TRAFFIC IMPACT AND PARKING STUDY

November 2021

Proposed Residential Development
6259 – 6293 Dorchester Road,
Niagara Falls, Ontario

Prepared for
A.J. Clarke and Associates

TRANS-PLAN
Transportation Engineering

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November 1, 2021

Mr. Miles Weekes, Planner
A.J. Clarke and Associates Ltd.
25 Main Street West, Suite 300
Hamilton, ON L8P 1H1

Re: Proposed Residential Development, 6259 – 6293 Dorchester Road, Niagara Falls, ON – Traffic Impact and Parking Study

TRANS-PLAN has prepared this Traffic Impact and Parking Study in support of the proposed residential development, located on 6259 – 6293 Dorchester Road, west of the Dorchester Road and Stokes Street intersection in the City of Niagara Falls, Ontario. The proposed residential development consists of a 5-storey apartment building that contains 76 dwelling units. The development's proposed parking supply consists of 92 at-grade vehicle parking spaces, inclusive of 2 accessible parking spaces, and 20 bicycle parking spaces. Access will be provided via a full-movement access onto Dorchester Road.

Our Traffic Impact Study findings indicate that the proposed development is expected to have minimal impacts on the road network. The findings of our signal warrant analyses indicate that a traffic signal is not warranted at the intersection of Dorchester Road and Stokes Street. While the left turn warrant analyses indicated that a northbound left turn lane is warranted, the Synchro and SimTraffic models indicate that the network is expected to operate acceptably without a northbound left turn lane. No roadway improvements were found necessary as a part of this study.

Our Parking Study findings indicate that the proposed parking supply of 92 parking spaces falls short of the City of Niagara Falls Zoning By-law but is expected to be sufficient based on proxy surveys conducted at another residential apartment in the city. The proposed accessible parking supply of 2 spaces falls short of the Accessibility for Ontarians with Disabilities Act (AODA) requirement of 4 spaces. It is recommended that two more accessible parking spaces be added to the site in order to meet this requirement.

Sincerely,

Anil Seegobin, P.Eng.
Partner, Engineer

Henry Tseng
Traffic Analyst

Trans-Plan Transportation Inc.
Transportation Consultants

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1. INTRODUCTION

Trans-Plan has been retained by A.J. Clark and Associates Ltd. to complete a Traffic Impact and Parking Study for the proposed residential development located at 6259-6293 Dorchester Road, Niagara Falls, Ontario.

The Traffic Impact Study (TIS) includes the following study components:

- A review of the study area and assessment of the existing road network
- An assessment of future background conditions based on anticipated traffic growth, area developments and planned transportation improvements in the study area
- An assessment of the impact of site-generated traffic on the adjacent roadway network under future background and total traffic conditions and queueing analysis for the site access under total conditions
- The determination of roadway and intersection improvements, as required, to accommodate the proposed development
- A left turn warrant analyses and signal warrant analyses for the intersection of Dorchester Road and Stokes Street

The Parking Study includes the following:

- A review of the City's Zoning By-law, and the Accessibility for Ontarians with Disabilities Act, for parking requirements in comparison to the proposed supply
- An analysis of proxy parking survey data conducted at another residential apartment in the city, from previous studies
- An estimate of future residential parking demands based on the surveyed parking demands of the proxy site
- Confirmation that the proposed parking supply will be adequate for future residents, employees, and visitors

Prior to commencing this study, transportation and planning staff at the City of Niagara Falls were contacted and provided with our study terms of reference for their review. Comments from the City were received and incorporated into this study. This report follows the City of Niagara Falls Traffic Impact Study Guidelines, dated May 2012.

2. SITE LOCATION

The site, shown in Figure 1, is located west of the intersection of Dorchester Road and Stokes Street in the City of Niagara Falls. The subject site is currently occupied by a single-detached dwelling. The site's immediate surroundings primarily consist of a single-detached residential neighbourhood, with low-rise apartment buildings along Dorchester Road. The subject site is approximately 600m south of Lundy's Lane, approximately 1.3 km south of its nearest interchange with Highway 420 at Frederica Street and approximately 1.5 km south of its nearest interchange with the Queen Elizabeth Way at Dorchester Road.

3. PROPOSED DEVELOPMENT

The proposed site plan, prepared BJC Architects Inc., is shown in Figure 2. The existing single-detached dwelling is proposed to be demolished in order to construct the proposed residential development, which consists of a 5-storey apartment building containing 76 dwelling units. The development will have a parking supply of 92 at-grade parking spaces, inclusive of 2 accessible parking spaces, and will also have 20 bicycle parking spaces. Access is proposed via a full-movement access onto Dorchester Road.

4. EXISTING ROAD NETWORK CONDITIONS

4.1 Road Network

The study area roadways in the vicinity of the site are described as follows:

Dorchester Road is an arterial roadway under the jurisdiction of the City of Niagara Falls that runs in a north-south direction and consists of two travel lanes, two lanes running in either direction, in the vicinity of the site. The speed limit of the roadway is 50 km/h.

Stokes Street is a local roadway under the jurisdiction of the City of Niagara Falls that runs in an east-west direction. Livingstone Street has two travel lanes, one lane running in either direction. The assumed speed limit of the roadway is 50 km/h.

The existing study roadway characteristics are shown in Figure 3.

4.2 Public Transit

The proposed development is served by Niagara Falls Transit, connecting transit riders to locations and transit terminals within Niagara Falls. The following transit routes are located in close proximity of the proposed development.

Niagara Falls Transit Route 111 is a bus route that operates in a north-south direction between Niagara Square and the Morrison-Dorchester transit hub. Route 111 operates from morning to evening between Monday to Saturday. The nearest stops are located adjacent to proposed development at the intersection of Dorchester Road and Stokes Street.

Niagara Falls Transit Route 211 is a bus route that operates in a north-south direction between Niagara Square and the Morrison-Dorchester transit hub. Route 211 operates from the evening to late night between Monday to Saturday and operates from morning to evening on Sundays and Holidays. The nearest stops are located adjacent to proposed development at the intersection of Dorchester Road and Stokes Street.

Table 1 provides details regarding transit service in proximity to the proposed development, including the route name, nearest transit stops to the site, and service frequencies. Figure 4 provides a map of the study area's local transit service.

Table 1 – Study Area Transit Service

Transit Route	Nearest Bust Stop	Approximate Service Time	Approximate Peak Service Frequency (min)
Niagara Falls Transit Route 111	Dorchester Road at Stokes Street	Mon – Sat: 6 AM – 7 PM	Mon – Sat: 30
Niagara Falls Transit Route 211	Dorchester Road at Stokes Street	Mon – Sat: 7 PM – 11 PM Sunday: 7:30 AM – 8:40 PM	Mon – Sat: 30 Sunday: 30

4.3 Traffic Counts

No historical traffic counts were available for the intersection of Dorchester Road and Stokes Road to provide insight on pre-pandemic traffic operations. To determine existing operating conditions in the study area, Trans-Plan conducted the turning movement counts (TMCs) on August 4th, 2021. The TMCs were recorded from 7:00 am – 9:00 am and 3:00 pm – 6:30pm. Table 2 provides a summary of the count hours and peak hours for the intersection. Given the provincial re-opening plan during the counts allowed for many businesses to be open to the public, the new survey data was utilized in the analysis. Traffic count data and current intersection signal timing plans are shown in Appendix A.

Table 2 – Intersection Turning Movement Count Details

Intersection	Source	Count Date	Count Hours	Peak Hours
Dorchester Road at Stokes Street	Trans-Plan	Wednesday, August 4, 2021	7:00am – 9:00am 3:00pm – 6:30pm	8:00am – 9:00am 4:15pm – 5:15pm

The existing traffic volumes for the weekday AM and PM peak hours are shown in Figure 5.

4.4 Pedestrian and Cyclist Networks

Sidewalks are provided on both sides of Dorchester Road and Stokes Street within the study area. There are no dedicated bicycle lanes within the study area.

5. FUTURE BACKGROUND CONDITIONS

Future background traffic volumes were determined based on a review of planned developments and future traffic volume growth in the study area. Planned roadway improvements are also reviewed in this section.

5.1 Horizon Years

The analysis of future conditions was completed using a 5-year planning horizon (2026).

5.2 Background Growth Rate

Based on correspondence with the City of Niagara Falls and Niagara Region staff, a growth rate of 2.0 percent per annum was applied to all roadways (and intersection turning movements) in the study area.

5.3 Planned Background Developments

Based on correspondence with City of Niagara Falls Transportation staff, there are no notable developments in the study area.

5.4 Planned Roadway Improvements and Transit Improvements

Based on correspondence with the City of Niagara Falls staff, there are no proposed roadway improvements in the study area. No transit improvements were identified for the study area. Based on correspondence with the staff, the City's Sustainable Transportation Master Plan (STMP) from 2011 identifies that Dorchester Road within the study area will operate over capacity in the next twenty years. The Dorchester Road corridor will be subject to a future Environmental Assessment (EA) to evaluate geometric and intersection improvements. The EA is not yet scheduled, and its completion date is unknown. The corridor is also a planned bicycle route; however, the use of bicycle lanes or a multi-use trail will be evaluated in the EA which has yet to be scheduled.

Future background traffic volumes for the 2026 horizon year for the weekday AM and PM peak hours are shown in Figure 6.

6. SITE TRAFFIC

6.1 Site Trip Generation

Site trips for the proposed development were generated using the Institute of Transportation Engineers (ITE) Trip Generation manuals, 10th Edition. The ITE Land Use Code (LUC) 221 "Multifamily Housing (Mid-Rise)" was utilized for trip rates.

The site trip generation for the subject site during the weekday AM, PM, and are shown in Table 3.

Table 3 – Site Trip Generation

Land Use	Size	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Multifamily Housing (Mid-Rise) LUC 221	76 units						
	Distribution	26%	74%	100%	61%	39%	100%
	Equation	Ln(T) = 0.98 Ln(X)-0.98			Ln(T) = 0.96 Ln(X)-0.63		
	Rate	0.08	0.26	0.34	0.27	0.17	0.44
	Trips	6	20	26	21	13	34

The proposed development is expected to generate 26 and 34 two-way trips during the AM and PM peak periods, respectively.

6.2 Trip Distribution and Assignment

Site trips were distributed and assigned to/from the site and study area roadways based on existing traffic patterns along Dorchester Road, based on the traffic counts. The assignment of site traffic during the weekday AM and PM peak period is shown in Figure 7.

7. FUTURE TOTAL TRAFFIC CONDITIONS

Site traffic volumes were added to the future background traffic volumes to obtain future total traffic volumes for the peak hours. The future total traffic volumes for the weekday AM and PM, for horizon year 2026, are shown in Figure 8.

7.1 Capacity Analysis and Queuing Analysis

A capacity and queuing analysis was performed for the study area intersections using Synchro and Sim Traffic analysis software. The results of the weekday AM and PM peak hour capacity analysis for the 2026 year are shown in Table 4. Capacity and Queuing Analysis Sheets and Level of Service (LOS) Definitions are provided in Appendix B and Appendix C, respectively.

Capacity Thresholds:

The City of Niagara Falls Traffic Impact Study Guidelines states that a volume-to-capacity (v/c) ratio of 0.85 or less is considered to be acceptable for overall intersection operations and shared through / turning movements. A v/c ratio of 0.95 or less is considered to be acceptable for exclusive left turn and right turn movements at signalized intersections. A LOS of E or better is considered to be acceptable for unsignalized intersections.

Queueing Thresholds

The City of Niagara Falls Traffic Impact Study Guidelines states that 95th percentile queues are considered to be acceptable when they are contained within their available storage length.

The results of the capacity analysis are summarized in this section for each intersection:

Dorchester Road & Stokes Street

Existing Conditions

For the existing conditions, during the weekday AM peak period, the intersection operates at an overall good LOS of A. During the weekday PM peak period, the intersection operates at a good LOS of B.

Future Horizon Years 2026 Conditions

Under future 2026 conditions, the intersection operates at a good LOS of A and B during the weekday AM and PM peak periods, respectively. The site access operates with an acceptable LOS of B and C during the weekday AM and PM peak periods, respectively.

Queuing Analysis

Under total 2026 weekday AM peak hour conditions, the westbound and southbound 95th percentile queues are expected to be 14.9m and 13.5m, respectively. Effectively, queue lengths of 14.9m and 13.5m for the westbound and southbound approach amount to approximately, 2 – 3 standard passenger vehicles. These queues are expected to be minimal.

Under total 2026 weekday PM peak hour conditions, the northbound 95th percentile queue is expected to be approximately 7.2 meters, which translates to approximately one vehicle. During the weekday PM peak period, the southbound 95th percentile queue is expected to be 12.1m which is approximately 2 vehicles. The westbound 95th percentile queue is 17.2m which is approximately three vehicles. The

northbound, southbound, and westbound queues are all expected to be minimal. During the weekday PM peak period, the eastbound queue is expected to be 10.4m which is approximately two vehicles. While the eastbound queue is more than the available storage throat length, the queue is expected to be contained within the proposed site.

