



***The Corporation of the City of Sarnia***

***School Crossing Guard Warrant Policy***

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School Crossing Guard Warrant Policy

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## **Overview And Description**

### **Role of the School Crossing Guard**

The role of the adult school crossing guard is to direct and supervise the movement of persons (as defined in Section 176 of the Highway Traffic Act) across a highway by creating necessary gaps in vehicular traffic to provide safe passage at a designated school crossing location.

### **Definition of a Designated School Crossing**

A school crossing is a point on a highway supervised by a school crossing guard, either at an intersection or mid-point location that has been designated through a warrant process. These designated school crossings shall be identified by pavement markings and signage, as set out under the provisions of the Ontario Traffic Manual, Book 6 & Book 11.

### **Site Inspection Authority**

The Engineering Department shall be responsible for conducting site inspections and gap studies at each location where a school crossing guard is designated or proposed and shall make recommendations to City council through council reports.

### **Terms of Reference**

In order to ensure that school crossings are implemented in a uniform and consistent manner, the following terms of reference will apply to all site inspections and gap studies the 'Site Inspection Authority' is required to conduct:

- Target school population –in road science it is generally accepted that by the age of twelve, students have the ability to make good judgement in traffic situations. As a criterion for school crossing guard implementation, the target school population shall be Kindergarten to Grade 6. However local knowledge and experience should be applied to the warrant process to include Grade 7 and 8 students where applicable.
- Minimum number of students using the crossing –Establishing a minimum number of students allows the City to focus resources at

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school crossings where student utilization is higher. As a criterion for school crossing guard implementation, the number of students shall be 5 to initiate a gap study.

- Minimum number of safe gaps –Less than four gaps in a five minute period for fifty percent or more of the five minute period being studied.
- Approval process – once the information is gathered, the 'Site Inspection Authority' shall make recommendations for approval in a form of a staff report to City Council.
- Inspection frequency –a minimum of one (1) site inspection shall be carried out at the existing crossing locations during the year, unless the 'Site Inspection Authority' determines that the circumstances have changed and another inspection is warranted. If circumstances change and a site inspection is necessary to determine whether a school crossing guard continues to be warranted at a crossing location, that site inspection will be conducted.
- Site inspection report and crossing guard warrant survey –standard report forms have been developed to be used at all site inspections and gap studies. See Appendix B and C
- Routing of site inspection requests –a site inspection, including gap studies, shall be made when notice from the school board or staff is received regarding a new school opening, school closing, changes in school boundaries, or changes in school lunch/nutrient breaks. An inspection request in writing from the school board or concerned citizen will initiate a site inspection and the findings will be reported to council for recommendation and acceptance.

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### Site inspection Report

The purpose of the site inspection is to study and analyze apparent hazards at an existing or potential school crossing location. The site inspection report is used to record information about site conditions that will then form the basis for recommendations regarding changes to the site if necessary. The site inspection report sheet should contain information about the site conditions such as:

- Time of day
- Weather
- The presence of traffic control devices
- Posted speed limit
- Parking patterns. May require parking enforcement or the addition of regulatory signs to improve sightlines
- Visibility of crossing pedestrians
- Sight obstructions (hedges, fences, trees) that may need to be reduced, removed or relocated
- Road grade (flat, curve)
- Road width (used in calculation of safe gap time)
- Road conditions (dry, wet, snow covered, ice)
- Presence of sidewalk (N,S,E,W)
- Proximity to school
- Collision history
- Route survey (shortcuts, shopping areas, transit bus route, construction, parked vehicles)
- Comments. May include observations on number of school buses, transit buses, trucks, school student population, stopping compliance, red light running, speeding or natural crossing pattern of students, any of which might impact recommendations)

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## **Unsignalized Intersection Or Mid Block Crossing**

### **GAP Study Report**

The Gap Study report is the objective measurement used to determining if the warrants are met for the implementation of a school crossing guard. The gap study relies on engineering principals and observations skills as a basis for data recording. The report contains the following information:

