metres from the original centerline of McLeod Road	Yes A road widening is required
Minimum rear yard depth	One-half the height of the building or 10 metres, whichever is greater	14.17 metres	Yes
Minimum interior side yard width	One-half the height of the building	5 metres 10.24 metres	No Yes

	13.5 metres/2 = 6.75 metres		
Minimum exterior side yard width	7.5 metres	n/a	n/a
Maximum lot coverage	30%	25%	Yes
Maximum height of building or structure	19 metres	13.5 metres	Yes
Number of apartment dwellings on one lot	1 only	3	No
Parking and access requirements	In accordance with section 4.19.1 1.4 parking spaces for each dwelling unit 1.4 x 44 dwelling units = 61.6 parking spaces	1.3 parking spaces for each dwelling unit 1.3 x 44 dwelling units = 57 parking spaces	No
Minimum parking stall width	2.75 metres 3 metres (parallel)	2.75 metres 3 metres (parallel)	Yes Yes
Minimum parking stall length	6 metres 6.7 metres (parallel)	6 metres 7 metres (parallel)	Yes Yes
Minimum manoeuvring aisle	6.3 metres 3 metres (parallel)	6.3 metres 6.3 metres (parallel)	Yes Yes
Accessory buildings and accessory structures	In accordance with sections 4.13 and 4.14	n/a	n/a
Minimum Landscaped Open Space Area	40% of the lot area	20% of the lot area	No
Parking in a front yard	Requires a decorative wall or landscaped berm 1 metre above the average level of the parking area in such front yard in accordance with section 4.194(c)	Not illustrated	Information required

A Great City ... For Generations To Come

Projection of balconies	1.8 metres into a required front yard and rear yard	Balconies do not project into the required front or rear yard	Yes
	0.45 metres into a required side yard	1.6 metres into the required side yard	No

Comments:

- Additional information is required as noted above to ensure zoning compliance.

SS

S:\PRECONSULTATION\2022\MAY 19\MCLEOD ROAD 5809-5829\ZONING COMMENTS.docx

IS
Comments

Nick DeBenedetti

From: Danaka Kimber
Sent: Thursday, May 19, 2022 3:19 PM
To: Nick DeBenedetti
Cc: GISRequest
Subject: Pre-Con Meeting - May 19 - 5809-5829 McLeod Rd

Hi Nick,

Just my official notation of comment in the meeting.

The three original addresses will be retired upon completion of the demo permits (5829 has already occurred).
A new single address with units will be issued during the site plan/condo process.
We would appreciate a full unit drawing before the registration of the site plan.
And as usual, I forgot to ask if this project will go to a standard condo plan in the near future.

Cheers,

Danaka Kimber BES, GISP | G.I.S. Senior Project Analyst | Information Systems | City of Niagara Falls
4343 Morrison St | Niagara Falls, ON L2E 6Z9 | (905) 356-7521 ext 4014 | Fax 905-374-2880 | dkimber@niagarafalls.ca

Nick DeBenedetti

Subject: FW: Niagara Falls Preconsultation Meeting - May 19

Nick

Municipal Works – Transportation comments on these preliminary applications:

1. 5809, 5819 & 5829 McLeod Road (44 Stacked Townhomes) – Zoning

McLeod Road next to the site is a Regional road. Regional Staff to comment on the proposed driveway.

A 44-unit stacked townhouse development requires 61 parking spaces, at a rate of 1.4 parking spaces per unit. There are 57 parking spaces noted (33 surface + 24 garage) at a rate of 1.30 parking spaces per unit. Staff can support this rate given that the site is alongside a transit route; the applicant is requested to provide a statement/rationale in their planning report on this.

The minimum number of accessible parking spaces is based on the parking lot capacity. A parking area having 33 parking spaces requires a minimum of two (2) accessible parking spaces and this is determined through the following formula for parking lots between 13 – 100 parking spaces: 4% of the total number of parking spaces, rounding up to the nearest whole number, thus $0.04 \times 33 = 1.32$, rounded up to 2 accessible parking spaces. Two (2) accessible parking spaces are shown.

Each accessible parking space must be signed and marked according to the prevailing by-law requirements, which includes:

- a. one authorized disabled parking sign on display;
- b. one '\$300.00 Fine' sign tab directly beneath the authorized disabled parking sign;
- c. both signs are to be permanently installed at the front and centre of the parking stall and mounted at a height of 1.0 metres to 1.5 metres from the ground to the bottom of the sign;
- d. **be a minimum of 3.9 metres (12 feet, 10 inches) in width** and 6 metres (19 feet, 8 inches) in length;
- e. **have a 1.5 metre wide aisle way** that extends the full length of the space on at least one side of every accessible parking space with barrier free access provided at the end of the access aisle;
- f. shall be marked with appropriate white pavement markings (lines and symbol) when located on a hard surface;
- g. located on a level surface; and,
- h. placed in a location as to minimize the distance to building entrances

Staff recommends placing the accessible parking spaces at the west side of the aisle, to enable pedestrians to use the walkway that extends along the west side of the property.

Three parking spaces on the east side of the property are parallel to the aisle with no immediate turnaround area. Generally parallel spaces work well when a driver can continue forward throughout the remainder of the site. Drivers should not have to reverse directly back onto McLeod Road.

Provide measurement for garage door widths / openings.

Staff notes that the on-site walkway along the west side of the property, extending from the existing municipal sidewalk on McLeod Road. Walkways to be 1.5m in width.

The municipal sidewalk is to continue uninterrupted through the proposed driveway, to indicate that pedestrians are afforded the right-of-way (as shown).

Staff notes that a molok garbage collection system is proposed, with bins alongside the east property line between the two blocks. A garbage truck template is required that demonstrates a driver can enter the site in a forward direction, access the garbage area, and exit the site in a forward direction.

There is two (2) daytime Niagara Falls Transit routes (106/112) in the immediate area. Bus stops are provided on both sides of McLeod Road at Alex Avenue for route 112, and on both sides of Ailanthus Avenue or Old McLeod Road for route 106. There is a continuous sidewalk on the north side of McLeod Road and on both sides of Ailanthus Avenue to provide persons the ability to walk to the bus stops.

John Grubich, C.E.T. | Traffic Planning Supervisor | Municipal Works - Transportation Services | City of Niagara Falls
8208 Heartland Forest Road | Niagara Falls, ON L2H 0L7 | (905) 356-7521 ext 5214 | Fax 905-356-5576 | jgrubich@niagarafalls.ca

City's
Engineering

Nick DeBenedetti

From: Josiah Jordan
Sent: Thursday, May 19, 2022 3:59 PM
To: Andrew Bryce; Julie Hannah; Nick DeBenedetti; Alexa Cooper
Cc: Kira Dolch; Eric Lehtinen; Michael Parniak
Subject: May 19, 2022 precon comments
Attachments: Precon Engineering Comments JJ - May 19.docx

Hi,

Please see the attached comments from your south side friends, Municipal works, Engineering

Let me know if you have any questions

Regards,
Josiah Jordan, C.E.T. | Development Technologist | Municipal Works | City of Niagara Falls
4310 Queen Street | Niagara Falls, ON L2E 6X5 | (905) 356-7521 ext 4105 | jjordan@niagarafalls.ca

Item #3

3:00 p.m.

