



Report for

**SCHOOL CROSSING GUARD  
FEASIBILITY STUDY  
2024 UPDATE AND REVIEW**

Submitted by:

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Submitted to:

Corporation of the Town of Amherstburg

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## Executive Summary

A school crossing is defined by the OTC School Crossing Guard Guide as a location supervised by a school crossing guard that has been recommended through a combination of a site inspection and a warrant evaluation process.<sup>1</sup> The role of the school crossing guard is to direct and supervise the movement of pedestrians (students) across a public road by creating necessary gaps in vehicular traffic to provide safe passage at a designated school crossing location.<sup>2</sup> The key to a successful and effective school crossing guard policy is clarity, consistency, and conformity.

Hrycay Consulting Engineers Inc. (HCEI) performed the initial School Crossing Guard Feasibility Study for the Town of Amherstburg (Town) in 2020 in order to suitably evaluate and respond to future issues and requests related to school crossing guards. The Town requested an updated study with new data collection and warrant analysis for the same sites evaluated in 2020, which include nine (9) crossings located throughout the town:

1. Richmond Street & Victoria Street South
2. Richmond Street & Fryer Street
3. Simcoe Street & Fryer Street
4. Fryer Street & Pickering Drive
5. Sandwich Street South & Richmond Street
6. Victoria Street South & Hamilton Drive
7. Simcoe Street & Victoria Street South
8. Richmond Street Path, near 252 Richmond Street
9. Alma Street & Victoria Street

The study followed a systematic method that involved data collection, synthesis of information, analysis of exposure warrants, and assessment of the subject crossing locations. Two warrant methods were used: the Exposure Index Method and the Gap Study Method. The OTC School Crossing Guard Guide establishes a minimum threshold of 40 pedestrians during the school peak periods when considering whether or not to provide a crossing guard treatment, and notes that a lower value may be used at the discretion of each municipality. For the purposes of this analysis, a threshold of 40 pedestrians as per the recommendation of the OTC Guide was used.

The Exposure Index method studies the interaction and conflict between vehicular and pedestrian volumes.<sup>3</sup> HCEI used the 85<sup>th</sup> percentile warrant graphs prepared during the 2020 study to evaluate the new data and identify locations where this threshold was met. This method is used to determine the necessity of a school crossing guard at existing or proposed locations by using

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<sup>1</sup> Ontario Traffic Council School Crossing Guard Guide, May 2017, pg. 5

<sup>2</sup> Ontario Traffic Council School Crossing Guard Guide, May 2017, pg. 5

<sup>3</sup> Ontario Traffic Council School Crossing Guard Guide, May 2017, pg. 5

the established threshold, which was based on a combination of vehicle volumes, pedestrian volumes, and crossing conflicts. The Exposure Index method is appropriate for controlled crossings, which are defined as locations with stop or yield control, pedestrian crossover (PXO) locations, intersection pedestrian signals (IPS), mid-block pedestrian signals (MPS), or full traffic control signals (TCS).<sup>4</sup>

The Gap Study Method uses site observations to establish a safe gap threshold for pedestrians to cross, and compares the available gaps in traffic to this threshold to determine the location's suitability for a crossing guard.<sup>5</sup> This method is used for uncontrolled crossings, which are locations where pedestrians do not have the right-of-way and are required to wait for a safe gap in traffic to cross.<sup>6</sup>

In addition to providing recommendations for the nine observed crossing locations, steps are outlined within this report which can be followed to aid in the analysis of crossing locations in the future using the developed warrants and/or study methods. These steps include:

1. Creating a site visit schedule and determining the peak periods.
2. Preparing physical copies of the appropriate warrant template(s).
3. Recording interactions at the crossing location and completing the template. Field work is limited to documenting pedestrian and vehicular volumes, and the video footage is used for counting gaps when using the Gap Study method.
4. Determine whether the given location meets the threshold based on the Exposure Index and/or Gap Study method, in conjunction with other factors, to ultimately assess whether the location is suitable for crossing guard treatment.

HCEI undertook a safety review of each of the existing crossing locations. It was found that intersection legs with stop signs experienced occasional rolling stops, especially at lower traffic intersections. However, these instances were not significant enough to necessitate a stop compliance study or to increase enforcement at these locations.

Existing signage including No Stopping, No Parking, and School Crossing were observed at all crossing locations, and no location was found to be deficient in required signage. This signage should be incorporated, along with all necessary pavement markings, at any future locations in conformance with the Ontario Traffic Manual.

Data was collected during morning and afternoon peak periods. The Town did not require a mid-day peak assessment as that is not a service level that is currently offered, and two of the three schools within the study area do not permit students to leave the property during nutrition breaks.

Of the existing crossing locations observed and based on pedestrian volumes and the developed warrants, 0% of the locations are recommended for a crossing guard during the morning peak period, and 33% during the afternoon peak period.

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<sup>4</sup> Ontario Traffic Council School Crossing Guard Guide, May 2017, pg. 6

<sup>5</sup> Ontario Traffic Council School Crossing Guard Guide, May 2017, pg. 6

<sup>6</sup> Ontario Traffic Council School Crossing Guard Guide, May 2017, pg. 7

It is recommended that the Town remove school crossing guards at locations deemed unwarranted and investigate alternative solutions. These alternative solutions include reviewing the walk and flashing don't walk times at signalized intersections, installing traffic calming devices and/or conducting signal warrants and all-way stop control warrants. Further study of respective locations is recommended to determine the appropriate alternative solutions on a case-by-case basis.

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- Appendix A – Exposure Index Method and Gap Study Method Templates
- Appendix B – Town of Amherstburg Exposure Index

## **1.0 Introduction**

### **1.1 Project Background**

In August, 2018, the Town of Amherstburg (Town) retained HRYCAY Consulting Engineers (HCEI) to conduct the initial school crossing guard feasibility study of current and potential crossing guard locations located in the Town of Amherstburg. In March, 2024, the Town requested a follow-up study be conducted by HCEI with new data collection and application of the developed warrants.

The purpose of this updated study was to determine if these school crossing guard locations are warranted. Major tasks of this study included:

- Review of applicable updates to current crossing guard standards and policies;
- Updated review and data collection for eight (8) existing crossings and one (1) potential crossing as identified in the initial feasibility study, including pedestrian and vehicular movement counts for AM and PM crossing periods. Data collection is limited to one day of peak hour data collection per crossing location;
- Warrant analysis of 8 existing crossings and 1 potential crossing locations using the previously developed Exposure Index and Gap Study methods;
- Provide crossing treatment recommendations at the identified locations;
- Review of conditions at existing and proposed crossings for safety concerns and propose recommended improvements; and
- Draft and final report containing our findings and recommendations for the Town's use.

