## Purpose & Scope

This policy, in conjunction with the Ontario Traffic Council (OTC) Crossing Guard Guide, will be used to assist staff with the placement of school crossing guards. School crossing guards can be placed on all roadways within the urban boundary of Milton, with a posted speed limit of 60km/h or less as per the Ontario Highway Traffic Act Section 176.

A school crossing guard is a person 18 years of age or older who is directing the movement of persons across a highway by creating necessary gaps in vehicular traffic to provide a safe passage at a designated school crossing location and is employed and trained by the Town of Milton.

School crossing guards will only be provided to assist students when all of the following criteria are met:

- attend schools operating under the Halton District School Board, Halton District Catholic School Board and the French Language School Board;
- live within the school's walking boundaries;
- are in Grades Junior Kindergarten to Six

School crossing guards will be placed at warranted locations a minimum of 30 minutes before the morning bell time and 30 minutes after school dismissal. At school crossing locations directly in front of a school, these guards will remain in place an additional 5 minutes should there be late students. The bell times are provided by the appropriate school board.

School crossing guards can be placed at signalized intersections, all-way stops, roundabouts, minor street stop controlled or at mid-block locations where warrants have been fulfilled.

## Definitions

85th Percentile:   Calculated by plotting the product (conflicting vehicles multiplied by pedestrians) for all existing crossing guard locations. Based on the plotted locations, the 85th percentile is calculated and this is the exposure threshold value.

Conflicting Vehicles: A conflicting vehicular movement is one that interferes with or compromises the safety of the crossing students. The conflicting vehicular movements vary depending on the type of intersection, crossing or control where students are crossing.
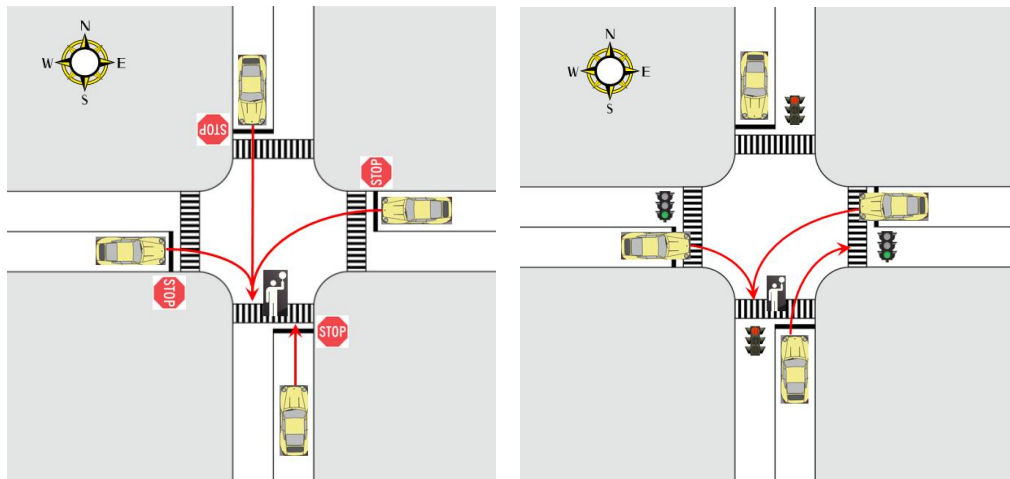
All Way Stop and Signalized Examples - Conflicting Movements

Exposure Index:    The Exposure Index method examines the level of interaction and conflict between vehicular and student pedestrian volumes. The Exposure Index method generates a graph based on historical trends at existing crossing guard locations. The graph is then used as a threshold for future crossing locations where a school crossing guard may be required. (See Appendix I)

Gap Study:    Measures the elapsed time naturally occurring between vehicles, measured in seconds, as vehicles cross the intended study location. The gaps are recorded in five-minute intervals.

Safe Gap Time:    A Safe Gap Time is the time required in a break within the traffic that permits students to cross the road safely. (See Appendix II)

Warrant:    The criteria used to determine if a school crossing guard is warranted.

## Requests for a School Crossing Guard

Requests from parents and schools must be submitted in writing addressed to the Community Services Department, Traffic Engineering.  The request should indicate the applicable school, daily walking route, preferred intersection (including leg of intersection)/location where they are requesting that a school crossing guard be placed. Upon Traffic Engineering staff's review of the student scatter map provided by the appropriate school board, a more suitable location may be considered and studied.