Proposed: ZBA Nick DeBenedetti
Applicant: 1959064 Ontario Inc.
Agent: Tom Vanle
Property: 5809-5829 McLeod Road
Proposal: Rezone for R4 to R5C to permit a proposed 44 unit stacked townhouse

Infrastructure on McLeod Road 300mmØ PVC Watermain
825mmØ Conc Sani Sewer
1650mmØ Conc Storm

As Part of ZBA

- Eng. Services requires a FSR with SWM brief where the applicant must ensure that the municipal infrastructure will adequately service the development as proposed. This is to include all necessary supporting documentation
- Based on FSR details, the city may require third party infrastructure modelling at applicants' expense (in accordance with City schedule of fees) to verify available infrastructure capacities
- Major storm events may be directed overland to an acceptable outlet
- Engineering drawings of existing underground infrastructure available upon request
- As McLeod is a regional road, the city will defer to Region Comments for infrastructure and Servicing comments

City's
Building

Nick DeBenedetti

From: Justin Smith
Sent: Friday, May 20, 2022 2:42 PM
To: Nick DeBenedetti
Cc: Ned Mijatovich
Subject: 5809-5829 McLeod Rd - May 19 - Pre-Con Comments - Bldg Justin
Attachments: 5809-5829 McLeod Rd - May 19 - Pre-Con Comments - Bldg Justin.docx

Hi Nick,

Please see attached comments from Building Department.

Regards,

Justin Smith | Senior Plans Examiner | Building and Municipal Enforcement Services | City of Niagara Falls
4310 Queen Street | Niagara Falls, ON L2E 6X5 | (905) 356-7521 ext 4254 | Fax 905-374-7500 | justinsmith@niagarafalls.ca

Inter-Departmental Memo

To: Nick DeBenedetti
Planner II
Ext. 4233

From: Justin Smith
Senior Plans Examiner
Ext. 4254

Cc: Ned Mijatovich, I. Eng, D.Eng, B. Eng
Senior Plan Examiner

Date: May 20, 2022

Re: 5809-5829 McLeod Rd, Niagara Falls, ON
Rezone for R4 to R5C to permit a proposed 44 stacked townhouse

I have reviewed the submitted documents and offer the following comments for the applicant:

1. All required Building Permits and Demolition permit(s) to be obtained prior to construction / demolition for review. Building Data Design Matrices shall be reviewed during the building and fire examination, application process.
2. Municipal, Regional and Education Development charges will be assessed / determined at the time of Building Permit Application review, if applicable. Parkland Dedication Fee under the direction of the Planning Division, if required.
3. Spatial-separation fire-protection provisions to be conducted, during the Building and Fire Prevention Division permit application review process.
4. Please be advised, at future building application submission / review, specified elevation of Part 9 buildings (i.e., less than 3-storeys and less than 600 m² in building area), shall be conducted accordingly (i.e., Part 3 vs Part 9). Any further comments regarding Part 9 buildings to be provided by Residential Examiner(s):
 - a. Jesse Mancino – ext. 4213
 - b. Tyler Esau – ext. 4358

5. Conformation will be required whether this building will be required to be designed in accordance with Part 3 or Part 9 of the Ontario Building Code. Part 3 is applicable, where the building is greater than 600 m² in building area AND where the building is greater than 3-storeys in building height. **Average grade** calculations will be required, in order to illustrate with compliance with Part 9 of the OBC.
6. Any earthquake / seismic recommendations and ground-water table conditions (including any contamination, soil-gas, ect...) shall be provided by a geotechnical consultant at building application submission.
7. OBC Matrix required to be submitted as part of the architectural drawings.

Nick DeBenedetti

City's
Fire

Comments

Subject: FW: Fire Department - Preconsultation Comments, May 19, 2022

From: Ben Trendle <btrendle@niagarafalls.ca>

Sent: Thursday, May 26, 2022 10:03 AM

To: Nick DeBenedetti <ndebenedetti@niagarafalls.ca>; Alexa Cooper <acooper@niagarafalls.ca>; Julie Hannah <jhannah@niagarafalls.ca>

Subject: Fire Department - Preconsultation Comments, May 19, 2022

Here are the Fire Department comments for last week's pre-consultation meeting.

Please do not hesitate to contact me if there are any questions.

Agenda Item #3: ZBA. 5809-5829 McLeod Road

- Fire has no comments/concerns with the zoning by-law amendment.
- Technical comments will be provided at time of site plan control.

Ben Trendle | Chief Fire Prevention Officer | Fire Department | City of Niagara Falls
5809 Morrison Street | Niagara Falls, ON L2E 2E8 | (905) 356-1321 ext 2211 | Fax 905-356-1583 | btrendle@niagarafalls.ca

