MAY 5, 2026

PROJECT NO: 3114-7873
SENT BY: EMAIL
ROB.RUSSELL@RUSSELLPLANNING.COM

Robert Russell Planning Consultants Inc
162 Guelph Street, Unit 209
Georgetown, ON L7G 5X7

Attention: **C/O RO RUSSELL, MCIP, RPP**
PRESIDENT

RE: **TRANSPORTATION IMPACT BRIEF**
11179 DERRY ROAD WEST
TOWN OF MILTON, HALTON REGION

Dear Rob,

In support of the proposed Zoning by-Law Amendment (ZBA) related to the proposed commercial redevelopment site located at 11179 Derry Road West (site) in the Town of Milton (Town), C.F. Crozier & Associates Inc. (Crozier) has prepared the following Transportation Impact Brief (TIB).

The purpose of this letter is to analyze the following aspects of the development from a transportation operations perspective:

- Forecast the trip generation characteristics of the development using the Institute of Transportation Engineers Manual (12th edition).
- Evaluate the site access from a sight distance perspective.
- Confirm the on-street parking requirements and minimum parking rates.
- Review existing and future Transportation Demand Management (TDM) opportunities

1.0 Introduction

C.F. Crozier & Associates Inc. (Crozier) was retained by Robert Russell Planning Consultants Inc. (Applicant) to complete a TIB for a commercial redevelopment situated at 11179 Derry Road West in the Town of Milton. The existing two-storey home will be converted to be used temporarily as a real estate office.

The purpose of this TIB is to assess the impact of the redevelopment on the surrounding road network and recommend transportation mitigation measures, if any.

The trips generated from the development are expected to be less than 100 new trips, therefore a Transportation Impact Study (TIS) is not required.

1.1 Development Lands

The subject land covers an area of approximately 0.37 ha and currently consists of a two-storey home. The property, located in the Derry Green Secondary Plan neighborhood, is bounded by new industrial buildings to the north, Derry Road West to the south and future business park lands to the east and west.

1.2 Development Proposal

The full buildout for this development is envisioned as the conversion of a two-storey residential dwelling into an office building.

2.0 Site Generated Traffic

The development will result in additional turning movements at the nearby intersections. Therefore, this section describes the trip forecasting methodology and results of this forecast for the development.

2.1 ITE Trip Generation

The trip generation of the dwelling was forecasted using published data from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 12th Edition. The gross floor area (GFA) of the property was found by measuring the dimensions of the existing house then doubling it to account for the second storey. The GFA of the existing residential home is approximately 5,105 ft^2.

The applicable fitted curve equation for Land Use Category (LUC) 215 "Single Tenant Office Building" was applied to the proposed real estate use on the site. Relevant excerpts from the ITE Trip Generation Manual, 12th Edition have been included in **Appendix A**. The forecasted trip generation of the proposed real estate office is summarized in **Table 1.**

Table 1: Site Generated Trips

Land Use (GFA)	Equation	Trip Generation			
		Weekday A.M.		Weekday P.M.	
		Inbound	Outbound	Inbound	Outbound
LUC 715: Single Tenant Office Building (2,152 ft²)	A.M. T = 2.22 X – 30.81 P.M. T = 1.99 X – 28.75	4	0	1	3

The development is expected to generate 4 two-way (4 inbound and 0 outbound) trips during the weekday a.m. peak hour, and 4 two-way (1 inbound and 3 outbound) trips during the weekday p.m. peak hour

Additionally, the client anticipates a maximum of 10 employees at the proposed real estate office. As employees will not all be on-site at the same time, the ITE trip generation is not considered as an unreasonable estimate of site-generated trips.

2.2 Mode Split

2022 Transportation Tomorrow Survey (TTS) data was used to determine the expected existing modal split for trips to the proposed real estate office. TTS is a comprehensive survey of transportation characteristics of households in the Greater Golden Horseshoe and surrounding areas.

The 2022 TTS Zone 5364 was selected as the most appropriate zone as it includes the existing residential site. Results were filtered to trips entering the 2022 TTS Zone 5364 for the purpose of 'usual work' and 'other work-related' during the weekday a.m. and p.m. peak hours. **Table 2** outlines the existing modal split**.**

Table 2: 2022 TTS Mode Split Data

Mode	Percentage of Trips (A.M. Peak Period)	Percentage of Trips (P.M. Peak Period)
Walk	0%	0%
Transit	0%	2%
Automobile (Driver and Passenger)	100%	98%
Cycle	0%	0%
Total	100%	100%

Based on the TTS results, majority of trips to the site will be via automobile. Relevant excerpts from the TTS 2022 data have been included in **Appendix A**

2.3 Trip Distribution

The trips generated by the proposed redevelopment will be distributed to the study road network gateways as listed below:

- 35% travelling to and from the East on Derry Road West
- 55% travelling to and from the West on Derry Road West
- 5% travelling to and from the North on Fifth Line
- 5% travelling to and from South on Fifth Line

The trip distribution results are comparable to existing travel patterns**.**

3.0 Site Access Review

It is important to check the site access for safety concerns for corner clearance, access spacing and sightlines. These were checked using the standards set out in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR) (June 2017).

3.1 Intersection Sight Distance

A review of the available sight distance at the site access was undertaken based on the TAC GDGCR (June 2017). Sight distance was measured from the site access using the following assumptions:

- A standard driver eye height of 1.08 metres for a passenger car.
- A 4.4 metre setback from the approximate extension of the outer curb to represent a passenger vehicle waiting to exit the site.

  Intersection sight distance is calculated using Equation 9.9.1 from the GDGCR as outlined below:

  *ISD = 0.278 * V major * tg*

  Where:

  ISD = Intersection Sight Distance

  V major = design speed of roadway (km/h)

  tg = assumed time gap for vehicles to turn from stop onto roadway (s)

A design speed 20 km/h higher than the posted or assumed speeds of each road of study was assumed for the sight distance analysis. **Table 3** summarizes the sight distance analysis.

Table 3: Site Access Sight Distance Calculations

Feature	Site Access and Derry Road West
Access Type	Full-Movement
Posted Speed Limit of Roadway	80 km/h
Assumed Design Speed	100 km/h
Base Time Gap	6.5 s (right) 7.5 s (left)
Grade of Roadway	Less than 3%
Horizontal Alignment of Roadway[1]	Relatively straight
Required Sight Distance (right turn)	185 m
Available Sight Distance (right turn)	185 m
Required Sight Distance (left turn)	210 m
Available Sight Distance (left turn)	250 m
Minimum Sight Distances Satisfied?	Yes

Utilizing equation 9.9.1 as well as tables 9.9.6 and 9.9.4 provided by the TAC guideline, the required sight distance of a passenger vehicle making a right-turn and a left-turn from stop are approximately 185 metres and 210 metres, respectively, for the design speed of 100 km/h. The site access along Derry Road West meets all relevant TAC GDGCR requirements for the sight distance analysis.