### **1.2 Study Area**

Eight (8) existing school crossing locations were studied, as outlined below:

1. Richmond Street & Victoria Street South
2. Richmond Street & Fryer Street
3. Simcoe Street & Fryer Street
4. Fryer Street & Pickering Drive
5. Sandwich Street South & Richmond Street
6. Victoria Street South & Hamilton Drive
7. Simcoe Street & Victoria Street South
8. Richmond Street Path, near 252 Richmond Street

One (1) potential school crossing location was studied, as outlined below:

9. Alma Street & Victoria Street

Figure 1 illustrates the location of each existing crossing that was investigated during this study.



**Figure 1 - Crossing Locations**

### **1.3 Study Methodology**

The study followed a systematic method that involved data collection, synthesis of information, review of exposure warrants, and analysis of the subject crossing locations.

Pedestrian and vehicle counts, along with site information, were collected over a 6-week period from April 10<sup>th</sup> to May 16<sup>th</sup>, 2024. From this information, school crossing warrants were developed using either the Exposure Index Method or the Gap Study Method, depending on the type of crossing, in conjunction with observed pedestrian volumes at each crossing. These warrants and volume thresholds were applied to the subject crossing locations to determine whether crossing facilities were justified.

In accordance with the OTC school Crossing Guard Guide, no data was recorded on the following atypical days:

- First and last week of school;
- Winter break;
- Spring break;
- Statutory, public and “elective” holidays such as Remembrance Day;
- Days that precede or follow a holiday break;
- Days that precede or follow a weekend (i.e., Monday and Friday)
- Professional Activity (PA) days;
- Days that precede or follow a PA day;



- Days with special events at the school such as a concert or track and field; and
- Days with inclement weather.<sup>7</sup>

HCEI considered any amount of rain as inclement weather, including very light rain. Site visits were not performed on any days where inclement weather was predicted on the radar, and recounts were performed in the event of unexpected light rain being encountered during data collection.

## 1.4 Material Reviewed

The following materials were referred to in the review of the intersections:

- Ontario Traffic Council School Crossing Guard Guide (May 2017 Edition)
- Highway Traffic Act (HTA) section 176
- OTM Book 5: Regulatory Signs
- OTM Book 6: Warning Signs
- OTM Book 11: Pavement, Hazard and Delineation Markings
- OTM Book 12: Traffic Signals
- OTM Book 15: Pedestrian Crossing Treatments

## 2.0 Existing Conditions

The first phase of the study began with the collection of background data. Over the course of six weeks, site inspections were performed during the morning and afternoon school peak periods. These 60-minute periods were provided by the Town and were influenced by the start time and dismissal time of adjacent schools. Site inspections were only performed on typical school days, as defined in the OTC School Crossing Guard Guide and Section 1.3 of this report.

HCEI used the template documents that were created for the initial School Crossing Guard Feasibility Study in 2020 to collect the necessary data for both Exposure Index Method and Gap Study Method evaluations. Data collection templates for each method can be found in Appendix A.

### 2.1 Data Collection: Exposure Index Method

The Exposure Index method was used for signalized, all-way stop-controlled, and minor street stop-controlled crossing facilities.<sup>8</sup> The number of pedestrians and number of conflicting vehicle movements for the leg of the intersection of interest were recorded in 5-minute intervals at existing school crossing guard locations.

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<sup>7</sup> Ontario Traffic Council School Crossing Guard Guide, May 2017, pg. 17

<sup>8</sup> Ontario Traffic Council School Crossing Guard Guide, May 2017, pg. 19

## 2.2 Data Collection: Gap Study Method

The Gap Study method was used for uncontrolled legs of an intersection, and is applied to determine if there are sufficient gaps in traffic for pedestrians to cross. Developing this method requires the calculation of a safe gap time (SGT), which is equal to:

$$\text{Safe Gap Time} = (\text{Preception \& Reaction Time}) + (\text{Crossing Time}) + (\text{Group Factor Time})^9$$

The number of pedestrians and duration of gaps (in seconds) for the leg of the intersection of interest were recorded in 5-minute intervals. For each interval, the number of gaps equal to or larger than the safe gap time were recorded, with gaps expressed in increments per the OTC School Crossing Guard Guide, if required. For example, if a gap was recorded to be three times larger than the safe gap, this is noted as three gaps that are equal to or larger than the safe gap time.

## 3.0 Warrant Analysis

Following the field visits and data collection, crossing guard warrants were analysed. As discussed, there are two warrant types, based on the crossing control: the Exposure Index Warrant, and the Gap Study Warrant.

### 3.1 Exposure Index Warrant

The data used in the Exposure Index warrant was derived from the critical leg and crossing period of each intersection. The critical leg and crossing period is defined as the intersection leg with the highest cross-product of conflicting vehicle movements and pedestrian crossings for a given period. By using the critical leg for the exposure index warrant, it ensures that the crossing location that poses the greatest risk to pedestrians is considered; if the critical leg is not satisfied by the warrant process, then all other legs of the intersection would similarly not be satisfied.

The OTC developed a screening tool template for the Exposure Index method, which was used for the initial study in 2020 to generate the 85<sup>th</sup> percentile curve of the critical data. This curve represents the threshold for future determinations of school crossing guard locations. The critical data from the 2024 study were input into the appropriate table of the Exposure Index screening tool. Separate screening tools were established for signalized intersections, all-way stop controlled intersections, and minor-street stop controlled intersections, and each depict a unique threshold curve related to the 85<sup>th</sup> percentile data.

If the plotted data point was above the 85<sup>th</sup> percentile curve, then the Exposure Index warrant was met. Conversely, if the resulting point was below the 85<sup>th</sup> percentile curve, then the Exposure Index warrant was not met.

In either case, other factors such as minimum student crossing volumes, collision hazard reporting frequency, visibility, number of gaps available at urban locations, and proximity to a school are considered when ultimately recommending a location for a crossing guard.

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<sup>9</sup> Ontario Traffic Council School Crossing Guard Guide, May 2017, pg. 39

The Exposure Index Screening Tool can be found in Appendix B. A digital Microsoft Excel copy of the warrant document has been included with this submission.