Examples

Multi Plexes

Lot 95x 120

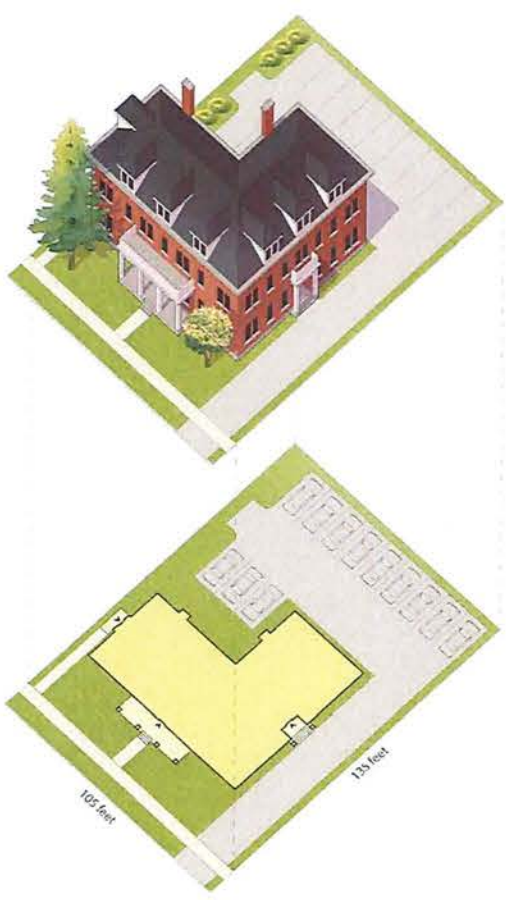
12 units

2.5 stories in height max

25 feet to 40 feet

Gross Density

Parking 1.25 spaces



Cottage Courts

125x 150 foot lot

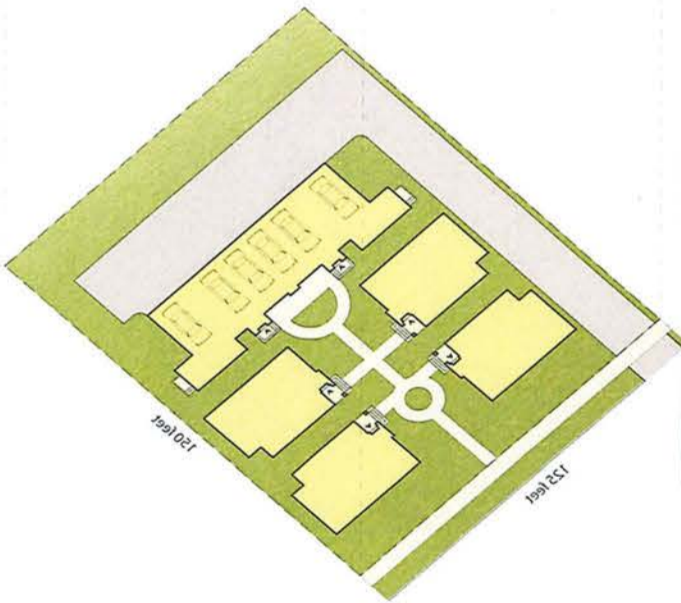
6 units

gross density of 12 unit per acre

6 off street parking spaces

Height 15 feet to eave

1 Storey





Appendix B

Traffic Movement Counts Data



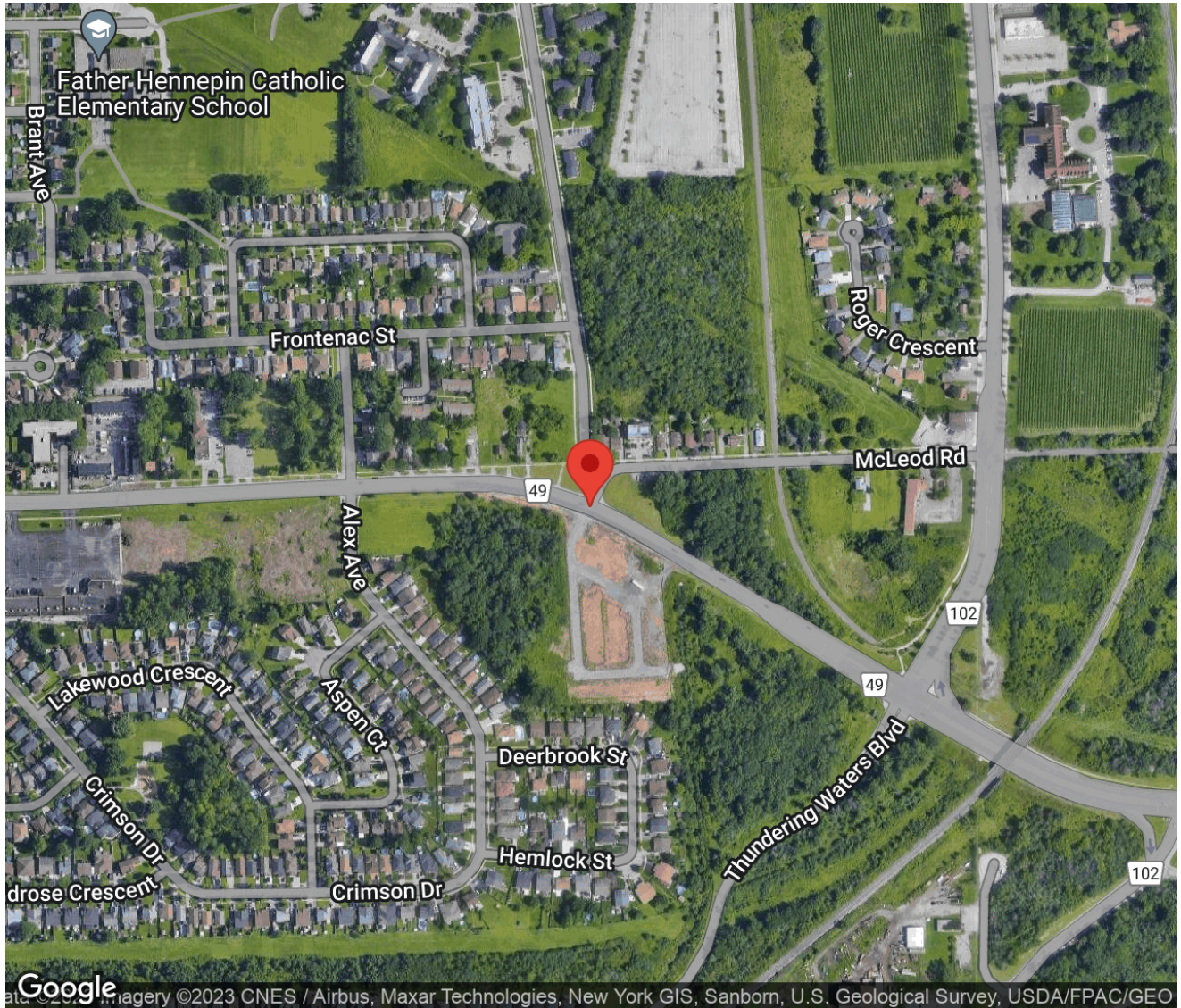
Project #23-163 - CGE Consulting

Intersection Count Report

Intersection: Marineland Pkwy & McLeod Rd
Municipality: Niagara Falls
Count Date: Thursday, May 25, 2023
Site Code: 2316300001
Count Categories: Cars, Trucks, Bicycles, Pedestrians
Count Period: 07:00-09:00, 16:00-18:00
Weather: Clear
Comments:

Traffic Count Map

Intersection: Marineland Pkwy & McLeod Rd
Site Code: 2316300001
Municipality: Niagara Falls
Count Date: May 25, 2023





Traffic Count Summary

Intersection: Marineland Pkwy & McLeod Rd
 Site Code: 2316300001
 Municipality: Niagara Falls
 Count Date: May 25, 2023

Marineland Pkwy - Traffic Summary

Hour	East Approach Totals						West Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
07:00 - 08:00	0	281	23	0	304	0	63	251	0	0	314	0	618
08:00 - 09:00	0	349	23	0	372	0	87	307	0	0	394	0	766
BREAK													
16:00 - 17:00	0	528	30	0	558	0	111	421	0	0	532	0	1090
17:00 - 18:00	0	434	29	0	463	0	113	456	0	0	569	0	1032
GRAND TOTAL	0	1592	105	0	1697	0	374	1435	0	0	1809	0	3506



Traffic Count Data

Intersection: Marineland Pkwy & McLeod Rd
 Site Code: 2316300001
 Municipality: Niagara Falls
 Count Date: May 25, 2023

North Approach - McLeod Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
07:00	0	0	11	0	11	0	0	0	0	0	0	0	0	0	0	0
07:15	2	0	7	0	9	0	0	0	0	0	0	0	0	0	0	0
07:30	2	0	8	0	10	0	0	1	0	1	0	0	0	0	0	0
07:45	3	0	12	0	15	0	0	0	0	0	0	0	0	0	0	0
08:00	3	0	9	0	12	0	0	2	0	2	0	0	0	0	0	0
08:15	4	0	10	0	14	0	0	0	0	0	0	0	0	0	0	0
08:30	1	0	10	0	11	1	0	2	0	3	0	0	0	0	0	0
08:45	0	0	15	0	15	0	0	1	0	1	0	0	0	0	0	0
SUBTOTAL	15	0	82	0	97	1	0	6	0	7	0	0	0	0	0	0



Traffic Count Data

Intersection: Marineland Pkwy & McLeod Rd
 Site Code: 2316300001
 Municipality: Niagara Falls
 Count Date: May 25, 2023

North Approach - McLeod Rd

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
16:00	4	0	26	0	30	1	0	1	0	2	0	0	0	0	0	0
16:15	5	0	32	0	37	0	0	0	0	0	0	0	0	0	0	0
16:30	1	0	16	0	17	1	0	3	0	4	0	0	0	0	0	0
16:45	7	0	26	0	33	0	0	0	0	0	0	0	0	0	0	0
17:00	1	0	32	0	33	0	0	0	0	0	0	0	0	0	0	0
17:15	4	0	19	0	23	0	0	1	0	1	0	0	0	0	0	0
17:30	4	0	21	0	25	1	0	1	0	2	0	0	0	0	0	0
17:45	1	0	18	0	19	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	27	0	190	0	217	3	0	6	0	9	0	0	0	0	0	0
GRAND TOTAL	42	0	272	0	314	4	0	12	0	16	0	0	0	0	0	0



Traffic Count Data

Intersection: Marineland Pkwy & McLeod Rd
 Site Code: 2316300001
 Municipality: Niagara Falls
 Count Date: May 25, 2023

East Approach - Marineland Pkwy

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
07:00	0	46	4	0	50	0	7	1	0	8	0	0	0	0	0	0
07:15	0	39	3	0	42	0	9	1	0	10	0	0	0	0	0	0
07:30	0	76	7	0	83	0	8	1	0	9	0	0	0	0	0	0
07:45	0	88	5	0	93	0	8	1	0	9	0	0	0	0	0	0
08:00	0	73	3	0	76	0	5	0	0	5	0	0	0	0	0	0
08:15	0	70	6	0	76	0	9	1	0	10	0	0	0	0	0	0
08:30	0	81	6	0	87	0	3	2	0	5	0	0	0	0	0	0
08:45	0	91	5	0	96	0	17	0	0	17	0	0	0	0	0	0
SUBTOTAL	0	564	39	0	603	0	66	7	0	73	0	0	0	0	0	0



Traffic Count Data

Intersection: Marineland Pkwy & McLeod Rd
 Site Code: 2316300001
 Municipality: Niagara Falls
 Count Date: May 25, 2023