- The number of safe gaps in traffic recorded in five minute intervals. The safe gap is calculated by measuring the width of the road in metres, divided by the average walking speed of a junior school student (1.1 metres per second), plus the time it takes the student to start to cross the road (four seconds). (Appendix A contains a detailed explanation for the method for calculating the safe gap times as well as for a table of pre-calculated safe gap times).
- The Volume of Traffic. The number of vehicles passing the crossing point in five minute intervals.
- Pedestrian/Vehicle conflicts observed. Record as a conflict if either a pedestrian or a vehicle has to take evasive action to avoid direct contact. For example, a pedestrian might have to stop or quicken their pace in the crosswalk to avoid being hit by a vehicle or a driver might have to stop suddenly or swerve to avoid contact with a pedestrian. Recording of such conflicts should be limited to student/vehicle conflicts.
- Recommendations. Record a recommendation that the warrant has or has not been satisfied for the implementation of a school crossing guard. This may also include recommendations such as: request for parking enforcement and /or Police enforcement, installation of traffic control devices or recommendation for student education based on observations as recorded on the site inspection report.

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### Meeting the Warrant for a School Crossing Guard

A school crossing guard warrant is met if:

- There are less than 4 safe gaps in traffic in fifty percent of the five minute timed intervals on a road having a posted speed limit of not more than 60 Km/h, and
- The number of students crossing meets or exceeds 5,

OR

- The designated crossing point is close to meeting the warrant based on less than 4 safe gaps in traffic in fifty per cent of the five minute timed intervals on a road having a posted speed limit of not more than 60 Km/h, and
- The number of students crossing meets or exceeds 5, and
- Student/vehicle conflict is observed or the potential for conflict is high due to poor crossing sight lines because of road geometrics, high volume of traffic or the lack of a logical crossing point resulting in students crossing at various locations. The Site Inspection Authority should consider all other options for alleviating the problem(s) first.

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## **Signalized Intersections**

Logic would dictate that school crossing guards should not be necessary at signalized intersections since traffic signals are in place to provide for the orderly flow of vehicles and pedestrians. Pedestrians have the right of way when lawfully 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 to motorists and should therefore be considered only as a last resort if several of the following are observed:

- A large volume of turning traffic through the intersection both right and left on the green signal and right turning on the red signal.
- There are students, and particularly young students, observed crossing on most signal cycles and the minimum number of students crossing meets or exceeds 5.
- The intersection leads to a main arterial or collector road and therefore there is a significant volume of trucks and 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 (conflict).
- The students appear timid in crossing the roadway or do not seem to be properly trained on how to cross the road safely, eg. Forgetting to push the pedestrian pushbutton if one is present or entering the roadway after the red flashing signal is showing.
- Staff with appropriate traffic training applying their professional judgement and experience to determine that there is the potential for vehicle/pedestrian conflict.



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### Gap Studies at Signalized Intersections

At a signalized intersection the gap is pre-set as part of the intersection timing plan therefore eliminating the need to measure gaps by stopwatch. Pedestrians crossing at a signalized intersection are only subject to potential conflict with turning traffic; right and left turns on a green signal, and right turns on a red signal. Therefore, it is not necessary to measure the width of the road, calculate a safe gap time, or use a stopwatch to measure gap time.

It is necessary to complete a site inspection report to record observations and data concerning site conditions. If it is determined that there are safety issues for which no alternative solutions can be found, a gap study should be undertaken.

The gap study should record:

- The number of vehicles making right and left turns through the proposed crosswalk on the green signal as well as the number of vehicles turning right on a red signal through the proposed crosswalk for each 5 minute interval studied.
- The number of pedestrians using the crosswalk by the same 5 minute interval.
- Vehicle/Pedestrian conflict and observation on driver and pedestrian behaviour. Do vehicles yield right of way to pedestrians, as they are required to do? Are pedestrians entering the crosswalk on the green signal only and/or remembering to activate the pedestrian button if there is one?

