CITY OF HAMILTON

PUBLIC WORKS DEPARTMENT
Transportation Division

TO: Mayor and Members General Issues Committee	**WARD(S) AFFECTED:** CITY WIDE
COMMITTEE DATE: November 6, 2013	
SUBJECT/REPORT NO: Pedestrian Signal Program (TOE01010a) - (City Wide) (Outstanding Business List)	
SUBMITTED BY: Gerry Davis, CMA General Manager Public Works Department **SIGNATURE:**	**PREPARED BY:** Steve Molloy (905) 546-2424, Extension 2975 Al Kirkpatrick (905) 546-2424, Extension 4173

RECOMMENDATION

(a) That the City of Hamilton Intersection Pedestrian and Mid-block Traffic Signals Policy (Report TOE01010), attached as Appendix A, be replaced with the Pedestrian Signal Program Policy attached as Appendix B to Report TOE01010a;

(b) That Council authorize the General Manager of Public Works to approach the Ministry of Transportation (MTO) to participate in a pilot study for “Courtesy Crossings” applications in Hamilton;

  (i) That subject to Council’s approval, participation in a minimum two (2) year “Courtesy Crossing” pilot be implemented with funds from the Hamilton Strategic Road Safety Program (HSRSP) not to exceed $200,000;

  (ii) That staff report back annually to General Issues Committee (GIC) on the proposed strategy and progress of the “Courtesy Crossings” Pilot for the City of Hamilton;

(c) That the item "Installation Policy for Intersection and Mid-Block Pedestrian Signals" be identified as completed and removed from the General Issues Committee Outstanding Business List.

EXECUTIVE SUMMARY

This staff report has been prepared in response to Council direction to review the installation policy of intersection and mid-block pedestrian signals in the City.

The City-Wide Transportation Master Plan has identified the need to increase walking and cycling trips within the City. In terms of walking trips, the City initiated the development of a Pedestrian Mobility Plan to develop a strategic approach to improving walkability within the City. Throughout the plan's development and extensive consultation with the public, several issues were identified that were perceived to hinder walking in the City. In addition, the Hamilton Strategic Road Safety Program (HSRSP) identifies vulnerable road users as one of its primary emphasis areas and identifies safe intersection and mid-block crossings as part of its action plan. This report addresses proactive steps to enhance the ability for pedestrians to safely cross municipal roads.

One of the challenges faced by the City and many other municipalities in Ontario is that under the existing Ontario *Highway Traffic Act* (HTA), there are two (2) distinct categories of pedestrian crossings: controlled crossings and uncontrolled crossings.

Any fundamental changes to the *Highway Traffic Act* to provide additional pedestrian right-of-way would represent a significant cultural shift to Ontarians. These changes would require an extensive and province-wide education and awareness campaign.

Notwithstanding these fundamental challenges, the City has a policy to address the Installation of Intersection Pedestrian and Mid-block Traffic Signals. The primary function of these two (2) types of traffic signals is to provide a controlled crossing opportunity for pedestrians once activated.

A review of the existing policy indicates that the City is a leading municipality in terms of flexibility in meeting criteria requirements for installation and improving overall walkability. The review identifies minor technical guideline changes to assist with making the policy more flexible and to take a proactive approach to implementing pedestrian signals.

In addition to the installation of a signalized controlled crossing, staff is recommending the pursuit of a pilot study of a proposed new crossing device termed "Courtesy Crossing", by coordinating with the Ministry of Transportation to proceed with participation in a two (2) year pilot. "Courtesy Crossings" do not give pedestrians the right-of-way to enter an intersection. Pedestrians are required to wait for a safe gap in traffic to cross. Drivers must stop and allow pedestrians that are within a marked crosswalk to continue to cross safely. The intent is to provide greater awareness and visibility of pedestrians crossing. At such a time, when legislation changes this device may provide pedestrians with the right-of-way. This device is intended for use on roads with two (2) travel lanes and with low volume and speed.

Alternatives for Consideration - See Page 9

FINANCIAL / STAFFING / LEGAL IMPLICATIONS

Financial: The approval of the Pedestrian Signal Program does not have immediate financial implications beyond those that presently exist.

If Council chooses to give staff direction to proceed with engaging the Ministry of Transportation to conduct a "Courtesy Crossing Pilot", the approximate cost to conduct a pilot [based on ten (10) locations and ten (10) control locations] is approximately two hundred thousand dollars ($200,000). A breakdown of costs is identified in Table 1.

The findings of the pilot will identify any long-term capital and operational impacts. Funding for the pilot would be accommodated through the Hamilton Strategic Road Safety Program (HSRSP). The findings of the pilot will identify any long-term capital and operational impacts. Additional locations would have capital and staffing impacts.

Table 1: Courtesy Crossing Pilot Cost Estimate

Item	**Cost (per location)**
Capital Cost: Pavement Markings (initial) Curb cuts, sidewalk alteration and other related work (Note: Cost will vary based on sites selected)	 $1,500 x 10 = $15,000 $7,500 x 10 = $75,000
Operating Cost: Maintenance (as required)	 $1,500 x 10 = $15,000
Education/Communication Print Materials/Advertising/ Outreach Events	$45,000 (one-time cost)
Monitoring Cost: Data collection/analysis (2-year Period)	$50,000 (one-time cost)
Total Cost	$200,000

Staffing: Currently, there is an impact of 0.2 FTE for each traffic signal design in the City. There are no additional staffing requirements associated with the proposed pedestrian signal program, nor are there any staffing impacts associated with proceeding with the courtesy crossing pilot.

Legal: There have been no substantial changes to the legislation's crosswalk provisions since a previous review of the HTA that was conducted in 1995. Legal Services have reaffirmed the specific HTA requirements that would apply to the proposed Courtesy Crossing Pilot. Furthermore, they have advised that the City work closely with the Ministry of Transportation to ensure that the proposed Courtesy Crossing Pilot program conforms to Ministry requirements. Information from both Legal Services and Risk Management will be used to ensure that the new crosswalks are designed with best practices.

Risk Management: As stated previously, there is no legal obligation under the HTA for vehicular traffic to yield to pedestrians at uncontrolled courtesy crossings. Risk Management advised that, the potential exists for litigation against the City due to

injuries arising from the use of courtesy crossings; if the City were found to be negligent in the application of courtesy crossings, joint and several liability rules may expose the City to financial hardships, especially for third party catastrophic injuries.

Accordingly, if Council directs staff to proceed with the possibility of implementing courtesy crossings, several measures would be considered in order to mitigate the City's potential liability as well as to ensure as much as possible the safety of parties using the crossings.

HISTORICAL BACKGROUND

Walkability in the City and pedestrian safety have been raised as important issues. These issues have been addressed through several documents and initiatives, including the City's Official and Transportation Master Plans, as well as the City's participation in the Canada Walks Master Class and subsequent signing of the International Charter for Walking, and recent development of a City-Wide Pedestrian Mobility Plan. In addition, the Hamilton Strategic Road Safety Program (HSRSP) identifies vulnerable road users as one of its primary emphasis areas and identifies safe intersection and mid-block crossings as part of its action plan. Despite these initiatives, the City has faced a fundamental challenge in addressing all of the issues raised by citizens.