East Approach - Marineland Pkwy

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
16:00	0	138	12	0	150	0	3	0	0	3	0	0	0	0	0	0
16:15	0	119	7	0	126	0	3	0	0	3	0	0	0	0	0	0
16:30	0	161	5	0	166	0	1	0	0	1	0	0	0	0	0	0
16:45	0	101	6	0	107	0	2	0	0	2	0	0	0	0	0	0
17:00	0	118	6	0	124	0	2	0	0	2	0	0	0	0	0	0
17:15	0	106	8	0	114	0	6	0	0	6	0	0	0	0	0	0
17:30	0	92	5	0	97	0	1	0	0	1	0	0	0	0	0	0
17:45	0	109	9	0	118	0	0	1	0	1	0	0	0	0	0	0
SUBTOTAL	0	944	58	0	1002	0	18	1	0	19	0	0	0	0	0	0
GRAND TOTAL	0	1508	97	0	1605	0	84	8	0	92	0	0	0	0	0	0



Traffic Count Data

Intersection: Marineland Pkwy & McLeod Rd
 Site Code: 2316300001
 Municipality: Niagara Falls
 Count Date: May 25, 2023

West Approach - Marineland Pkwy

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
07:00	11	34	0	0	45	1	3	0	0	4	0	0	0	0	0	0
07:15	11	52	0	0	63	0	10	0	0	10	0	0	0	0	0	0
07:30	17	64	0	0	81	1	2	0	0	3	0	0	0	0	0	0
07:45	22	82	0	0	104	0	4	0	0	4	0	0	0	0	0	0
08:00	23	56	0	0	79	2	8	0	0	10	0	0	0	0	0	0
08:15	27	67	0	0	94	0	8	0	0	8	0	0	0	0	0	0
08:30	17	80	0	0	97	2	3	0	0	5	0	0	0	0	0	0
08:45	14	80	0	0	94	2	5	0	0	7	0	0	0	0	0	0
SUBTOTAL	142	515	0	0	657	8	43	0	0	51	0	0	0	0	0	0



Traffic Count Data

Intersection: Marineland Pkwy & McLeod Rd
 Site Code: 2316300001
 Municipality: Niagara Falls
 Count Date: May 25, 2023

West Approach - Marineland Pkwy

Start Time	Cars					Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
16:00	20	77	0	0	97	1	2	0	0	3	0	0	0	0	0	0
16:15	29	104	0	0	133	0	7	0	0	7	0	0	0	0	0	0
16:30	22	108	0	0	130	0	3	0	0	3	0	0	0	0	0	0
16:45	39	112	0	0	151	0	8	0	0	8	0	0	0	0	0	0
17:00	33	114	0	0	147	1	2	0	0	3	0	0	0	0	0	0
17:15	25	121	0	0	146	0	0	0	0	0	0	0	0	0	0	0
17:30	26	107	0	0	133	0	1	0	0	1	0	0	0	0	0	0
17:45	28	109	0	0	137	0	2	0	0	2	0	0	0	0	0	0
SUBTOTAL	222	852	0	0	1074	2	25	0	0	27	0	0	0	0	0	0
GRAND TOTAL	364	1367	0	0	1731	10	68	0	0	78	0	0	0	0	0	0

Peak Hour Diagram

Specified Period

From: 07:00:00
To: 09:00:00

One Hour Peak

From: 08:00:00
To: 09:00:00




Intersection: Marineland Pkwy & McLeod Rd
Site Code: 2316300001
Count Date: May 25, 2023

Weather conditions: Clear




**** Unsignalized Intersection ****

Major Road: Marineland Pkwy runs E/W




North Approach

	Out	In	Total
	52	101	153
	6	9	15
	0	0	0
Totals	58	110	168




McLeod Rd

	0	0	0
	5	1	0
	44	8	0
Totals	49	9	0

East Approach

	Out	In	Total
	335	291	626
	37	25	62
	0	0	0
Totals	372	316	688

Marineland Pkwy

			Totals
0	0	0	0
0	6	81	87
0	24	283	307

Peds: 0




Peds: 0






Peds: 0

Peds: 0


Marineland Pkwy

Totals			
0	0	0	0
23	20	3	0
349	315	34	0

West Approach

	Out	In	Total
	364	359	723
	30	39	69
	0	0	0
Totals	394	398	792

 - Cars

 - Trucks

 - Bicycles

Comments



Peak Hour Summary

Intersection: Marineland Pkwy & McLeod Rd
 Site Code: 2316300001
 Count Date: May 25, 2023
 Period: 07:00 - 09:00

Peak Hour Data (08:00 - 09:00)

Start Time	North Approach McLeod Rd						South Approach						East Approach Marineland Pkwy						West Approach Marineland Pkwy						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
08:00	3		11	0	0	14					0		78	3	0	0	81	25	64			0	0	89	184
08:15	4		10	0	0	14					0		79	7	0	0	86	27	75			0	0	102	202
08:30	2		12	0	0	14					0		84	8	0	0	92	19	83			0	0	102	208
08:45	0		16	0	0	16					0		108	5	0	0	113	16	85			0	0	101	230
Grand Total	9		49	0	0	58					0	0	349	23	0	0	372	87	307			0	0	394	824
Approach %	15.5		84.5	0	-	-					-	-	93.8	6.2	0	-	-	22.1	77.9			0	-	-	
Totals %	1.1		5.9	0	7						0		42.4	2.8	0	45.1		10.6	37.3			0		47.8	
PHF	0.56		0.77	0	0.91						0		0.81	0.72	0	0.82		0.81	0.9			0		0.97	0.9
Cars	8		44	0		52					0		315	20	0	335	81	283			0		364	751	
% Cars	88.9		89.8	0		89.7					0		90.3	87	0	90.1		93.1	92.2			0		92.4	91.1
Trucks	1		5	0		6					0		34	3	0	37	6	24			0		30	73	
% Trucks	11.1		10.2	0		10.3					0		9.7	13	0	9.9		6.9	7.8			0		7.6	8.9
Bicycles	0		0	0		0					0		0	0	0	0	0	0	0			0		0	0
% Bicycles	0		0	0		0					0		0	0	0	0		0	0			0		0	0
Peds					0	-					0	-				0	-					0	-	0	-
% Peds					0	-					0	-				0	-					0	-	0	-

Peak Hour Diagram

Specified Period

From: 16:00:00
To: 18:00:00

One Hour Peak

From: 16:15:00
To: 17:15:00




Intersection: Marineland Pkwy & McLeod Rd
Site Code: 2316300001
Count Date: May 25, 2023

Weather conditions: Clear




**** Unsignalized Intersection ****




Major Road: Marineland Pkwy runs E/W

North Approach




	Out	In	Total
	120	147	267
	4	1	5
	0	0	0
Totals	124	148	272

McLeod Rd







	0	0	0
	3	1	0
	106	14	0
Totals	109	15	0

East Approach

	Out	In	Total
	523	452	975
	8	21	29
	0	0	0
Totals	531	473	1004

Marineland Pkwy

				Totals
	0	0	0	0
	0	1	123	124
	0	20	438	458

Peds: 0




Peds: 0






Peds: 0

Peds: 0


Marineland Pkwy

Totals			
0	0	0	0
24	24	0	0
507	499	8	0

West Approach

	Out	In	Total
	561	605	1166
	21	11	32
	0	0	0
Totals	582	616	1198

 - Cars

 - Trucks

 - Bicycles

Comments



Peak Hour Summary

Intersection: Marineland Pkwy & McLeod Rd
 Site Code: 2316300001
 Count Date: May 25, 2023
 Period: 16:00 - 18:00

Peak Hour Data (16:15 - 17:15)