### Meeting a Warrant at a Signalized Intersection

There is a greater element of judgement required in recommending the implementation of a school crossing guard at a signalized intersection. However, the recording of data in the gap study report relative to the number of pedestrians, the number of turning vehicles, and conflicts as well as the

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recording of observations of student and driver behaviour provides the basis for all recommendation. A school crossing guard should be approved if:

- There is consistently a line-up of vehicles turning through the proposed crosswalk on each signal cycle, and
- Actual or potential pedestrian/vehicle conflicts are observed or identified which can be reduced or eliminated by the provision of a school crossing guard, and
- There are students, and particular young students, crossing on most signal cycles observed and the minimum number of students crossing meets or exceeds 5, and
- Students appear to be intimidated by poor driver behaviour.

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### **Temporary School Crossing Guards**

The Site Inspection Authority will consider a request from the appropriate board of education for a temporary school crossing guard provided that:

- The appropriate school board provided the Site Inspection Authority with detailed proposed route map indicating the estimate volumes at all significant crossings;
- The Site Inspection Authority completes an assessment through its own survey of traffic volumes and completes a site inspection of the area.

### **Term**

- Any recommendation to install a temporary school crossing guard must specify when a re-inspection will take place to determine if the guard should be removed or made permanent.
- That the school crossing guard has been assigned on a temporary basis only and should not be considered permanent unless the review supports a permanent school crossing guard and has been approved by Council through a staff report.

### **Notice to Parents**

The appropriate school is responsible for advising parents of children using the crossing:

- That a temporary school crossing guard has been provided only until the matter has been reviewed by the site Inspection Authority and the appropriate warrant has been met, and
- That the school crossing guard has been assigned on a temporary basis until approved by Council through a staff report, and
- That the school crossing guard may be removed or relocated subject to the findings of the warrant analysis.

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### **Removal of a School Crossing Guard**

From time to time it may be necessary to review the need of an existing school crossing. In some instances it may be the result of a school being closed, or a school boundary change such that students are no longer required to cross at the school crossing location, or the students previously using the school crossing are now eligible for busing. These are obvious reasons for removing a school crossing, therefore it is not required that a site inspection and gap study be completed prior to removal of the school crossing.

However if, in monitoring existing school crossings, it is observed that traffic patterns have changed or it appears that the minimum number of students criterion is no longer met, it may be necessary to conduct a site inspection and gap study in order to provide the rationale for removing the school crossing. In this instance the relevant warrant criteria would be applied as if the school crossing was being studied for the implementation of a school crossing guard and the results would be recommendation, through a staff report, to Council by the Site Inspection Authority for removal.

Prior to the staff report being prepared, the school principal would be notified of the findings of the warrant review and the recommendation of the City to remove the crossing guard. It will be the responsibility of the school principal to ensure that the parents are notified of the intent to the City to remove the crossing guard.

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## Appendix A – Gap Time

### *DETERMINATION OF ACCEPTABLE GAP TIME EXPLANATION OF FORMULA, APPLICATION AND TERMINOLOGY*

Based on the results of the survey undertaken as part of this review, there appears to be some uncertainty surrounding the methodology used to determine the minimum acceptable gap threshold used in the warrant criteria. As the warrant uses the number of acceptable gaps in a five minute time period to determine need, it is critical that the practitioner responsible for applying the warrant understands the inputs that are used to derive acceptable gap times and is capable of measuring said inputs in the field. In general terms, the formula used to derive acceptable gap times is simply a combination of the actual time it takes a child to cross the road, the time it takes a child to perceive and react to a situation (perception and reaction time), and the time between successive rows of students crossing in large groups(headway). The relationship between these three elements can be expressed as follows:

#### **1. Acceptable Gap = Perception & Reaction time + Crossing Time + Headway**

The actual formula used to determine the acceptable gap time has been taken from the “Manual of Transportation Engineering Studies, 5th Edition”, published by the Institute of Transportation Engineers (ITE). The formula can be expressed as follows:

#### **2. $G = P + W / S + H ( N - 1 )$**

Where:

- G = Acceptable gap time measured in seconds,
- P = Perception and reaction time measured in seconds (usually 4.0 seconds),
- W = Critical width of the roadway to be crossed measured in metres,

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- S = Walking speed of child measured in metres per second (typically 1.1 m/s),
- H = Headway between successive rows of students measured in seconds (typically 2.0 seconds),
- N = 85<sup>th</sup> percentile group size (explanation to follow).