Unlike other Provinces in Canada, under the existing Ontario *Highway Traffic Act* (HTA), there are two (2) distinct categories of pedestrian crossings:

1. ***A controlled crossing***: Where vehicles are required to stop or yield to traffic legally in the intersection, which includes pedestrians
2. ***An uncontrolled crossing***: Where pedestrians must wait for safe gaps in traffic, sufficient for them to cross the roadway, prior to attempting to enter the roadway

In late 2011 the Ontario Traffic Manual Book 15 (Pedestrian Crossing Facilities) was released following a review of the Ministry of Transportation of Ontario (MTO). The manual provides practical guidance and application of information on the planning, design, and operation of pedestrian roadway crossings and to promote the uniformity of approaches across Ontario. To date this manual has not been officially adopted by MTO.

Also in 2011, a letter was sent to the Minister of Transportation of Ontario regarding three (3) key recommendations from the Book 15 Committee. This letter was sent on behalf of sixteen (16) municipalities, including the City of Hamilton. These recommendations include:

1) *New Legal Crossing Device:* The Book 15 Committee recommends that a new signed and marked control crossing be implemented with rules of the road comparable to a pedestrian crossover. This new device is needed to enable crossing at mid-block locations, right turn slots (also known as right turn channels or islands) and roundabouts. This device is intended to be applied for crossing two or fewer lanes on lower speed roads.

2) *Defining "traffic" in the HTA*: The Book 15 Committee recommends that changes to the rules of the road are needed to make clear the obligation of both vehicular and pedestrian traffic. The term "traffic" is not explicitly defined in the Highway Traffic Act, leading to possible ambiguity in interpreting the rules of the road for scenarios involving drivers approaching a STOP-controlled sign or a YIELD-controlled sign, in particular related to whether pedestrians are considered "traffic".
3) *A change in the HTA to provide greater protection for pedestrians:* The Book 15 Committee recommends requiring drivers to come to a full stop and yield the right-of-way to a pedestrian who is within the crossover or using a school crossing, rather than the current requirement for drivers to yield to pedestrians within the nearest half of the crossing.

As of August 2013, no major changes to the HTA's crosswalk provisions have been made since the last review by Legal Staff in 1995.

In between signalized intersections, especially along multi-lane arterial roadways that operate with higher traffic volumes and speed than local residential roadways, the City, along with other municipalities in Ontario, have limited options of what it can provide in terms of protection to pedestrians.

The most common method to address this crossing situation is to provide a Pedestrian Signal, pending a review of technical criteria. A framework for these criteria is established in the Ontario Traffic Manual (OTM) Book 12 - Traffic Signal Devices. This document provides guidelines on the development of traffic signals consistent with the intent of the HTA. Other devices such as the Pedestrian Crossover (PXO), commonly associated with the City of Toronto are in the process of being replaced with traffic signals on arterial roads.

The development of the recent OTM Book 15 - Pedestrian Crossing Facilities has identified the challenges faced by municipalities and the need to amend the HTA to improve walkability across the Province and provide more opportunities for pedestrians to cross roadways. Within OTM Book 15, a new pedestrian crossing device, referred to as "Courtesy Crossings", is a potential solution on two (2) lane roadways that operate with lower traffic volumes and speeds. Under the current legislation, this new device does not give pedestrians the right-of-way to enter an intersection. However, the intent is to provide greater awareness and visibility of pedestrians crossing at these locations. At such a time when legislation changes; this facility may provide pedestrians with the right-of-way.

COURTESY CROSSING CONSIDERATIONS

The following safeguards be considered in order to mitigate the City's potential liability as well as to ensure as much as possible the safety of parties using the crossings:

ENGINEERING

- Crossings can incorporate visual markings (patterned concrete, road markings)
- Crossings can incorporate signs to alert pedestrians and motorists to their intended use;

- Consider the following with respect to signs;
    - Signage advising pedestrians to yield to oncoming traffic.
    - Signs stating “Caution - Vehicles Not Required to Stop
    - Advisory signage indicating “High Pedestrian Activity”
    - Signage should be of sufficient size and colour to attract the attention of pedestrians and drivers.
- Ensuring that courtesy crossing areas are well illuminated so that approaching drivers have a good view of the crosswalk from a distance at night to allow sufficient time to stop and/or yield to pedestrians.
- Ensuring that the City of Hamilton meets the standard of care to maintain the crosswalk as per the Minimum Maintenance Standards as specified in the Municipal Act. It is highly recommended that a system of inspection, patrol, maintenance and repair be deployed to ensure a safe crosswalk for pedestrian use. For example, identification and remediation of road surface deficiencies (pot holes, wash outs), winter operations (sanding and salting of roadway), maintenance of road signage and road markings, ensuring signage is free from any obstructions (poles, trees, branches), etc…
- Ensuring that there are sufficient draining systems in place to reduce the overflow of water onto the road surface and the creation of ponding or icy conditions.
- Consider placement on roadways that have a reasonably low volume of traffic, that are preferably two-lane, and where the vehicle operating speed is less than 60 km/h.
- Do not install crossings close to elementary schools to avoid putting young children at risk.
- Avoid placing courtesy crosswalks near a bus stop, which could potentially obstruct a pedestrian’s view of the road, and could result in an injury to a pedestrian.
- Avoid placing on-street parking close to courtesy crosswalks, as this could create a sight line issue obstructing a pedestrian’s view of the roadway.
- Avoid placing a courtesy crosswalk close to an intersecting side street. Drivers who are making right hand turns may only pay attention to vehicular traffic from the left hand side, which could have negative consequences for pedestrians who are using the crosswalk. This will avoid potential litigation against the City for design and construction deficiencies.

EDUCATION

- Education - the effectiveness of the design of a roadway and crosswalk installation is greatly dependent upon the driver and pedestrian’s knowledge and compliance with rules of the road. The objective of road safety and crosswalk education is to make road users aware of the risks associated with violating road traffic laws by encouraging safe driver and pedestrian behaviours. It is strongly recommended that the public be made aware of the new courtesy crossing and their safe usage through measures such as a media campaign to educate both

drivers and pedestrians, partnering with school boards to educate students, partnering with driving school associations to include courtesy crossing training to young drivers.

ENFORCEMENT

- Increase law enforcement in areas where courtesy crossings are located to ensure compliance with the applicable speed limit to increase pedestrian safety.

POLICY IMPLICATIONS/LEGISLATED REQUIREMENTS

The Pedestrian Signal Program identifies minor technical modifications to assist with the flexibility to install a pedestrian signal. In addition, conducting a "Courtesy Crossing" pilot does not require any municipal legislative changes. However, it does require consultation with MTO, and staff is recommending to proceed with engaging the Ministry to participate in a pilot study.

RELEVANT CONSULTATION

Throughout the development of the Pedestrian Mobility Plan, the issues relating to pedestrians crossing roadways were highlighted by both the public and members of Council. In addition, consultation as part of the Neighbourhood Action Plans identified the issue of pedestrian crossings. Consultation also occurred with staff from the Corporate Assets and Strategic Planning Division of the Public Works Department.

ANALYSIS / RATIONALE FOR RECOMMENDATION

Exclusive of reportable collisions, there are five (5) considerations as part of the criteria for the Installation of Intersection Pedestrian and Mid-Block Signals, including: Pedestrian Volume, Pedestrian Delay and Signal Spacing. Below is a summary of the existing policy, state-of-the-practice review and proposed modification to the existing policy.