## Types of Studies Used to Determine Locations for School Crossing Guards

Appropriate studies to place a school crossing guard will be conducted at requested locations. All applicable studies will be conducted 30 minutes prior to school entrance times and 30 minutes following school dismissal.

If a school crossing guard is being considered, a site study will be conducted on a typical school day, Tuesday to Thursday with fair weather, to determine if the location is appropriate and if it meets the minimums for the applicable warrant.

The site study would include the following:

- The location's proximity to another traffic control device or existing  school crossing guard;
- Number of students utilizing the crossing location;
- Existing sidewalks i.e. is construction complete or nearly complete in the area;
- Driver and pedestrian behaviour - is education or police enforcement required;
- Site lines - would the school crossing guard and children be clearly visible by traffic at this location;
- Parked vehicles - staff may be required to review area for parking/stopping prohibitions

In order for a school crossing guard to be warranted, all parts of the applicable warrants must be met.  A three-year collision review will also be completed at all studied locations to determine if there is a collision pattern during school entrance and dismissal times.

## Gap Study - Minor Street Stop-Controlled Intersections/Mid-Block Locations

A Gap Study measures the elapsed time naturally occurring between vehicles, measured in seconds, as vehicles cross the intended study location.  The gaps are recorded in five-minute intervals.

At all locations where a Gap Study is performed, a Site Inspection Report will be completed (See Appendix III). All components of the warrant must be met.

**Minimum Warrant Requirements – Gap Study**

- Less than four safe gaps present in 50% of the five minute intervals in either the morning or afternoon study period
- Minimum of 40 students during a study period
- Average daily traffic volumes less than 12,000 vehicles/day on leg of intersection where highest number of students cross

## Exposure Index Study – All-Way Stops

An Exposure Index Study quantifies the level of interaction and potential conflict between vehicular and child pedestrian movements at a given crossing. For a crosswalk at an all-way stop, the conflicting movements considered as part of the Exposure Index would be those vehicles turning left, right or going straight through that crosswalk. The Exposure Index is determined by multiplying the number of conflicting vehicular movements by the number of school aged pedestrians at a crossing. It provides an empirically based value, which can be used objectively to determine if a school crossing guard is warranted at a location. When completing a count, a vehicle drives through a crossing or it does not. The subjectivity is removed from the review.

A Site Inspection Report will be completed. All components of the warrant must be met.

**Minimum Warrant Requirements – Exposure Index Study**

- Minimum  number of students during the school peak period either am or pm must be 40
- Minimum  Exposure Threshold must be 8,102
- Average daily traffic volumes less than 12,000 vehicles/day on leg of intersection where highest number of students cross

## Signalized Intersections

Very few municipalities are using the Exposure Index at signalized intersections and many municipalities do not place crossing guards at signalized intersections. The municipalities that do use the Exposure Index all have different thresholds based on their existing locations. The Town of Milton only has crossing guards at one signalized intersections, which is not a large enough sample to create an Exposure Index. Therefore, at this time the Exposure Index will not be used at signalized intersections and the existing procedure will continue, which was outlined in the previous OTC Crossing Guard Guides from 2017.

Logic would dictate that school crossing guards should not be necessary at signalized intersections since traffic control signals are in place and provide for the orderly flow of traffic and pedestrians. Pedestrians have right of way when crossing on a green signal, which should minimize vehicle/pedestrian conflict. The use of a school crossing guard at a signalized intersection could adversely affect traffic flow, causing undue delay for motorists and should therefore be considered only as a last resort if several of the following are observed:

- A large number of conflicting movements through the intersection both right and left on the green signal and right turning traffic on the red signal.
- A large number of students, particularly young students crossing.
- The intersection leads to a main arterial or collector road and therefore there is a significant volume of trucks or other large vehicles using the intersection, potentially affecting visibility for both pedestrians and drivers.
- Poor driver behaviour, not yielding right of way to pedestrians, not coming to a complete stop prior to turning on a red signal, drivers inching forward, thus intimidating pedestrians in or about to cross the roadway and/or drivers weaving through pedestrians as they cross the roadway.
- The students appear timid in crossing the road or do not seem to be properly trained on how to cross the road safely, e.g. forgetting to push the pedestrian button or entering the roadway after the red flashing hand is showing.