3.2 Stopping Sight Distance

Derry Road West has a posted speed limit of 80 km/h. Accordingly, a design speed of 100 km/h was selected for the sight distance analysis. Derry Road West is relatively straight in the study area. For level roadways, the stopping sight distance requirements are tabulated in TAC GDGCR Table 2.5.2.

Table 4: Stopping Sight Distance Assessment

Intersection	Derry Road West and Site Access Posted Speed = 80 km/h Design Speed = 100 km/h
Formula (TAC GDGCR 2.5.2)	**SSD = 0.278 * V * t + 0.039 * (V^2/a)**
Design Speed (V)	100 km/h
Brake Reaction Time (t)	2.5 s
Deceleration Rate (a)	3.4 m/s^2
Required Stopping Sight Distance	185 m
Available Sight Distance	185 m

According to **Table 4**, clear visibility of 185 meters is available to the east and west of the site access on Derry Road West. Accordingly, there is sufficient stopping sight distance for vehicles

approaching from the east and west of the site accesses respectively. There is sufficient clear sight distance for outgoing vehicles to exit the site access safely, and clear sight distance for vehicles approaching the site to stop safely. **Appendix B** contains relevant TAC GDGCR excerpts.

3.3 Corner Clearance

Corner clearance is the distance between the site access and nearby intersections. The required spacing per Figure 8.8.2 in TAC GDGCR is summarized in **Table 5. Appendix B** contains relevant TAC GDGCR excerpts.

Table 5: Corner Clearence

Feature	Site Access and Fifth Line	Site Access and 11233 Derry Road West
Minimum Spacing Requirement	70 m	
Available Spacing	~235 m	~85 m
Minimum Spacing Satisfied?	**Yes**	**Yes**

The spacing between the access and the crossroad satisfies the requirements outlined in TAC.

3.4 Clear Throat Length

The clear throat length of the proposed site driveway was reviewed in accordance with Chapter 8 (Access) of the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR). The review is summarized in **Table 6.**

Table 6: Clear Throat Length Review

Lane Use (GFA)	TAC Requirement
Office (200 m^2)	15 m

As outlined above, a minimum clear throat length of 15 metres is required for general office site with a GFA less than 5,000 m^2 along a major arterial, in accordance with Table 8.9.3 in Section 8.9.10 of the TAC guidelines. requirements. **Appendix B** contains relevant TAC GDGCR excerpts. Per the current concept plan, the parking spaces result in a clear throat length of 12 metres. It is noted that this site is temporary in nature and that the parking spaces may not be fully occupied at all times.

4.0 Parking Review

The following section reviews the adequacy of the parking supply of the proposed development. The parking review includes an assessment of the proposed parking supply of the site against the requirements outlined in the Town of Milton's Comprehensive Zoning By-Law No. 016-2014, Zone M2 – Industrial Zone requirements. **Appendix C** contains relevant Zoning By-Law No. 016-2014 excerpts.

4.1 Vehicle Parking Assessment

The Town of Milton's Urban Zoning By-Law 016-2014 Table 5G was used to determine the adequacy of the parking supply for the site. The parking assessment for the development is shown below. The Zoning By-Law excerpts can be found in **Appendix C.**

Table 7: Milton Zoning By-Law Parking Requirements

Land Use	GFA	Parking Rate	Required Parking Spaces
Offices	200 m^2	1 parking space per 30m^2 of gross floor area	7

According to the Zoning By-law, the site is required to provide 7 standard parking spaces. Currently, the site includes a driveway which could fit ten (10) vehicles in tandem. Per the Town of Milton's Zoning By-law, only two (2) of these spaces can count towards the supply. As such, there is a deficit per Zoning By-law of five (5) spaces. Based on information provided by the client, this supply is considered sufficient as the site is a temporary condition and is meant to accommodate up to 10 employees, who will not all be present on-site at the same time and can coordinate to utilize the tandem spaces.

4.2 Accessible Parking Requirement

The Town of Milton's Urban Zoning By-Law 016-2014 Table 5H was used to determine the accessible parking requirement for the site. The requirement as outlined in Section 5.9 of the By-law is as follows:

- *4% of the required parking supply shall be designated accessible spaces.*

The accessible parking assessment for the development is shown below.

Table 8: Milton Zoning By-Law Accessible Parking Requirements

GFA	Required Parking Spaces	Required Accessible Parking Space
200 m^2	7	1

According to the Zoning By-Law, the site is required to provide 1 Type A accessible parking spaces.

4.3 Bicycle Parking Assessment

The Town of Milton's Urban Zoning By-Law 016-2014 Table 5I was used to determine the bicycle parking requirement for the site. The requirement as outlined in Section 5.9 of the By-law is as follows:

- *3% of the required parking supply shall be designated bicycle spaces.*

The site is required to provide 1 bicycle parking space near the entrance of the property.

4.4 Institute of Transportation Engineers (ITE) Parking Generation

To further assess the parking supply at the proposed development, the Institute of Transportation Engineers (ITE) Parking Generation Manual, 6th Edition was used to forecast the peak parking demand. The Land Use Category 715 – Single Tenant Office was used for the development. It is noted that the ITE rates captures both the tenant and visitor parking. For the analysis, the "General Urban/Suburban" setting location was used, and the average rates were used as they are more conservative than the fitted curve trip generation. **Table 9** presents the peak parking demand for the proposed site redevelopment based on the ITE parking rates.

Table 9: ITE ParkGen Rates

Land Use	GFA	Peak Demand Parking ITE Rate	Peak Parking Demand
LUC 715 – Single Tenant Office	2,152 ft²	3.14	7
		Total Parking Proposed:	**7**
		Parking Surplus/Deficit ITE Rates Only:	**0**

Based on the ITE parking rates for the weekday period, the proposed parking supply for the development meets the spaces required when compared to the peak parking demand.

5.0 Transportation Demand Management

Transportation Demand Management (TDM) is the practice of influencing or maximizing the travel choices for users through infrastructure improvements, strategic services and programs, or public outreach, with the purpose to make efficient use of the transportation system.