A review of ten (10) municipalities in Ontario (Toronto, London, Ottawa, Milton, Burlington, Oakville, Brampton, Waterloo, Windsor, Kingston) was undertaken to compare the approach taken by the City amongst its' peers. A summary of this review is provided in "Appendix C".

Based on the state-of-the-practice review in Ontario, Hamilton is generally lower than most other municipalities. For example, six (6) of ten (10) of the municipalities reviewed require a pedestrian volume of two hundred (200) within an eight (8) hour period as compared to Hamilton's one hundred (100) in seven (7) hours. This demonstrates Hamilton as a leader among Ontario municipalities for improving walkability and that the existing policies applied in Hamilton are among the most progressive in Ontario.

However, Staff recognizes the community support for further pedestrian crossing improvements. A further modification to the process and technical criteria has been

identified that may assist with meeting criteria thresholds for Pedestrian Signals as outlined in Appendix "D".

The HSRSP provides a proactive approach to identifying the location of Pedestrian Signals through network screening that will identify opportunities to address existing safety concerns. In addition to this approach, requests from the neighbourhood associations, Ward Councillors, and the general public may be received.

Once a request has been received by staff, the affected neighbourhood association or community council and ward councillor will be notified of the request, if they were not previously aware. The notice is intended to engage the affected community and provide an opportunity for a transparent decision-making process.

Although not part of the scoring system, an important part of the Pedestrian Signal Program is educating the public. Community education for pedestrians to encourage use of this signal type will help in maintaining their effectiveness. Education and public notices of pedestrian rights and vehicle driver rights of the proposed Courtesy Crossing Pilot will help reduce potential confusion and injury. This could be part of HSRSP overall strategy to educate motorists and vulnerable road users.

Notwithstanding the proposed program, regular updates to policies are recommended according to applicable legislative changes and emerging best practices, which is currently the practice of the City. A review of the program is recommended to occur at a minimum once every five (5) years and coincide with the City-wide Transportation Master Plan Review.

***Courtesy Crossing Pilot*: (Minimum Two-Year Pilot Study)**

Through findings of the Pedestrian Mobility Plan and the network screening associated with the HSRSP, a list of candidate sites will be identified and initial criteria will be developed. Other requirements that may be identified by MTO regarding the responsibilities of participating in the pilot will be documented and communicated back to Council.

The candidate locations will also include a number of control locations to collect before and after data for the pilot. This will assist in determining the effectiveness of the new device. A monitoring program will be developed similar to the approach used in the City of Kingston, who conducted a similar pilot project. The findings of the City of Kingston pilot study is attached in Appendix "E". Participation in a pilot represents a great opportunity for Hamilton to demonstrate leadership in pedestrian and traffic planning and engineering. Findings of the pilot will be communicated to Council, which will then provide further direction to staff.

ALTERNATIVES FOR CONSIDERATION

Three (3) alternative solutions associated are identified below.

Alternative 1 - Do not accept the Pedestrian Signal Program as presented and do not proceed with undertaking a pilot on Courtesy Crossings

The City could choose not to accept the Pedestrian Signal Program as presented. This alternative is not recommended since it does not address the issues raised by the public through other transportation planning studies and by individual Councillors. It is therefore beneficial to support the Pedestrian Signal Program as presented. Furthermore, the City could choose not to endorse City staff to investigate with MTO the potential to conduct a “Courtesy Crossings” pilot in Hamilton

Alternative 2 - Do not accept the Pedestrian Signal Program as presented and proceed with undertaking a pilot on “Courtesy Crossings”

The City could choose not to accept the Pedestrian Signal Program as presented. This alternative is not recommended since it does not address the issues raised by the public through other transportation planning studies and by individual Councillors. However, if the City chooses to endorse City staff to investigate with MTO the potential to conduct a “Courtesy Crossings” pilot in Hamilton, the results of the pilot could address existing policy concerns expressed by the public and individual Councillors.

Alternative 3 - Accept the Pedestrian Signal Program as presented and do not proceed with undertaking a pilot on “Courtesy Crossings”

The City could choose to accept the Pedestrian Signal Program as presented. This would address most of the issues raised by the public through other transportation planning studies and by individual Councillors. If the City chooses to not to endorse City staff to investigate with MTO the potential to conduct a “Courtesy Crossings” pilot in Hamilton, it may not accomplish all of the pedestrian needs to consider alternatives to the cost restrictive nature of installing pedestrian signals.

ALIGNMENT TO THE 2012 - 2015 STRATEGIC PLAN

Strategic Priority #1
A Prosperous & Healthy Community

WE enhance our image, economy and well-being by demonstrating that Hamilton is a great place to live, work, play and learn.

Strategic Objective
1.4 Improve the City's transportation system to support multi-modal mobility and encourage inter-regional connections.
1.5 Support the development and implementation of neighbourhood and City wide strategies that will improve the health and well-being of residents.

APPENDICES / SCHEDULES

Appendix “A”	Existing Intersection and Midblock Pedestrian Policy
Appendix “B”	Pedestrian Signal Program Policy
Appendix “C”	Summary Review of Ontario Municipalities
Appendix “D”	Pedestrian Signal Program: Decision-Making Process
Appendix “E”	City of Kingston “Courtesy Crossings Pilot” Paper

CITY OF HAMILTON

- RECOMMENDATION -

DATE: January 8, 2001
Author: Hart Solomon, P. Eng.

REPORT TO: Mayor and Members
Committee of the Whole
City of Hamilton

FROM: Peter M. Crockett, P.Eng.
General Manager
Transportation, Operations & Environment

SUBJECT: **Installation Criteria for Intersection and Mid-Block Pedestrian Signals (TOE01010)**

RECOMMENDATION:

That the policy entitled “Installation Criteria for Intersection and Mid-Block Pedestrian Signals”, Appendix A of this report, dated January 2001, be approved.

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Peter M. Crockett, P. Eng.

FINANCIAL/STAFFING/LEGAL IMPLICATIONS:

N/A

BACKGROUND:

The proposed policy attached to this report describes the background and considerations for determining the installation of intersection and mid-block pedestrian signals. The policy has notes for each section explaining the rationale for the proposed policy. The first three parts of the policy restate the present policy and practice, while the fourth section is newly added.

HLS/mad (Ext.4584)

City of Hamilton – Traffic Engineering/Operations Policy

Title: Installation Criteria for Intersection and Mid-Block Pedestrian Signals

Date: January 2001

Background:

This policy details the installation criteria for determining when it is appropriate to install traffic signals that are exclusively to assist pedestrians crossing the roadway.

These signals may be located at an intersection or between intersections. If they are located at an intersection (intersection pedestrian signal – IPS) the signal will consist of red, amber and green signal heads for vehicular traffic on the main street, pedestrian signals for persons crossing the main street and stop signs for the side street traffic.

The intersection pedestrian signal was introduced to Ontario in 1993. Hamilton was the site of five of the first six trial locations and the success of the device in Hamilton has led to it being incorporated in the Highway Traffic Act. Hamilton has approximately 24 intersection pedestrian signals and 11 mid-block pedestrian signals at present.