### **3.2 Gap Study Method**

The Gap Study method requires there to be sufficient gaps in traffic for pedestrians to safely cross at that location. Using the safe gap time that was calculated for each intersection (see Section 2.0), the proportion of 5-minute intervals with less than four safe gaps was determined as a percentage of total intervals in the study period.

If more than 50 percent of the 5-minute intervals had fewer than four safe gaps, the gap study threshold was met. Conversely, if fewer than 50 percent of the 5-minute intervals had less than four safe gaps, the gap study threshold was not met. In either case, other factors such as minimum student crossing volumes, collision hazard reporting frequency, visibility, and proximity to a school are considered when ultimately recommending a location for a crossing guard.

### **3.3 Minimum Pedestrian Crossing Volumes**

The minimum pedestrian crossing volume is the minimum number of school-age pedestrians crossing during the school peak periods and is used in conjunction with the Exposure Index and Gap Study methods to evaluate the need for crossing guards. This minimum value ensures a consistent method of evaluation, and allows municipalities to focus their resources at school crossings where pedestrian use is higher.<sup>10</sup>

Since this study is evaluating the warrant for school crossing locations, “pedestrians” is in reference to elementary school age pedestrians from kindergarten to Grade 5, in accordance with the OTC School Crossing Guard Guide. In Ontario, these students are generally between the ages of 4 and 10. The study team recognizes that it is not reasonable to survey the age of every pedestrian using a given intersection in order to perform an exact count of pedestrians within the kindergarten to Grade 5 bracket. To account for the subjectivity of estimating pedestrian ages, the study team considered any pedestrian appearing to be under the age of 15 to qualify as elementary school age for the purposes of this study. As a result of this approach, the pedestrian volume totals may skew higher than the actual pedestrian volume totals.

The OTC School Crossing Guard Guide establishes a threshold of 40 pedestrians during the school peak periods, and notes that a lower value may be used at the discretion of each municipality. For the purposes of this analysis, a threshold of 40 pedestrians as per the recommendation of the OTC Guide was used for this study.

Table 1 includes the total number of pedestrians for each intersection location evaluated, as a sum of all pedestrian volumes at an intersection. All legs in which a pedestrian was observed crossing during the relevant peak period was evaluated by HCEI using either the Exposure Index or Gap Study methods. Since school crossing guards are able to provide treatment to any leg of the intersection while being stationed during the peak period, HCEI elected to evaluate the total number of pedestrians at each location to determine warrants based on pedestrian volumes, rather than considering the pedestrian volumes at each intersection leg, which were considerably lower. This provides a broader threshold for determining eligibility for crossing guard locations.

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<sup>10</sup> Ontario Traffic Council School Crossing Guard Guide, May 2017, pg. 40

**Table 1: Total Number of Pedestrians**

Location	AM	PM
Richmond Street & Victoria Street South	20	33
Richmond Street & Fryer Street	33	58
Simcoe Street & Fryer Street	11	10
Fryer Street & Pickering Drive	12	28
Sandwich Street South & Richmond Street	0	10
Simcoe Street & Victoria Street	9	10
Victoria Street & Hamilton Drive	32	42
Richmond Street Path, near 252 Richmond Street	38	49
Alma Street & Victoria Street	8	9

## 4.0 Evaluation of Crossings

The following is an evaluation of the existing and potential crossings within the Town using the warrant process. Any leg of the intersection that was used by pedestrians to cross was observed.

### 4.1 Richmond Street & Victoria Street South

**Control Type:** All Way Stop  
**Applicable Study Type:** Exposure Index  
**Critical Leg Identified:** East Leg (Richmond Street)  
**Crossing Guard Present:** No

Richmond Street is an urban two-lane road that runs generally east-west with a posted speed limit of 50 km/h. Sidewalks are present on both sides of the road to the west of Victoria Street South and only on the north side of the road to the east of Victoria Street South. Victoria Street South is an urban two-lane road that runs generally north-south with a posted speed limit of 50 km/h. Sidewalks are present on both sides of the road to the south of Richmond Street and only on the east side of the road to the north of Richmond Street.

**Table 2: Exposure Index Summary, East Leg (Richmond Street)**

Peak Period	85 <sup>th</sup> Percentile Threshold Warrant	Number of Pedestrians Observed	Warrant based on Pedestrians
Morning (8:15 – 9:15 a.m.)	No	20	No
Afternoon (3:00 – 4:00 p.m.)	No	33	No

## 4.2 Richmond Street & Fryer Street

**Control Type:** All Way Stop  
**Applicable Study Type:** Exposure Index  
**Critical Leg Identified:** North Leg (Fryer Street)  
**Crossing Guard Present:** Yes

Richmond Street is an urban two-lane road that runs generally east-west with a posted speed limit of 50 km/h. A sidewalk is present on the north side of the road. Fryer Street is an urban two-lane road that runs generally north-south with a posted speed limit of 40 km/h. Sidewalks are present on both sides of the road.

**Table 3: Exposure Index Summary, North Leg (Fryer Street)**

Peak Period	85 <sup>th</sup> Percentile Threshold Warrant	Number of Pedestrians Observed	Warrant based on Pedestrians
Morning (8:15 – 9:15 a.m.)	Yes	33	No
Afternoon (3:00 – 4:00 p.m.)	Yes	58	Yes

## 4.3 Simcoe Street & Fryer Street

**Control Type:** Traffic Signal  
**Applicable Study Type:** Exposure Index  
**Critical Leg Identified:** East Leg (Simcoe Street)  
**Crossing Guard Present:** No

Simcoe Street is an urban two-lane road that runs generally east-west with a posted speed limit of 50 km/h. No sidewalks are present. There are paved multi-use trails on both sides of the road. Fryer Street is an urban two-lane road that runs generally north-south with a posted speed limit of 50 km/h. Sidewalks are present on both sides of the road.

**Table 4: Exposure Index Summary, East Leg (Simcoe Street)**

Peak Period	85 <sup>th</sup> Percentile Threshold Warrant	Number of Pedestrians Observed	Warrant based on Pedestrians
Morning (8:15 – 9:15 a.m.)	Yes	11	No
Afternoon (3:00 – 4:00 p.m.)	Yes	10	No

#### 4.4 Fryer Street & Pickering Drive

**Control Type:** All Way Stop  
**Applicable Study Type:** Exposure Index  
**Critical Leg Identified:** North Leg (Fryer Street)  
**Crossing Guard Present:** No

Fryer Street is an urban two-lane road that runs generally north-south with a posted speed limit of 40 km/h. Sidewalks are present on both sides of the road to the north of Pickering Drive and only on the west side of the road to the south of Pickering Drive. Pickering Drive is an urban two-lane road that runs generally east-west with a posted speed limit of 50 km/h. A sidewalk is present on the north side of the road.