When a school is located adjacent to a signalized intersection, additional measures may be taken. These measures will include but are not limited to:

- Implementing Leading Pedestrian Intervals (LPI) - The LPI provides an advanced walk signal so that pedestrians begin to cross the road before vehicles get a green light and it provides pedestrians an advantage over turning vehicles.
- Prohibiting right turns on red during the LPI time
- Extending the pedestrian walk time
- Ensuring pedestrian countdown and information signs are installed at the intersection

- Provide training to students on how to properly use pedestrian signals

Signal monitoring equipment at these intersections will allow traffic engineering staff to monitor the intersections more frequently and make signal timing adjustments if necessary.

## *Pedestrian Crossovers (PXOs)*

*The warrant method at a PXO is dependent on whether the PXO is located at a midblock location or in the vicinity of an intersection. This differentiation is crucial as a midblock PXO faces no conflicting vehicular movements since all through traffic must yield, prioritizing pedestrian safety, including students. Conversely, a PXO at an intersection would be susceptible to conflicting vehicular movements from the side streets. With respect to this difference, the school crossing guard warrant methods for PXOs located at both locations are outlined below:*

### *Minimum Warrant Requirements – Exposure Index Study (Intersection)*

- *Minimum number of students during the school peak period either am or pm must be 40*
- *Minimum Exposure Threshold must be 8,102*
- *Average daily traffic volumes less than 12,000 vehicles/day on leg of intersection where highest number of students cross*

### *Minimum Warrant Requirements – Midblock PXO*

- *Less than four safe gaps present in 50% of the five minute intervals in either the morning or afternoon study period*
- *Minimum of 40 students during a study period*
- *Average daily traffic volumes less than 12,000 vehicles/day on leg of intersection where highest number of students cross*

## *Roundabout Intersections*

*Some municipalities employ the Exposure Index method and the Gap Study method to assess the necessity of school crossing guards at roundabouts. When determining the most appropriate warrant approach, the municipality should take into account the following considerations:*

*If the sample size is inadequate and roundabouts are not anticipated to be frequently constructed in the municipality, the Exposure Index method may not be applicable. In such cases, a Gap Study conducted at the roundabout could be considered, especially if historical data or existing roundabouts are unavailable.*

*Minimum Warrant Requirements – Gap Study*

- *Less than four safe gaps present in 50% of the five minute intervals in either the morning or afternoon study period*
- *Minimum of 40 students during a study period*
- *Average daily traffic volumes less than 12,000 vehicles/day on leg of intersection where highest number of students cross*

*As roundabouts become more prevalent in Ontario, it is recommended that the effectiveness of implementing school crossing guards directly at roundabouts be compared to other safety measures, such as implementing PXOs at roundabouts or shifting the guard to a midblock location. A better understanding of the impact of various aspects of the roundabout on the operation of a school crossing guard should also be monitored.*

## New School Opening

School boards must notify the Community Services Department three months in advance of the opening dates of all new schools in Milton.  They are to provide the catchment area of the registered children for the subject school and a scatter map showing the potential walking students.

 *A site visit will occur within three weeks of the school opening to review potential sites for future studies based on student volumes at all significant crossings. School crossing guards will not be placed before school opens, as traffic/pedestrian patterns have not been established.  Construction surrounding schools should be nearing completion, which would include sidewalks and curbs. The safety of pedestrians and the school crossing guard must be taken into consideration.  Approximately six to eight weeks after the school opens (pending construction progress) applicable studies would be conducted and warranted guards would be placed.*

## Removal of a School Crossing Guard

The Commissioner, Community Services, is authorized to remove school crossing guard locations without further study due to school closure, a school boundary change or if the students are now eligible for bussing.  Additionally, locations can be removed following the completion of three gap/exposure studies where any of the three studies fall short of meeting warrants within a school year. Staff will advise Council as well as affected schools of the locations where school crossing guards are being removed.  The affected school(s) will be responsible for advising parents/caregivers of the removal of the school crossing guard. Removals should be effective after the end of school year.