5.1 Existing Pedestrian and Bicycle Facilities

The current pedestrian facilities around the site include 3-meter multi-use paths on both sides of Fifth Line north of Derry Road West. Painted bike lanes are also provided on both sides of Fifth Line; it is noted that the bike lanes end 85 meters south of Derry Road West.

No pedestrian or cycling facilities are noted along Derry Road West in the vicinity of the study area.

6.0 Conclusion

This study has analyzed potential traffic impact on the boundary road network in relation to the commercial redevelopment to turn a two-storey residential dwelling into a temporary real state office at 11179 Derry Road West in the Town of Milton. The conclusion in this report may be summarized with the following key findings:

- The development is expected to generate four (4) two-way (4 inbound and 0 outbound) trips during the weekday a.m. peak hour, and four (4) two-way (1 inbound and 3 outbound) trips during the weekday p.m. peak hour.
- Analysis of site access safety components associated with the development indicate the following:
    - The available sight distance, stopping sight distance, corner clearance, and clear

throat length at the site access exceeds the minimum sight distance requirements set out in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR), June 2017.

- The development is required to provide 7 vehicle parking spaces to satisfy the parking requirements outlined in the Town's Zoning By-law. The assumed existing supply of approximately 7 spaces is sufficient, as not all employees will be on-site at the same time. These rates were analyzed despite the temporary nature of the redevelopment.

- The proposed parking supply was further assessed using the ITE Parking Generation Manual to forecast the peak parking demand. ITE forecasts a peak parking demand for 7 parking spaces.

- The existence of pedestrian and cycling infrastructure at the site is expected to reduce auto trips on the study road network.

The analysis undertaken herein was prepared using the most recent concept plan available at the time of writing this report. Any minor changes to the plan are not expected to materially affect the conclusions contained within this report. In conclusion, the residential development can be supported from a traffic operations and safety perspective.

Respectfully submitted,

C.F. CROZIER & ASSOCIATES INC.

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IL/sa

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Appendix A

ITE 12th Edition, ParkGen and TTS Excerpts

Single Tenant Office Building
(715)

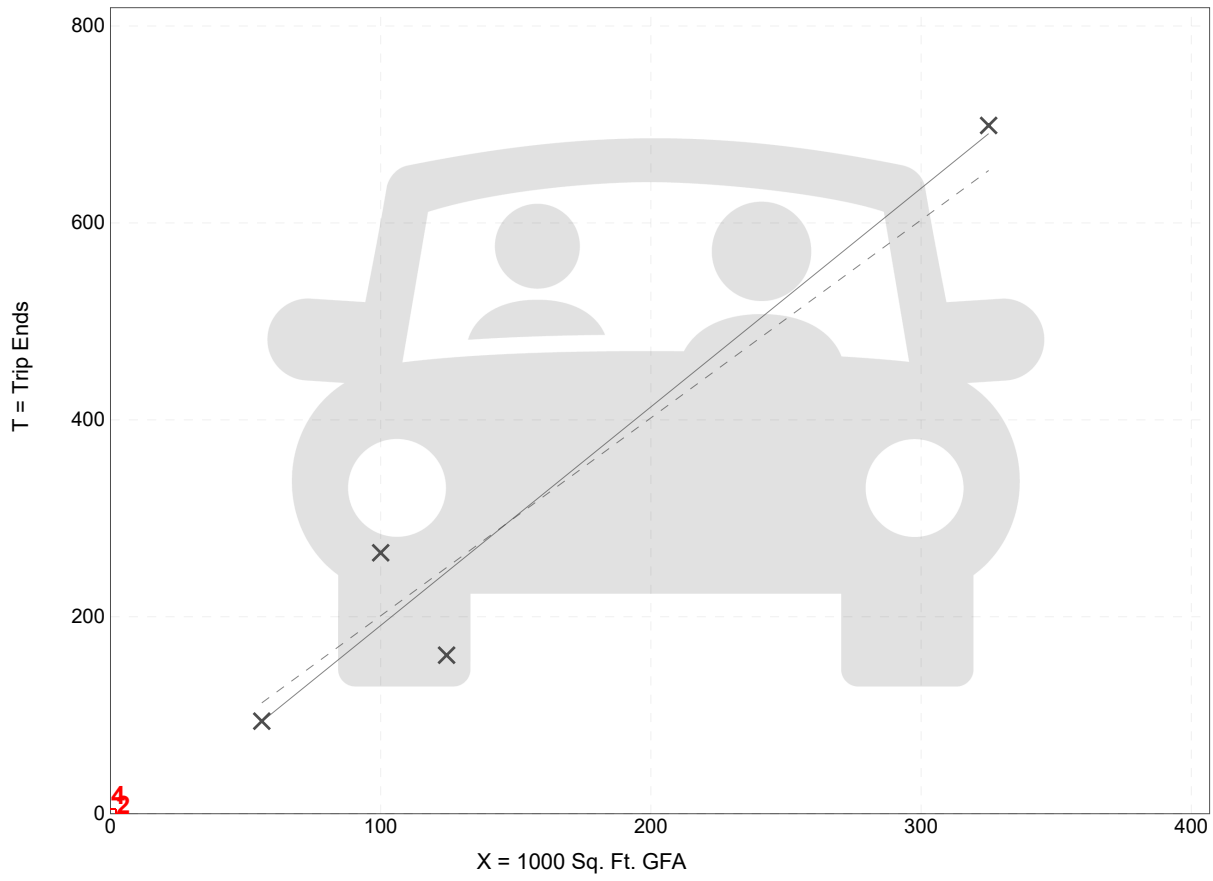
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 4
Avg. 1000 Sq. Ft. GFA: 151
Directional Distribution: 89% entering, 11% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.01	1.29 - 2.65	0.51

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: T = 2.22(X) - 30.81

R^2= 0.94

Single Tenant Office Building
(715)