Table 4 – Capacity and Queuing Analysis Results

Intersection	Approximate Storage Length (m)	Existing 2021 Traffic Conditions				Background 2026 Traffic Conditions				Total 2026 Traffic Conditions					
Movement		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak			PM Peak		
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Queue Length (m)	Delay	LOS	Queue Length (m)
Dorchester Road & Stokes Street															
Westbound Left / Right	123	11	B	11	B										
Northbound Through / Right	177	0	A	0	A										
Southbound Through / Left	180	0	A	0	A										
Dorchester Road & Site Access/Stokes Street															
Eastbound Through / Left / Right	5					0	A	0	A	0	A	0	24	C	10.4
Westbound Through / Left / Right	123					14	B	0	A	20	C	14.9	21	C	17.2
Northbound Through / Left / Right	177					0	A	0	A	0	A	0	0	A	7.2
Southbound Through / Left / Right	180					0	A	1	A	1	A	13.5	1	A	12.1

8. SIGNAL WARRANT ANALYSIS

A signal warrant analysis was completed based on the Ontario Traffic Manual, Book 12 – Traffic Signals guidelines for the intersection of Dorchester Road and Stokes Street, Niagara Falls, ON. To complete the signal warrant analysis 8 hours of traffic volumes are needed. For the proposed development, the signal warrant analysis reviews the intersection under future conditions (2026). Traffic volumes were collected on Wednesday August 4,2021 by Trans-Plan. The traffic volumes recorded by Trans-Plan and the 24 mid-block data for the intersection obtained from the city were used to complete the signal warrant analysis.

The hourly percent distribution of traffic throughout the day as a ratio of the peak period volumes was calculated using the 24-mid-block data. The traffic volume percentage used in the analysis for each off-peak hour, in comparison to the weekday AM and PM peak hour volumes is shown in Table 5.

Table 5 – Weekday Hourly Volumes, Dorchester Road and Stokes Street

	AM Peak				PM Peak			
Hour Ending	7:00	8:00	9:00	10:00	15:00	16:00	17:00	18:00
Traffic Volumes	325	616	700	711	981	1025	992	868
Percent of Peak Hour	46%	87%	98%	100%	96%	100%	97%	85%

It was assumed that the hourly traffic distribution would be the same in the 2026 horizon year. Therefore, using the percent distribution and forecasted future 2026 peak hour volumes, as shown in Figure 6, hourly volumes were calculated for 2026. Using the generated volumes, a signal warrant analysis was conducted to determine is a traffic signal is warranted under future conditions. The detailed signal warrant analysis is provided in Appendix D and the results are summarized below in Table 6.

Table 6 – Signal Warrant Analysis Results, Dorchester Road and Stokes Street

Traffic Signal Warrant	Future Total Conditions		
	Required	Satisfied	Warrant Met?
1 - Minimum Vehicular Volume	100%	46%	No
2 - Delay to Cross Traffic	100%	58%	No
Combination Warrant (1 & 2)	80%	46%	No
Overall Result			No

The warrant analysis results indicate that a traffic signal is not warranted at the Dorchester Road and Stokes Street intersection. The intersection could be maintained as unsignalized.

9. TURN LANE WARRANT ANALYSIS

9.1 Northbound Left Turn Lane, Dorchester Road and Stokes Street

A left turn warrant was completed for the northbound left movement at the intersection of Dorchester Road and Stokes Street. The MTO Geometric Design Standards for Ontario Highways warrants were analyzed based on the two-lane configuration for future total traffic conditions. Source information is provided in Appendix E with the findings summarized below in Table 7.

Table 7 – Dorchester Road and Stokes Street Northbound Left Turn Warrant Justification

Criteria	AM Peak Hour Traffic Volumes	PM Peak Hour Traffic Volumes
North Left Turn (NBLT) Traffic Volumes	2	8
Advancing Traffic Volumes (Northbound)	251	557
% Left Turns in Advancing Traffic Volumes (NB)	1%	1%
Opposing Traffic Volumes (Southbound)	275	526
Exclusive left turn lane justified?	No	Yes

The results indicate that an exclusive northbound left turn lane at the intersection of Dorchester Road and Stokes Street is warranted due traffic volumes in the PM Peak Period. However, based on the capacity and queuing analysis conducted using Synchro and SimTraffic, the intersection is expected to operate acceptably without a northbound left turn lane. The capacity and queuing analysis indicated that the northbound queue during the weekday PM peak period is approximately 7.2m. Given that a standard passenger vehicle is approximately 5m in length, only one vehicle is expected to be queued during the 95th percentile queue.

10. PARKING STUDY

10.1 Auto Parking Supply

The proposed development has a total parking supply of 92 at-grade parking spaces that includes two accessible parking spaces.

10.2 Minimum Parking Requirements

A parking requirements review was conducted to determine if the proposed development's parking supply development is sufficient based on general parking rates from City of Niagara Falls Zoning By-law 79-200. Table 8 shows the parking requirements of the proposed development and an excerpt of the by-law is provided in Appendix F.

Table 8 – Parking Requirements and Supply

Land Use	**Units**	**Parking Requirement**		**Parking Supply (Spaces)**	**Deficit/ Surplus (Spaces)**
		Rate	**Spaces**		
Dwelling containing 3 or more dwelling units	76	1.4 spaces per unit	106	92	-14

Source: City of Niagara Falls Zoning By-law 79-200

Based on the City's Zoning By-law, the respective parking requirements for this development is 106 spaces. The total proposed parking supply is short of the minimum requirement by 14 spaces. To determine if the proposed supply would be sufficient, residential proxy surveys within Niagara Falls were completed to determine actual residential parking demands.

10.3 Proxy Parking Survey

Due to the ongoing pandemic, and its effects on traffic patterns, proxy parking data for residential apartment sites in the City of Niagara Falls was collected through a search of pre-pandemic surveys in Trans-Plan's database. One mid-rise apartment site, 3515 McLeod Road, of similar height and unit count to the proposed development was identified and it is expected to have a similar parking demand.

The methodologies and the survey data completed at the proxy sites were as follows:

- Conducted on Thursday November 7, 2019 (i.e. a typical weekday), Saturday November 9, 2019 (i.e. a typical Saturday), and Sunday November 10, 2019 (i.e. a typical Sunday) between the hours of 6:00am and 12:00am
- Recorded the number of vehicles entering and exiting the parking area in 15-minute intervals
- Recorded the number of vehicles parked (i.e. a spot count) in the parking area at the start of each survey date

The proxy site statistics and parking survey results are summarized in Table 9 and detailed survey results are provided in Appendix G.

Table 9 – Proxy Parking Survey Results

Proxy Site	**6515 McLeod Road**					
Land Use	Residential					
Number of Units	64					
Parking Supply	Supply		Rate			
	64		1.28			
Proxy Survey Date	Thursday November 7, 2019		Saturday November 9, 2019		Sunday November 10, 2019	
Proxy Survey Results Peak Demand	Spaces	Rate	Spaces	Rate	Spaces	Rate
	69	1.07	66	1.03	69	1.07
Peak Demand Rate	1.07					

The proxy surveys indicated a peak parking demand rate of 1.07 spaces per unit the weekday and Sunday late night periods. This peak demand rate is below the by-law minimum rate of 1.4 spaces per unit.

10.4 Estimated Future Parking Demands and Proposed Residential Park Rate

The peak residential apartment proxy rate from Section 10.3 was applied to the residential component of the proposed development to estimate future parking demands and is shown below in Table 10.

Table 10 – Estimated Future Parking Demand, Subject Site

Number of Units	**Parking Demand Rate**		**Residential Parking Supply**		**Parking Surplus**
	Rate	**Space**	**Rate**	**Space**	
76	1.07 spaces per unit	82	1.21 spaces per unit	92	+10

Based on the parking demand determined from the proxy surveys, the proposed parking supply provided a surplus of 10 parking space. Therefore, the proposed residential parking rate of 1.21 spaces per unit is expected to be sufficient to accommodate the residential uses of the site.

10.5 Minimum Accessible Parking Requirements

The City of Niagara Falls Zoning By-law 79-200 does not include requirements for accessible parking spaces. Therefore, the minimum accessible parking requirement was calculated using Section 80.36 of the Accessibility for Ontarians with Disabilities Act (AODA), 2005. A comparison of the site's accessible parking requirements and supply is provided in Table 11 and an excerpt of the AODA is provided in Appendix H.

Table 11 – Accessible Parking Requirements

Total Parking Supply	Minimum Rate	Minimum Requirement	Proposed Accessible Parking Supply	Deficit/ Surplus
92	4% of the total number of parking spaces where there are between 13 and 100 parking spaces*	4	2	-2

Note: (*) Rounded up to the nearest whole number as per the by-law
Source: Accessibility for Ontarians with Disabilities Act, Section 80.36

The proposed development's AODA accessible parking requirement is 4 spaces and its proposed accessible parking supply of 2 spaces results in a deficit of 2 spaces. It is recommended that 2 additional accessible parking spaces be added to the subject site.

11. SUMMARY AND RECOMMENDATIONS

Our Traffic Impact Study and Parking Study for the proposed residential development at 6259 – 6293 Dorchester Road in the City of Niagara Falls is summarized as follows:

11.1 Summary of Traffic Impact Study

- The subject site is located west of the Dorchester Road and Stokes Street intersection. The site is currently occupied by a single-detached dwelling that will removed in order to construct the proposed residential development.
- The proposed residential development consists of a 5-storey residential building with 76 dwelling units. The proposed parking supply is 92 parking spaces provided at grade. Additionally, two accessible parking spaces are proposed. One full movement access is provided off Dorchester Road.
- Historical Turning Movement Counts (TMC) data was not available for purchase. Therefore, TMCs were conducted by Trans-Plan on August 4th, 2021, for both the AM and PM peak period. A background traffic growth of 2 percent per annum was also applied to the study area roadway for the future conditions.
- Based on the ITE Trip Generation manual, the proposed residential development is expected to generate 26 and 34 two-way during the weekday AM and PM peak periods, respectively.
- The proposed site access on Dorchester Road is expected to be operating acceptably in the future.

- Based on the signal warrant analysis conducted for the intersection of Dorchester Road and Stokes Street, traffic control signals at the intersection will not be required.
- The left turn analysis conducted for the intersection of Dorchester Road and Stokes Street indicates that a northbound left turn lane is warranted. However, based on capacity and queuing analysis conducted using Synchro and SimTraffic, which indicate that northbound vehicle queues are estimated to be one vehicle, the intersection is expected to operate acceptably without a northbound left turn lane.

11.2 Summary of Parking Study

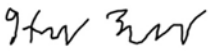
- The proposed development has a parking supply of 92 at-grade parking spaces and 2 accessible parking spaces. Based on the City of Niagara Falls Zoning By-law 79-200, the parking requirements for the subject site is 106 parking spaces, leading to a total deficit of 14 spaces.
- One residential apartment proxy parking survey site in Niagara Falls was identified within Trans-Plan's database. The proxy parking surveys indicated an average peak parking demand rate of 1.07 spaces per unit. This rate is lower than the site's proposed residential rate of 1.21 spaces per unit.
- Based on the surveyed average peak demand rate of 1.07 spaces per unit, the future residential parking demand for the subject site is expected to be 82 spaces. Compared to the proposed parking supply of 92 spaces, the parking surplus is 10 spaces. Given the parking surplus it is our opinion that the proposed parking rate of 1.21 spaces per unit is sufficient to accommodate future residents.
- A review of accessible parking requirements was conducted using Section 80.36 from the Accessibility for Ontarians with Disabilities Act. The subject site requires 4 accessible spaces. Our recommendation is to add an additional two accessible parking spaces.

11.3 Recommendations

Overall, the road network can operate acceptably under future traffic conditions. The proposed development is expected to have minimal impacts on the surrounding road network. No roadway improvements were found necessary to accommodate future traffic growth and site traffic.

Based on the data collected during the proxy survey, a parking rate of 1.21 spaces/ unit is expected to be sufficient. The parking demand can be accommodated by the proposed total parking supply of 92 spaces. It is recommended that an additional 2 accessible parking spaces be provided on the subject site.