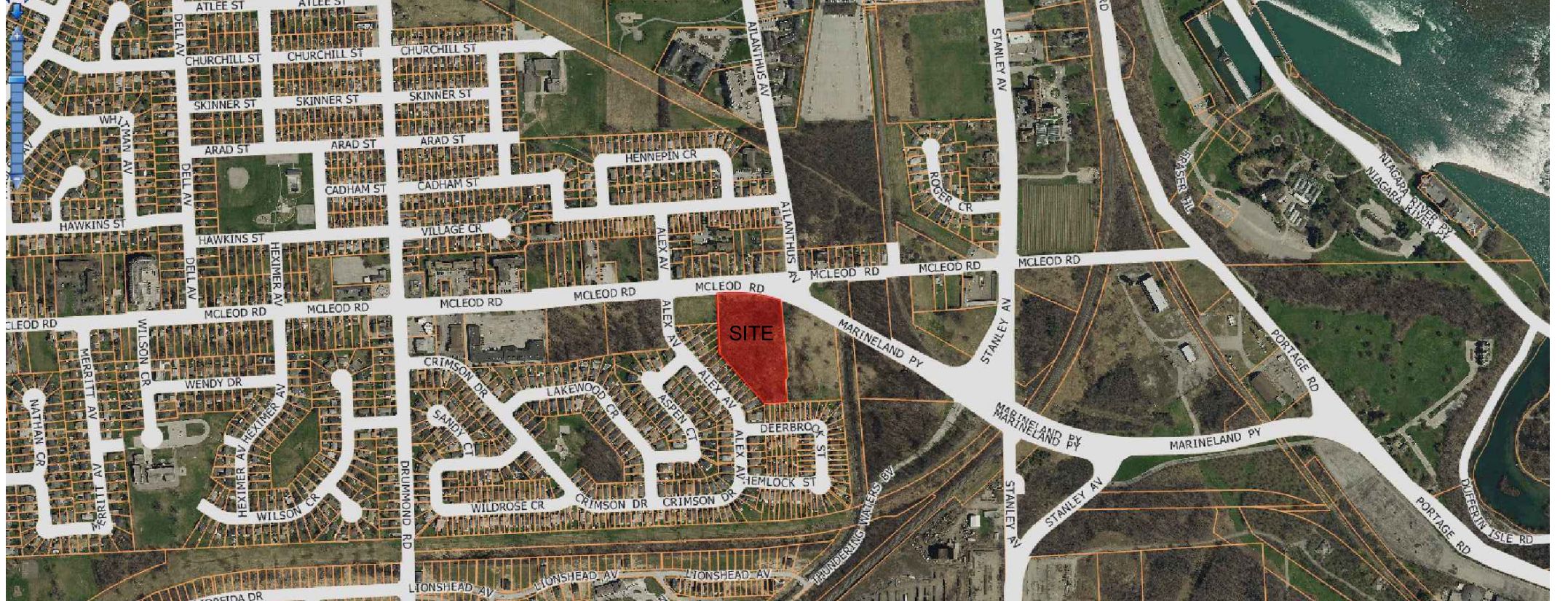
Start Time	North Approach McLeod Rd						South Approach						East Approach Marineland Pkwy						West Approach Marineland Pkwy						Total Vehicles	
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total		
16:15	5		32	0	0	37					0			122	7	0	0	129	29	111			0	0	140	306
16:30	2		19	0	0	21					0			162	5	0	0	167	22	111			0	0	133	321
16:45	7		26	0	0	33					0			103	6	0	0	109	39	120			0	0	159	301
17:00	1		32	0	0	33					0			120	6	0	0	126	34	116			0	0	150	309
Grand Total	15		109	0	0	124					0	0		507	24	0	0	531	124	458			0	0	582	1237
Approach %	12.1		87.9	0	-	-					-	-		95.5	4.5	0	-	-	21.3	78.7			0	-	-	
Totals %	1.2		8.8	0	10						0			41	1.9	0		42.9	10	37			0		47	
PHF	0.54		0.85	0	0.84						0			0.78	0.86	0		0.79	0.79	0.95			0		0.92	0.96
Cars	14		106	0		120					0			499	24	0		523	123	438			0		561	1204
% Cars	93.3		97.2	0		96.8					0			98.4	100	0		98.5	99.2	95.6			0		96.4	97.3
Trucks	1		3	0		4					0			8	0	0		8	1	20			0		21	33
% Trucks	6.7		2.8	0		3.2					0			1.6	0	0		1.5	0.8	4.4			0		3.6	2.7
Bicycles	0		0	0		0					0			0	0	0		0	0	0			0		0	0
% Bicycles	0		0	0		0					0			0	0	0		0	0	0			0		0	0
Peds					0	-					0	-						0	-				0	-	0	
% Peds					0	-					0	-						0	-				0	-	0	

Appendix C

Background Developments Supporting Documents

5600 McLeod Road & The Mist - Site Generated Traffic

Site	Land Use (ITE Code)	# Dwelling Units	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
5600 McLeod Road	Semi-Detached Housing (215)	55	7	19	26	18	13	31
	Multifamily Housing Low-Rise (220)	88	12	38	50	37	21	58
The Mist	Semi-Detached Housing (215)	42	5	15	20	14	10	24
Total Trips			19	57	96	55	34	113



KEY PLAN
N.T.S.

SITE STATISTICS
5600 McLeod Rd, Niagara Falls, ON
Residential Development
Approximate Numbers

	m2	ft2	ha	Acre
Site Area Gross	19,279.9	207,529	1.93	4.76
Total GFA	15,969.5	171,896		
Total Units	143			
Total FSI	0.8			
Density				
Unit per hectare	74.2			
Unit per acre	30.0			
Lot Coverage	39.6%			
Building Area	7,631.5	82,145		
Landscaped Area	6,746.7	34,99%		
Paved Area	4,622.5	49,757		

SUMMARY

Type	Block #	Number of Units	Total GFA		Height
			m2	ft2	
REGULAR TOWNHOUSES (TH)	BLOCK 1	5	617.1	6,642.1	7.20
	BLOCK 2	5	610.3	6,569.3	7.20
	BLOCK 3	5	610.3	6,569.3	7.20
	BLOCK 4	5	610.3	6,569.3	7.20
	BLOCK 5	5	610.3	6,569.3	7.20
	BLOCK 6	5	609.4	6,559.6	7.20
	BLOCK 7	6	732.7	7,886.2	7.20
	BLOCK 8	7	1097.7	11,815.6	9.40
	BLOCK 9	6	939.7	10,114.9	9.52
	BLOCK 10	6	732.7	7,886.2	9.55
	Subtotal	55	7170.4	77181.9	
STACKED TOWNHOUSES (STH)	BLOCK 11	14	1379.3	14,846.6	13.10
	BLOCK 12	14	1379.3	14,846.6	13.08
	BLOCK 13	15	1510.5	16,259.1	13.30
	BLOCK 14	15	1508.4	16,236.4	12.70
	BLOCK 15	12	1211.1	13,036.3	13.10
	BLOCK 16	18	1810.6	19,488.9	12.88
		Subtotal	88	8799.1	94713.8
	Total	143	15,969.5	171,895.7	

UNDERGROUND GARAGE

	Block #	Number of Spots	Total GFA	
			m2	ft2
STACKED TOWNHOUSES (STH)	BLOCK 11	34	1,195.9	12,872.6
	BLOCK 12			
	BLOCK 13			
	BLOCK 14			
	BLOCK 15			
	BLOCK 16			
	Total	104	3,643.3	39,216.2