Relationship to Previous Policies:

The policy that follows is substantially the same as policies that were previously approved by the City of Hamilton and the Regional Municipality of Hamilton-Wentworth. The fourth item is new, although it has been part of the informal decision making in the past. Previously, Hamilton had coined the name Pedestrian Priority Signal for intersection pedestrian signals. We are now using the more commonly accepted technical name.

Policy Use:

When considering the installation of an intersection or mid-block pedestrian signal, the conditions required in all four sections must be achieved before a signal is justified or would be recommended.

1 – Distance to Nearest Protected Crossing

Mid-block or intersection pedestrian signals shall not be installed less than 215 metres from another protected crossing (traffic signal, all-way stop or school crossing guard location) on a two-way street, or 140 metres from a protected crossing on a one way street.

Explanation: The minimum spacing between traffic control devices is required for pedestrian and driver safety. If two traffic signals or other devices are located in close proximity, there is a significant chance that the driver may look past the first device and

take his cues from the farther location. This could result in a pedestrian being struck or rear end collision occurring.

The minimum spacing prescribed by the Ontario Traffic Manual, which is the Provincial standard applying to traffic signals, is 215 m. The two-way street standard is consistent with the manual. Hamilton experience has shown that the 140 metre standard will work adequately on one-way streets, where signals can be set to prevent the problems which occur with spacing this close on two-way streets.

2- Minimum Pedestrian Volume

A mid-block or intersection pedestrian signal shall not be installed unless there are a minimum of 100 pedestrians crossing at the intersection or in the immediate vicinity, in a 7 hour period of one day, and the pedestrians are not or cannot be provided with an alternate form of protection.

Explanation: The 100 pedestrian volume minimum provides a very reasonable threshold for considering the pedestrian signal. This number is significantly lower than the provincial standard contained in the Ontario Traffic Manual which requires at very minimum 200 pedestrians in 8 hours, and depending on the volume traffic on the main street or the delay to pedestrians, significantly higher numbers.

3 – Justification System

The City's justification system shall be used to determine when it is appropriate and/or necessary to install a pedestrian signal. The system shall consider the volume of pedestrians, delay to pedestrians, age and mobility status of pedestrians, speed of traffic on the main road and distance to the nearest protected crossing as well as the pedestrian safety history. Unless particularly unusual conditions exist, a minimum threshold of 90 points on the justification system shall be required before the installation of the pedestrian signal would be considered. Only those pedestrians crossing without other forms of protection shall be considered in the justification system.

Explanation: In conjunction with the introduction of intersection pedestrian signals to Hamilton, staff developed a justification system to determine when it is appropriate to install intersection pedestrian signals, and in what order funds should be expended. Existing systems from Vancouver, Edmonton, Saskatoon, the province of British Columbia, and the U.S. were considered before the City developed its own system. The basis of the system is the volume of pedestrians and the length of time that the pedestrians have to wait to cross the street. The waiting time is the key element in that it indicates how difficult it is to get across the street, and therefore, the true need of the signal. Inherent in the waiting time, are the demographics of the crossing population. If there are a large number of elderly, this would be reflected in a longer waiting time on the curb and a higher point rating. As well, independent of the waiting time measured, the group of crossing pedestrians also receives a higher score if there are large number of young, very old pedestrians or handicapped individuals crossing.

The system was originally built with the intention of a threshold of 100 points. Experience operating the signals has shown that a threshold of approximately 90 points is appropriate as an adequate balance between serving pedestrians and interrupting the flow of traffic on a arterial roadway. There are 24 IPS presently in operation in Hamilton. All but five of these exceed 86 points on the rating scale. Two of the five with point ratings below 90 points were installed specifically to address serious safety problems.

4 – Use of Adult Crossing Guards at Pedestrian Signal Locations

If a pedestrian signal is to be installed based on the standards in Parts 1, 2 and 3 of this policy being met, and the location is presently under the control of a school crossing guard during portions of the day, the adult guard shall be removed after the signal has been installed and a suitable introductory period has concluded.

Explanation: Intersection pedestrian signals were chosen for Hamilton over the pedestrian crossover systems, as used in Toronto, because the pedestrian signal provides a positive recognizable form of traffic control.

The first 5 locations chosen for Hamilton were all locations with an adult school crossing guard. The guard was removed at the time of signal installation at all 5 locations. Only one location has received the same treatment since 1995, while guards have been retained at 5 other new signals. In all 6 cases for which the adult school crossing guard was removed, the signals have operated very safely, in some cases crossing as many as 300 school-aged pedestrians daily. No collisions involving school-aged children during school hours have occurred at any of the 6 locations, from 1993 to the present.

Recently, members of Council have requested installation of intersection pedestrian signals at several locations but have not supported the removal of the adult crossing guard. On this basis, the staff recommendation to committee and Council was not to install the signal. There were not enough pedestrians crossing at other times of the day to justify the installation. If the policy was that the guard was to be removed, one or more of these locations would have been recommended. An advantage gained is that the pedestrian signal provides 24-hour, 7 day a week protection for students outside the hours that the crossing guard would be present.

There is no need to retain the two forms of traffic control at one location, and financial savings can be realized at the same time.

Hamilton

Operational Policy	***Pedestrian Signal Program Policy***
IMS #	*PW-*
No. of Pages:	*2*
Issue Date:	*November 2013*
Created by:	

1. PURPOSE

1.1 The intent of this policy is to provide the installation criteria for determining when it is appropriate to install traffic signals that are exclusively to assist pedestrians crossing the roadway.

1.2 These signals may be located at an intersection or between intersections. If they are located at an intersection (intersection pedestrian signal – IPS) the signal will consist of red, amber and green signal heads for vehicular traffic on the main street, pedestrian signals for persons crossing the main street and stop signs for the side street traffic.

2. POLICY USE (Conditions)

2.1 When considering the installation of an intersection or mid-block pedestrian signal, the **conditions** required must be achieved before a signal is justified or would be recommended.

3. PEDESTRIAN SIGNAL CONDITIONS

3.1 **Pedestrian Volume**
Use of one hundred (100) pedestrians within a **seven (7)** hour period
Revised to:
Use of one hundred (100) pedestrians within an **eight (8)** hour period

3.2 **Pedestrian Delay**

Average calculated delay based on pedestrian wait time for a gap in traffic and time to cross a roadway based on field data collection

No Change

3.3 **Pedestrian Generators**

n/a

Revised to:

To address latent demand for pedestrians, factors will be applied to locations with land uses within a walkable distance, typically considered to be within 400 metres

3.4 **Traffic Control Spacing**

Minimum spacing between a traffic signal or stop controlled intersection:

1) One hundred and forty (140) metres on a one (1) way roadway
2) Two hundred and fifteen **(215) metres** on a two (2) way roadway

Revised to:

1) One hundred and forty (140) metres on a one (1) way roadway
2) Two hundred **(200) metres** on a two (2) way roadway

3.5 **Preventable Collisions**

Average number of preventable collisions over a period of ten (10) years

3.6 **Operating Speed**

Based on posted speed limit and observed speed data.

3.7 **Implementation Programming (City's Justification System)**

A justification system that determines whether a pedestrian signal is installed or not installed.