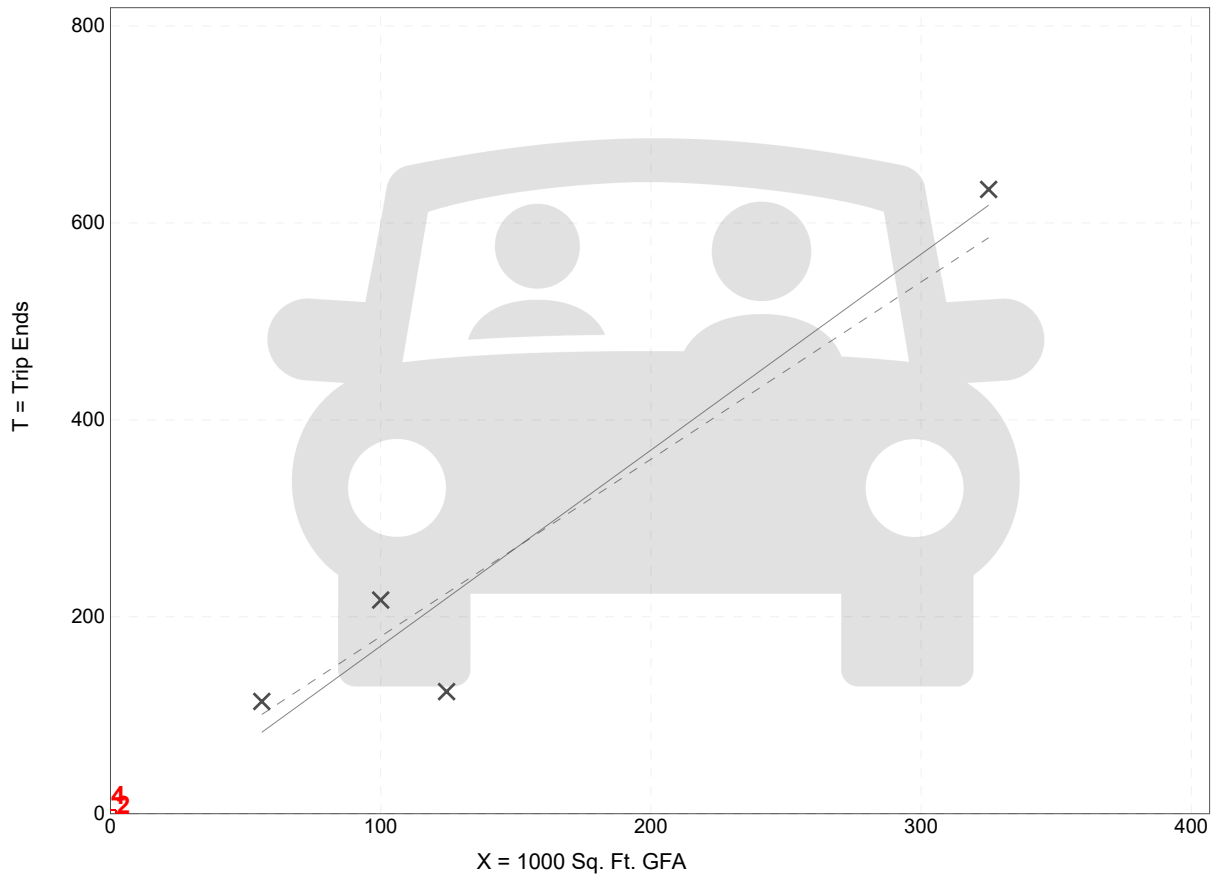
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 4
Avg. 1000 Sq. Ft. GFA: 151
Directional Distribution: 15% entering, 85% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.80	1.00 - 2.17	0.48

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: T = 1.99(X) - 28.75

R^2= 0.93

AM

Mon Apr 27 2026 12:02:23 GMT-0400 (Eastern Daylight Time) - Run Time: 3305ms

Cross Tabulation Query Form - Trip - 2022

Row: 2022 TTS zone of destination - tts22_dest
Column: Primary travel mode of trip - mode_prime

Filters:
2022 TTS zone of destination - tts22_dest In 5364,
and
Start time of trip - start_time In 0630-0930
and
2022 Trip purpose of destination - purp_dest2022 In 10, 11,

Trip 2022
Table:

,Auto driver,Auto passenger
5364,217,51

	Auto Drive	Transit exc	Cycle	Auto passe	Walk	Total
5364	217	0	0	51	0	268
	81%	0%	0%	19%	0%	100%

PM

Mon Apr 27 2026 12:04:05 GMT-0400 (Eastern Daylight Time) - Run Time: 3299ms

Cross Tabulation Query Form - Trip - 2022

Row: 2022 TTS zone of destination - tts22_dest
Column: Primary travel mode of trip - mode_prime

Filters:
2022 TTS zone of destination - tts22_dest In 5364,
and
Start time of trip - start_time In 1530-183
and
2022 Trip purpose of destination - purp_dest2022 In 10, 11,

Trip 2022
Table:

,Transit excluding GO rail,Auto driver,Auto passenger
5364,6,235,63

	Auto Drive	Transit exc	Cycle	Auto passe	Walk	Total
5364	253	6	0	63	0	322
	79%	2%	0%	20%	0%	100%