Once the known constants are input into the formula, it can be expressed as follows:

$$3. G = 4.0 + W/1.1 + 2 ( N - 1 )$$

Although constant values have been provided for various inputs, field measurements are always preferred. If alternate values based on technical study and observation have been established, these values should be used instead of the constants provided.

### *DETERMINING CRITICAL CROSSING WIDTH (W)*

When measuring the road to determine a crossing distance to be input into the formula, it is common practice to simply use the pavement width that is present at the crossing location. Unfortunately, using this width does not take into consideration any personal buffer zones that may be used by students to protect themselves from passing traffic while they wait to cross the road. It is rare for any pedestrian, especially students, to stand directly upon the edge of the road they are attempting to cross while they wait for a safe gap in the traffic stream. Typically, they will give themselves a personal buffer one and will stand behind the edge of the pavement while they wait to cross. As a result, using the pavement width as an input into the formula may underestimate the actual gap time required to cross the road safely.

In order to prevent this situation from occurring, it is important to observe where the majority of the students queue while they wait for a safe gap in the traffic stream. The measurement for critical width should be taken from this point and not from the edge of the pavement.

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*DETERMINING PREDOMINANT (85TH PERCENTILE) GROUP SIZE (N)*

Measuring the arrival rate of groups of students is critical in determining adequate gap time. By observing and recording the size of the groups forming prior to crossing the road, the predominant group size (N) can be determined and input into the formula. It is important to note that this type of study is typically conducted prior to undertaking the adequate gap study. In instances where two observers are being used or gaps are being recorded through the use of automatic traffic recorders (ATR), the gap study and the group size study can be undertaken concurrently. For the purposes of recording group sizes, groups are considered to be comprised of rows and each row is comprised of a maximum of five (5) students. As a result, if four students cross the road as a group, this is considered to be one row and should be recorded as such. If seven students cross the road as a group, this is considered to be two rows and should be recorded as such. Stragglers are not to be counted in the group. The predominant group size, as defined by the Institute of Transportation Engineers, is the group size (number of rows) that represents the 85<sup>th</sup> percentile of all groups recorded. The following example illustrates how to calculate predominant group size.

**Example 1 – Determination of “N” for a Limited Data Set**

| <b>No. of Rows (N)</b> | <b>Tally (Frequency)</b> | <b>Total</b> | <b>Cumulative Total</b> | <b>Cumulative Frequency</b> |
|------------------------|--------------------------|--------------|-------------------------|-----------------------------|
| 1                      | III                      | 3            | 3                       | 7.9%                        |
| 2                      | IIII III                 | 9            | 12                      | 31.6%                       |
| 3                      | IIII IIII I              | 11           | 23                      | 60.5%                       |
| 4                      | IIII III                 | 8            | 31                      | 81.6%                       |
| 5                      | III                      | 4            | 35                      | 92.1%                       |
| 6                      | III                      | 3            | 38                      | 100%                        |

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Based on the data contained in the above table, a total sample of 38 groups was recorded during the study period. In order to determine the predominant group size for this data set, simply multiple the total number of groups sampled (38) by the percentile level you want to satisfy (85% or 0.85). Using this data, the predominant group size for this sample is 32.3 ( $38 \times 0.85$ ) and, when this value is input back into the "Cumulative Frequency" column of the table, it translates to an "N" value of five (5). Please note that as you are attempting to satisfy at least the 85<sup>th</sup> highest group size measured in the field and you must use whole numbers in the formula, you should "round up" to the next highest whole number as a "rule of thumb". Although the 85<sup>th</sup> percentile group size in the example (32.3) is closer to the cumulative total of 31 (N=4) than the cumulative total of 35 (N=5), the higher value should be used as it satisfies the 85<sup>th</sup> percentile requirement (92.1% versus 81.6%). Having said this, it must be noted that smaller sample sizes are susceptible to greater variation and are easily skewed by non-representative data. As such, engineering judgement must always be used when applying these statistics.