Respectfully submitted,

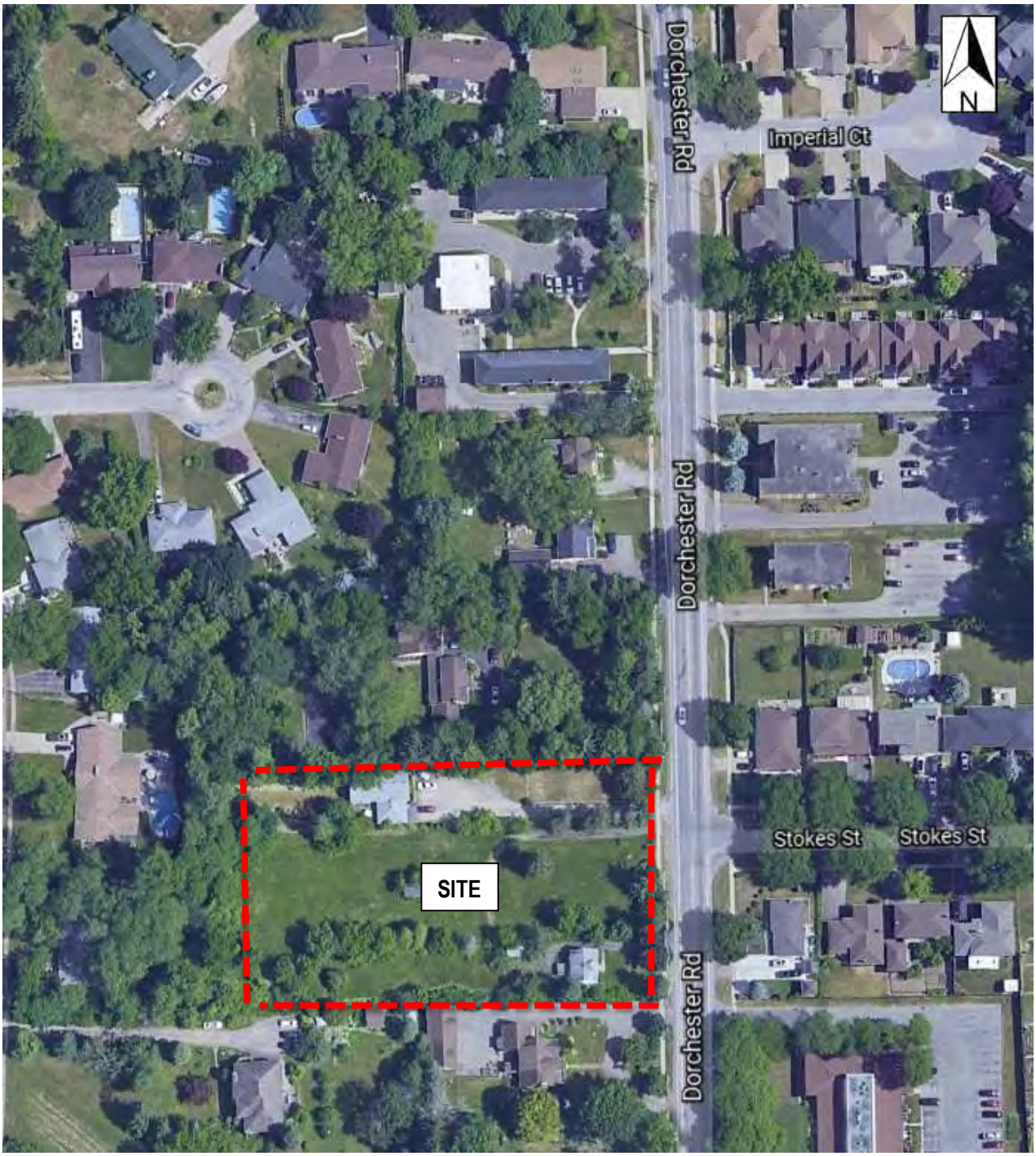


Anil Seegobin, P.Eng.
Partner, Engineer

Henry Tseng
Traffic Analyst

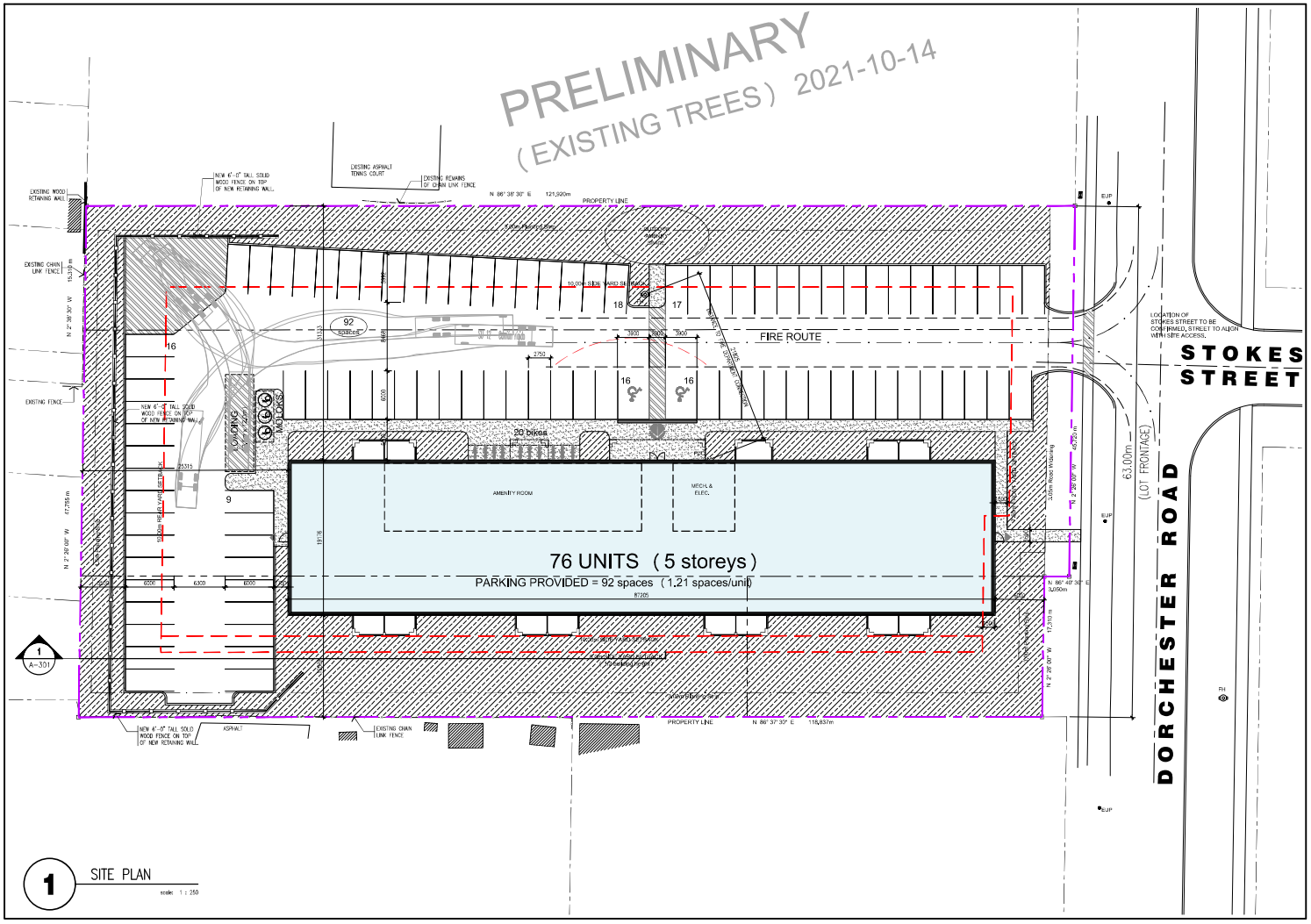
Trans-Plan Transportation Inc.
Transportation Consultants

Figure 1 – Site Location



Source: Google Earth

Figure 2 – Site Plan



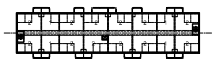
LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- BUILDING SETBACK LINE
- LANDSCAPE BUFFER STRIP
- LINE OF ROAD WIDENING
- FIRE ROUTE — CENTER LINE OF TRUCK ACCESS ROUTE with 12.0 m TURNING RADIUS.
- NEW SOLID WOOD FENCE
- EXISTING CHAIN LINK FENCE
- AREA OF LANDSCAPING
- PAINTED LINES
- NEW CONCRETE SIDEWALK
- MAIN ENTRANCE
- EXIT / ENTRANCE
- BARRIER CURB
- BIKE PARKING
- NEW FIRE HYDRANT
- EXISTING UTILITY POLE
- EXISTING BELL PEDESTAL
- FDC — FIRE DEPARTMENT CONNECTION
- MOLOK (GARBAGE BINS)

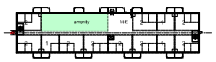
STANDARD PARKING SPACE: 6.00m x 2.75m with 7.00m AISLE

ACCESSIBLE PARKING SPACE: 3.90m x 6.00m, 2.00m SHARED ACCESSIBLE AISLE with 7.00m AISLE

FLOOR PLANS



16 units/floor
2nd, 3rd, 4th, 5th levels = 64 units
(16 - 1 bdrm, 48 - 2 bdrm)



12 units
(3 - 1 bdrm, 9 - 2 bdrm)
+ M & E room
+ entrance
+ amenity space

TOTAL = 76 units
1-Bedroom Units = 19
2-Bedroom Units = 57

R.5C RESIDENTIAL

REGULATIONS	REQUIRED	PROVIDED	CONFORMS
MINIMUM LOT AREA	7600.0 m² (0.76 Ha)	7,630.9 m² (0.7630 Ha)	YES
MINIMUM LOT AREA / DWELLING UNIT	100 m² / DWELLING UNIT	100 m² / DWELLING UNIT	YES
MINIMUM LOT FRONTAGE	30.0 m	66.09m (DORCHESTER RD)	YES
MINIMUM FRONT YARD	7.50 m	8.0 m	NO
MINIMUM EXTERIOR SIDE YARD	NOT APPLICABLE	NOT APPLICABLE	YES
MINIMUM INTERIOR SIDE YARD	1/2 BUILDING HEIGHT = 8.30 m	10.0 m	YES
MINIMUM REAR YARD	10.0 m	22.1m	YES
MAXIMUM BUILDING HEIGHT	19.0 m	16.0 m	YES
MAXIMUM BUILDING COVERAGE (% OF LOT AREA)	30 % (2287.8m²)	24.65 % (BLDG AREA = 1854.9 m²)	YES
MINIMUM LANDSCAPE OPEN SPACE (% OF LOT AREA)	30 % (2287.8m²)	31.09 % (AREA = 2372.8 m²)	YES

OFF-STREET PARKING

ZONING REGULATION	REQUIRED	PROVIDED	COMPLIANCE
PARKING REQUIREMENTS: 1.4 spaces/unit	TOTAL 107 spaces REQUIRED (for 76 units)	92 spaces (= 1.21 spaces/unit)	NO
PARKING DIMENSIONS	2.75m X 6.00m	2.75m X 6.00m	YES
ACCESSIBLE PARKING REQUIREMENTS	2 spaces	2 spaces	YES
ACCESSIBLE PARKING DIMENSIONS	3.9m x 6.0m	3.9m x 6.0m	YES
MINIMUM WIDTH OF DRIVEWAYS AND PARKING AISLES	6.30 m	6.20m	YES
MINIMUM BIKE PARKING	0.25 bike spaces / unit = 19 spaces	20 bike spaces	YES

SURVEY NOTE:

THE INFORMATION AND SURVEY LAYOUT USED IN THE PREPARATION OF THIS DRAWING HAS BEEN TAKEN FROM:

PLAN OF SURVEY WITH TOPOGRAPHIC INFORMATION, DATED MAY 26, 2021
FOR PART OF STAMFORD TOWNSHIP LOT 148, CITY OF NIAGARA FALLS, REGIONAL MUNICIPALITY OF NIAGARA
PREPARED BY J.D. BARNES LIMITED, PROJECT No. 21-16-100-00

AND

GOOGLE EARTH IMAGES FOR EXISTING ADJACENT CONDITIONS. LOCATION OF STOKES STREET TO BE CONFIRMED.

KEY MAP

PANORAMIC PROPERTIES INC.

No.	REVISIONS	date
01	RE-ISSUED FOR ZONING AMENDMENT	21.07.19
01	ISSUED FOR ZONING AMENDMENT	21.06.10

PROJECT NORTH — TRUE NORTH — scale 1: 250

drawn CRT
last worked on 2021.10.14 by LH
checked BRJ
print date 21.07.19

BJC architects inc.

client
PANORAMIC PROPERTIES INC.
9582 BEAVERDAMS ROAD NIAGARA FALLS ONTARIO

project
5 STOREY APARTMENT BUILDING
(NIAGARA FALLS)
2659 DORCHESTER ROAD NIAGARA FALLS ONTARIO

drawing title
SITE PLAN

reference
project no. 21-023
client reference number
sheet no. A-101 01

Figure 3: Existing Study Area Roadway Characteristics

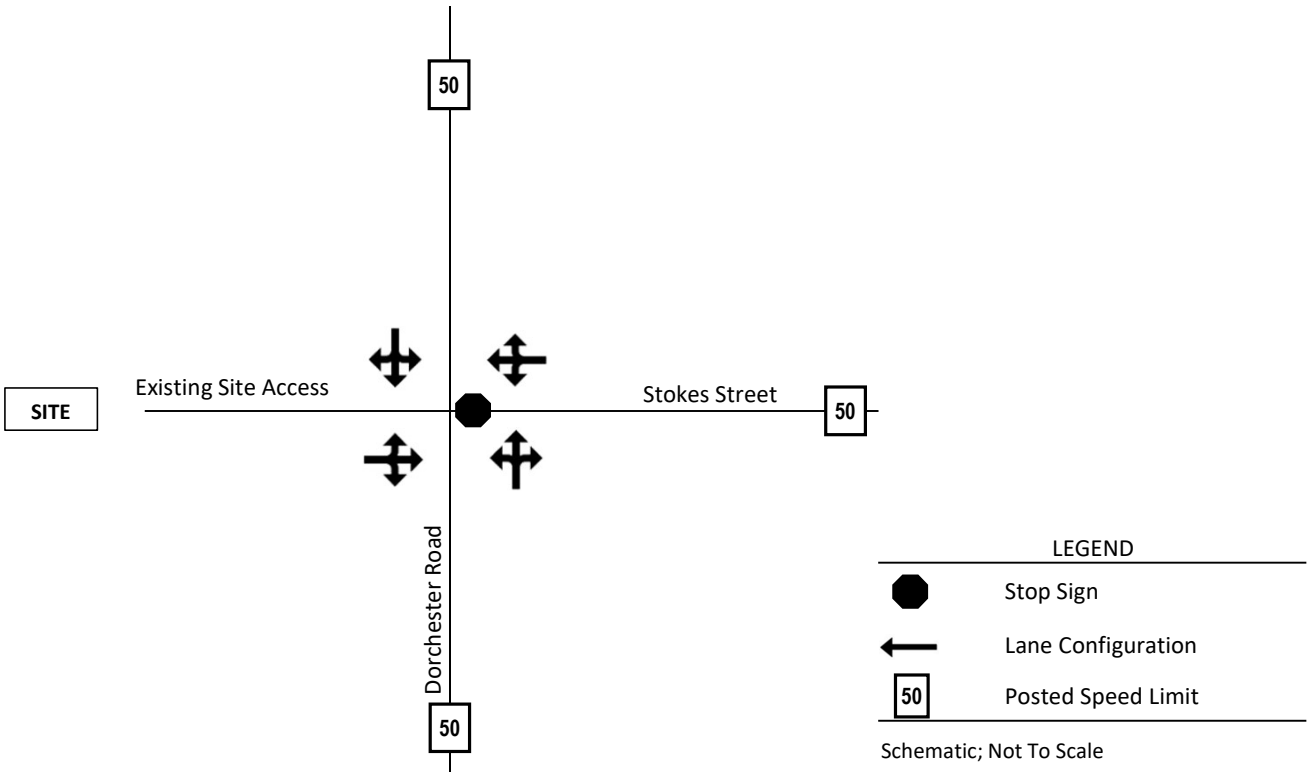


Figure 4 – Study Area Transit Service

Sources: Niagara Falls Transit Service website

Figure 5: Existing Traffic Volumes, Weekday AM and PM Peak Hours (2021)