## Updating of Policy

*The Placement of School Crossing Guards Policy will be reviewed and updated, as necessary, each term of Council. This will include updating the Exposure Threshold to ensure existing conditions are being captured and reflected.*

*As per Council Report ENG-023-19, the Commissioner is delegated the authority to update the policy. Updates to the policy will be communicated to Council via an information report to Council.*

Appendix I – Exposure Index Graph
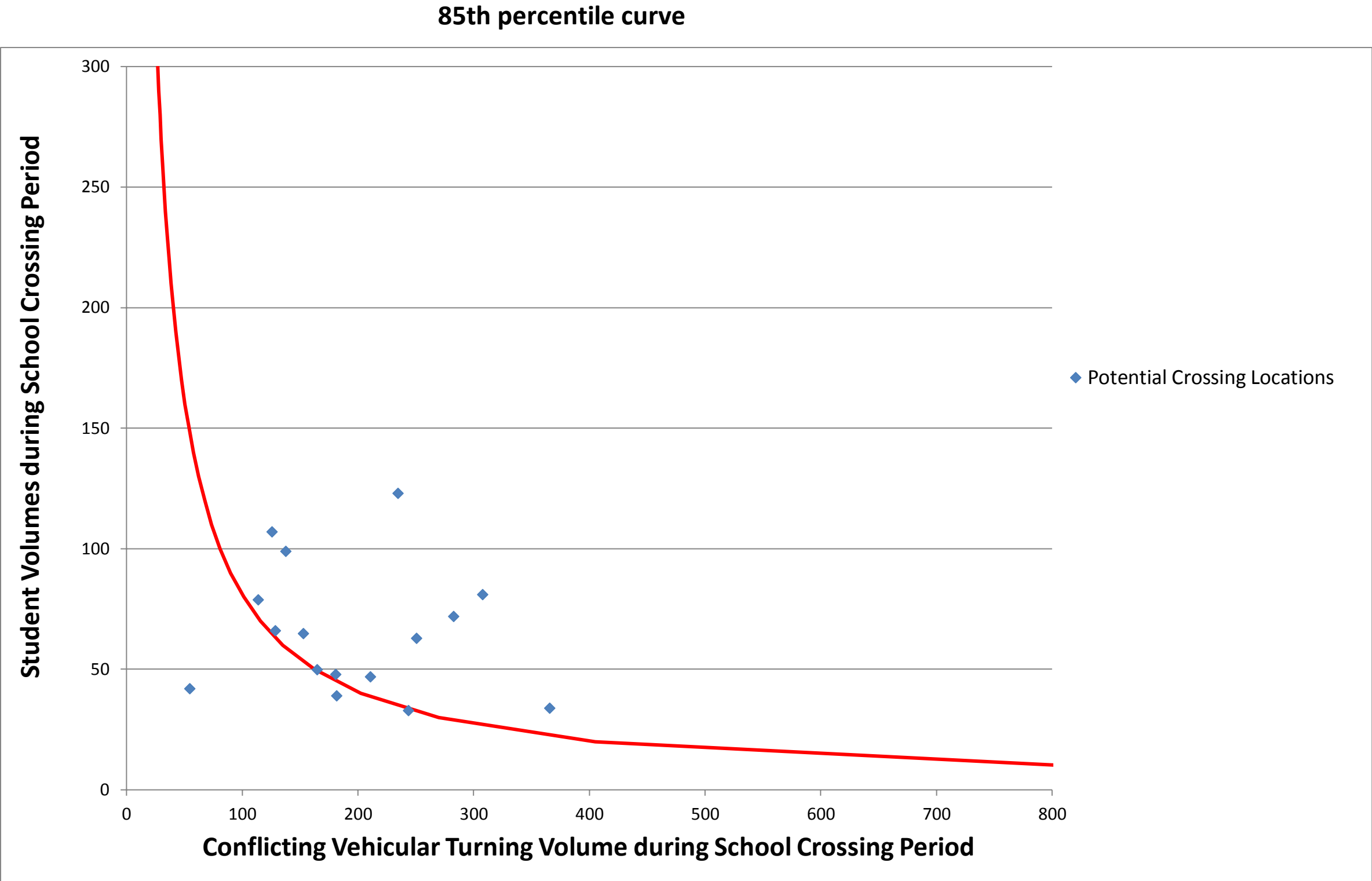*Appendix II – Safe Gap Time definition from OTC Crossing Guard Guide 2023*
Appendix III – Site Survey Form and Gap Study