**Table 5: Exposure Index Summary, North Leg (Fryer Street)**

Peak Period	85 <sup>th</sup> Percentile Threshold Warrant	Number of Pedestrians Observed	Warrant based on Pedestrians
Morning (8:15 – 9:15 a.m.)	Yes	12	No
Afternoon (3:00 – 4:00 p.m.)	Yes	28	No

#### 4.5 Sandwich Street South & Richmond Street

**Control Type:** Traffic Signal  
**Applicable Study Type:** Exposure Index  
**Critical Leg Identified:** North Leg (Sandwich Street South)  
**Crossing Guard Present:** No

Sandwich Street South is an urban three-lane road that runs generally north-south with a posted speed limit of 50 km/h. There consists one-left and one-right turning lane at this intersection. Sidewalks are present on both sides of the road. Richmond Street is an urban two-lane road that runs generally east-west with a posted speed limit of 50 km/h. There consists one-left and one-right turning lane at the west leg of this intersection. Sidewalks are present on both sides of the road.

**Table 6: Exposure Index Summary, North Leg (Sandwich Street South)**

Peak Period	85 <sup>th</sup> Percentile Threshold Warrant	Number of Pedestrians Observed	Warrant based on Pedestrians
Morning (8:15 – 9:15 a.m.)	Yes	0	No
Afternoon (3:00 – 4:00 p.m.)	Yes	10	No

## 4.6 Victoria Street & Hamilton Drive

<b>Control Type:</b>	Minor Stop Control on Hamilton Drive
<b>Safe Gap Time:</b>	15.5s
<b>Applicable Study Type:</b>	Gap Study & Exposure Index
<b>Critical Leg Identified:</b>	South Leg (Victoria Street) (Exposure Index Method) South Leg (Victoria Street) (Gap Analysis Method)
<b>Crossing Guard Present:</b>	Yes

Victoria Street is an urban two-lane road that runs generally north-south with a posted speed limit of 50 km/h. A sidewalk is present on the east side of the road. Hamilton Drive is an urban two-lane road that runs generally east-west with a posted speed limit of 50 km/h and is controlled by a stop sign. A sidewalk is present on the south side of the road.

As per the OTC School Crossing Guard Guide for minor street stop-controlled intersections, pedestrians crossing the minor stop-controlled street (i.e., parallel to the major through street) should be evaluated using the Exposure Index method. Pedestrians crossing the major through street rely on gaps in the free-flow traffic, and also are exposed to conflicting movements. As a result, crossings at the uncontrolled legs of the intersection can be evaluated using either the Gap Study method or Exposure Index method. Since the south leg of Victoria Street at this crossing location is a through leg that are not controlled by traffic control devices, it is reasonable to evaluate the intersection using both warrants, as illustrated below.

**Table 7: Exposure Index Summary, South Leg (Victoria Street)**

Peak Period	85 <sup>th</sup> Percentile Threshold Warrant	Number of Pedestrians Observed	Warrant based on Pedestrians
Morning (8:15 – 9:15 a.m.)	Yes	32	No
Afternoon (3:00 – 4:00 p.m.)	Yes	42	Yes

**Table 8: Gap Analysis Summary, South Leg (Victoria Street)**

Peak Period	% of Intervals Not Meeting Gap Threshold	Warrant based on Gaps	Number of Pedestrians Observed	Warrant based on Pedestrians
Morning (8:15 – 9:15 a.m.)	17%	Likely	32	No
Afternoon (3:00 – 4:00 p.m.)	17%	Likely	42	Yes

Note: During the observed study periods, a crossing guard was present and active at this location, which affected the measurement proportion of gap intervals less than the safe gap time. As shown in the above table, both the morning and afternoon peak periods were measured at 17% due to the presence of the crossing guard, and the afternoon period met the minimum threshold for pedestrian volumes. Therefore, it is likely that the afternoon period would meet both the exposure warrant and the minimum pedestrian volumes in the absence of a posted crossing guard.

## 4.7 Simcoe Street & Victoria Street

**Control Type:** Minor Stop Control on Victoria Street  
 Pedestrian Crossover Level 2 Type C at west leg of Simcoe Street

**Applicable Study Type:** Exposure Index

**Critical Leg Identified:** West Leg (Simcoe Street)

**Crossing Guard Present:** No

Simcoe Street is an urban two-lane road that runs generally east-west with a posted speed limit of 50 km/h. A sidewalk is present on the north side of the road. The pedestrian crossing on Simcoe Street on the west side of the intersection is signalized with flashing lights and auditory indicators for pedestrians. Victoria Street is an urban two-lane road that runs generally north-south with a posted speed limit of 50 km/h. A sidewalk is present on the west side of the road.

**Table 9: Exposure Index Summary, West Leg (Simcoe Street)**

Peak Period	85 <sup>th</sup> Percentile Threshold Warrant	Number of Pedestrians Observed	Warrant based on Pedestrians
Morning (8:15 – 9:15 a.m.)	Yes	9	No
Afternoon (3:00 – 4:00 p.m.)	Yes	10	No

## 4.8 Richmond Street Path, near 252 Richmond Street

**Control Type:** Uncontrolled

**Safe Gap Time:** 14s

**Applicable Study Type:** Gap Study

**Crossing Guard Present:** Yes

Richmond Street is an urban two-lane road that runs generally east-west with a posted speed limit of 50 km/h. Sidewalks are present on both sides of the road.

**Table 10: Gap Analysis Summary, Richmond Street Path**

Peak Period	% of Intervals Not Meeting Gap Threshold	Warrant based on Gaps	Number of Pedestrians Observed	Warrant based on Pedestrians
Morning (8:15 – 9:15 a.m.)	0%	Likely	38	No
Afternoon (3:00 – 4:00 p.m.)	0%	Likely	49	Yes

Note: During the observed study periods, a crossing guard was present and active at this location, which affected the measurement of gap intervals less than the safe gap time. As shown in Table 10, both the morning and afternoon peak periods were measured at 0% due to the presence of the crossing guard, and both periods met the minimum threshold for pedestrian volumes. Therefore, it is likely that the morning and afternoon period would meet both the exposure warrant and the minimum pedestrian volumes in the absence of a posted crossing guard.