### *DETERMINING ACCEPTABLE GAP (G)*

Once you have determined your critical crossing width (W) and your predominant group size (N), simply input these values into the acceptable gap formula to derive your gap time. In an effort to make this calculation easier, Table A-1 outlines the acceptable gap times for various critical crossing widths (W) and predominant group sizes (N).



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**Table A-1**

Acceptable Gap Times for Various Crossing Widths And Group Sizes

| <b>ACCEPTABLE GAP TIMES (G)</b><br><b>(seconds)</b> |                                    |    |    |    |    |    |
|---|------------------------------------|----|----|----|----|----|
| <b>Critical Crossing<br/>Width (W)<br/>(metres)</b> | <b>Predominant Group Sizes (N)</b> |    |    |    |    |    |
|   | 1                                  | 2  | 3  | 4  | 5  | 6  |
| <b>7.0</b>  | 11                                 | 13 | 15 | 17 | 19 | 21 |
| <b>7.5</b>  | 11                                 | 13 | 15 | 17 | 19 | 21 |
| <b>8.0</b>  | 12                                 | 14 | 16 | 18 | 20 | 22 |
| <b>8.5</b>  | 12                                 | 14 | 16 | 18 | 20 | 22 |
| <b>9.0</b>  | 13                                 | 15 | 17 | 19 | 21 | 23 |
| <b>9.5</b>  | 13                                 | 15 | 17 | 19 | 21 | 23 |
| <b>10.0</b>   | 14                                 | 16 | 18 | 20 | 22 | 24 |
| <b>10.5</b>   | 14                                 | 15 | 18 | 20 | 22 | 24 |
| <b>11.0</b>   | 14                                 | 15 | 18 | 20 | 22 | 24 |
| <b>11.5</b>   | 15                                 | 17 | 19 | 21 | 23 | 25 |
| <b>12.0</b>   | 15                                 | 17 | 19 | 21 | 23 | 25 |
| <b>12.5</b>   | 16                                 | 18 | 20 | 22 | 24 | 26 |
| <b>13.0</b>   | 16                                 | 18 | 20 | 22 | 24 | 26 |
| <b>13.5</b>   | 17                                 | 19 | 21 | 23 | 25 | 27 |
| <b>14.0</b>   | 17                                 | 19 | 21 | 23 | 25 | 27 |
| <b>14.5</b>   | 18                                 | 20 | 22 | 24 | 26 | 28 |
| <b>15.0</b>   | 18                                 | 20 | 22 | 24 | 26 | 28 |

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## Appendix B – Site Inspection Report

### SITE INSPECTION REPORT – WARRANT STUDIES

|                     |   |
|---------------------|---|
| <b>OBSERVER</b>     | Observed By: _____<br>Date of Inspection: _____ Day: _____<br>Times: _____<br>Requested By: _____<br>Weather Conditions: <input type="checkbox"/> Dry <input type="checkbox"/> Sunny <input type="checkbox"/> Rain <input type="checkbox"/> Snow <input type="checkbox"/> Other   |
| <b>SITE</b>         | Location: _____<br>Name of School(s): _____<br>Type of Crossing: <input type="checkbox"/> 4-Way Intersection <input type="checkbox"/> 3-Way Intersection <input type="checkbox"/> Midblock<br>Type of Control: <input type="checkbox"/> No Control <input type="checkbox"/> Traffic Lights<br><input type="checkbox"/> Stop Signs (Traffic stopped on one street only)<br><input type="checkbox"/> All Way Stop (Traffic stopped in all directions)   |
| <b>OBSERVATIONS</b> | School Signs: <input type="checkbox"/> School Crossing Signs <input type="checkbox"/> School Warning Signs<br>Posted Speed: <input type="checkbox"/> 40 km/h <input type="checkbox"/> 50 km/h <input type="checkbox"/> 60 km/h <input type="checkbox"/> Other _____<br>Pedestrian Site Distance: _____ (m) <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good<br>Sight Obstructions: <input type="checkbox"/> Hedges <input type="checkbox"/> Trees <input type="checkbox"/> Fences <input type="checkbox"/> Bus Shelter<br><input type="checkbox"/> Newspaper Boxes <input type="checkbox"/> Other (specify) _____<br>Road Grade: <input type="checkbox"/> Flat <input type="checkbox"/> Incline <input type="checkbox"/> Decline<br>Road Geometrics: <input type="checkbox"/> Straight <input type="checkbox"/> Curved<br>Road Width (m):    Curb to curb _____ Curb to median _____<br>Road Conditions: <input type="checkbox"/> Dry <input type="checkbox"/> Wet <input type="checkbox"/> Snow Covered <input type="checkbox"/> Ice<br>Sidewalks: <input type="checkbox"/> North <input type="checkbox"/> South <input type="checkbox"/> East <input type="checkbox"/> West <input type="checkbox"/> Not Present<br>Proximity to School: <input type="checkbox"/> In front of <input type="checkbox"/> Within _____ (m)<br>Route Survey: <input type="checkbox"/> Shopping Area <input type="checkbox"/> Construction <input type="checkbox"/> Driveway<br><input type="checkbox"/> Parked Vehicle(s) <input type="checkbox"/> Transit Bus Stop<br><input type="checkbox"/> Other _____<br><br>Comments: _____<br>_____<br>_____ |