**Appendix I**
**Exposure Index Graph**

## Exposure Index Graph for All-way Stop-controlled Intersections

**85 percentile threshold** **8,102**

| Existing Crossing Guard Locations | | | |
|---|---|---|---|
| 1 | 153 | 65 | 9,945 |
| 2 | 244 | 33 | 8,052 |
| 3 | 114 | 79 | 9,006 |
| 4 | 138 | 99 | 13,662 |
| 5 | 308 | 81 | 24,948 |
| 6 | 211 | 47 | 9,917 |
| 7 | 366 | 34 | 12,444 |
| 8 | 235 | 123 | 28,905 |
| 9 | 283 | 72 | 20,376 |
| 10 | 129 | 66 | 8,514 |
| 11 | 251 | 63 | 15,813 |
| 12 | 55 | 42 | 2,310 |
| 13 | 126 | 107 | 13,482 |
| 14 | 181 | 48 | 8,688 |
| 15 | 165 | 50 | 8,250 |
| 16 | 182 | 39 | 7,098 |
| | | | |
| | | | 8,102 |

| Potential Crossing Locations | | | |
|---|---|---|---|
| ID | Conflicting movements | Students (JK-6) | Product |
| BENNETT / ARMSTRONG | 153 | 65 | 9,945 |
| BENNETT / CLARK | 244 | 33 | 8,052 |
| Costigan / Denyes (new?) | 114 | 79 | 9,006 |
| Costigan / Miller (new?) | 138 | 99 | 13,662 |
| FARMSTEAD / MCLAUGHL | 308 | 81 | 24,948 |
| LAURIER / COSTIGAN | 211 | 47 | 9,917 |
| LAURIER / COXE | 366 | 34 | 12,444 |
| LAURIER / DENYES | 235 | 123 | 28,905 |
| LAURIER / HOLLY | 283 | 72 | 20,376 |
| PHILBROOK / CLARK | 129 | 66 | 8,514 |
| SAVOLINE / PRINGLE | 251 | 63 | 15,813 |
| THOMAS / HESLOP | 55 | 42 | 2,310 |
| WOODWARD / DIXON | 126 | 107 | 13,482 |
| WOODWARD / WILSON | 181 | 48 | 8,688 |
| YATES / BOLINGBROKE | 165 | 50 | 8,250 |
| YATES / HOLLY | 182 | 39 | 7,098 |



85th percentile curve

Y-axis: Student Volumes during School Crossing Period
X-axis: Conflicting Vehicular Turning Volume during School Crossing Period

♦ Potential Crossing Locations

**Appendix II**
**Safe Gap Time definition from OTC Crossing Guard Guide 2023**

## Sample Calculation of Safe Gap Time

The following sample midblock location has been chosen to demonstrate how the Safe Gap Time is calculated based on the equation:

*Safe Gap Time (G) = Perception & Reaction Time (P) + Crossing Time + Group Factor Time*

$$G = P + (W / S) + T (N - 1)$$



**Perception time (P):** Because there were not enough students crossing at this midblock location, the default value of 4.0 seconds is adopted.

**Width of roadway (W):** The pavement width plus the boulevard width on the side with the crossing sign was measured. This is the more conservative approach that assumes students would not wait on the edge of the road and curb, but rather the boulevard area while waiting for a gap. The distance was measured to be 15.6 m with a measuring wheel.

**Average walking speed of students (S):** The default value was 1.0 m/s was used because there were insufficient sample size.

**Group factor (T):** Information for this was not available at the time of the survey so the default 2.0 seconds is adopted.

**Predominant group size (N):** From an upstream all-way stop-controlled intersection, students were observed to be crossing in groups of typically two to three students. It was conservatively assumed that this trend would continue if a crossing guard was assigned to this midblock location. Thus, N equals to one since the average group size does not exceed one increment of three.

Based on the above parameters, the Safe gap Time is calculated as:

$$G = 4 + (15.6 / 1) + 2 (1 - 1) = \textbf{19.6 seconds}$$

**Appendix III**
**Site Survey Form and Gap Study**

# Site Inspection Report

**MILTON**

| Observers | | |
|---|---|---|
| **Observed By** | and | |
| **Date of Inspection** | | |
| **Times:** | AM: | PM: |
| **Requested by** | | |
| **Weather Conditions** | ☐ Dry  ☐ Sunny  ☐ Rain  ☐ Snow  ☐ Other:_____ | |

| Site | | | |
|---|---|---|---|
| **Location** | Please include map of intersection showing portion studied | | |
| **Leg** | ☐ North  ☐ East  ☐ South  ☐ West | | |
| **Name of School(s)** | | | |
| **Type of Crossing/ Intersection** | ☐ 4 Way | ☐ 3 Way | ☐ Mid-block |
| **Type of Control** | ☐ No Control   ☐ Traffic signals   ☐ PXO<br>☐ Stop Signs (Traffic Stopped on one Street only)<br>☐ All Way Stop (Traffic Stopped in all directions) | | |