PARKING

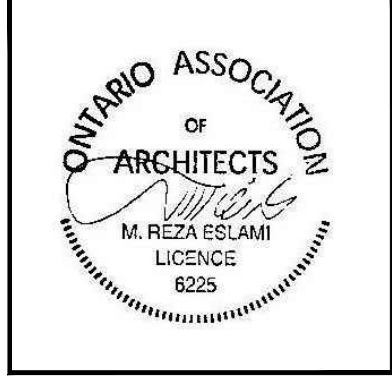
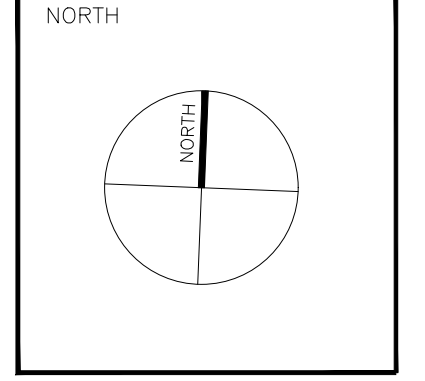
Driveway spaces (Regular Towns)	55 spaces
Underground spaces	104 spaces
Surface parking spaces	19 spaces
Total	178 spaces

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Legend:

CB	DENOTES BUILDING ACCESS/EGRESS POINTS
○	DENOTES CATCHBASIN
MH	DENOTES MANHOLE
HP	DENOTES HYDRO POLE
LS	DENOTES LIGHT STANDARD
●	DENOTES FIRE HYDRANT
WV	DENOTES WATER VALVE
FR	DENOTES FIRE ROUTE (NO PARKING)
BF	DENOTES BARRIER FREE PARKING SPACE

NO.	REVISION/AS/UP	DATE	NO.	REVISION/AS/UP	DATE
1	ISSUED FOR CONSTRUCTION	4/20/2023			



**5600 MCLEOD ROAD
NIAGARA FALLS, ON**

DRAWING TITLE
SITE PLAN

Scale: 1/500
Date: JAN. 30, 2023
Project No. 19112

Drawn by: MG
Checked by: RE
Drawing No. A101

1813 - 4789 YONGE ST. TORONTO
M4N 0G3 ICONARCHITECTS.CA
T: 416-224-0905 F: 416-224-0504

ICON ARCHITECTS

PLOT DATE: NOV. 19, 2020

THE Mist
CONDOS & TOWNS IN NIAGARA

SITE MAP



BAYCREST HOMES
HOMES BUILT WITH PRIDE

Appendix D

Synchro Analysis Output

Appendix D1

Synchro Analysis Output – Existing Conditions

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	87	307	349	23	9	49
Future Vol, veh/h	87	307	349	23	9	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	90	81	72	56	77
Heavy Vehicles, %	7	8	10	13	11	10
Mvmt Flow	107	341	431	32	16	64

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	463	0	-	0	832 232
Stage 1	-	-	-	-	447 -
Stage 2	-	-	-	-	385 -
Critical Hdwy	4.24	-	-	-	7.02 7.1
Critical Hdwy Stg 1	-	-	-	-	6.02 -
Critical Hdwy Stg 2	-	-	-	-	6.02 -
Follow-up Hdwy	2.27	-	-	-	3.61 3.4
Pot Cap-1 Maneuver	1060	-	-	-	290 746
Stage 1	-	-	-	-	586 -
Stage 2	-	-	-	-	631 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1060	-	-	-	261 746
Mov Cap-2 Maneuver	-	-	-	-	261 -
Stage 1	-	-	-	-	527 -
Stage 2	-	-	-	-	631 -

Approach	EB	WB	SB
HCM Control Delay, s	2.1	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1060	-	-	-	543
HCM Lane V/C Ratio	0.101	-	-	-	0.147
HCM Control Delay (s)	8.8	-	-	-	12.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.5

Intersection						
Int Delay, s/veh	3.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	124	458	507	24	15	109
Future Vol, veh/h	124	458	507	24	15	109
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	79	95	78	86	54	85
Heavy Vehicles, %	1	4	2	0	7	3
Mvmt Flow	157	482	650	28	28	128

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	678	0	-	0	1219 339
Stage 1	-	-	-	-	664 -
Stage 2	-	-	-	-	555 -
Critical Hdwy	4.12	-	-	-	6.94 6.96
Critical Hdwy Stg 1	-	-	-	-	5.94 -
Critical Hdwy Stg 2	-	-	-	-	5.94 -
Follow-up Hdwy	2.21	-	-	-	3.57 3.33
Pot Cap-1 Maneuver	917	-	-	-	166 654
Stage 1	-	-	-	-	460 -
Stage 2	-	-	-	-	525 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	917	-	-	-	138 654
Mov Cap-2 Maneuver	-	-	-	-	138 -
Stage 1	-	-	-	-	381 -
Stage 2	-	-	-	-	525 -

Approach	EB	WB	SB
HCM Control Delay, s	2.4	0	20.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	917	-	-	-	393
HCM Lane V/C Ratio	0.171	-	-	-	0.397
HCM Control Delay (s)	9.7	-	-	-	20.1
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.6	-	-	-	1.9

Appendix D2

Synchro Analysis Output – Background Conditions

HCM 2010 TWSC
 3: McLeod Road & Marineland Pkwy

06-07-2023

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	106	411	2	3	437	28	4	1	9	11	1	60
Future Vol, veh/h	106	411	2	3	437	28	4	1	9	11	1	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	90	92	92	81	72	92	92	92	56	92	77
Heavy Vehicles, %	7	8	2	2	10	13	2	2	2	11	2	10
Mvmt Flow	131	457	2	3	540	39	4	1	10	20	1	78

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	579	0	0	459	0	0	997	1305	230	1057	1287	290
Stage 1	-	-	-	-	-	-	720	720	-	566	566	-
Stage 2	-	-	-	-	-	-	277	585	-	491	721	-
Critical Hdwy	4.24	-	-	4.14	-	-	7.54	6.54	6.94	7.72	6.54	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.72	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.72	5.54	-
Follow-up Hdwy	2.27	-	-	2.22	-	-	3.52	4.02	3.32	3.61	4.02	3.4
Pot Cap-1 Maneuver	957	-	-	1098	-	-	198	159	772	168	163	683
Stage 1	-	-	-	-	-	-	385	430	-	454	506	-
Stage 2	-	-	-	-	-	-	706	496	-	505	430	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	957	-	-	1098	-	-	156	137	772	147	140	683
Mov Cap-2 Maneuver	-	-	-	-	-	-	156	137	-	147	140	-
Stage 1	-	-	-	-	-	-	332	371	-	392	504	-
Stage 2	-	-	-	-	-	-	622	495	-	429	371	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.1	0	16.8	17.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	156	528	957	-	-	1098	-	-	386
HCM Lane V/C Ratio	0.028	0.021	0.137	-	-	0.003	-	-	0.256
HCM Control Delay (s)	28.7	12	9.4	-	-	8.3	-	-	17.5
HCM Lane LOS	D	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0.1	0.5	-	-	0	-	-	1

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑↘		↙	↑↘		↙	↘			↔	
Traffic Vol, veh/h	151	580	5	9	654	29	3	1	4	18	1	133
Future Vol, veh/h	151	580	5	9	654	29	3	1	4	18	1	133
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	95	92	92	78	86	92	92	92	92	92	85
Heavy Vehicles, %	1	4	2	2	2	0	2	2	2	7	2	3
Mvmt Flow	191	611	5	10	838	34	3	1	4	20	1	156

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	872	0	0	616	0	0	1436	1888	308	1563	1873	436
Stage 1	-	-	-	-	-	-	996	996	-	875	875	-
Stage 2	-	-	-	-	-	-	440	892	-	688	998	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.54	6.54	6.94	7.64	6.54	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.64	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.64	5.54	-
Follow-up Hdwy	2.21	-	-	2.22	-	-	3.52	4.02	3.32	3.57	4.02	3.33
Pot Cap-1 Maneuver	775	-	-	960	-	-	94	70	688	72	71	565
Stage 1	-	-	-	-	-	-	262	320	-	300	365	-
Stage 2	-	-	-	-	-	-	566	358	-	391	320	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	775	-	-	960	-	-	54	52	688	57	53	565
Mov Cap-2 Maneuver	-	-	-	-	-	-	54	52	-	57	53	-
Stage 1	-	-	-	-	-	-	198	241	-	226	361	-
Stage 2	-	-	-	-	-	-	404	354	-	291	241	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.6	0.1	43.2	38.7
HCM LOS			E	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	54	200	775	-	-	960	-	-	276
HCM Lane V/C Ratio	0.06	0.027	0.247	-	-	0.01	-	-	0.642
HCM Control Delay (s)	75.9	23.5	11.2	-	-	8.8	-	-	38.7
HCM Lane LOS	F	C	B	-	-	A	-	-	E
HCM 95th %tile Q(veh)	0.2	0.1	1	-	-	0	-	-	4