Revised to:

The points accumulated through the scoring system will help to maintain a list of locations to assist in prioritizing implementation. This list will be submitted as part of the annual Capital Budget submission for deliberation by Council.

3.8 **Reporting**

n/a

Revised Program:

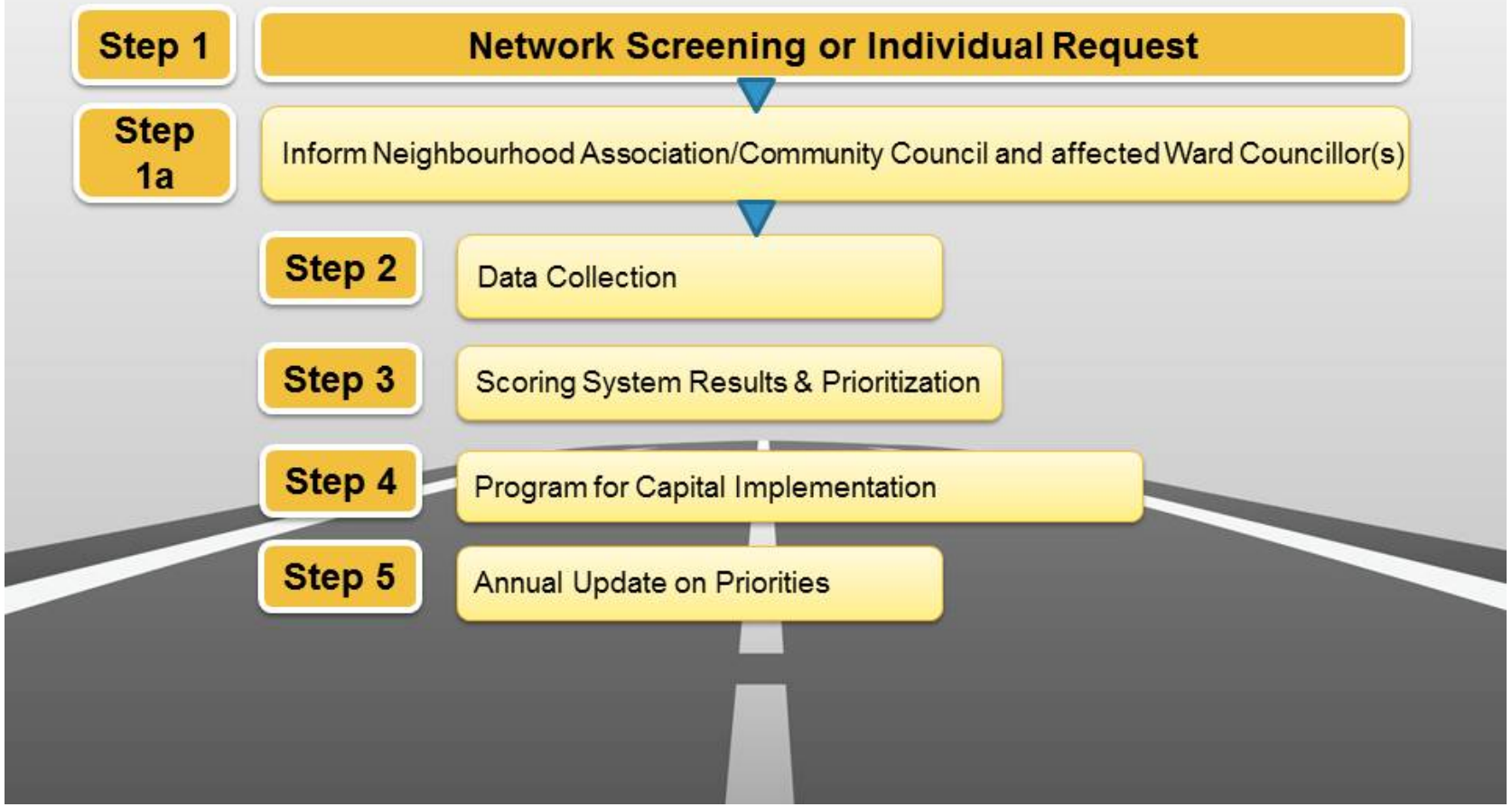
An annual update will be prepared for Council to report back on implementation progress and the list of outstanding priority locations in the City.

	Installation Criteria								
	Do they have an IPS/mid-Block Installation Criteria Policy?	**Distance to Nearest Protected Crossing**	**Minimum Pedestrian Volume**	**Vehicular Volume**	**Posted Speed Limit (maximum)**	**Sight Distance**	**Justification/ Warrant System**	**Use of Adult Crossing Guards at Pedestrian Signal Locations**	**Other/ Notes**
Municipality									
Hamilton, ON (2007) Population: 519,949	Yes	215 m (on a two-way street); 140 m (one-way street)	100 pedestrians in a 7 hour period	Not identified	Not identified	Not identified	A minimum threshold of 90 points on the justification system is required. The system considers the following: • volume of pedestrians • delay to pedestrians • age and mobility status • distance to nearest protected crossing • speed of traffic on main road	Adult guard shall be removed after signal installation, and suitable period of adjustment time has passed	
Toronto, ON (2002) Population: 2,615,060	No	Current policy is to continue to allow PXOs (instead of removing and replacing with IPS or mid-block crossings). However, where warranted under OTM Book 12 requirements, certain locations with existing PXOs will be converted into full traffic control signals.							Due to the safety concerns surrounding PXOs, Toronto has tried to increase the visibility of PXOs. Such enhancements include zebra striped pavement markings, flashing beacons, and signs.
Brampton, ON (2007) Population: 523,911	Yes (Pedestrian safety plan)	Brampton has adopted a policy of implementing only full traffic signals at locations where IPS are warranted under the OTM guidelines							
Burlington, ON (2013) Population: 175,779	Yes	200 m (on two-way street); 125 m (one-way street)	100 pedestrians during the highest (peak) 8 hour period	< 5,000 vpd (24hr volume) can be present on the intersecting side street approaches	Not identified	Adequate sight distances at intersection must exist, sudden changes in horizontal or vertical alignment can not be present	Minimum threshold of 70 points is required. There are 5 warrants (each with separate points calculations) considered including: • pedestrian volume & delay • avg. # of preventable pedestrian collisions • distance to nearest protected crossing • vehicle operating speed • special conditions	Not identified	Special conditions (warrant 5) include a minimum of 4 traffic lanes, or if the location is within 200 m of a pedestrian generator
Oakville, ON (2003) Population: 182,520	Yes (draft)	On roads ≤ 60 km/h - minimum 215 m; On roads ≤50 km/h - minimum 160 m	Exposure-based approad (using 8 hr pedestrian volumes vs. 12 hr vehicular volume). Standard range of 50-250 pedestrians required	Exposure-based approad (using both 8 hr pedestrian volumes vs. 12 hr vehicular volume). Standard range of 1000-10,000 vehicles required	Installation only appropriate on roadways with posted speed limit of 60km/h or less	Adequate stopping sight distance must be available, and no parking or loading within the “no stopping” zone	Uses pedestrian and vehicular volume, schoolchildren routing (i.e. logical placement of crossing), and distance to next nearest crossing. No point system used/ developed currently.	Not identified	Pedestrian Signal Report mimicks Oakville's PXO warrant policy, as they are phasing out PXOs. Oakville's warrants and criteria for IPS is currently in draft mode
Waterloo, ON (2002) Population: 98,780	Yes (uses OTM warrant criteria too)	215 m (on two-way street); 125 m (one-way street)	Follows OTM Book 12 requirements, minimum 200 during highest 8 hr period (uses a combination matrix involving both pedestrian and vehicle volumes)	Not identified	Installation of IPS not permitted on roadways with posted speed limit of 60 km/h or greater	Adequate sight distance must be available for both pedestrians and vehicles for the operating speed of the roadway.	Follows the OTM Book 12 warrants. A traffic control device shall be considered if minimum pedestrian volume, and pedestrian delay criteria are met	Not identified	Pedestrian count should include all pedestrians crossing the main road within 25 m of the intersection (or within reasonable distance for specific location based on judgement call)
Milton, ON (2011) Population: 84,362	Yes	Not identified	200 pedestrians in an 8 hour period	Warrant is based on 12 hour vehicular traffic (does not specify minimum requirement)	Not identified	Not identified	Uses minimum pedestrian volume (200 in 8 hour period) as the main criterion; may incorporate other justifications, however no others are mentioned in the report in relation to mid-block or IPS crossings	Not identified	