## 4.9 Alma Street & Victoria Street (Potential Crossing)

<b>Control Type:</b>	Minor Stop Control on Victoria Street
<b>Safe Gap Time:</b>	15.5s
<b>Applicable Study Type:</b>	Gap Study & Exposure Index (Alma Street) Exposure Index (Victoria Street)
<b>Critical Leg Identified:</b>	South Leg (Victoria Street) (Exposure Index Method) East Leg (Alma Street) (Gap Analysis Method)
<b>Crossing Guard Present:</b>	No

Alma Street is an urban two-lane road that runs generally east-west with a posted speed limit of 50 km/h. Sidewalks are present on both sides of the road. Victoria Street is an urban two-lane road that runs generally north-south with a posted speed limit of 50 km/h. A sidewalk is present on the east side of the road. Victoria Street is controlled by stop signs.

As per the OTC School Crossing Guard Guide for minor street stop-controlled intersections, pedestrians crossing the minor stop-controlled street (i.e., parallel to the major through street) should be evaluated using the Exposure Index method. Pedestrians crossing the major through street rely on gaps in the free-flow traffic, and also are exposed to conflicting movements. As a result, crossings at the uncontrolled legs of the intersection can be evaluated using either the Gap Study method or Exposure Index method. Since the east & west legs of Alma Street at this crossing location are through legs that are not controlled by traffic control devices, it is reasonable to evaluate the intersection using both warrants, as illustrated below.

**Table 11: Exposure Index Summary, South Leg (Victoria Street)**

Peak Period	85 <sup>th</sup> Percentile Threshold Warrant	Number of Pedestrians Observed	Warrant based on Pedestrians
Morning (8:15 – 9:15 a.m.)	Yes	8	No
Afternoon (3:00 – 4:00 p.m.)	Yes	9	No

**Table 12: Gap Analysis Summary, East Leg (Alma Street)**

Peak Period	% of Intervals Not Meeting Gap Threshold	Warrant based on Gaps	Number of Pedestrians Observed	Warrant based on Pedestrians
Morning (8:15 – 9:15 a.m.)	58%	Yes	8	No
Afternoon (3:00 – 4:00 p.m.)	92%	Yes	9	No

## 4.10 Summary of Warrant Study for Crossings

Table 13 summarizes the warrant determined by HCEI in accordance with the requirements of the Town and the OTC School Crossing Guard Guide for crossing guards at each intersection studied and for each peak period. It is recommended that if the warrant or minimum requirements are met for a given period (i.e. based on pedestrian volume or gaps), then a crossing guard be stationed at that location for that period.

**Table 13: Summary of Crossing Guard Warrants**

Intersection and Period	Pedestrian Volumes Satisfied	85 <sup>th</sup> Percentile Warrant Satisfied	Gap Warrant Satisfied	Recommendation for Treatment
<b>Richmond Street &amp; Victoria Street</b>				
AM	No	No	Not applicable	No treatment
PM	No	No	Not applicable	No treatment
<b>Richmond Street &amp; Fryer Street</b>				
AM	No	Yes	Not applicable	No treatment
PM	Yes	Yes	Not applicable	Crossing guard
<b>Simcoe Street &amp; Fryer Street</b>				
AM	No	Yes	Not applicable	No treatment
PM	No	Yes	Not applicable	No treatment
<b>Fryer Street &amp; Pickering Drive</b>				
AM	No	Yes	Not applicable	No treatment
PM	No	Yes	Not applicable	No treatment
<b>Sandwich Street South &amp; Richmond Street</b>				
AM	No	Yes	Not applicable	No treatment
PM	No	Yes	Not applicable	No treatment
<b>Victoria Street South &amp; Hamilton Drive</b>				
AM	No	Yes	Likely	No treatment
PM	Yes	Yes	Likely	Crossing guard
<b>Simcoe Street &amp; Victoria Street</b>				
AM	No	Yes	Not applicable	No treatment
PM	No	Yes	Not applicable	No treatment
<b>Richmond Street Path, near 252 Richmond Street</b>				
AM	No	Not applicable	Likely	No treatment
PM	Yes	Not applicable	Likely	Crossing guard
<b>Alma Street &amp; Victoria Street*</b>				
AM	No	Yes	Yes	No treatment
PM	No	Yes	Yes	No treatment

\*Denotes potential crossing location

The OTC School Crossing Guard Guide provides alternative solutions to a crossing guard for locations where they are not warranted. Some of these solutions include:

- For signalized intersections, review walk and flashing don't walk times to ensure there is enough time for pedestrians to cross the intersection safely.
- Install traffic calming devices such as curb extensions, medians, and refuge islands.
- For all-way stop-controlled and minor street stop-controlled intersections, conduct signal warrants (OTM Book 12) and all-way stop control warrants (OTM Book 5) to determine the best type of control for the intersection.<sup>11</sup>

## 5.0 Future Crossings

### 5.1 Evaluation Process for Future Crossings

Outlined below are the steps that should be followed to evaluate future crossings using the warrants and/or methods developed as part of this study. These processes are derived from the OTC School Crossing Guard Guide.

#### Step 1. Schedule Site Visits

Create a site visit schedule which complies with what the OTC School Crossing Guard Guide defines as a typical school day. According to the Guide, the following atypical days should be avoided:

- First and last week of school;
- Christmas break;
- Spring break;
- Statutory, public and "elective" holidays such as Remembrance Day;
- Days that precede or follow a holiday break;
- Days that precede or follow a weekend (i.e., Monday and Friday)
- Professional Activity (PA) days;
- Days that precede or follow a PA day;
- Days with special events at the school such as a concert or track and field; and
- Days with inclement weather.<sup>12</sup>

In addition, obtain the peak periods for each intersection. All peak periods should be visited on the same day to ensure consistency.

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<sup>11</sup> Ontario Traffic Council School Crossing Guard Guide, May 2017, pg. 14

<sup>12</sup> Ontario Traffic Council School Crossing Guard Guide, May 2017, pg. 17

## Step 2. Prepare Materials

Prepare physical copies of the appropriate warrant template(s), which can be found in Appendix A. Recall that the Exposure Index is used for controlled and uncontrolled intersection legs, and the Gap Study for uncontrolled legs. It is recommended to bring extra copies of each template as more than one leg of the intersection may have crossing pedestrians.