Appendix D3

Synchro Analysis Output – Future Conditions

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	106	411	2	3	437	28	4	1	9	11	1	60
Future Vol, veh/h	106	411	2	3	437	28	4	1	9	11	1	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	90	92	92	81	72	92	92	92	56	92	77
Heavy Vehicles, %	7	8	2	2	10	13	2	2	2	11	2	10
Mvmt Flow	131	457	2	3	540	39	4	1	10	20	1	78

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	579	0	0	459	0	0	997	1305	230	1057	1287	290
Stage 1	-	-	-	-	-	-	720	720	-	566	566	-
Stage 2	-	-	-	-	-	-	277	585	-	491	721	-
Critical Hdwy	4.24	-	-	4.14	-	-	7.54	6.54	6.94	7.72	6.54	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.72	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.72	5.54	-
Follow-up Hdwy	2.27	-	-	2.22	-	-	3.52	4.02	3.32	3.61	4.02	3.4
Pot Cap-1 Maneuver	957	-	-	1098	-	-	198	159	772	168	163	683
Stage 1	-	-	-	-	-	-	385	430	-	454	506	-
Stage 2	-	-	-	-	-	-	706	496	-	505	430	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	957	-	-	1098	-	-	156	137	772	147	140	683
Mov Cap-2 Maneuver	-	-	-	-	-	-	156	137	-	147	140	-
Stage 1	-	-	-	-	-	-	332	371	-	392	504	-
Stage 2	-	-	-	-	-	-	622	495	-	429	371	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.1	0	16.8	17.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	156	528	957	-	-	1098	-	-	386
HCM Lane V/C Ratio	0.028	0.021	0.137	-	-	0.003	-	-	0.256
HCM Control Delay (s)	28.7	12	9.4	-	-	8.3	-	-	17.5
HCM Lane LOS	D	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0.1	0.5	-	-	0	-	-	1

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕↗		↖	↕↗		↖	↗			↕↗	
Traffic Vol, veh/h	151	580	5	9	654	29	3	1	4	18	1	133
Future Vol, veh/h	151	580	5	9	654	29	3	1	4	18	1	133
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	95	92	92	78	86	92	92	92	92	92	85
Heavy Vehicles, %	1	4	2	2	2	0	2	2	2	7	2	3
Mvmt Flow	191	611	5	10	838	34	3	1	4	20	1	156

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	872	0	0	616	0	0	1436	1888	308	1563	1873	436
Stage 1	-	-	-	-	-	-	996	996	-	875	875	-
Stage 2	-	-	-	-	-	-	440	892	-	688	998	-
Critical Hdwy	4.12	-	-	4.14	-	-	7.54	6.54	6.94	7.64	6.54	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.64	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.64	5.54	-
Follow-up Hdwy	2.21	-	-	2.22	-	-	3.52	4.02	3.32	3.57	4.02	3.33
Pot Cap-1 Maneuver	775	-	-	960	-	-	94	70	688	72	71	565
Stage 1	-	-	-	-	-	-	262	320	-	300	365	-
Stage 2	-	-	-	-	-	-	566	358	-	391	320	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	775	-	-	960	-	-	54	52	688	57	53	565
Mov Cap-2 Maneuver	-	-	-	-	-	-	54	52	-	57	53	-
Stage 1	-	-	-	-	-	-	198	241	-	226	361	-
Stage 2	-	-	-	-	-	-	404	354	-	291	241	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	2.6			0.1			43.2			38.7		
HCM LOS							E			E		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	54	200	775	-	-	960	-	-	276
HCM Lane V/C Ratio	0.06	0.027	0.247	-	-	0.01	-	-	0.642
HCM Control Delay (s)	75.9	23.5	11.2	-	-	8.8	-	-	38.7
HCM Lane LOS	F	C	B	-	-	A	-	-	E
HCM 95th %tile Q(veh)	0.2	0.1	1	-	-	0	-	-	4

Appendix E

Level of Service Definitions

LEVEL OF SERVICE ANALYSIS AT SIGNALIZED INTERSECTIONS

To assist in clarifying the arithmetic analysis associated with traffic engineering, it is often useful to refer to “Level of Service”. The term Level of Service implies a qualitative measure of traffic flow at an intersection. It is dependent upon vehicle delay and vehicle queue lengths at the approaches. Specifically, Level of Service criteria are stated in terms of the average stopped delay per vehicle for a 15-minute analysis period. The following table describes the characteristics of each level:

<u>Level of Service</u>	<u>Features</u>	<u>Stopped Delay per Vehicle (sec)</u>
A	At this level of service, almost no signal phase is fully utilized by traffic. Very seldom does a vehicle wait longer than one red indication. The approach appears open, turning movements are easily made and drivers have freedom of operation.	≤ 5.0
B	At this level, an occasional signal phase is fully utilized and many phases approach full use. Many drivers begin to feel somewhat restricted within platoons of vehicles approaching the intersection.	> 5.0 and ≤ 15.0
C	At this level, the operation is stable though with more frequent fully utilized signal phases. Drivers feel more restricted and occasionally may have to wait more than one red signal indication, and queues may develop behind turning vehicles. This level is normally employed in urban intersection design.	> 15.0 and ≤ 25.0
D	At this level, the motorist experiences increasing restriction and instability of flow. There are substantial delays to approaching vehicles during short peaks within the peak period, but there are enough cycles with lower demand to permit occasional clearance of developing queues and prevent excessive backups.	> 25.0 and ≤ 40.0
E	At this level, capacity is reached. There are long queues of vehicles waiting upstream of the intersection and delays to vehicles may extend to several signal cycles.	> 40.0 and ≤ 60.0
F	At this level, saturation occurs, with vehicle demand exceeding the available capacity.	> 60.0