London, ON (1998) Population: 366,151	No (follows OTM Book 12 warrant requirements for all criteria)	215 m	Follows OTM Book 12 requirements,minimum 200 during highest 8 hr period (uses a combination matrix involving both pedestrian and vehicle volumes)	Follows OTM Book 12 requirements, range of 1440-7000 during highest 8 hr period (using the pedestrian vs vehicular volume matrix)	Installation of IPS not permitted on roadways with posted speed limit of 80 km/h or greater	Not identified	Follows the OTM Book 12 warrants, section 4.8 which includes pedestrian volume and delay	Not identified	IPS are considered warranted if the conditions meet or exceed warrant requirements of section 4.8 of OTM - Book 12
Windsor, ON (2005) Population: 210,891 or CMA - 319,246	No	Windsor has adopted the policy of implementing only full traffic signals at locations where IPS are warranted under the OTM guidelines							For mid-block crossings, which are used in Windsor, the city follows any applicable provincial warrants
Kingston, ON (2012 - Revised) Population: 123,363 or CMA - 159,561	Yes	200 m	> 80 per hour over peak 6 hours of the day	> 15,000 AADT (daily traffic volume)	Not identified	Not identified	Uses a Pedestrian Experience justification system. IPS or mid-block crossing considered when a resonable number of these conditions are met: Pedestrian volume, vehicle volume, vehicle speed, number of lanes, sidewalks present, distance to nearest protected crossing	Not identified	Sidewalks must be present for safety reasons when considering the installation of an IPS or mid-block signal. The City of Kingston does not adhere to MTO warrants for pedestrian traffic signals.
Ottawa, ON (2001) Population: 883,391	Yes	Not identified	Two stages: First must meet minimum requirements set out in OTM-Book 12. Secondly, the total of the highest 6 hr pedestrian volume crossing must meet or exceed the minimum value required based on the 12 hr vehicular traffic volume. (Does not identify the minimum value)	Specific volume numbers not identified, but mentions the volume count is taken from the highest 12 hr period of the day	Not identified	Not identified	Must meet the following two warrants before a location can be recommended for a pedestrian signal: Minimum Pedestrian Crossing Volume Warrant & Minimum Pedestrian Delay Warrant	Not identified	

Pedestrian Signal Program

Proposed



Pedestrian Courtesy Crossing Pilot Project In the City of Kingston

by
Deanna Green, M.Sc., P.Eng.

ABSTRACT

Pedestrians in the Province of Ontario do not have the right-of-way over vehicles at non-vehicular controlled locations as specified in the provincial *Highway Traffic Act*. Motorists are only required to yield to pedestrians where any of the following forms of traffic control are present: traffic signal, intersection pedestrian signal (IPS), pedestrian cross-over (PXO), school crossing guard or a stop sign. Since it is not practical to install some form of vehicular control at all locations where pedestrians cross, it is a challenge for municipalities in Ontario to provide pedestrian crossings at locations with relatively low pedestrian volumes.

In June of 2003, in response to numerous requests for the City of Kingston to provide an improved pedestrian crossing adjacent to a seniors' residence, the City installed a Courtesy Crossing as a pilot project. This Courtesy Crossing consisted of oversized fluorescent yellow warning signs that stated "COURTESY CROSSING" along with a large black X. Bright yellow ladder-type pavement markings were installed to draw further attention to the crossing.

In accordance with the *Highway Traffic Act of Ontario*, pedestrians still do not have the right-of-way over vehicles while in a Courtesy Crossing. So that pedestrians did not gain a false sense of security, signs were posted that stated, "Caution - Vehicles Not Required to Stop". These signs were installed such that they were not visible to motorists. An educational campaign regarding this Courtesy Crossing was commenced in the community, and information bulletins were distributed throughout the area.

In order to assess the effectiveness of the Courtesy Crossing, detailed before and after studies were completed. The results of the studies indicated that prior to the installation of the Courtesy Crossing, an average of 22% of motorists yielded to pedestrians at the crossing. After the Courtesy Crossing was installed, the percent of motorists yielding increased to 55%.

Based on the results of the Rideau Street Pedestrian Courtesy Crossing pilot project, the City installed a second Courtesy Crossing on King Street in front of the Kingston General Hospital in June of 2006. The results of the studies indicated that prior to the installation of the Courtesy Crossing, an average of 4% of motorists yielded to pedestrians on King Street in the vicinity of the hospital. After the Courtesy Crossing was installed, the percent of motorists yielding increased to 44%.

INTRODUCTION

In recent years, Kingston's City Council and numerous members of the public have expressed the need for a policy that would facilitate an increase in the number of "legal" pedestrian crossings throughout the City. Pedestrians in the Province of Ontario do not have the right-of-way over vehicles at non-vehicular controlled locations as specified in the provincial *Highway Traffic Act*. Motorists are only required to yield to pedestrians where any of the following forms of traffic control are present: traffic signal, intersection pedestrian signal (IPS), pedestrian cross-over (PXO), school crossing guard or a stop sign. Since it is not practical to install some form of vehicular control at all locations where pedestrians cross, it is a challenge for municipalities in Ontario to provide pedestrian crossings at locations with relatively low pedestrian volumes.

Since the laws within the *Highway Traffic Act of Ontario* take precedence over any local by-law, municipalities are unable to develop by-laws that provide pedestrians with the right-of-way at locations with no vehicular traffic control. Furthermore, to install crosswalks at non-vehicular controlled locations throughout the City could create potential safety issues since pedestrians could gain a false sense of security and mistakenly believe that they have the right-of-way.

The City of Kingston completed research in order to determine how pedestrians could be accommodated at non-vehicular controlled locations. As a component of this research, iTrans Consulting was hired by the City in 2003 to obtain information with respect to pedestrian rights at non-vehicular controlled locations. iTrans also gathered statistical data on pedestrian collisions across Canada in similar sized cities to Kingston.