Other recommended materials/equipment to bring onsite include:

- Video camera
- Charging cord for camera
- Pens/Pencils
- Clipboard
- Measuring tape/Measuring wheel
- Folding chair
- Watch/Cell phone
- Compass

## Step 3. Attend The Study Site and Set Up for Study

Arrive onsite approximately 10-15 minutes before the start of the peak period. Complete the first page of the template, and fill out the 5-minute time intervals and conflicting movements on the second page. Set up the video camera so there is a clear visibility of all intersection legs.

## Step 4. Perform the Study

At the start of the peak period, start recording on the video camera and begin documenting the number of pedestrians crossing and number of each type of conflicting vehicle movements for the intersection leg of interest. Keep track of the time and ensure documentation in the correct row according to the time interval. Continue in this manner for the duration of the period.

It is recommended to only focus on one leg of the intersection at a time when in the field. If it was found that pedestrians crossed at more than one leg of the intersection, document this additional information using the video footage at a later time. In addition, it is recommended that the gaps are measured and counted post-recording when using the Gap Study Method to maximize accuracy. Field work is limited to recording pedestrian and vehicular volumes.

## Step 5. Perform Data Analysis and Warrant Application

*Exposure Index Warrant (for controlled and uncontrolled legs):*

1. Input the data from the critical intersection leg into the digital copy of the Exposure Index which was provided with this report. The method to determine the critical leg of the intersection is outlined in Section 3.0.
2. If the data point is above the 85<sup>th</sup> percentile curve, then the Exposure Index warrant is met.

3. Conversely, if the resulting point is below the 85<sup>th</sup> percentile curve, then the Exposure Index warrant is not met.
4. In either case, other factors such as minimum student crossing volumes, collision hazard reporting frequency, visibility, number of gaps available at urban locations, and proximity to a school are considered when ultimately recommending a location for a crossing guard.

*Gap Study Warrant (For uncontrolled legs):*

1. Determine the safe gap time, which is explained further in Section 2.0.
2. Record gaps less than the safe gap time with a tally mark (I).
3. Record gaps equal to or greater than the safe gap time and include the length of time of the gap, in seconds.
4. Sum the number of gaps greater than the safe gap time next to each interval row. Be sure to express gaps in increments, if required. For example, if a gap was recorded to be three times larger than the safe gap, this is noted as three gaps that are equal to or larger than the safe gap time.
5. If more than 50 percent of the 5-minute intervals had less than four safe gaps, the gap study threshold is met.
6. Conversely, if less than 50 percent of the 5-minute intervals had less than four safe gaps, the gap study threshold is met.
7. In either case, other factors such as minimum student crossing volumes, collision hazard reporting frequency, visibility, and proximity to a school are considered when ultimately recommending a location for a crossing guard.

## **6.0 Safety Analysis**

### **6.1 Observed Conditions**

Some rolling stops were observed at intersection legs with stop signs. Busier intersections with more vehicular traffic experienced fewer rolling stops. From the observed number of rolling stops, HCEI does not believe there to be sufficient evidence to initiate a stop compliance study at crossing locations to determine if additional enforcement is required.

All existing crossing locations have the recommended No Stopping/Parking Signs and School Crossing Signs in advance of the crossing.

All existing locations also have the appropriate pavement markings to clearly indicate the school crossings.

## 6.2 Crossing Treatment Recommendations for Future Crossing Locations

When designing a new school crossing, the following should be taken into consideration:

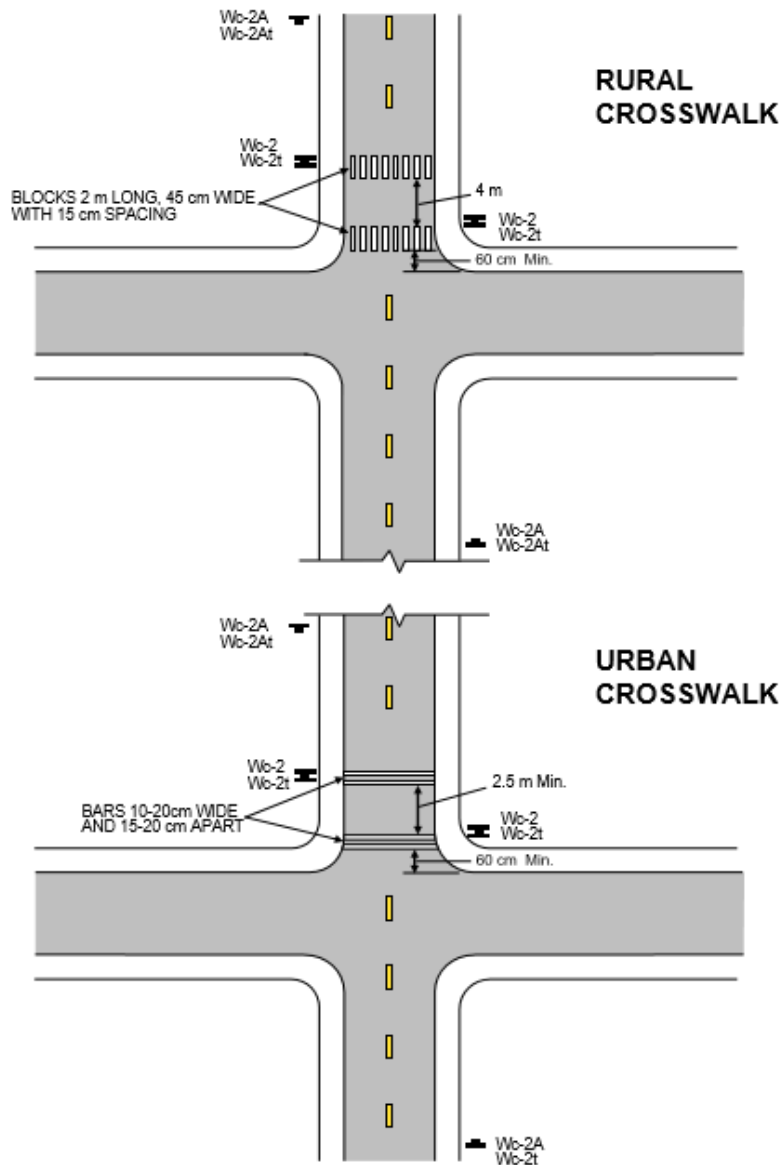
- Conduct a signal warrant (OTM Book 12) and pedestrian crossover warrant (OTM Book 15) to evaluate the adequate control type prior to installing the school crossing. Table 14 summarizes the required, desirable, and optional components of a designated supervised school crossing.
- No Stopping/Parking and School Crossing signage should be installed within the vicinity of the crossing. The appropriate School Crossing signage to install at various intersection types can be found in Section 7 of OTM Book 6 and are included in Table 14.