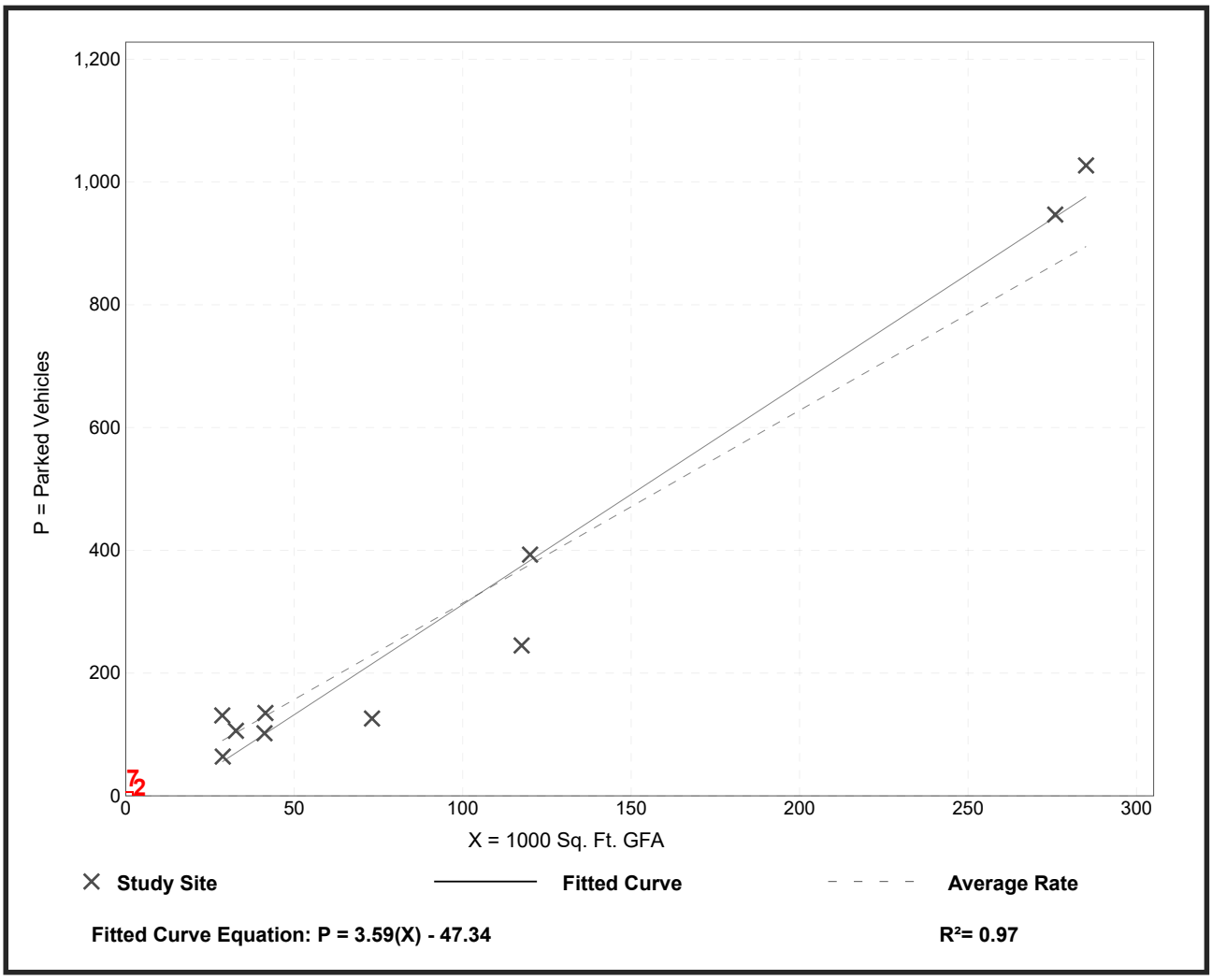
Single Tenant Office Building
(715)

Peak Period Parking Demand vs: **1000 Sq. Ft. GFA**
On a: **Weekday (Monday - Friday)**
Setting/Location: **General Urban/Suburban**
Number of Studies: 10
Avg. 1000 Sq. Ft. GFA: 104

Peak Period Parking Demand per 1000 Sq. Ft. GFA

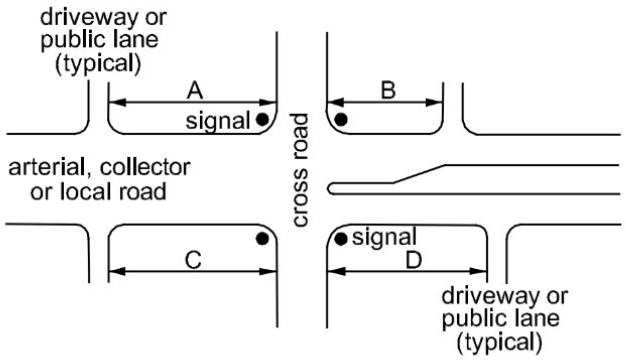
Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
3.14	1.72 - 4.57	2.38 / 3.94	***	0.70 (22%)

Data Plot and Equation



Appendix B

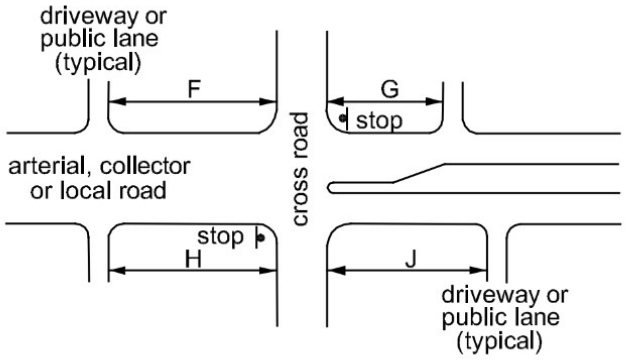
TAC Excerpts



item	min. clearance, m		
	arterial	collector [b]	local [d]
A	70 [c]	55	15
B	# [a]	25	15
C	70	55	15
D	70 [c]	55	15

Notes: a. Distance (#) positions driveway or public lane in advance of the left turn storage length (min.) plus bay taper (des.).
b. Lesser values reflect lower volumes and reduces level of service on collectors and locals.
c. Reduced distances feasible if auxiliary lane implemented, see Section 8.5
d. Values based on operating speed of 50km/h, higher values desirable for higher speeds or may be warranted by traffic conditions.

signals at the cross road



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

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

stop control at the cross road

Figure 8.8.2: Suggested Minimum Corner Clearances to Accesses or Public Lanes at Major Intersections

Inadequate corner clearance between accesses and signalized intersections along a major road, such as a major arterial, can create serious operational problems including:

Stopping sight distance is the sum of the distance travelled during the perception and reaction time and the braking distance.

$$SSD = 0.278Vt + 0.039 \frac{V^2}{a} \quad (2.5.2)$$

Where:

SSD = Stopping sight distance (m)
t = Brake reaction time, 2.5 s
V = Design speed (km/h)
a = Deceleration rate (m/s^2)

Table 2.5.2 gives the minimum stopping sight distances on level grade, on wet pavement, for a range of design speeds. These values are used for vertical curve design, intersection geometry and the placement of traffic control devices. The stopping sight distances quoted in **Table 2.5.2** may need to be increased for a variety of reasons related to grade and vehicle type as noted below.

Table 2.5.2: Stopping Sight Distance on level roadways for Automobiles[54]

Design speed (km/h)	Brake reaction distance (m)	Braking distance on level (m)	Stopping sight distance	
			Calculated (m)	Design (m)
20	13.9	4.6	18.5	20
30	20.9	10.3	31.2	35
40	27.8	18.4	46.2	50
50	34.8	28.7	63.5	65
60	41.7	41.3	83.0	85
70	48.7	56.2	104.9	105
80	55.6	73.4	129.0	130
90	62.6	92.9	155.5	160
100	69.5	114.7	184.2	185
110	76.5	138.8	215.3	220
120	83.4	165.2	248.6	250
130	90.4	193.8	284.2	285

Note: Brake reaction distance predicated on a time of 2.5 s; deceleration rate of 3.4 m/s^2 used to determine calculated sight distance.