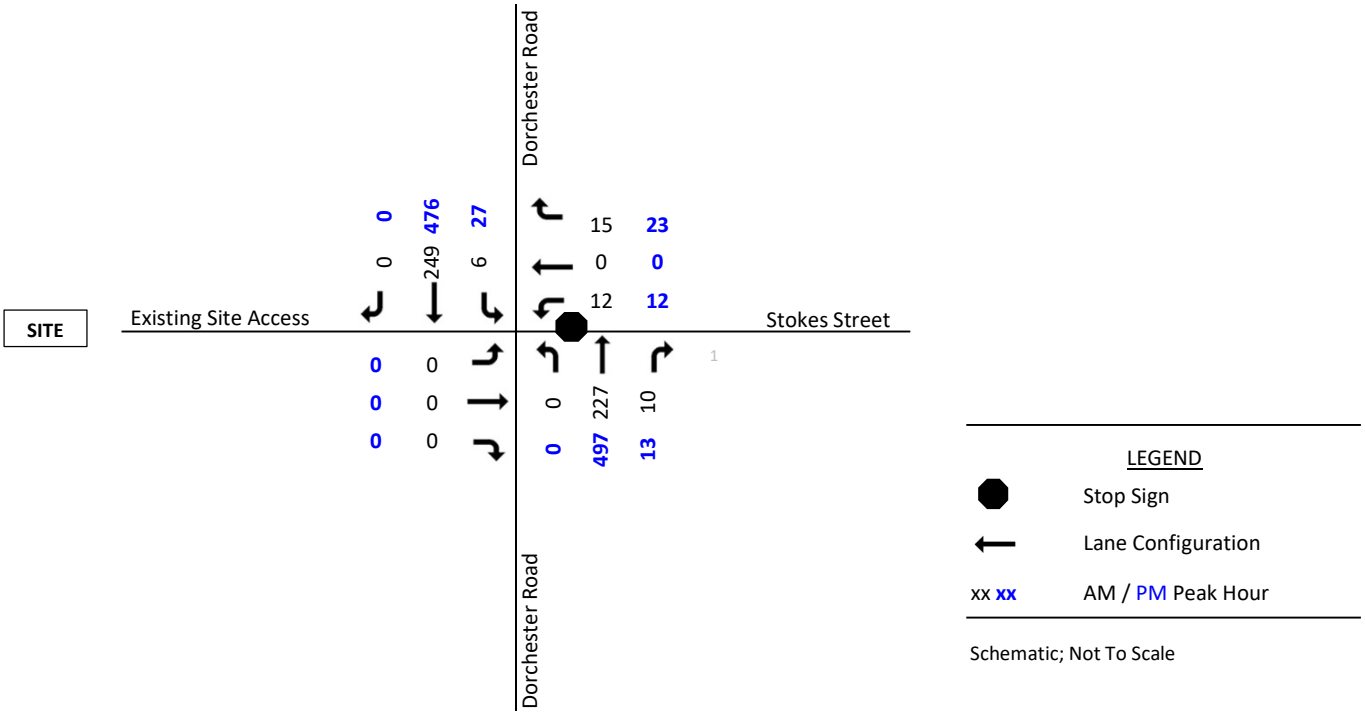


Figure 6: 2026 Background Traffic Volumes, Weekday AM and PM Peak Hours

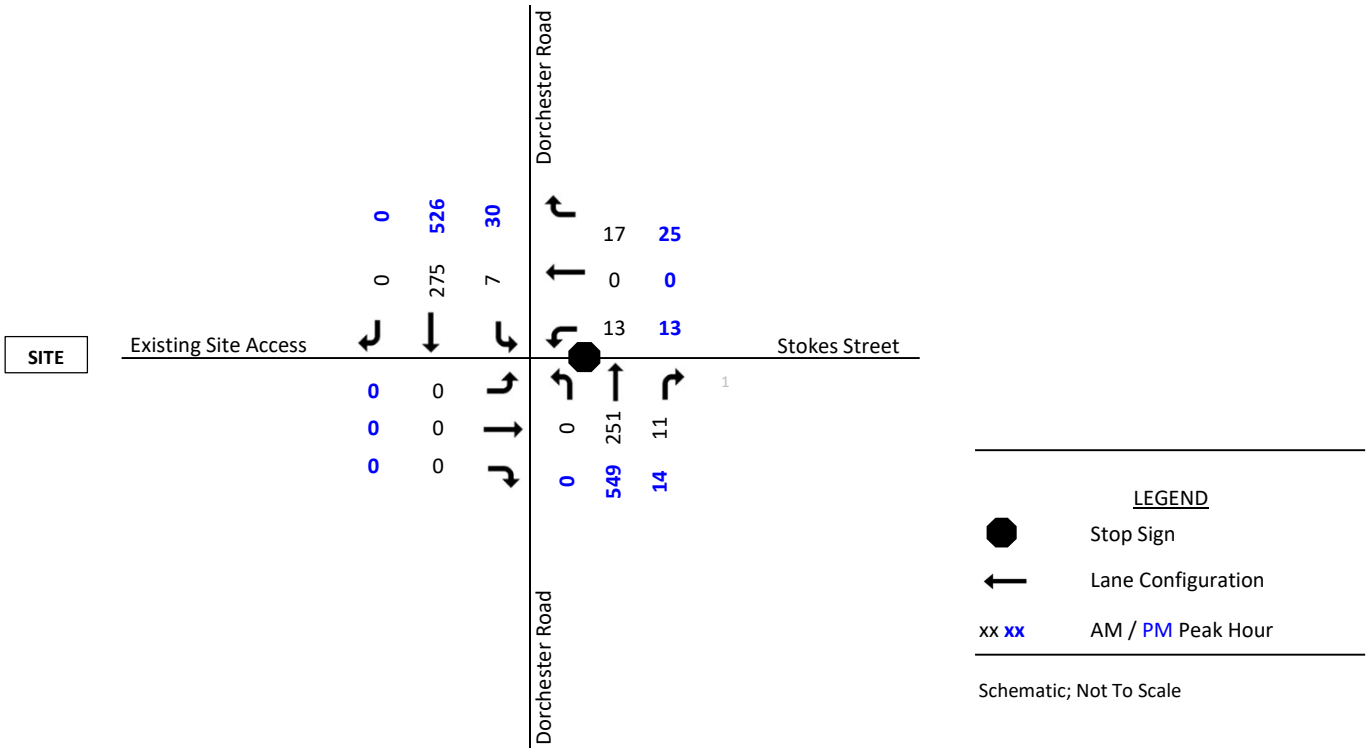


Figure 7: Site Traffic Assignment, Weekday AM and PM Peak Hours

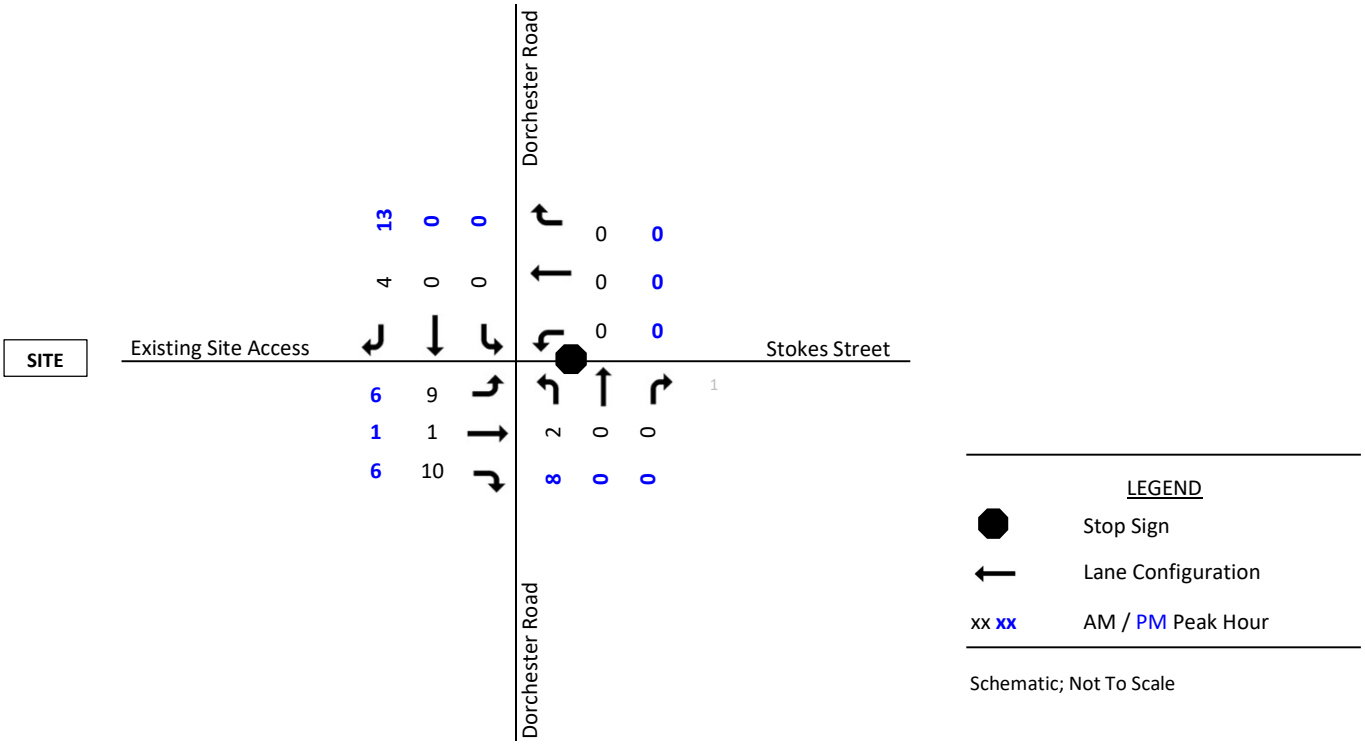
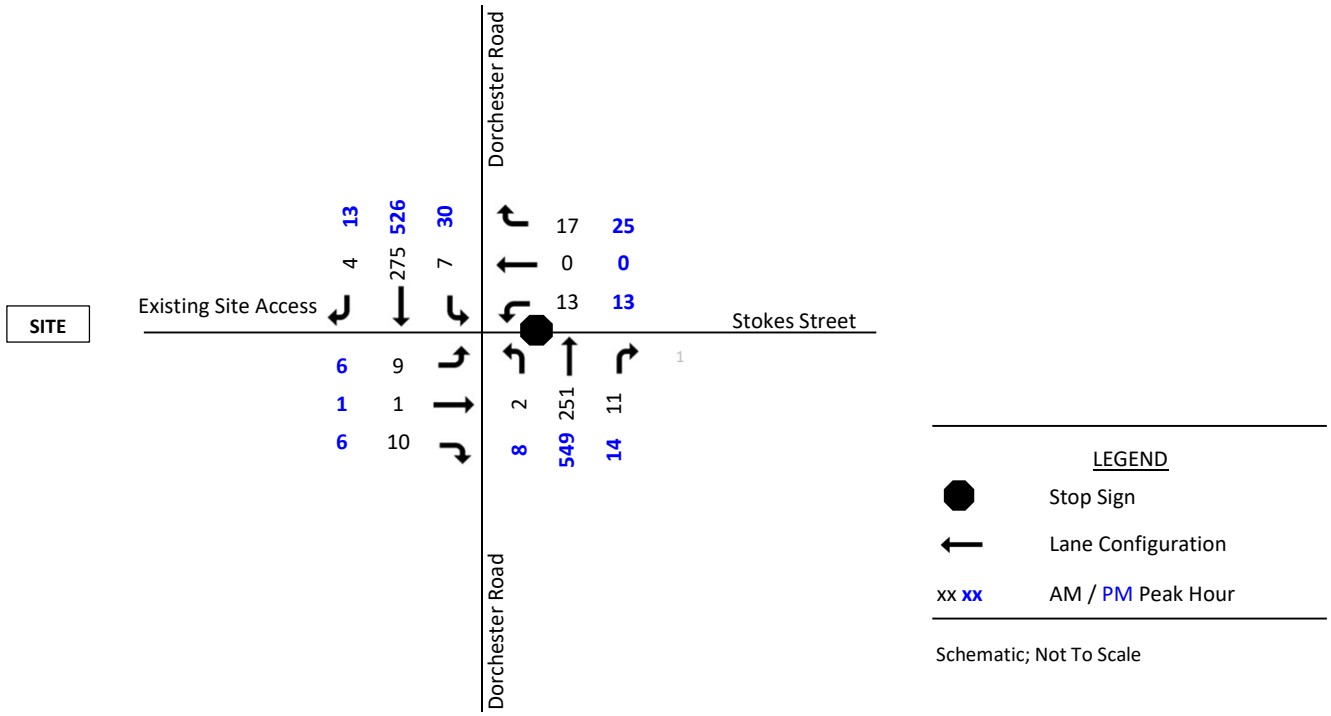