**Table 14: Components of School Crossing, OTM Book 15**

Required Components	Desirable Components	Optional Components
<ul style="list-style-type: none"> <li>• Crossing Guard</li> <li>• School Crosswalk Markings for supervised crossing according to OTM Book 11 (different requirements for urban and rural locations)</li> <li>• School Crossing Sign (Wc-2, Wc-102)</li> <li>• School Crossing Tab Sign (Wc-2t, Wc-102t)</li> <li>• School Crossing Ahead Sign (Wc-2A, Wc-102A)</li> <li>• Crossing Ahead Tab sign (Wc-2At, Wc-102At)</li> <li>• Parking and other sight obstructions prohibition within at least 30 m of crossings</li> <li>• Stopping prohibition for a minimum of 15 m on each approach to the crossing, and 10 m following the crossing</li> </ul>	<ul style="list-style-type: none"> <li>• Refuge Islands and Centre Medians with mandatory:                             <ul style="list-style-type: none"> <li>• Pavement markings on approaches to obstructions</li> <li>• Keep Right Sign (Rb-25, Rb-125)</li> <li>• Object Marker Sign (Wa-33L)</li> </ul> </li> <li>• School Zone Maximum Speed Sign (Rb-6)</li> <li>• School Zone Maximum Speed When Flashing Sign (Rb-6A)</li> <li>• Stopping prohibition for a minimum of 30 m on each approach to the crossing, and 15 m following the crossing</li> </ul>	<ul style="list-style-type: none"> <li>• Raised Crosswalk</li> <li>• Textured Crosswalk</li> <li>• Advance Stop Bar</li> <li>• Safety elements including Barricades, Pedestrian Fencing, Gates, Walls, Bollards, and Barriers</li> </ul>

- As per to OTM Book 11, “crosswalk markings for supervised school crosswalks or signalized intersections must conform to Figure 2. School crosswalks may be supplemented with signs and/or pavement markings warning of a school crossing ahead. Pavement markings stating “SCHOOL” or “SCHOOL XING” may be provided on both approaches to the school crossing. If used, advance warning text should be elongated to be legible at a distance. Text characters should be no less than 1.2 m long on roads with speeds under 50 km/h, and no less than 1.8 m long on other urban roads. Text legends consisting of more than one line must be arranged so that the first line is nearest to the road user approaching the crossing. Text markings must be centred laterally in the approach lane(s).”<sup>13</sup>

<sup>13</sup> OTM Book 11, Pavement, Hazard and Delineation Markings, March 2000, pg. 97



**Figure 2 - School Crosswalks for Supervised Crossing, OTM Book 11**

## 7.0 Summary

With the existing traffic and pedestrian volumes and using the established warrants and thresholds, many crossings throughout the Town of Amherstburg do not require crossing guards at locations where they are currently stationed. Crossing guard location warrants were developed based on the Exposure Index Method, Gap Study Method, and pedestrian volumes, for which a threshold of 40 pedestrians was used.

Of the existing crossing locations observed and based on pedestrian volumes and the developed warrants, 0% of the locations are recommended for a crossing guard during the morning peak period, and 33% during the afternoon peak period.

Locations where crossing guards are recommended, based on the warrant process, are as follows:

- Richmond Street & Fryer Street (PM)
- Victoria Street & Hamilton Drive (PM)
- Richmond Path, near 252 Richmond (PM)

In a comparison of the recommendations put forth in the original Crossing Guard Feasibility Study, we note the following changes:

- Richmond Street & Fryer Street recommendations remain the same, as this location met study thresholds for the afternoon period in both 2019 and 2024.
- Victoria Street & Hamilton Drive did not meet the study thresholds in 2019, and was added as a recommended crossing for the afternoon period based on 2024 data.
- Richmond Path, near 252 Richmond Street recommendations remain the same, as this location met study thresholds for the afternoon period in both 2019 and 2024.

Alternative solutions such as reviewing walk and flashing don't walk times, installing traffic calming devices, and conducting signal warrants and all-way stop control warrants should be considered where crossing guards are not recommended based on the parameters set forth in this study.

While conducting pedestrian and vehicle volume counts, the study team evaluated each location and confirmed compliance with signage and pavement markings requirements.

In terms of roadway safety, some rolling stops were observed at intersection legs with stop signs. Busier intersections with more vehicular traffic experienced fewer rolling stops. From the observed number of rolling stops, HCEI does not believe there to be sufficient justification to initiate a stop compliance study at crossing locations to determine if additional enforcement is required.

Analysis has shown that often, school crossing controls requested by the public are costly, unnecessary, and are liable to decrease the respect for actual warranted controls. This in turn tends to reduce the effectiveness of necessary controls. Providing crossing guards at warranted locations can ensure cost savings, effectiveness, and overall safety for pedestrians involved.

Respectfully submitted,



Justine Arbour, B.A.Sc., M.E.M., P.Eng.  
HRYCAY Consulting Engineers Inc.



## **8.0 References**

“School Crossing Guard Guide”, Ontario Traffic Council, May 2017

“Regulatory Signs”, Book 5, Ontario Traffic Manual, December 2021

“Warning Signs”, Book 6, Ontario Traffic Manual, Queen’s Printer for Ontario, July 2001

“Pavement, Hazard and Delineation Markings”, Book 11, Ontario Traffic Manual, March 2000

“Traffic Signals”, Book 12, Ontario Traffic Manual, Queen’s Printer for Ontario, March 2012

“Pedestrian Crossing Treatments”, Book 15, Ontario Traffic Manual, Queen’s Printer for Ontario, June 2016