LEVEL OF SERVICE ANALYSIS AT UNSIGNALIZED INTERSECTIONS⁽¹⁾

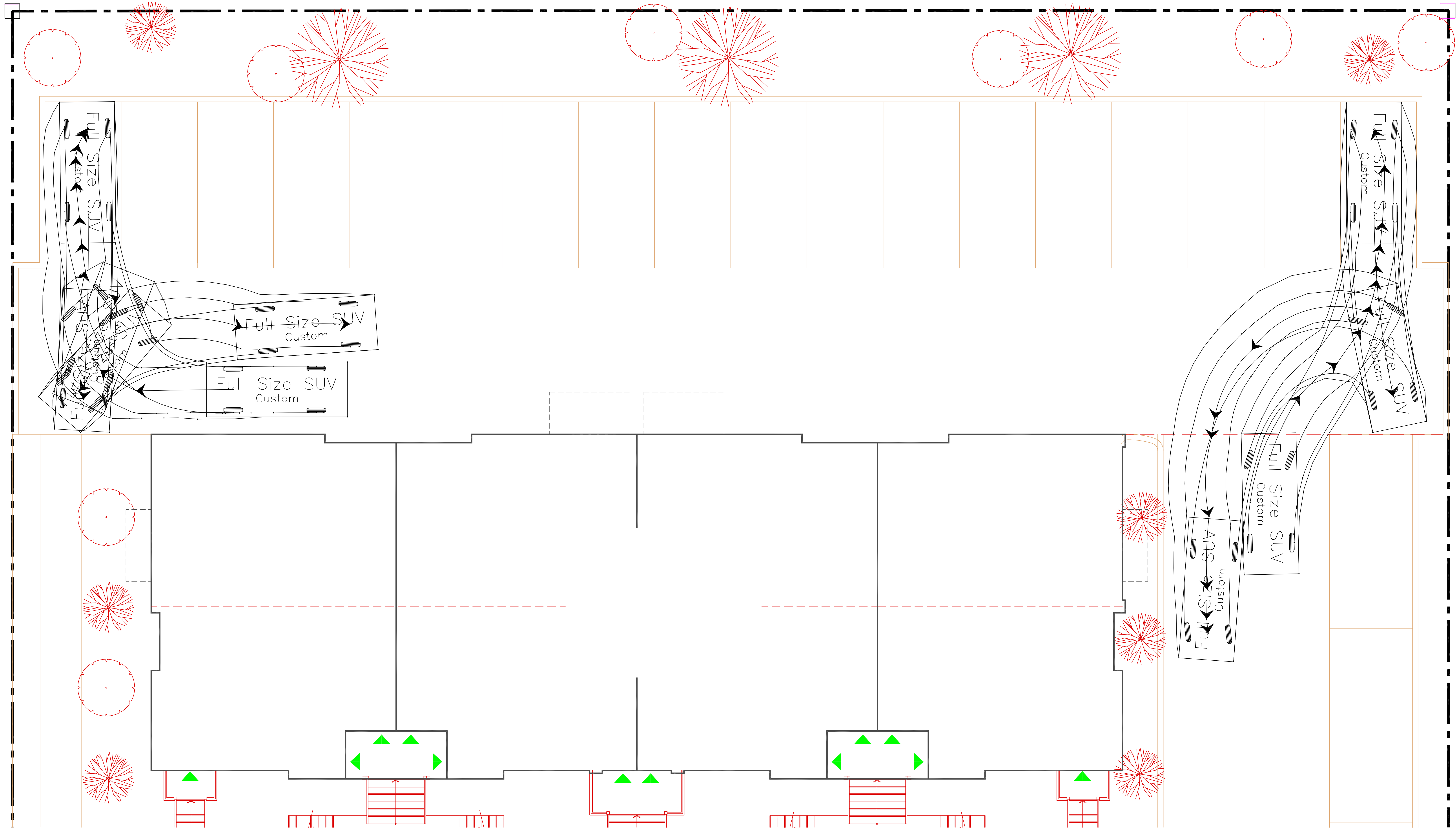
The term "level of service" implies a qualitative measure of traffic flow at an intersection. It is dependent upon the vehicle delay and vehicle queue lengths at approaches. The level of service at unsignalized intersections is often related to the delay accumulated by flows on the minor streets, caused by all other conflicting movements. The following table describes the characteristics of each level.

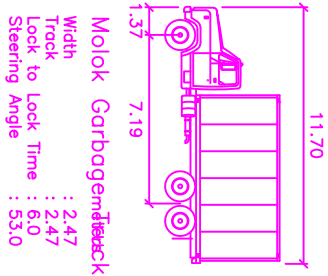
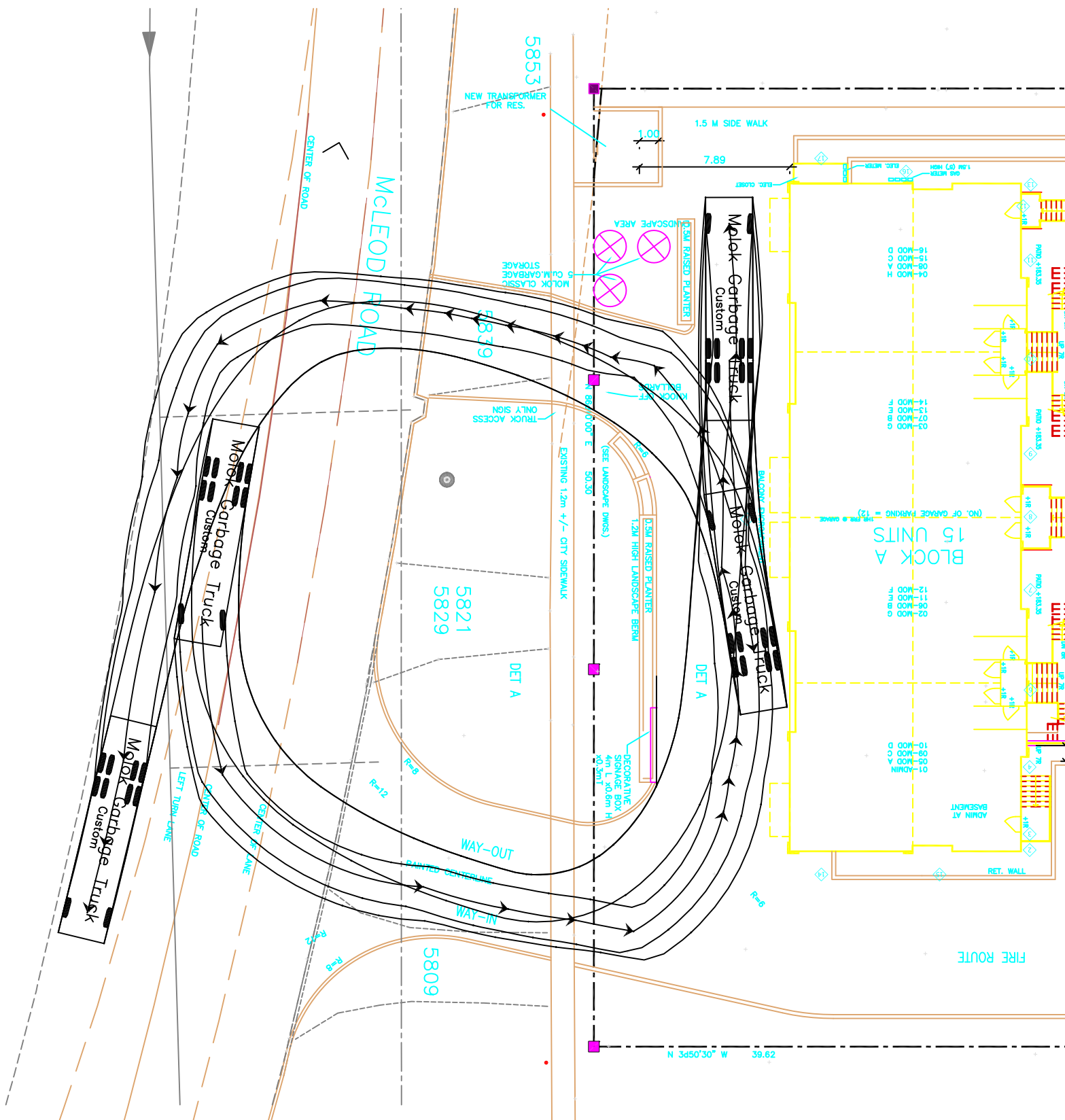
Level of Service	Features
A	Little or no traffic delay occurs. Approaches appear open, turning movements are easily made, and drivers have freedom of operation.
B	Short traffic delays occur. Many drivers begin to feel somewhat restricted in terms of freedom of operation.
C	Average traffic delays occur. Operations are generally stable, but drivers emerging from the minor street may experience difficulty in completing their movement. This may occasionally impact on the stability of flow on the major street.
D	Long traffic delays occur. Motorists emerging from the minor street experience significant restriction and frustration. Drivers on the major street will experience congestion and delay as drivers emerging from the minor street interfere with the major through movements.
E	Very long traffic delays occur. Operations approach the capacity of the intersection.
F	Saturation occurs, with vehicle demand exceeding the available capacity. Very long traffic delays occur.

⁽¹⁾ Highway Capacity Manual - Special Report No. 209, Transportation Research Board, 1985.

Appendix F

AutoTurn Analyses





- Molok Garbage Truck
- Width : 2.47
- Track : 2.47
- Lock to Lock Time : 6.0
- Steering Angle : 53.0