Figure 8: 2026 Total Traffic Volumes, Weekday AM and PM Peak Hours



APPENDIX A

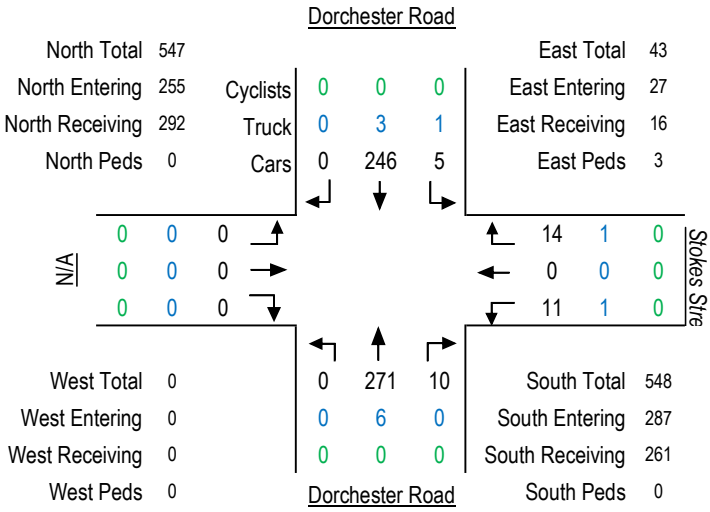
Turning Movement Counts

Turning Movement Count Diagram

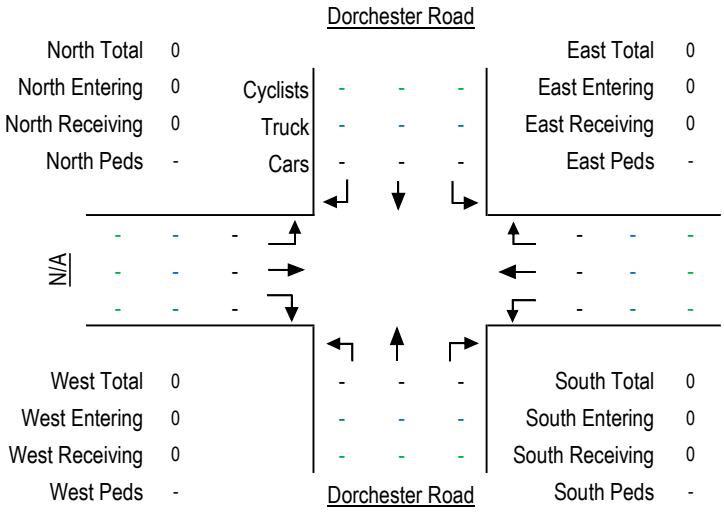
Intersection: Dorchester Road at Stokes Street
Municipality: Niagara Falls, Ontario

Intersection ID:
Date: August 4, 2021

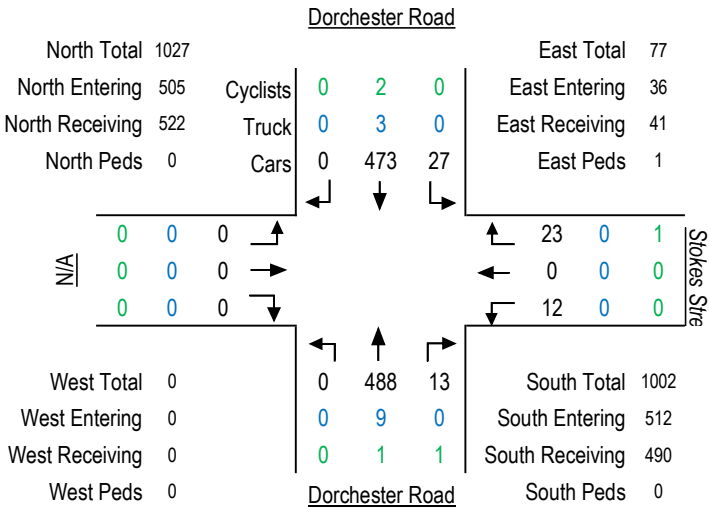
AM Peak Hour: 8:00 to 9:00



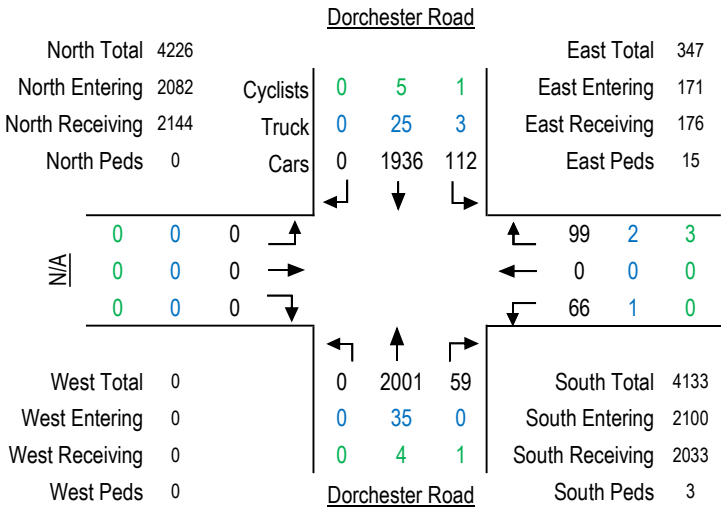
MD Peak Hour: - to -



PM Peak Hour: 16:15 to 17:15



Total 8-Hour Count



APPENDIX B

Capacity Analysis Sheets

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	15	227	10	6	249
Future Volume (Veh/h)	12	15	227	10	6	249
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	16	247	11	7	271
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	538	252			258	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	538	252			258	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	98			99	
cM capacity (veh/h)	502	786			1307	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	29	258	278
Volume Left	13	0	7
Volume Right	16	11	0
cSH	627	1700	1307
Volume to Capacity	0.05	0.15	0.01
Queue Length 95th (m)	1.2	0.0	0.1
Control Delay (s)	11.0	0.0	0.2
Lane LOS	B		A
Approach Delay (s)	11.0	0.0	0.2
Approach LOS	B		

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		27.9%	ICU Level of Service	A
Analysis Period (min)		15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	23	497	13	27	476
Future Volume (Veh/h)	12	23	497	13	27	476
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	25	540	14	29	517
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1122	547			554	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1122	547			554	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	95			97	
cM capacity (veh/h)	221	537			1016	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	38	554	546
Volume Left	13	0	29
Volume Right	25	14	0
cSH	361	1700	1016
Volume to Capacity	0.11	0.33	0.03
Queue Length 95th (m)	2.8	0.0	0.7
Control Delay (s)	16.1	0.0	0.8
Lane LOS	C		A
Approach Delay (s)	16.1	0.0	0.8
Approach LOS	C		

Intersection Summary				
Average Delay		0.9		
Intersection Capacity Utilization		57.1%	ICU Level of Service	B
Analysis Period (min)		15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	13	0	0	549	14	0	0	0
Future Volume (Veh/h)	0	0	0	0	13	0	0	549	14	0	0	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	14	0	0	597	15	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	612	612	0	604	604	604	0			612		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	612	612	0	604	604	604	0			612		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	97	100	100			100		
cM capacity (veh/h)	395	408	1085	410	412	498	1623			967		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	14	612	0
Volume Left	0	0	0	0
Volume Right	0	0	15	0
cSH	1700	412	1623	1700
Volume to Capacity	0.00	0.03	0.00	0.00
Queue Length 95th (m)	0.0	0.8	0.0	0.0
Control Delay (s)	0.0	14.0	0.0	0.0
Lane LOS	A	B		
Approach Delay (s)	0.0	14.0	0.0	0.0
Approach LOS	A	B		

Intersection Summary					
Average Delay			0.3		
Intersection Capacity Utilization			39.7%	ICU Level of Service	A
Analysis Period (min)			15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	13	0	25	0	549	14	30	526	0
Future Volume (Veh/h)	0	0	0	13	0	25	0	549	14	30	526	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	0	27	0	597	15	33	572	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1270	1250	572	1242	1242	604	572			612		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1270	1250	572	1242	1242	604	572			612		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	91	100	95	100			97		
cM capacity (veh/h)	134	167	520	147	169	498	1001			967		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	0	41	612	605
Volume Left	0	14	0	33
Volume Right	0	27	15	0
cSH	1700	275	1001	967
Volume to Capacity	0.00	0.15	0.00	0.03
Queue Length 95th (m)	0.0	4.1	0.0	0.8
Control Delay (s)	0.0	20.4	0.0	0.9
Lane LOS	A	C		A
Approach Delay (s)	0.0	20.4	0.0	0.9
Approach LOS	A	C		

Intersection Summary					
Average Delay			1.1		
Intersection Capacity Utilization			62.2%	ICU Level of Service	B
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis <TOT2026> AM Peak
1: Dorchester Road & Site Access/Stokes Street 08-11-2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	1	10	13	0	17	2	251	11	7	275	4
Future Volume (Veh/h)	9	1	10	13	0	17	2	251	11	7	275	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	1	11	14	0	18	2	273	12	8	299	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	618	606	301	612	602	279	303			285		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	618	606	301	612	602	279	303			285		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	99	96	100	98	100			99		
cM capacity (veh/h)	390	408	739	396	410	760	1258			1277		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	32	287	311
Volume Left	10	14	2	8
Volume Right	11	18	12	4
cSH	512	542	1258	1277
Volume to Capacity	0.04	0.06	0.00	0.01
Queue Length 95th (m)	1.1	1.5	0.0	0.2
Control Delay (s)	12.4	12.1	0.1	0.3
Lane LOS	B	B	A	A
Approach Delay (s)	12.4	12.1	0.1	0.3
Approach LOS	B	B		

Intersection Summary					
Average Delay	1.2				
Intersection Capacity Utilization	29.3%	ICU Level of Service		A	
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis <TOT2026> PM Peak
1: Dorchester Road & Site Access/Stokes Street 08-11-2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1	6	13	0	25	8	549	14	30	526	13
Future Volume (Veh/h)	6	1	6	13	0	25	8	549	14	30	526	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	1	7	14	0	27	9	597	15	33	572	14
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	1294	1275	579	1275	1274	604	586			612		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1294	1275	579	1275	1274	604	586			612		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	95	99	99	90	100	95	99			97		
cM capacity (veh/h)	128	160	515	137	160	498	989			967		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	41	621	619
Volume Left	7	14	9	33
Volume Right	7	27	15	14
cSH	201	262	989	967
Volume to Capacity	0.07	0.16	0.01	0.03
Queue Length 95th (m)	1.9	4.4	0.2	0.8
Control Delay (s)	24.4	21.3	0.2	0.9
Lane LOS	C	C	A	A
Approach Delay (s)	24.4	21.3	0.2	0.9
Approach LOS	C	C		

Intersection Summary					
Average Delay	1.5				
Intersection Capacity Utilization	56.1%	ICU Level of Service		B	
Analysis Period (min)	15				

Queuing and Blocking Report
<TOT2026> AM Peak 08-16-2021

Intersection: 1: Dorchester Road & Site Access/Stokes Street

Movement	WB	SB
Directions Served	LTR	LTR
Maximum Queue (m)	16.0	21.5
Average Queue (m)	8.1	3.6
95th Queue (m)	14.9	13.5
Link Distance (m)	120.0	168.1
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report
<TOT2026> PM Peak 08-13-2021

Intersection: 1: Dorchester Road & Site Access/Stokes Street

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (m)	9.3	16.6	16.4	16.3
Average Queue (m)	3.4	8.3	1.2	3.3
95th Queue (m)	10.4	17.2	7.2	12.1
Link Distance (m)	129.8	120.0	219.4	168.1
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 0

APPENDIX C

Level of Service Definition

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.

is supervised by a school crossing guard or where the intersection is frequented by seniors, an average walking speed of 1.0 metres / second is used instead. The clearance interval must be set at this time length; it cannot be shortened or extended.

Walk Time Calculation:

50% of the 'Don't Walk' time, minimum of 7 seconds. For intersections that operate under a fixed time setting, the walk time is extended to equal the maximum green time for that phase.

Example:

Crossing Distance	=	25 metres, as measured along the midpoint of the crosswalk from curb to curb
Crossing Time	=	25 metres / 1.2 metres per second walking speed
	=	20.83 seconds OR 21 seconds (rounded)
Amber Time	=	3.3 seconds OR 3 seconds (rounded)
Don't Walk Time	=	21 seconds crossing time - 3 seconds amber clearance time
	=	**18 seconds**
Walk Time	=	50% of the Don't Walk time, minimum of 7 seconds
	=	**9 seconds** (*Note: if this intersection is operating as fixed time and the maximum green is set at 40 seconds, the walk time is then increased to 22 seconds)*

The analysis should include the identification of signalized intersections where one or more of the following is met:

- Volume to capacity (v/c) ratios for overall intersection operations, through movements, or shared through/turning movements increased to 0.85 or above
- v/c ratios for exclusive left turn or right turn movements increased to 0.95 or above
- 95th percentile queues for an individual movement are projected to exceed available turning lane storage. The analyst will recommend signal timing changes to mitigate vehicle spillovers.