Table 9.9.3: Time Gap for Case B1, Left Turn from Stop

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck (WB 19 and WB 20)	11.5
Longer truck	To be established by road authority

Notes: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.2 s for each percent grade for left turns.
- Some road authorities use higher values for certain specialized vehicles (e.g., Alberta uses 22 s for very long log trucks).

The intersection sight distance along the major road (distance b in **Figure 9.9.2**) is determined by:

$$ISD = 0.278\ V_{major}\ t_g \qquad (9.9.1)$$

Where:

ISD = intersection sight distance (length of the leg of sight triangle along the major road) (m)
V_{major} = design speed of the major road (km/h)
t_g = time gap for minor road vehicle to enter the major road (s)

For example, a passenger car turning left onto a two-lane major road should be provided sight distance equivalent to a time gap of 7.5 s in major-road traffic. If the design speed of the major road is 100 km/h, this corresponds to a sight distance of 0.278(100)(7.5) = 208.5 or 210 m, rounded for design.

A passenger car turning left onto a four-lane undivided roadway will need to cross two near lanes, rather than one. This increases the recommended gap in major-road traffic from 7.5 to 8.0 s. The corresponding value of sight distance for this example would be 223 m. If the minor-road approach to such an intersection is located on a 4% upgrade, then the time gap selected for intersection sight distance design for left turns should be increased from 8.0 to 8.8 s, equivalent to an increase of 0.2 s for each percent grade.

The design values for intersection sight distance for passenger cars are shown in **Table 9.9.4**. **Figure 9.9.4** includes design values, based on the time gaps for the design vehicles included in **Table 9.9.3**.

No adjustment of the recommended sight distance values for the major-road grade is generally needed because both the major- and minor-road vehicle will be on the same grade when departing from the intersection. However, if the minor-road design vehicle is a heavy truck and the intersection is located near a sag vertical curve with grades over 3%, then an adjustment to extend the recommended sight distance based on the major-road grade should be considered.

Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn From Stop

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	41.7	45
30	35	62.6	65
40	50	83.4	85
50	65	104.3	105
60	85	125.1	130
70	105	146.0	150
80	130	166.8	170
90	160	187.7	190
100	185	208.5	210
110	220	229.4	230
120	250	250.2	255
130	285	271.1	275

Note: Intersection sight distance shown is for a stopped passenger car to turn left onto a two-lane highway with no median and grades 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

Sight distance design for left turns at divided-highway intersections should consider multiple design vehicles and median width. If the design vehicle used to determine sight distance for a divided-highway intersection is larger than a passenger car, then sight distance for left turns will need to be checked for that selected design vehicle and for smaller design vehicles as well. If the divided-highway median is wide enough to store the design vehicle with a clearance to the through lanes of approximately 1 m at both ends of the vehicle, no separate analysis for the departure sight triangle for left turns is needed on the minor-road approach for the near roadway to the left. In most cases, the departure sight triangle for right turns (case B2) will provide sufficient sight distance for a passenger car to cross the near roadway to reach the median. Possible exceptions are addressed in the discussion of case B3.

The time gaps in **Table 9.9.3** can be decreased by 1.0 s for right-turn maneuvers without undue interference with major-road traffic. These adjusted time gaps for the right turn from the minor road are shown in **Table 9.9.5**. Design values based on these adjusted time gaps are shown in **Table 9.9.6** for passenger cars. **Figure 9.9.5** includes the design values for the design vehicles for each of the time gaps in **Table 9.9.5**.

Table 9.9.5: Time Gap for Case B2—Right Turn from Stop and Case B3—Crossing Maneuver

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	6.5
Single-unit truck	8.5
Combination truck (WB 19 and WB 20)	10.5

Note: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.1 s for each percent grade for left turns.

Table 9.9.6: Design Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	36.1	40
30	35	54.2	55
40	50	72.3	75
50	65	90.4	95
60	85	108.4	110
70	105	126.5	130
80	130	144.6	145
90	160	162.6	165
100	185	180.7	185
110	220	198.8	200
120	250	216.8	220
130	285	234.9	235

Note: Intersection sight distance shown is for a stopped passenger car to turn right onto or to cross a two-lane highway with no median and with grades of 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

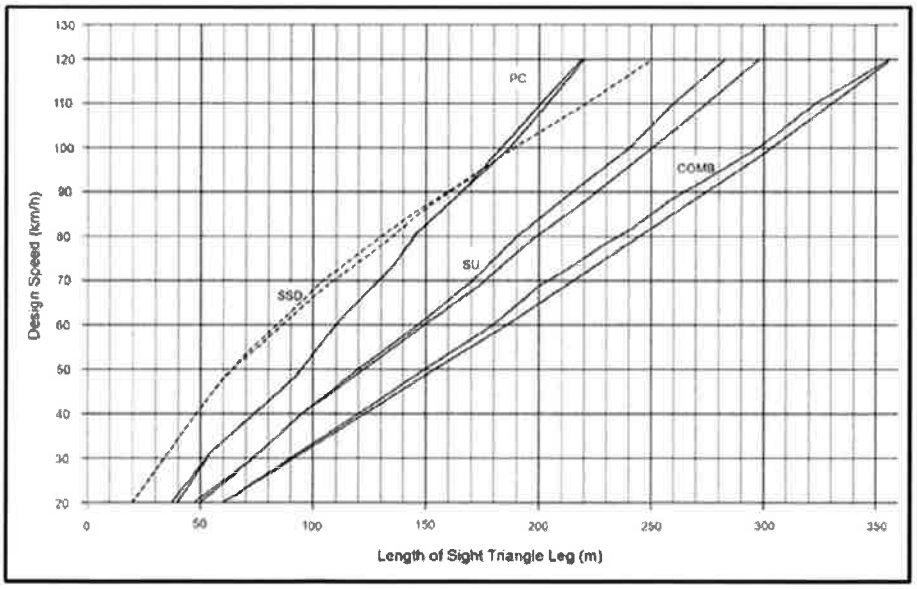


Figure 9.9.5: Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver (Calculated and Design Values Plotted)

Case F – Left Turns from the Major Road

All locations along a major highway from which vehicles are permitted to turn left across opposing traffic, including intersections and driveways, should have sufficient sight distance to accommodate the left-turn maneuver. Left-turning drivers need sufficient sight distance to decide when to turn left across the lane(s) used by opposing traffic. Sight distance design should be based on a left turn by a stopped vehicle, since a vehicle that turns left without stopping would need less sight distance. The sight distance along the major road to accommodate left turns is the distance traversed at the design speed of the major road in the travel time for the design vehicle given in **Table 9.9.11**.