“Highway Traffic Act”, Section 176, December 2019, c. H.8

**Appendix A**  
**Exposure Index Method and Gap Study**  
**Method Templates**

Inspection Information			
Inspection Date:		Inspector:	
Inspection Start:		Inspection End:	
Weather:			
Site Information			
Type of Crossing:	<input type="checkbox"/> 4-way intersection <input type="checkbox"/> 3-way intersection <input type="checkbox"/> Midblock (i.e. not an intersection)		
Major Road:	Name	Minor Road:	Name
Travel Direction:		Travel Direction:	
Posted Speed Limit:		Posted Speed Limit:	
Avg. Road Width:		Avg. Road Width:	
Lane Configuration:	___ # of Left Turn Lanes ___ # of Through Lanes ___ # of Right Turn Lanes	Lane Configuration:	___ # of Left Turn Lanes ___ # of Through Lanes ___ # of Right Turn Lanes
Bike Lanes:	<input type="checkbox"/> Not Present <input type="checkbox"/> One Side: _____ <input type="checkbox"/> Both Sides	Bike Lanes:	<input type="checkbox"/> Not Present <input type="checkbox"/> One Side: _____ <input type="checkbox"/> Both Sides
Road Grade:	<input type="checkbox"/> Flat <input type="checkbox"/> Incline <input type="checkbox"/> Decline	Road Grade:	<input type="checkbox"/> Flat <input type="checkbox"/> Incline <input type="checkbox"/> Decline
Road Geometrics:	<input type="checkbox"/> Straight <input type="checkbox"/> Curved	Road Geometrics:	<input type="checkbox"/> Straight <input type="checkbox"/> Curved
Control Type:	<input type="checkbox"/> No Control <input type="checkbox"/> Stop <input type="checkbox"/> Yield <input type="checkbox"/> Traffic Signal <input type="checkbox"/> Pedestrian Signal	Control Type:	<input type="checkbox"/> No Control <input type="checkbox"/> Stop <input type="checkbox"/> Yield <input type="checkbox"/> Traffic Signal <input type="checkbox"/> Pedestrian Signal
Sidewalks:	<input type="checkbox"/> Not Present <input type="checkbox"/> One Side: _____ <input type="checkbox"/> Both Sides	Sidewalks:	<input type="checkbox"/> Not Present <input type="checkbox"/> One Side: _____ <input type="checkbox"/> Both Sides
Site Conditions			
School Signs	<input type="checkbox"/> School Area Signs	<input type="checkbox"/> School Crossing Signs	<input type="checkbox"/> Parking/Stopping Prohibition
Visibility of Crossing Pedestrians:	<input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor   Comments: _____		
Sight Obstructions:	<input type="checkbox"/> Hedges <input type="checkbox"/> Newspaper Boxes	<input type="checkbox"/> Trees <input type="checkbox"/> Bus Shelter	<input type="checkbox"/> Fences <input type="checkbox"/> Other (specify): _____

**Site Sketch:**

(indicate north, major/minor street, crossing location, crosswalks, intersection controls, location of school relative to the intersection)

	<b>Conflicting Vehicle Movements:</b>
	<input type="checkbox"/> NB Left <input type="checkbox"/> EB Left <input type="checkbox"/> NB Through <input type="checkbox"/> EB Through <input type="checkbox"/> NB Right <input type="checkbox"/> EB Right  <input type="checkbox"/> SB Left <input type="checkbox"/> WB Left <input type="checkbox"/> SB Through <input type="checkbox"/> WB Through <input type="checkbox"/> SB Right <input type="checkbox"/> WB Right



Inspection Information			
Inspection Date:		Inspector:	
Inspection Start:		Inspection End:	
Weather:			
Site Information			
Type of Crossing:	<input type="checkbox"/> 4-way intersection <input type="checkbox"/> 3-way intersection <input type="checkbox"/> Midblock (i.e. not an intersection)		
Major Road:	Name	Minor Road:	Name
Travel Direction:		Travel Direction:	
Posted Speed Limit:		Posted Speed Limit:	
Avg. Road Width:		Avg. Road Width:	
Lane Configuration:	___ # of Left Turn Lanes ___ # of Through Lanes ___ # of Right Turn Lanes	Lane Configuration:	___ # of Left Turn Lanes ___ # of Through Lanes ___ # of Right Turn Lanes
Bike Lanes:	<input type="checkbox"/> Not Present <input type="checkbox"/> One Side: _____ <input type="checkbox"/> Both Sides	Bike Lanes:	<input type="checkbox"/> Not Present <input type="checkbox"/> One Side: _____ <input type="checkbox"/> Both Sides
Road Grade:	<input type="checkbox"/> Flat <input type="checkbox"/> Incline <input type="checkbox"/> Decline	Road Grade:	<input type="checkbox"/> Flat <input type="checkbox"/> Incline <input type="checkbox"/> Decline
Road Geometrics:	<input type="checkbox"/> Straight <input type="checkbox"/> Curved	Road Geometrics:	<input type="checkbox"/> Straight <input type="checkbox"/> Curved
Control Type:	<input type="checkbox"/> No Control <input type="checkbox"/> Stop <input type="checkbox"/> Yield <input type="checkbox"/> Traffic Signal <input type="checkbox"/> Pedestrian Signal	Control Type:	<input type="checkbox"/> No Control <input type="checkbox"/> Stop <input type="checkbox"/> Yield <input type="checkbox"/> Traffic Signal <input type="checkbox"/> Pedestrian Signal
Sidewalks:	<input type="checkbox"/> Not Present <input type="checkbox"/> One Side: _____ <input type="checkbox"/> Both Sides	Sidewalks:	<input type="checkbox"/> Not Present <input type="checkbox"/> One Side: _____ <input type="checkbox"/> Both Sides
Site Conditions			
School Signs	<input type="checkbox"/> School Area Signs	<input type="checkbox"/> School Crossing Signs	<input type="checkbox"/> Parking/Stopping Prohibition
Visibility of Crossing Pedestrians:	<input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor   Comments: _____		
Sight Obstructions:	<input type="checkbox"/> Hedges <input type="checkbox"/> Newspaper Boxes	<input type="checkbox"/> Trees <input type="checkbox"/> Bus Shelter	<input type="checkbox"/> Fences <input type="checkbox"/> Other (specify): _____

**Site Sketch:**

(indicate north, major/minor street, crossing location, crosswalks, intersection controls, location of school relative to the intersection)

	<b>Conflicting Vehicle Movements:</b>
	<input type="checkbox"/> NB Left <input type="checkbox"/> EB Left <input type="checkbox"/> NB Through <input type="checkbox"/> EB Through <input type="checkbox"/> NB Right <input type="checkbox"/> EB Right  <input type="checkbox"/> SB Left <input type="checkbox"/> WB Left <input type="checkbox"/> SB Through <input type="checkbox"/> WB Through <input type="checkbox"/> SB Right <input type="checkbox"/> WB Right



**Appendix B**  
**Town of Amherstburg Exposure Index**