Throughout the course of this research, it was discovered that in Ontario, the City of Belleville, the Town of Perth, the Town of Bancroft and the Municipality of Dysart have installed a limited number of Courtesy Crossings for pedestrians. These crossings are marked with oversized fluorescent yellow warning signs that state "COURTESY CROSSWALK" along with a large black X. After the completion of field studies and telephone surveys with two of these municipalities, the City of Kingston installed its first Courtesy Crossing as a pilot project in 2003 on Rideau Street, and a second Courtesy Crossing on King Street in front of the Kingston General Hospital in 2006. The results of the detailed before and after studies completed at both of these locations will be reviewed in detail in this paper.

PEDESTRIAN POLICY IN CANADA

It is important when discussing pedestrian policy to acknowledge that the Province of Ontario is unique relative to other provinces across Canada. As part of the research undertaken by iTrans in 2003, the Highway Traffic Acts of all ten provinces were reviewed in order to obtain information about pedestrian rights across Canada at non-vehicular controlled locations.

The iTrans research determined that all provincial Highway Traffic Acts contain clauses stating that a driver must yield the right-of-way to a pedestrian who is crossing the roadway within a crosswalk. In addition, where a pedestrian is crossing the roadway at a point other than at a crosswalk, the pedestrian must the yield right-of-way. While the location may or may not be a non-vehicular controlled location, six provinces (British Columbia, Saskatchewan, Manitoba, Prince Edward Island, New Brunswick and Newfoundland) explicitly identify these rights to govern crossing locations where traffic control signals are not in place or not in operation. Other provinces (Alberta, Quebec and Nova Scotia) do not explicitly state that the location must be signalized, but may still be applicable to locations without signals. By contrast, in Ontario, under Clause 144 (7), pedestrian right-of-way is stipulated only under the section for traffic control signals and pedestrian control signals. Similar rights are stipulated under the pedestrian crossover section (overhead amber pedestrian flasher), which is not applicable at non-vehicular controlled locations.

The 1995 *Manual of Uniform Traffic Control Devices* published by the Ontario Ministry of Transportation does not include any regulatory pedestrian signage for marked and signed crosswalks. This manual does however include pedestrian signage for vehicular controlled locations such as at pedestrian cross-overs (PXO's).

The 1998 *Manual of Uniform Traffic Control Devices for Canada* published by the Transportation Association of Canada (TAC) includes what is typically installed as regulatory pedestrian signage in provinces outside of Ontario. Since this type of signage is not regulatory in Ontario and is not recognized by the provincial *Highway Traffic Act*, there are liability issues that should be considered before installing marked and signed crosswalks at non-vehicular controlled pedestrian crossings in Ontario.

Pedestrian Collision Data Comparison

In order to determine if the difference in Ontario's pedestrian policy impacts the frequency of pedestrian collisions, iTrans gathered data on pedestrian collisions in other Canadian cities that were similar in size to Kingston.

Table 1.0 summarizes the data gathered for seven cities that are similar in population size to Kingston. The collision averages are based on at least three consecutive years of data. The frequency of collisions in the cities surveyed ranged from an annual average of 30 in Trois-Rivières, Quebec to 90 in Thunder Bay, Ontario. The average annual number of pedestrian collisions from all cities surveyed was 52. Since there is an average of 44 pedestrian collisions per year in Kingston, the data indicates that the frequency of pedestrian collisions in Kingston is below average when compared to other similar-sized cities. It is possible that pedestrians in Kingston have a different expectation of driver behaviour, and both adjust their behaviour accordingly.

Table 1.0 – Summary of Pedestrian Collision Data

City, Province	Population (2001 Census)	Average Annual Number of Pedestrian Collisions*
Thunder Bay, ON	121,986	**90**
Saint John, NB	122,678	**30**
Trois-Rivières, QC	137,507	**30**
Kingston, ON	**146,838**	**44**
Abbotsford, BC	147,370	**64**
Sherbrooke, QC	153,811	**56**
Chicoutimi-Jonquiere, QC	154,938	**33**
St. Johns, NL	172,918	**71**

*minimum three-year average

RIDEAU STREET COURTESY CROSSING

Rideau Street is currently a two-lane roadway that carries a two-way volume of 10,000 vehicles per day. It has a posted speed limit of 40 km/h and an 85th percentile speed as high as 57 km/h. Prior to June of 2003, there was a marked pedestrian crossing adjacent to a seniors' home on Rideau Street. This crossing was non-vehicular controlled and was designated with two parallel white lines on the pavement. Warning signs that stated, "SENIORS", in addition to other specialized seniors crossing signs were utilized at this location.

Since there is no law in Ontario that requires motorists to yield to pedestrians at this type of crossing, the large majority of motorists did not provide the right-of-way to pedestrians at this location. Although only 40 pedestrians typically cross Rideau Street in front of this seniors' home during an 8-hour peak period, many of these residents have mobility challenges.

In June of 2003, in response to numerous requests for the City of Kingston to provide an improved pedestrian crossing adjacent to this seniors' residence, the City installed a Courtesy Crossing as a pilot project. As shown in **Figure 1**, this Courtesy Crossing consisted of oversized (90 by 120 cm) fluorescent yellow warning signs that stated "COURTESY CROSSING" along with a large black X. Oversized advanced signage, illustrated in **Figure 2**, was also installed in order to warn motorists that a pedestrian crossing was ahead. Bright yellow ladder-type pavement markings were also installed to draw further attention to the crossing.

Figure 1: Rideau Street – Courtesy Crossing Sign

Figure 2: Rideau Street – Advance Courtesy Crossing Sign

In accordance with the *Highway Traffic Act of Ontario*, pedestrians still do not have the right-of-way over vehicles while in a Courtesy Crossing. So that pedestrians did not gain a false sense of security, signs were posted that stated, "Caution - Vehicles Not Required to Stop". These signs, shown in **Figure 3,** were installed such that they were not visible to motorists. An educational campaign regarding this Courtesy Crossing was commenced in the community, and information bulletins were distributed throughout the area.

Figure 3: Pedestrian Caution Sign at Courtesy Crossing

In order to assess the effectiveness of the Courtesy Crossing, detailed before and after studies were completed. Since the pedestrian activity at this location is relatively low, City employees were used to undertake the pedestrian crossing movements in order to obtain a significant crossing sample. The following pedestrian types were used during this research: mobility challenged senior citizen, woman with stroller, visually impaired female with a white cane, male (age 25) and female (age 35). Only one pedestrian type attempted to cross at a time while the remaining "pedestrians" and data collectors remained hidden from the view of motorists. (Note: a good time was had by all). Motorist behaviour in the near and far-side lanes was tabulated and both north and southbound pedestrian crossing movements were assessed. All data was collected on weekday afternoons before the pm peak period when the weather was clear and warm and the pavement was dry.

The detailed results of the Rideau Street before and after studies are summarized in **Tables 2a and 2b**. The numbers in the table refer to the number of vehicles that either yielded to the pedestrian or did not yield during repeated crossing attempts by each pedestrian type. Since the sample size was related to the vehicle volume and was

dependent on whether a driver yielded or not, there were some variations in the before and after sample sizes.