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Appendix C – Crossing Guard Warrant Survey

| CROSSING GUARD WARRANT SURVEY |    |       |                          |                         |                          |                     |                    |                       |
|-------------------------------|----|-------|--------------------------|-------------------------|--------------------------|---------------------|--------------------|-----------------------|
| Intersection:                 |    |       |                          |                         |                          |                     |                    |                       |
| Schools:                      |    |       |                          |                         |                          |                     |                    |                       |
| Date:                         |    |       |                          |                         |                          |                     |                    |                       |
| Safe Gap Time                 |    |       | 13 Second Gaps (seconds) | Number of Gaps Recorded | Total Gap Time (seconds) | Number of Safe Gaps | Number of Vehicles | Number of Pedestrians |
| 7:45                          | to | 7:50  |                          |                         |                          |                     |                    |                       |
| 7:50                          | to | 7:55  |                          |                         |                          |                     |                    |                       |
| 7:55                          | to | 8:00  |                          |                         |                          |                     |                    |                       |
| 8:00                          | to | 8:05  |                          |                         |                          |                     |                    |                       |
| 8:05                          | to | 8:10  |                          |                         |                          |                     |                    |                       |
| 8:10                          | to | 8:15  |                          |                         |                          |                     |                    |                       |
| 8:15                          | to | 8:20  |                          |                         |                          |                     |                    |                       |
| 8:20                          | to | 8:25  |                          |                         |                          |                     |                    |                       |
| 8:25                          | to | 8:30  |                          |                         |                          |                     |                    |                       |
| 8:30                          | to | 8:35  |                          |                         |                          |                     |                    |                       |
| 8:35                          | to | 8:40  |                          |                         |                          |                     |                    |                       |
| 8:40                          | to | 8:45  |                          |                         |                          |                     |                    |                       |
| 8:45                          | to | 8:50  |                          |                         |                          |                     |                    |                       |
| 8:50                          | to | 8:55  |                          |                         |                          |                     |                    |                       |
| 8:55                          | to | 9:00  |                          |                         |                          |                     |                    |                       |
| 9:00                          | to | 9:05  |                          |                         |                          |                     |                    |                       |
| <b>TOTAL</b>                  |    |       |                          |                         |                          |                     |                    |                       |
| <b>AVERAGE</b>                |    |       |                          |                         |                          |                     |                    |                       |
| 11:10                         | to | 11:15 |                          |                         |                          |                     |                    |                       |
| 11:15                         | to | 11:20 |                          |                         |                          |                     |                    |                       |
| 11:20                         | to | 11:25 |                          |                         |                          |                     |                    |                       |
| 11:25                         | to | 11:30 |                          |                         |                          |                     |                    |                       |
| 11:30                         | to | 11:35 |                          |                         |                          |                     |                    |                       |
| 11:35                         | to | 11:40 |                          |                         |                          |                     |                    |                       |
| 11:40                         | to | 11:45 |                          |                         |                          |                     |                    |                       |
| 11:45                         | to | 11:50 |                          |                         |                          |                     |                    |                       |
| 11:50                         | to | 11:55 |                          |                         |                          |                     |                    |                       |
| 11:55                         | to | 12:00 |                          |                         |                          |                     |                    |                       |
| 12:00                         | to | 12:05 |                          |                         |                          |                     |                    |                       |
| 12:05                         | to | 12:10 |                          |                         |                          |                     |                    |                       |
| 12:10                         | to | 12:15 |                          |                         |                          |                     |                    |                       |
| 12:15                         | to | 12:20 |                          |                         |                          |                     |                    |                       |
| 12:20                         | to | 12:25 |                          |                         |                          |                     |                    |                       |
| 12:25                         | to | 12:30 |                          |                         |                          |                     |                    |                       |
| 12:30                         | to | 12:35 |                          |                         |                          |                     |                    |                       |
| 12:35                         | to | 12:40 |                          |                         |                          |                     |                    |                       |
| 12:40                         | to | 12:45 |                          |                         |                          |                     |                    |                       |
| 12:45                         | to | 12:50 |                          |                         |                          |                     |                    |                       |
| 12:50                         | to | 12:55 |                          |                         |                          |                     |                    |                       |
| 12:55                         | to | 1:00  |                          |                         |                          |                     |                    |                       |
| 1:00                          | to | 1:05  |                          |                         |                          |                     |                    |                       |
| 1:05                          | to | 1:10  |                          |                         |                          |                     |                    |                       |
| <b>TOTAL</b>                  |    |       |                          |                         |                          |                     |                    |                       |
| <b>AVERAGE</b>                |    |       |                          |                         |                          |                     |                    |                       |