Identification of unsignalized intersections where one or more of the following is met:

- Level of service (LOS), based on average delay per vehicle, on individual movements exceeds LOS "E"
- The estimated 95th percentile queue length for an individual movement exceeds the available queue storage

Conventional signal timing plans should be used and all proposed adjustments to traffic signal timing, phasing and cycle lengths should be evaluated in terms of pedestrian crossing time, effect on queue lengths, adequacy of existing storage and effects on the existing signal co-ordination.

For analyses carried out using the Synchro software package (version 5.0 and later), the intersection summary reports should be printed to show the following information:

- Describes source, method and assumptions for adjusting gross trip generation for pass-by trips or site interaction rates.
- Obvious or unrealistic trip rate discounting will result in the report being returned to the Consultant for revision, which could result in a longer than expected approval timeline.

15. Sustainable Forms of Transportation / Transportation Demand Management (TDM)

- If TDM reductions are being applied to trip generation, a TDM plan should be prepared that identifies existing and future (proposed) sustainable forms of transportation, routes and infrastructure within the study area
- Plan should describe and evaluate the potential impacts and changes to pedestrian, cycling and transit modal split associated with the development / redevelopment.

16. Evaluation of Impacts

- Should indicate existing traffic, transit, pedestrian/cyclist traffic volumes for roadways and intersections, heavy truck movements;
- Must be based on recent data as noted in Data Collection section of these guidelines;
- Describes methodologies and parameters used in evaluation;
- Transportation analysis must be undertaken for:
  - Existing conditions;
  - Future background conditions;
  - Total future conditions which includes traffic (including transit, cyclist and pedestrians) for the opening day of the development and 5 years (and 10 years, if required) based on the criteria noted under Study Horizons);
- Operational analysis must be undertaken for:
  - Street segments and/or intersections located in an area exhibiting congestion and/or high rate of growth and/or if as part of the new development a new traffic control signal or roundabout is proposed to be constructed on a Regional road.
  - All signalized and major unsignalized intersections in the study area network shall be evaluated.
    - At signalized intersections, through and/or through-right and/or right-turn movements with a v/c ratio greater than 0.85 are deemed to be “critical” in terms of operations. Dedicated left-turn movements with a v/c ratio greater than 0.90 are deemed to be “critical” in terms of operations. Movements that experience a v/c ratio noted as

"critical" or greater would be considered for geometric and/or other improvement(s).[1] Access should be evaluated related to the level of service at all driveways.

- At unsignalized intersections analysis must highlight where movements are expected to operate at LOS "D" or worse and/or where the estimated 95th percentile queue length for an individual movement exceeds the available queuing space.

- The following shall be included as part of the reporting for operational analysis:
  - v/c ratios;
  - Delay;
  - Level of Service (LOS); and
  - 95th percentile queue lengths;
- The results of the operational analysis and/or MTO warrants shall be used to determine the need for left-turn and right-turn auxiliary lanes.
- All volumes should be shown in exhibits.

17. Traffic Signal Justification / Roundabouts

- The need for traffic and pedestrian signals and/or underground provisions (conduits) should be reviewed at all locations affected by the proposed development and for each proposed development stage(s). Refer to OTM Book 12 to determine when traffic signals or provisions for signals are warranted. Utilize OTM Book 12 Traffic Signal Justifications and/or Niagara Region IPS Warrant (for pedestrian signals);
- All proposed new traffic and pedestrian signals should be evaluated for conformance to Region Standards, proximity to other adjacent traffic signals, traffic signal progression and any impacts on the corridor;
- If a traffic signal is justified, then a screening to determine the suitability of a roundabout may be required by the Region. Consultation with the Region regarding the need for a roundabout screening should have taken place during the pre-study conference, however, if this did not occur, the Region shall be contacted regarding the potential need. Details on the requirements of the screening are included in **Appendix C**.
  - If a roundabout is deemed to be feasible based on the screening then a functional design of the roundabout would be required.
  - The functional design of the roundabout should be adequately sized to provide the required capacity to accommodate the 10-year horizon traffic volume and design vehicles, should

[1] Other improvements coul d include pedestrian and cycling facilities, HOV, transit, TDM, etc.

APPENDIX D

Signal Warrant Analysis

Analysis Sheet

Input Sheet | Results Sheet | Proposed Collision

GO TO Justification:

Intersection: Dorchester Road at Stokes Street Count Date: Jun,2 ,2021

Justification 1: Minimum Vehicle Volumes

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 Lanes		2 or More Lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
1A	480	720	600	900	293	555	467	1,021	900	1,151	1,196	1,123		
	COMPLIANCE %				33	62	52	100	100	100	100	100	646	81
1B	120	170	120	170	26	51	44	95	84	108	113	106		
	COMPLIANCE %				15	30	26	56	49	64	66	62	369	46

Restricted Flow Signal Justification 1:

Both 1A and 1B 100% Fulfilled each of 8 hours — Yes ☐ No ☑

Lesser of 1A or 1B at least 80% fulfilled each of 8 hours — Yes ☐ No ☑

Justification 2: Delay to Cross Traffic

Restricted Flow Urban Conditions

Justification	Guidance Approach Lanes				Percentage Warrant								Total Across	Section Percent
	1 lanes		2 or More lanes		Hour Ending									
Flow Condition	FREE FLOW ☐	RESTR. FLOW ☐	FREE FLOW ☐	RESTR. FLOW ☑	8:00	9:00	12:00	13:00	14:00	16:00	17:00	18:00		
2A	480	720	600	900	267	504	423	926	816	1,043	1,083	1,017		
	COMPLIANCE %				30	56	47	100	91	100	100	100	623	78
2B	50	75	50	75	14	28	24	52	48	59	62	58		
	COMPLIANCE %				19	37	32	69	64	79	83	77	460	58

Restricted Flow Signal Justification 2:

Both 2A and 2B 100% fulfilled each of 8 hours — Yes ☐ No ☑

Lesser of 2A or 2B at least 80% fulfilled each of 8 hours — Yes ☐ No ☑

Justification 3: Combination

Combination Justification 1 and 2

	Justification Satisfied 80% or More			Two Justifications Satisfied 80% or More	
Justification 1	Minimum Vehicle Volume	YES ☐	NO ☑	YES ☐	NO ☑
Justification 2	Delay Cross Traffic	YES ☐	NO ☑		NOT JUSTIFIED

Justification 4: Four Hour Volume

Justification	Time Period	Total Volume of Both Approaches (Main) X	Heaviest Minor Approach Y (actual)	Required Value Y (warrant threshold)	Average % Compliance	Overall % Compliance
Justification 4	13:00	926	50	222	23 %	30 %
	16:00	1,043	57	180	32 %	
	17:00	1,083	59	168	35 %	
	18:00	1,017	55	189	29 %	

Results Sheet

Input Sheet | Analysis Sheet | Proposed Collision

GO TO Justification:

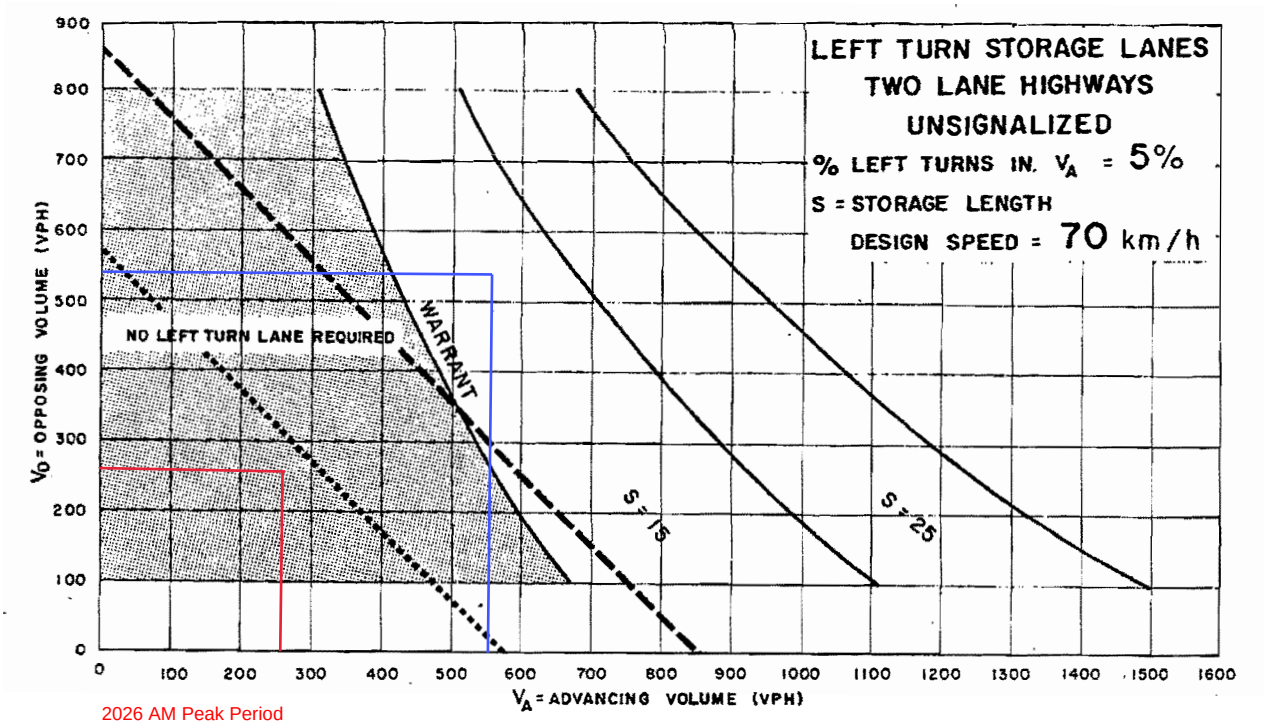
Intersection: Dorchester Road at Stokes Street Count Date: Jun,2 ,2021

Summary Results

Justification			Compliance		Signal Justified? YES	Signal Justified? NO
1. Minimum Vehicular Volume	A	Total Volume	81	%	☐	☑
	B	Crossing Volume	46	%		
2. Delay to Cross Traffic	A	Main Road	78	%	☐	☑
	B	Crossing Road	58	%		
3. Combination	A	Justificaton 1	46	%	☐	☑
	B	Justification 2	58	%		
4. 4-Hr Volume			30	%	☐	☑

APPENDIX E

MTO Geometric Design Standards for Ontario Highways



2026 AM Peak Period

2026 PM Peak Period

TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS

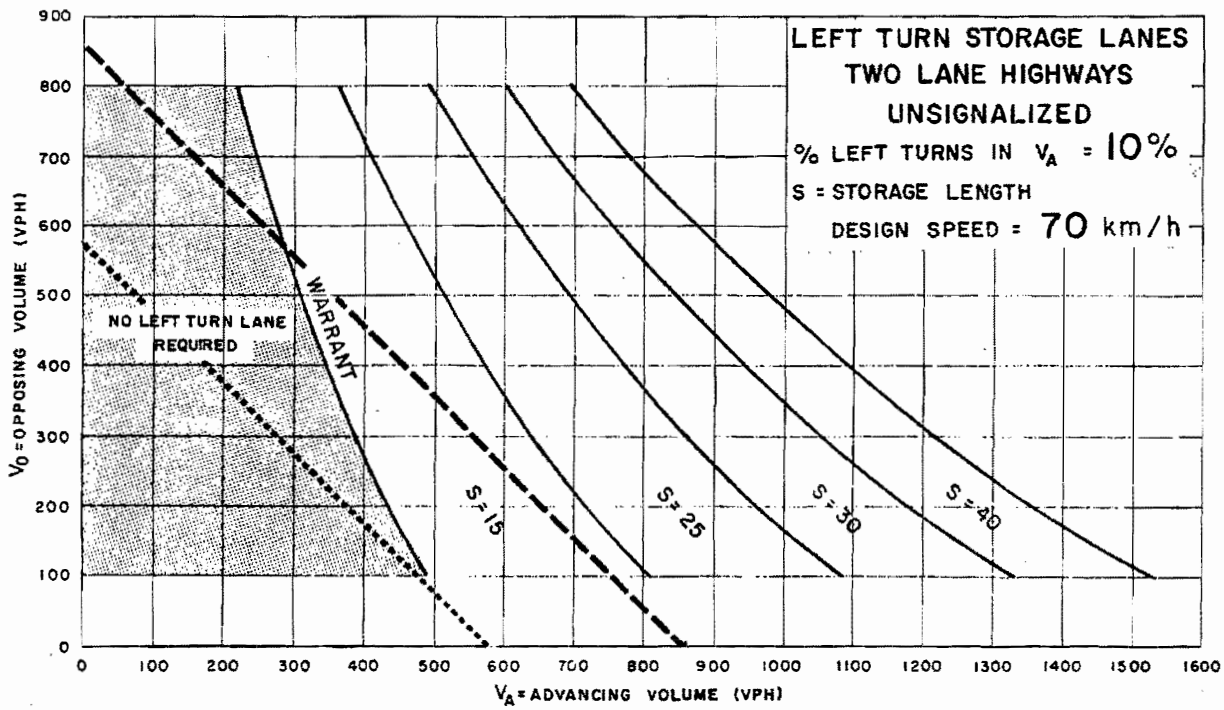


Figure EA-10

E.9.1 LEFT TURN LANES FOR TWO-LANE HIGHWAYS

In the intersection design process the traffic volumes and flow diagrams are analyzed and adequate numbers and configuration of traffic lanes established. For left turn warrant graphs and application see Appendix A.