Table 9.9.11: Time Gap for Case F, Left Turns from the Major Road

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	5.5
Single-unit truck	6.5
Combination truck (WB 19 and WB 20)	7.5

Note: Adjustment for multi-lane highways: For turning vehicles that cross more than one opposing lane, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane to be crossed.

The table also contains appropriate adjustment factors for the number of major-road lanes to be crossed by the turning vehicle. The unadjusted time gap in **Table 9.9.11** for passenger cars was used to develop the sight distances in **Table 9.9.12** and is illustrated in **Figure 9.9.8.**

Table 9.9.12: Intersection Sight Distance – Case F, Left Turn from the Major Road

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance	
		Passenger Cars	
		Calculated (m)	Design (m)
20	20	30.6	35
30	35	45.9	50
40	50	61.2	65
50	65	76.5	80
60	85	91.7	95
70	105	107.0	110
80	130	122.3	125
90	160	137.6	140
100	185	152.9	155
110	220	168.2	170
120	250	183.5	185
130	285	198.8	200

Note: Intersection sight distance shown is for a passenger car making a left turn from an undivided highway. For other conditions and design vehicles, the time gap should be adjusted and the sight distance recalculated.

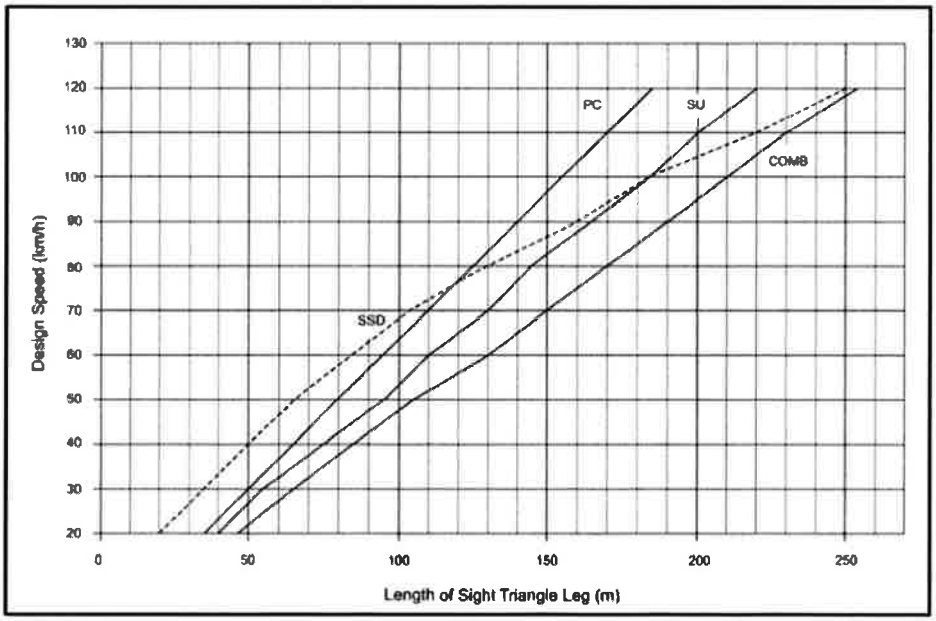


Figure 9.9.8: Intersection Sight Distance – Case F, Left Turn from the Major Road

8.9.10 CLEAR THROAT LENGTHS

In order for major driveways to operate efficiently, both from the road side and internally, it is desirable to provide a no conflict and storage zone within the driveway. This zone is commonly referred to as the clear throat length or set-back distance and is measured from the ends of the driveway curb return radii at the roadway and the point of first conflict on-site. **Figure 8.5.2** illustrates how a throat length is measured. Failure to provide sufficient throat distance results in frequent blocking of on-site circulation roads which can in turn create queues of entering vehicles. The provision of appropriate clear throat length or storage space is particularly important for drive-in service developments where the customers remain in their vehicles while waiting to be served. These types of developments include drive-in restaurants and banks, automatic car washes, and parking facilities with entry control. For large developments, the appropriate throat length is best determined by a detailed traffic analysis based on the traffic control provided at the road and the anticipated volumes and types of traffic. **Table 8.9.3** is a guideline for suggested minimum clear throat lengths for various types of developments.

Table 8.9.3: Suggested Minimum Clear Throat Lengths for Major Driveways[14]

Land Use	Development Size	Minimum Clear Throat Length (m)	
		Collector	Arterial
Light Industrial	<10,000 m^2	8	15
	10,000 – 45,000 m^2	15	30
	>45,000 m^2	15	60
Discount Store	>3,000 m^2	8	15-25
Shopping Centre	<25,000 m^2	8	15
	25,000 – 45,000 m^2	15	25
	45,001 – 70,000 m^2	25	60
	>70,000 m^2	40	75
Supermarket	<2,000 m^2	15	25
	>2,000 m^2	25	40
Apartments	<100 units	8	15
	100 – 200 units	15	25
	>200 units	25	40
Quality restaurant	<1,500 m^2	8	15
	>1,500 m^2	8	25
Fast food restaurant	<200 m^2	8	25
	>200 m^2	15	40
General office	<5,000 m^2	8	15
	5,000 – 10,000 m^2	8	25
	10,001 – 20,000 m^2	15	30
	20,001 – 45,000 m^2	30	45
	>40,000 m^2	40	75
Motel	<150 rooms	8	25
	>150 rooms	8	30

Notes
1. Refer to Figure 8.5.2 for method of measurement
2. For major developments, it is desirable to determine throat lengths and queue on the basis of a site-specific traffic study

Appendix C

Town of Milton Zoning By-Law

TABLE 5A

ZONES	**SURFACE TREATMENT EXEMPTION**
M2 *Zone*	*Rear Yard* Only
Open Space *Zone*	All *yards* of *Public Parks* 2.0 ha or greater, excluding a minimum 15.0m *driveway* apron, and provided the *parking area* is *setback* a minimum 50.0m from any Residential *Zone* or *Use*.

and,

xi) In addition to the provisions as set out above, for *single detached*, *semi detached* and *townhouse dwellings* with individual *residential driveway* access from a *street*, no person shall *use* any area of the *lot*, other than an *attached* or *detached garage*, or *driveway* for the purposes of off-street vehicular *parking*.