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| Safe Gap Time        |    |      | 13 Second Gaps (seconds) | Number of Gaps Recorded | Total Gap Time (seconds) | Number of Safe Gaps | Number of Vehicles | Number of Pedestrians |
|----------------------|----|------|--------------------------|-------------------------|--------------------------|---------------------|--------------------|-----------------------|
| 2:45                 | to | 2:50 |                          |                         |                          |                     |                    |                       |
| 2:50                 | to | 2:55 |                          |                         |                          |                     |                    |                       |
| 2:55                 | to | 3:00 |                          |                         |                          |                     |                    |                       |
| 3:00                 | to | 3:05 |                          |                         |                          |                     |                    |                       |
| 3:05                 | to | 3:10 |                          |                         |                          |                     |                    |                       |
| 3:10                 | to | 3:15 |                          |                         |                          |                     |                    |                       |
| 3:15                 | to | 3:20 |                          |                         |                          |                     |                    |                       |
| 3:20                 | to | 3:25 |                          |                         |                          |                     |                    |                       |
| 3:25                 | to | 3:30 |                          |                         |                          |                     |                    |                       |
| 3:30                 | to | 3:35 |                          |                         |                          |                     |                    |                       |
| 3:35                 | to | 3:40 |                          |                         |                          |                     |                    |                       |
| 3:40                 | to | 3:45 |                          |                         |                          |                     |                    |                       |
| 3:45                 | to | 3:50 |                          |                         |                          |                     |                    |                       |
| 3:50                 | to | 3:55 |                          |                         |                          |                     |                    |                       |
| 3:55                 | to | 4:00 |                          |                         |                          |                     |                    |                       |
| 4:00                 | to | 4:05 |                          |                         |                          |                     |                    |                       |
| 4:05                 | to | 4:10 |                          |                         |                          |                     |                    |                       |
| 4:10                 | to | 4:15 |                          |                         |                          |                     |                    |                       |
| 4:15                 | to | 4:20 |                          |                         |                          |                     |                    |                       |
| <b>TOTAL</b>         |    |      |                          |                         |                          |                     |                    |                       |
| <b>AVERAGE</b>       |    |      |                          |                         |                          |                     |                    |                       |
| <b>DAILY TOTAL</b>   |    |      |                          |                         |                          |                     |                    |                       |
| <b>DAILY AVERAGE</b> |    |      |                          |                         |                          |                     |                    |                       |