Left turn lanes are required when conflicts between through and turning traffic cause congestion or create collision hazards. Those requirements are generally substantiated by applying the left turn lane warrant graphs.

E.9.1.1 Left Turn Lane in One Direction

The left turn lane at 'T' intersections and on one approach to cross intersections is applied where the turning volume warrants a separate left turn lane.

The left turn lane can be developed:

(a) on the right of the highway centre line
(b) on the left of the highway centre line
(c) in the middle of the highway cross-section.

(a) The left turn lane design on the right of the highway centre line is the preferred type. The by-pass lane for the through traffic is added on the right or outside of the original through lane, see Figure E9-2 (a).

The lengths of by-pass lanes are governed by the lengths of the left turn lanes, which in turn vary with the volume of left turning traffic and the highway design speed. Appropriate roundings are applied throughout the by-pass lane to soften the deflection angles.

(b) The left turn lane designed on the left side is applicable at intersections where the right of way restrictions do not permit the construction of an additional lane on the right of the highway alignment. A well defined pavement marking should be applied in the left turn runout lane on the far side of the intersection to deflect opposing traffic around vehicles in the left turn lane, see Figure E9-2(b), especially in cases of curved alignment as shown in Figure E9-11.

(c) The left turn lane designed in the middle of the roadway is acceptable where the full additional lane width on the right of the centre line cannot be accommodated. Although the through traffic is deflected by one-half of the lane width, a well defined pavement marking should be applied in the left turn runout lane. See Figure E9-2(c).

The design illustrated in Figure E9-3 is applied only when the projected traffic flow will not indicate a need for a left turn lane in two directions.

APPENDIX F

City of Niagara Falls By-law Excerpt

used for any of the purposes listed in Table 1 of this section shall provide and maintain a **parking area** which shall be located on the same **lot** occupied by such building or structure. The said parking area shall contain individual **parking spaces** to the extent at least prescribed in said Table 1 for the respective classes of uses, buildings or structures set out therein together with a manoeuvring aisle to serve each row or each 2 rows of parking spaces. The said parking area shall be provided and maintained in accordance with the requirements of this section and such requirements as may be made a condition to the approval of plans and drawings in a site plan control area established under section 35a of The Planning Act. Where a building, structure or lot accommodates more than one use or purpose, the required parking spaces shall be the sum of the required parking spaces for each such use or purpose.

Table 1

CLASS OF USE, BUILDING OR STRUCTURE	MINIMUM PARKING SPACE REQUIREMENTS
Arena	1 parking space for each 5 seats
Bank, trust company, credit union, Currency exchange, sightseeing tourist information centre, timeshare sales office, office other than a dental or medical office or clinic medical office or clinic 2002-061	1 parking space for each 25 square metres (269.1 sq. ft.) of gross leasable floor area
Barbershop or hairdressing establishment	3 parking spaces plus 1 additional parking space for each chair above 3
Car Wash 81-62 #40	4 parking spaces in line per bay
Dental or Medical Clinic or office	3 parking spaces for each practitioner
Drive-in-Restaurant	25 parking spaces plus 1 parking space for each 5 seats within the building or structure
Drive-through Facility	12 parking spaces in a queuing lane
accessory to a restaurant or retail store	measured from where products are dispensed, each with a minimum length of 6 metres and a minimum width of 2.75 metres.
Drive-through Facility	3 spaces in a queuing lane, measured
accessory to a financial institution	from where products are dispensed, each with a minimum length of 6 metres and a minimum width of 2.75 metres.
Detached dwelling, Duplex dwelling or Semi-detached dwelling and an on street townhouse dwelling	1 parking space for each dwelling unit
Dwelling containing 3 or more dwelling units save and except an on street townhouse dwelling	1.4 parking space for each dwelling unit
Funeral Home	15 parking spaces
Home for the Aged, Nursing Home	2 parking spaces for each 5 beds
Hospital	1 parking space for each 2 beds
Hotel	1 parking space for each two bedrooms. plus 1

APPENDIX G

Proxy Site Data

Proxy Site Condominium Parking Surveys

Date: Thursday November 7, 2019
Location: 6515 McLeod Road, Niagara Falls
Weather: Snow, 0ºC
Land Use: Mid-Rise Condominium (64 dwelling units)
Surveyor: Trans-Plan
Total Parking Supply: 82 spaces

Time	Total Surveyed Parking Demand (Tenants + Visitors)				ITE 10th Generation Parking Manual			Wilson Crescent / On-Street Parking Demand(2) (vehicles)
	Inbound Driveway Volumes (vehicles)	Outbound Driveway Volumes (vehicles)	Surveyed Parking Demand(1) (spaces)	Surveyed Parking Lot % Utilization	% of Peak Parking Demand (ITE 10th Gen)	Expected Parking Demand (spaces)	Expected Parking Lot % Utilization	
6:00 AM	0	0	59	72%	83%	57	70%	1
6:15 AM	0	0	59	72%	83%	57	70%	1
6:30 AM	0	1	59	72%	83%	57	70%	1
6:45 AM	0	3	58	71%	83%	57	70%	1
7:00 AM	1	0	55	67%	71%	49	60%	1
7:15 AM	0	1	56	68%	71%	49	60%	1
7:30 AM	1	3	55	67%	71%	49	60%	0
7:45 AM	1	1	53	65%	71%	49	60%	0
8:00 AM	1	2	53	65%	61%	42	51%	0
8:15 AM	0	0	52	63%	61%	42	51%	0
8:30 AM	1	3	52	63%	61%	42	51%	0
8:45 AM	0	1	50	61%	61%	42	51%	0
9:00 AM	2	1	49	60%	55%	38	46%	0
9:15 AM	2	2	50	61%	55%	38	46%	0
9:30 AM	0	2	50	61%	55%	38	46%	0
9:45 AM	0	1	48	59%	55%	38	46%	0
10:00 AM	0	0	47	57%	54%	37	45%	0
10:15 AM	2	0	47	57%	54%	37	45%	0
10:30 AM	3	3	49	60%	54%	37	45%	0
10:45 AM	3	3	49	60%	54%	37	45%	0
11:00 AM	1	4	49	60%	53%	37	45%	0
11:15 AM	2	1	46	56%	53%	37	45%	0
11:30 AM	2	0	47	57%	53%	37	45%	1
11:45 AM	2	1	49	60%	53%	37	45%	1
12:00 PM	0	5	50	61%	50%	35	43%	1
12:15 PM	7	1	45	55%	50%	35	43%	1
12:30 PM	0	3	51	62%	50%	35	43%	1
12:45 PM	2	1	48	59%	50%	35	43%	1
1:00 PM	2	1	49	60%	49%	34	41%	1
1:15 PM	1	2	50	61%	49%	34	41%	1
1:30 PM	2	2	49	60%	49%	34	41%	1
1:45 PM	0	3	49	60%	49%	34	41%	1
2:00 PM	0	1	46	56%	49%	34	41%	1
2:15 PM	4	2	45	55%	49%	34	41%	2
2:30 PM	3	1	47	57%	49%	34	41%	2
2:45 PM	2	2	49	60%	49%	34	41%	2
3:00 PM	3	4	49	60%	50%	35	43%	2
3:15 PM	2	1	48	59%	50%	35	43%	2
3:30 PM	4	0	49	60%	50%	35	43%	2
3:45 PM	4	3	53	65%	50%	35	43%	2
4:00 PM	5	1	54	66%	58%	40	49%	2
4:15 PM	3	0	58	71%	58%	40	49%	2
4:30 PM	4	1	61	74%	58%	40	49%	1
4:45 PM	3	3	64	78%	58%	40	49%	1
5:00 PM	2	2	64	78%	64%	44	54%	0
5:15 PM	3	3	64	78%	64%	44	54%	0
5:30 PM	1	1	64	78%	64%	44	54%	0
5:45 PM	4	2	64	78%	64%	44	54%	2
6:00 PM	2	2	66	80%	67%	46	56%	2
6:15 PM	1	4	66	80%	67%	46	56%	1
6:30 PM	0	2	63	77%	67%	46	56%	1
6:45 PM	0	1	61	74%	67%	46	56%	1
7:00 PM	1	0	60	73%	70%	48	59%	1
7:15 PM	2	0	61	74%	70%	48	59%	1
7:30 PM	2	0	63	77%	70%	48	59%	2
7:45 PM	0	0	65	79%	70%	48	59%	1
8:00 PM	2	0	65	79%	76%	52	63%	1
8:15 PM	1	3	67	82%	76%	52	63%	1
8:30 PM	0	1	65	79%	76%	52	63%	1
8:45 PM	0	0	64	78%	76%	52	63%	1
9:00 PM	1	0	64	78%	83%	57	70%	1
9:15 PM	3	0	65	79%	83%	57	70%	1
9:30 PM	2	2	68	83%	83%	57	70%	1
9:45 PM	1	0	68	83%	83%	57	70%	1
10:00 PM	0	0	69	84%	90%	62	76%	1
10:15 PM	0	0	69	84%	90%	62	76%	1
10:30 PM	0	0	69	84%	90%	62	76%	1
10:45 PM	0	0	69	84%	90%	62	76%	1
11:00 PM	0	0	69	84%	93%	64	78%	1
11:15 PM	0	0	69	84%	93%	64	78%	1
11:30 PM	0	0	69	84%	93%	64	78%	0
11:45 PM	0	0	69	84%	93%	64	78%	0

Proxy Site Condominium Parking Surveys

Date: Thursday November 7, 2019
Location: 6515 McLeod Road, Niagara Falls
Weather: Snow, 0ºC
Land Use: Mid-Rise Condominium (64 dwelling units)
Surveyor: Trans-Plan
Total Parking Supply: 82 spaces

Time	Total Surveyed Parking Demand (Tenants + Visitors)				ITE 10th Generation Parking Manual			Wilson Crescent / On-Street Parking Demand(2) (vehicles)
	Inbound Driveway Volumes (vehicles)	Outbound Driveway Volumes (vehicles)	Surveyed Parking Demand(1) (spaces)	Surveyed Parking Lot % Utilization	% of Peak Parking Demand (ITE 10th Gen)	Expected Parking Demand (spaces)	Expected Parking Lot % Utilization	
12:00 AM	0	0	69	84%	100%	69	84%	0

Note: (1) Observed at start of 15-minute interval
(2) No on-street parking demands were observed to access the proxy site

Peak 15-Minute Interval Parking Demand

Land Use	Size (Units)	Weekday	Saturday	Sunday
Multifamily Housing (Mid-Rise)	64			
ITE Code 221	Equation	P = 1.34(X) - 8.73	n/a	Insufficient Data Points
	Average Rate	1.31	1.22	
	Peak Parking Demand (spaces)	77.03	78.08	n/a

Note: Weekday peak parking demand based on equation

Proxy Site Condominium Parking Surveys

Date: Saturday November 9, 2019
Location: 6515 McLeod Road, Niagara Falls
Weather: Cloudy, 2ºC
Land Use: Mid-Rise Condominium (64 dwelling units)
Surveyor: Trans-Plan
Total Parking Supply: 82 spaces

Time	Total Surveyed Parking Demand (Tenants + Visitors)				ITE 10th Generation Parking Manual			Wilson Crescent / On-Street Parking Demand(2) (vehicles)
	Inbound Driveway Volumes (vehicles)	Outbound Driveway Volumes (vehicles)	Surveyed Parking Demand(1) (spaces)	Surveyed Parking Lot % Utilization	% of Peak Parking Demand (ITE 10th Gen)	Expected Parking Demand (spaces)	Expected Parking Lot % Utilization	
6:00 AM	0	0	65	79%	97%	65	79%	2
6:15 AM	0	0	65	79%	97%	65	79%	2
6:30 AM	0	0	65	79%	97%	65	79%	2
6:45 AM	0	1	65	79%	97%	65	79%	2
7:00 AM	0	0	64	78%	95%	64	78%	2
7:15 AM	0	0	64	78%	95%	64	78%	2
7:30 AM	0	2	64	78%	95%	64	78%	2
7:45 AM	0	0	62	76%	95%	64	78%	2
8:00 AM	1	3	62	76%	88%	59	72%	1
8:15 AM	0	2	60	73%	88%	59	72%	1
8:30 AM	0	0	58	71%	88%	59	72%	1
8:45 AM	0	1	58	71%	88%	59	72%	1
9:00 AM	2	1	57	70%	83%	56	68%	1
9:15 AM	2	0	58	71%	83%	56	68%	1
9:30 AM	1	2	60	73%	83%	56	68%	1
9:45 AM	0	2	59	72%	83%	56	68%	1
10:00 AM	0	4	57	70%	75%	50	61%	1
10:15 AM	0	0	53	65%	75%	50	61%	1
10:30 AM	3	2	53	65%	75%	50	61%	1
10:45 AM	1	1	54	66%	75%	50	61%	1
11:00 AM	0	3	54	66%	71%	48	59%	1
11:15 AM	2	1	51	62%	71%	48	59%	1
11:30 AM	2	3	52	63%	71%	48	59%	1
11:45 AM	3	5	51	62%	71%	48	59%	1
12:00 PM	4	0	49	60%	68%	46	56%	1
12:15 PM	1	2	53	65%	68%	46	56%	1
12:30 PM	5	2	52	63%	68%	46	56%	1
12:45 PM	4	1	55	67%	68%	46	56%	1
1:00 PM	4	4	58	71%	66%	44	54%	1
1:15 PM	2	2	58	71%	66%	44	54%	1
1:30 PM	3	2	58	71%	66%	44	54%	1
1:45 PM	0	5	59	72%	66%	44	54%	1
2:00 PM	1	0	54	66%	70%	47	57%	2
2:15 PM	3	0	55	67%	70%	47	57%	2
2:30 PM	1	2	58	71%	70%	47	57%	2
2:45 PM	3	1	57	70%	70%	47	57%	2
3:00 PM	4	2	59	72%	69%	46	56%	2
3:15 PM	3	3	61	74%	69%	46	56%	2
3:30 PM	2	3	61	74%	69%	46	56%	2
3:45 PM	4	0	60	73%	69%	46	56%	2
4:00 PM	1	1	64	78%	72%	48	59%	2
4:15 PM	2	0	64	78%	72%	48	59%	2
4:30 PM	3	2	66	80%	72%	48	59%	3
4:45 PM	0	4	67	82%	72%	48	59%	2
5:00 PM	2	2	63	77%	74%	50	61%	2
5:15 PM	2	1	63	77%	74%	50	61%	1
5:30 PM	3	2	64	78%	74%	50	61%	2
5:45 PM	0	2	65	79%	74%	50	61%	2
6:00 PM	0	1	63	77%	74%	50	61%	2
6:15 PM	0	0	62	76%	74%	50	61%	2
6:30 PM	1	0	62	76%	74%	50	61%	2
6:45 PM	0	1	63	77%	74%	50	61%	2
7:00 PM	3	3	62	76%	73%	49	60%	2
7:15 PM	3	1	62	76%	73%	49	60%	2
7:30 PM	1	2	64	78%	73%	49	60%	2
7:45 PM	2	2	63	77%	73%	49	60%	2
8:00 PM	0	0	63	77%	75%	50	61%	1
8:15 PM	0	1	63	77%	75%	50	61%	1
8:30 PM	2	2	62	76%	75%	50	61%	1
8:45 PM	0	0	62	76%	75%	50	61%	1
9:00 PM	0	0	62	76%	78%	52	63%	1
9:15 PM	2	3	62	76%	78%	52	63%	1
9:30 PM	1	0	61	74%	78%	52	63%	1
9:45 PM	0	0	62	76%	78%	52	63%	1
10:00 PM	1	0	62	76%	82%	55	67%	1
10:15 PM	1	0	63	77%	82%	55	67%	1
10:30 PM	0	0	64	78%	82%	55	67%	1
10:45 PM	1	0	64	78%	82%	55	67%	1
11:00 PM	1	1	65	79%	88%	59	72%	1
11:15 PM	0	0	65	79%	88%	59	72%	1
11:30 PM	0	0	65	79%	88%	59	72%	1
11:45 PM	1	0	65	79%	88%	59	72%	1