5.2 CALCULATION OF *PARKING* REQUIREMENTS

i) Where the minimum number of *parking spaces* are calculated on the basis of a rate or ratio, the required number of spaces shall be rounded to the next highest whole number.

ii) For the purposes of calculating required *parking*, the *Gross Floor Area* shall not include any area intended, designed or used exclusively for the *parking* of a *motor vehicle* and minus 10%.

5.3 MORE THAN ONE *USE* ON A *LOT*

The *parking* requirements for more than one *use* on a single *lot* or for a *building* containing more than one *use*, shall be the sum total of the *parking* requirements for each of the component *use*s, unless otherwise noted.

5.4 ADDITIONS TO *BUILDINGS*

i) The *parking* and *loading space* requirements of this By-law shall not apply to any *building* in existence at the date of passing of this By-law so long as the g*ross floor area*, as it existed at such date, is not increased nor the *building* or *structure* is used for a purpose that requires more *parking spaces*;

ii) If an addition is made to the *building* that increases the g*ross floor area*, additional *parking* and *loading space*s shall be provided for the additional *gross floor area* as required by the regulations of this By-law;

iii) Notwithstanding ii) above, where an addition is proposed for a single unit *industrial use*, the existing *floor area* shall be used in the calculation of requirements.

Type or Nature of *Use*	Minimum Off-Street *Parking* Requirements
Medical clinic	• 1 *parking spaces* per 17m^2 *gross floor area*
Motor vehicle body shop, *Motor vehicle repair garage*	• 3 *parking spaces* per service bay
Motor vehicle gas bar or Motor vehicle service station	• 1 *parking space* for every 45m^2 of *floor space* dedicated to *accessory* retail sales
Night Club	• 1 *parking space* per 5 m^2 of *gross floor area* PLUS • 1 *parking space* per 18 m^2 of patio *area*
Offices	• 1 *parking space* per 30 m^2 of *gross floor area*
Place of assembly	• 1 *parking space* per 9 m^2 of *gross floor area*
Place of entertainment Indoor Playgrounds All Other Entertainment *Uses*	 • 1 *parking space* per 20 m^2 of *gross floor area* • 1 *parking space* per 9 m^2 of *gross floor area*
Place of worship	• 1 *parking space* per 5.5m^2 of *gross floor area* in the nave PLUS • 1 spaces per 11m^2 of *gross floor area* for a public hall, *banquet hall* or community/multi-*use* hall if permitted and associated with or on the same site as the *Place of Worship*.
Police Station	• 1 *parking space* per 20 m^2,

Type or Nature of *Use*	Minimum Off-Street *Parking* Requirements
Restaurant and *Restaurant, Take Out*	• 1 *parking space* per 9m^2 of *gross floor area* PLUS • 1 *parking space* per 18m^2 of patio area
Retail store	• 1 *parking space* per 20m^2 of *gross floor area*
School Elementary *School* Secondary *School* All Other *Schools* Before and After School Programs	• 2 *parking spaces* per class room; • 4 *parking spaces* per class room; • 5 *parking spaces* per class room For Before and After School Daycare programs, refer to the parking requirements under "*Day Care Centre*".
Service and repair shop	• 1 *parking space* per 20m^2 of *gross floor area*
Social Services Establishment	• 1 *parking space* per 30m^2 of *gross floor area*
*Use*s permitted by this By-law other than those listed in this Table	• 1 *parking space* per 30m^2 of *gross floor area*

5.9 ACCESSIBLE *PARKING* REQUIREMENTS (38-2019)

Designated accessible *parking space*s for persons with a disability shall be provided in accordance with the provisions of this By-law and the Highway Traffic Act.

i) The minimum required accessible *parking spaces* for persons with a disability shall be provided in accordance with the following:

TABLE 5H

No. of Required *Parking Space*s	No. of Designated Accessible *Spaces*
1 to 12	1 Type A
13 to 100	4% **(*1)**
101 to 200	1 accessible parking space PLUS 3% **(*1)**
201 to 1000	2 accessible parking spaces PLUS 2% **(*1)**
More than 1000 spaces	11 accessible parking spaces PLUS 1% **(*1)**

Footnotes to Table 5H

(*1) Where the minimum number of accessible *parking spaces* required is even, an equal number of Type A and Type B *accessible parking spaces* shall be provided. Where the minimum number of *accessible parking spaces* is odd, an equal number of Type A and Type B *accessible parking spaces* shall be provided but the last accessible *parking space* may be a Type B.

ii) The total number of accessible *parking space*s shall be included within the total required *parking* calculation for the *lot* or *use* and shall be rounded up to the nearest whole number;

iii) Where required parking on a lot is calculated separately for a residential component, a visitor component, and/or a non-residential component and the parking is provided in a common parking area, the accessible parking required by this by-law shall also be calculated and provided separately for each of the individual components.

iv) Accessible parking spaces shall be signed in accordance with the Town of Milton's Accessible Parking By-law and/or Highway Traffic Act; and,

v) Accessible *parking space*s shall be located in proximity to the primary entrance(s) to a *building* and shall have direct access to the entrance(s) by a minimum 2.2m wide unobstructed sidewalk or access route.

5.10 BICYCLE *PARKING SPACE* REQUIREMENTS (052-2018)(089-2022)

i) The minimum *parking* requirements for bicycle *parking* shall be provided in accordance with the following:

TABLE 5I

Type of Nature of *Use*	Minimum Bicycle *Parking Spaces*
Apartment Building and *Mixed Use Building*	0.5 *long term bicycle parking space*/ unit (*1) PLUS 0.05 *short term bicycle parking space*/unit (*2)
UGC-MU *Apartment Building* and *Mixed Use Building*	1 *long term bicycle parking space*/unit (*1) PLUS 0.05 *short term bicycle parking space*/unit (*2)
Dwelling, *Retirement*	0.1 spaces/ unit
Elementary and Secondary *Schools*	5% of the required *parking spaces* for the *use* or *lot*
All other Commercial, Employment and Institutional *Uses*	3% of the required *parking spaces* for the *use* or *lot*

Footnote(s) to TABLE 5I

(*1) *Long-term bicycle parking spaces* must be provided in a bicycle rack located in an enclosed, secure area with controlled access or within individual, secure, bicycle enclosures/lockers for use by the occupants of a *building*.

(*2) *Short-term bicycle parking spaces* must be provided in a bicycle rack located in an easily accessible location and available for visitors to a *lot* or *building.*

ii) Deleted;