Table 2a – Rideau Street: Number of Vehicles That Yielded or Did Not Yield Before and After Installation of Courtesy Crossing

Pedestrian Type	BEFORE		AFTER	
	Yielded	***Did Not Yield***	***Yielded***	***Did Not Yield***
Senior Citizen	24	32	65	50
Woman with stroller	11	39	30	18
Visually impaired	10	15	26	16
Male (age 25)	4	50	25	26
Female (age 35)	7	67	33	35
TOTAL ALL GROUPS	**56**	**203**	**179**	**145**

The change in motorist behaviour before and after the installation of the Rideau Street Courtesy Crossing is displayed with percentages in **Table 2b**.

Table 2b – Rideau Street: Percentage of Vehicles That Yielded Before and After Installation of Courtesy Crossing

	BEFORE	AFTER	DIFFERENCE (mathematical)	DIFFERENCE (from the base)
Senior Citizen	43%	57%	14%	**33%**
Woman with stroller	22%	63%	41%	**186%**
Visually impaired	40%	62%	22%	**55%**
Male (age 25)	7%	49%	42%	**600%**
Female (age 35)	9%	49%	40%	**444%**
TOTAL ALL GROUPS	**22%**	**55%**	**33%**	**150%**

It is interesting to note that the motorists surveyed were relatively courteous to the senior citizen and the visually impaired female with the white cane even before the Courtesy Crossing was installed. Therefore the increase in the percentage of motorists that yielded after the Courtesy Crossing was installed was more significant for the remaining pedestrian groups, particularly the 25-year old male and the 35-year old female.

The overall results of the studies indicated that before the installation of the Courtesy Crossing on Rideau Street, an average of **22%** of motorists yielded to pedestrians at the crossing. After the Courtesy Crossing was installed, the percent of motorists yielding

increased to **55%**. The mathematical difference of the percent of motorists that yielded to pedestrians before and after the Courtesy Crossing was installed was 33% while the percentage difference from the base was 150%.

KING STREET COURTESY CROSSING

Based on the positive feedback and the encouraging results of the Rideau Street Pedestrian Courtesy Crossing pilot project, at the request of the Kingston General Hospital (KGH) the City installed a second Courtesy Crossing on King Street in front of the hospital in June of 2006.

King Street is currently a two-lane roadway that carries a two-way volume of more than 11,000 vehicles per day. It has a posted speed limit of 50 km/h and an 85th percentile speed as high of 51 km/h. Since traffic is fairly steady throughout the day, it is often a challenge for pedestrians to cross this street.

The signage installed at the King Street Courtesy Crossing was identical to what was utilized on Rideau Street. Oversized fluorescent yellow warning signs that stated "COURTESY CROSSING", as illustrated in **Figure 4**, were installed adjacent to the crossing in addition to oversized advance signs. In order to draw further attention to the new crossing, portable variable message signs were utilized for the first two weeks in advance of the hospital area that stated, "CAUTION – NEW PEDESTRIAN CROSSING AHEAD".

Figure 4: King Street Courtesy Crossing

For the first time in Kingston, DuraTherm (StreetPrint) was utilized, as shown in **Figure 5**, for the pavement markings at the crossing on King Street. DuraTherm is an asphalt-based inlaid thermoplastic product that provides a wide range of pattern and colour choices. The City chose this product for the King Street Courtesy Crossing in order to provide a highly visible and durable crossing that would require no maintenance for several years. The disruption to traffic during the installation was minimal.

Figure 5: DuraTherm Crosswalk Markings on King Street

Prior to June of 2006, there were no marked pedestrian crossings of any type on King Street in the vicinity of the hospital. Since there are short duration visitor parking lots as well as a waterfront trail on the opposite side of King Street from the hospital, several hundred pedestrians cross the street throughout the day in a haphazard fashion.

The format of the before and after studies completed on King Street was simplified in comparison to the previous studies completed on Rideau Street. As pedestrian activity is relatively high on King Street, data was collected by monitoring actual pedestrian activity as opposed to using City staff to undertake repeated crossing attempts. The data was collected at various times throughout the day on different weekdays when the weather was clear. Some of the after data was collected during the winter but the pavement conditions at the time were relatively dry.

The detailed results of the King Street before and after studies are summarized in **Table 3**. The numbers in the table refer to the number of vehicles that either yielded to the pedestrian or did not yield. Motorist behaviour in the near and far-side lane was also tabulated. Groups of two or more pedestrians were documented as one movement. Both north and southbound pedestrian crossing movements were assessed. Since the sample

size was related to vehicle volume and was dependent on whether a driver yielded or not, there were some variations in the before and after sample sizes. In addition, since it was possible to document actual pedestrian activity at this Courtesy Crossing, data was collected on numerous occasions after installation in order to further monitor the effectiveness of this new pedestrian facility.

Table 3.0 – King Street: Before and After Installation of Courtesy Crossing

BEFORE	# of vehicles that yielded	**13**
	# of vehicles that **did not** yield	**298**
	% of vehicles that yielded	**4%**
AFTER	# of vehicles that yielded	**84**
	# of vehicles that **did not** yield	**109**
	% of vehicles that yielded	**44%**
DIFFERENCE	Mathematical	**40%**
	From the Base	**1000%**

The before studies indicated that during peak periods of the day, up to 90 pedestrians per hour crossed on King Street in the vicinity of the hospital at a variety of locations.
The overall results of the studies indicated that before the installation of the Courtesy Crossing on King Street, an average of **4%** of motorists yielded to pedestrians in the vicinity of the hospital. After the Courtesy Crossing was installed, the percent of motorists yielding increased to **44%**. The mathematical difference of the percent of motorists that yielded to pedestrians before and after the Courtesy Crossing was installed was 40% while the percentage difference from the base was 1000%.

CONCLUSIONS & RECOMMENDATIONS

In recent years, two "Courtesy Crossings" were installed on separate roadways in Kingston as part of a pilot project. The before and after studies completed at these crossings indicated that a significantly higher number of motorists yielded to pedestrians after the Courtesy Crossings were installed.

As specified in the provincial *Highway Traffic Act*, pedestrians in Ontario do not have the right-of-way over vehicles at non-vehicular controlled locations. Pedestrians therefore, do not have the right-of-way over vehicles while in a Courtesy Crossing. Even if the provincial *Highway Traffic Act* was amended to provide the right-of-way for pedestrians at non-vehicular controlled locations, there is concern that the aggressive motorist attitude towards pedestrians in Ontario is so engrained that it would be difficult to change. Without tremendous education, enforcement and support from the Province and all municipalities, there is a risk that marked and signed crosswalks at non-vehicular locations in Ontario would merely provide pedestrians with a false sense of security.

For these reasons, the installation of Courtesy Crossings in Ontario should be viewed with caution.

In order to limit liability and to inform pedestrians that they do not have the right-of-way at Courtesy Crossings, it is important to install signs such as, "Caution - Vehicles Not Required to Stop". An educational campaign regarding any new Courtesy Crossing should also be completed in the community, and information bulletins should be distributed throughout the area.

It is also recommended that Courtesy Crossings only be considered on relatively low volume two-lane roadways where there is adequate sight distance and the vehicle operating speed is less than 60 km/h.

REFERENCES

- Manual of Uniform Traffic Control Devices, 1995, Ontario Ministry of Transportation
- Manual of Uniform Traffic Control Devices for Canada, 1998, Transportation Association of Canada (TAC)
- iTrans Consulting Memorandum, 2003, Pedestrian Research Results, City of Kingston
- Highway Traffic Act of Ontario