Proxy Site Condominium Parking Surveys

Date: Saturday November 9, 2019
Location: 6515 McLeod Road, Niagara Falls
Weather: Cloudy, 2ºC
Land Use: Mid-Rise Condominium (64 dwelling units)
Surveyor: Trans-Plan
Total Parking Supply: 82 spaces

Time	Total Surveyed Parking Demand (Tenants + Visitors)				ITE 10th Generation Parking Manual			Wilson Crescent / On-Street Parking Demand(2) (vehicles)
	Inbound Driveway Volumes (vehicles)	Outbound Driveway Volumes (vehicles)	Surveyed Parking Demand(1) (spaces)	Surveyed Parking Lot % Utilization	% of Peak Parking Demand (ITE 10th Gen)	Expected Parking Demand (spaces)	Expected Parking Lot % Utilization	
12:00 AM	0	0	66	80%	100%	67	82%	1

Note: (1) Observed at start of 15-minute interval
(2) No on-street parking demands were observed to access the proxy site

Peak 15-Minute Interval Parking Demand

Land Use	Size (Units)	Weekday	Saturday	Sunday
Multifamily Housing (Mid-Rise)	64			
ITE Code 221	Equation	P = 1.34(X) - 8.73	n/a	Insufficient Data Points
	Average Rate	1.31	1.22	
	Peak Parking Demand (spaces)	77.03	78.08	n/a

Note: Weekday peak parking demand based on equation

Proxy Site Condominium Parking Surveys

Date: Sunday November 10, 2019
Location: 6515 McLeod Road, Niagara Falls
Weather: Cloudy, 7ºC
Land Use: Mid-Rise Condominium (64 dwelling units)
Surveyor: Trans-Plan
Total Parking Supply: 82 spaces

Time	Total Surveyed Parking Demand (Tenants + Visitors)				ITE 10th Generation Parking Manual			Wilson Crescent / On-Street Parking Demand(2) (vehicles)
	Inbound Driveway Volumes (vehicles)	Outbound Driveway Volumes (vehicles)	Surveyed Parking Demand(1) (spaces)	Surveyed Parking Lot % Utilization	% of Peak Parking Demand (ITE 10th Gen)	Expected Parking Demand (spaces)	Expected Parking Lot % Utilization	
6:00 AM	0	0	64	78%	-	-	-	1
6:15 AM	0	0	64	78%	-	-	-	1
6:30 AM	0	1	64	78%	-	-	-	1
6:45 AM	0	0	63	77%	-	-	-	1
7:00 AM	0	0	63	77%	-	-	-	1
7:15 AM	0	0	63	77%	-	-	-	1
7:30 AM	1	1	63	77%	-	-	-	1
7:45 AM	0	0	63	77%	-	-	-	1
8:00 AM	0	2	63	77%	-	-	-	1
8:15 AM	1	1	61	74%	-	-	-	1
8:30 AM	1	4	61	74%	-	-	-	2
8:45 AM	2	1	58	71%	-	-	-	2
9:00 AM	3	2	59	72%	-	-	-	3
9:15 AM	1	2	60	73%	-	-	-	3
9:30 AM	1	3	59	72%	-	-	-	4
9:45 AM	0	2	57	70%	-	-	-	4
10:00 AM	2	5	55	67%	-	-	-	3
10:15 AM	2	1	52	63%	-	-	-	3
10:30 AM	1	0	53	65%	-	-	-	3
10:45 AM	0	0	54	66%	-	-	-	3
11:00 AM	0	1	54	66%	-	-	-	3
11:15 AM	2	3	53	65%	-	-	-	2
11:30 AM	3	1	52	63%	-	-	-	1
11:45 AM	1	2	54	66%	-	-	-	1
12:00 PM	0	3	51	62%	-	-	-	1
12:15 PM	1	2	50	61%	-	-	-	2
12:30 PM	1	1	50	61%	-	-	-	3
12:45 PM	1	3	48	59%	-	-	-	4
1:00 PM	6	2	52	63%	33%	23	28%	4
1:15 PM	8	0	60	73%	33%	23	28%	4
1:30 PM	4	4	60	73%	33%	23	28%	4
1:45 PM	1	4	57	70%	33%	23	28%	4
2:00 PM	1	3	55	67%	40%	28	34%	4
2:15 PM	4	1	58	71%	40%	28	34%	4
2:30 PM	4	2	60	73%	40%	28	34%	4
2:45 PM	0	1	59	72%	40%	28	34%	4
3:00 PM	1	0	60	73%	27%	19	23%	4
3:15 PM	1	3	58	71%	27%	19	23%	4
3:30 PM	1	0	59	72%	27%	19	23%	3
3:45 PM	8	3	64	78%	27%	19	23%	2
4:00 PM	3	0	67	82%	13%	9	11%	2
4:15 PM	1	3	65	79%	13%	9	11%	2
4:30 PM	4	4	65	79%	13%	9	11%	2
4:45 PM	0	2	63	77%	13%	9	11%	2
5:00 PM	4	3	64	78%	33%	23	28%	2
5:15 PM	1	1	64	78%	33%	23	28%	2
5:30 PM	2	0	66	80%	33%	23	28%	1
5:45 PM	1	2	65	79%	33%	23	28%	2
6:00 PM	0	1	64	78%	60%	41	50%	1
6:15 PM	1	1	64	78%	60%	41	50%	1
6:30 PM	2	2	64	78%	60%	41	50%	1
6:45 PM	1	0	65	79%	60%	41	50%	1
7:00 PM	2	1	66	80%	67%	46	56%	1
7:15 PM	1	0	67	82%	67%	46	56%	1
7:30 PM	0	0	67	82%	67%	46	56%	1
7:45 PM	0	1	66	80%	67%	46	56%	1
8:00 PM	2	0	68	83%	47%	32	39%	1
8:15 PM	0	1	67	82%	47%	32	39%	1
8:30 PM	1	0	68	83%	47%	32	39%	1
8:45 PM	0	1	67	82%	47%	32	39%	1
9:00 PM	1	0	68	83%	53%	37	45%	1
9:15 PM	0	0	68	83%	53%	37	45%	1
9:30 PM	0	0	68	83%	53%	37	45%	0
9:45 PM	1	1	68	83%	53%	37	45%	0
10:00 PM	0	0	68	83%	73%	50	61%	0
10:15 PM	0	0	68	83%	73%	50	61%	0
10:30 PM	0	0	68	83%	73%	50	61%	0
10:45 PM	0	0	68	83%	73%	50	61%	0
11:00 PM	0	0	68	83%	93%	64	78%	0
11:15 PM	1	0	69	84%	93%	64	78%	0
11:30 PM	0	0	69	84%	93%	64	78%	0
11:45 PM	0	0	69	84%	93%	64	78%	0

Proxy Site Condominium Parking Surveys

Date: Sunday November 10, 2019
Location: 6515 McLeod Road, Niagara Falls
Weather: Cloudy, 7ºC
Land Use: Mid-Rise Condominium (64 dwelling units)
Surveyor: Trans-Plan
Total Parking Supply: 82 spaces

Time	Total Surveyed Parking Demand (Tenants + Visitors)				ITE 10th Generation Parking Manual			Wilson Crescent / On-Street Parking Demand(2) (vehicles)
	Inbound Driveway Volumes (vehicles)	Outbound Driveway Volumes (vehicles)	Surveyed Parking Demand(1) (spaces)	Surveyed Parking Lot % Utilization	% of Peak Parking Demand (ITE 10th Gen)	Expected Parking Demand (spaces)	Expected Parking Lot % Utilization	
12:00 AM	0	0	69	84%	100%	69	84%	0

Note: (1) Observed at start of 15-minute interval
(2) No on-street parking demands were observed to access the proxy site

Peak 15-Minute Interval Parking Demand

Land Use	Size (Units)	Weekday	Saturday	Sunday
Multifamily Housing (Mid-Rise)	64			
ITE Code 221	Equation	P = 1.34(X) - 8.73	n/a	Insufficient Data Points
	Average Rate	1.31	1.22	
	Peak Parking Demand (spaces)	77.03	78.08	n/a

Note: Weekday peak parking demand based on equation

APPENDIX H

Excerpt from Accessibility for Ontarians with Disabilities Act, 2005 Ontario Regulation 191/11 Integrated Accessibility Standards

3. Parking for law enforcement vehicles.

4. Parking for medical transportation vehicles, such as ambulances.

5. Parking used as a parking lot for impounded vehicles. O. Reg. 413/12, s. 6.

(2) The requirements in respect of off-street parking facilities do not apply to off-street parking facilities if,

(a) the off-street parking facilities are not located on a barrier-free path of travel, regulated under Ontario Regulation 350/06 (Building Code) made under the *Building Code Act, 1992; and*

(b) the obligated organization has multiple off-street parking facilities on a single site that serve a building or facility. O. Reg. 413/12, s. 6.

Types of accessible parking spaces

80.34 Off-street parking facilities must provide the following two types of parking spaces for the use of persons with disabilities:

1. Type A, a wider parking space which has a minimum width of 3,400 mm and signage that identifies the space as “van accessible”.

2. Type B, a standard parking space which has a minimum width of 2,400 mm. O. Reg. 413/12, s. 6.

Access aisles

80.35 (1) Access aisles, that is the space between parking spaces that allows persons with disabilities to get in and out of their vehicles, must be provided for all parking spaces for the use of persons with disabilities in off-street parking facilities. O. Reg. 413/12, s. 6.

(2) Access aisles may be shared by two parking spaces for the use of persons with disabilities in an off-street parking facility and must meet the following requirements:

1. They must have a minimum width of 1,500 mm.

2. They must extend the full length of the parking space.

3. They must be marked with high tonal contrast diagonal lines, which discourages parking in them, where the surface is asphalt, concrete or some other hard surface. O. Reg. 413/12, s. 6.

Minimum number and type of accessible parking spaces

80.36 (1) Off-street parking facilities must have a minimum number of parking spaces for the use of persons with disabilities, in accordance with the following requirements:

1. One parking space for the use of persons with disabilities, which meets the requirements of a Type A parking space, where there are 12 parking spaces or fewer.

2. Four per cent of the total number of parking spaces for the use of persons with disabilities, where there are between 13 and 100 parking spaces in accordance with the following ratio, rounding up to the nearest whole number:

   i. Where an even number of parking spaces for the use of persons with disabilities are provided in accordance with the requirements of this paragraph, an equal number of parking spaces that meet the requirements of a Type A parking space and a Type B parking space must be provided.

   ii. Where an odd number of parking spaces for the use of persons with disabilities are provided in accordance with the requirements of this paragraph, the number of parking spaces must be divided equally between parking spaces that meet the requirements of a Type A parking space and a Type B parking space, but the additional parking space, the odd-numbered space, may be a Type B parking space.

3. One parking space for the use of persons with disabilities and an additional three per cent of parking spaces for the use of persons with disabilities, where there are between 101 and 200 parking spaces must be parking spaces for the use of persons with disabilities, calculated in accordance with ratios set out in subparagraphs 2 i and ii, rounding up to the nearest whole number.