| Observations | | | |
|---|---|---|---|
| **School Signs** | ☐ School Crossing | ☐ School Warning | ☐ None |
| **Posted Speed** | ☐ 40 km/hr-when flashing   ☐ 50 km/hr-when flashing<br>☐ 40 km/hr no flash   ☐ 50 km/hr no flash   ☐ 60 km/hr no flash | | |
| **Pedestrian Site Distance** | ☐ Poor | ☐ Fair | ☐ Good |
| **Sight Obstructions** | ☐ Trees   ☐ Hedges   ☐ Fences   ☐ Bus Shelter<br>☐ News Paper Boxes ☐ None   ☐ Other: | | |
| **Road Grade** | ☐ Flat | ☐ Incline | ☐ Decline |
| **Road Geometrics** | ☐ Straight | ☐ Curved | |
| **Road Width (m)** | Curb to Curb:   Curb to Median: | | |
| **Road Conditions** | ☐ Dry   ☐ Wet   ☐ Ice   ☐ Snow covered | | |
| **Sidewalks** | ☐ North  ☐ East  ☐ South  ☐ West  ☐ Not Present | | |
| **Proximity to School(s)** | School:_____ ☐ In front of ☐ Within _____ (m)<br>School:_____ ☐ In front of ☐ Within _____ (m) | | |
| **Route Survey** | ☐ Shopping Area   ☐ Construction  ☐ Driveway  ☐ Bus Stop<br>☐ Parked Vehicle(s)  ☐ Other: | | |
| **Comments** | | | |
| | | | |
| | | | |
| | | | |

# Pre-Calculated Safe Gap Times

| Intersection Width | | Safe Gap | Intersection Width | | Safe Gap |
|---|---|---|---|---|---|
| Feet | Metres | (seconds) | Feet | Metres | (seconds) |
| 24 | 7.30 | 11 | 51 | 15.50 | 19 |
| 25 | 7.60 | 11 | 52 | 15.90 | 19 |
| 26 | 7.90 | 11 | 53 | 16.20 | 19 |
| 27 | 8.25 | 12 | 54 | 16.50 | 19 |
| 28 | 8.50 | 12 | 55 | 16.75 | 20 |
| 29 | 9.00 | 12 | 56 | 17.00 | 20 |
| 30 | 9.10 | 13 | 57 | 17.40 | 20 |
| 31 | 9.50 | 13 | 58 | 17.70 | 21 |
| 32 | 9.75 | 13 | 59 | 18.00 | 21 |
| 33 | 10.00 | 13 | 60 | 18.30 | 21 |
| 34 | 10.35 | 14 | 61 | 18.60 | 21 |
| 35 | 10.67 | 14 | 62 | 18.90 | 22 |
| 36 | 11.00 | 14 | 63 | 19.20 | 22 |
| 37 | 11.25 | 15 | 64 | 19.50 | 22 |
| 38 | 11.60 | 15 | 65 | 19.80 | 23 |
| 39 | 11.90 | 15 | 66 | 20.10 | 23 |
| 40 | 12.20 | 15 | 67 | 20.40 | 23 |
| 41 | 12.50 | 16 | 68 | 20.70 | 23 |
| 42 | 12.80 | 16 | 69 | 21.00 | 24 |
| 43 | 13.10 | 16 | 70 | 21.30 | 24 |
| 44 | 13.40 | 17 | 71 | 21.60 | 24 |
| 45 | 13.70 | 17 | 72 | 22.00 | 25 |
| 46 | 14.00 | 17 | 73 | 22.25 | 25 |
| 47 | 14.30 | 17 | 74 | 22.50 | 25 |
| 48 | 14.60 | 18 | 75 | 22.90 | 25 |
| 49 | 15.00 | 18 | 76 | 23.20 | 26 |
| 50 | 15.25 | 18 | 77 | 23.50 | 26 |
| | | | 78 | 23.80 | 26 |
| | | | 79 | 24.00 | 27 |
| | | | 80 | 24.40 | 27 |

* Note: school aged children only, no adults or bussed students. Circle = conflict, / = vehicle, numbers = seconds elapsed

| No. of children | # | Time in 5 minute increments | Gap = _____ | Seconds Totalled | Total ÷ Gap | Total # Cars |
|---|---|---|---|---|---|---|
| e.g. 1,5,3,1 | 9 | 8:05-8:10 | Gap = 15   // 23 ɪɪɪɪ ɪɪɪɪ // (19) 23 18 // | 83 | 5.53 | 20 |
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Notes: