

**Transportation Standing Committee
January 15, 2014**

TO: Chair and Members of the Transportation Standing Committee

Original signed

SUBMITTED BY: _____
David Hubley, P.Eng., Acting Director, Transportation & Public Works

DATE: December 19, 2013

SUBJECT: Zebra Crosswalk Markings

INFORMATION REPORT

ORIGIN

Item 7.4.1 raised at the October 2, 2013 meeting of the Transportation Standing Committee.

MOVED by Councillor Fisher, seconded by Councillor Dalrymple, that the Transportation Standing Committee request a staff report on the budget implications and options for zebra striping at all uncontrolled marked crosswalks in the Halifax Regional Municipality. The report should include the best orientation of stripes, width and best practices for zebra striping and if available, local safety statistics.

MOTION PUT AND PASSED

LEGISLATIVE AUTHORITY

Part 1, Section 21, "Standing, Special and Advisory Committees" of the HRM Charter.

BACKGROUND

The Transportation Association of Canada (TAC) Pedestrian Crossing Control Guide (2012) identifies zebra crosswalk markings as a "desirable" treatment for marked crosswalks. The guide indicates that desirable components have the potential to improve the overall system performance; however their implementation is not essential for effective system operation. It is also noted that once a decision has been made to apply any of the desirable components, it is important to maintain consistency in its application.

DISCUSSION

Similar to many jurisdictions across Canada, HRM's Traffic and Right of Way Services has adopted TAC guidelines for the use and application of various pavement marking treatments, including crosswalks. The accepted configuration of zebra crosswalk markings, as outlined in the 2012 TAC Pedestrian Crossing Control Guide, consists of an alternating series of 600 mm wide white lines and 600 mm spaces placed across a road and aligned parallel to the travel lanes. If HRM were to adopt the use of zebra crosswalk markings, they would be placed in accordance with the TAC standard.

There are approximately 500 uncontrolled, marked crosswalks within the core service area of HRM. Estimated unit rates were obtained for painting zebra markings at uncontrolled, marked crosswalks. Because the initial painting of the zebra markings would require layout and spacing of the markings, two estimates were obtained. The first estimate included the additional cost of layout and the second estimate was for repainting only.

For the initial installation of the zebra markings it would cost approximately \$155,000 more than the standard twin parallel line crosswalk and approximately \$85,000 more on an on-going basis to repaint all of the approximately 500 marked, uncontrolled crosswalk locations.

Optionally, zebra crosswalk markings could be considered for only those crossing locations on multi-lane arterial/collector roadways where overhead RA-5 crosswalk lights are located. There are about 185 of these locations and the additional cost would be approximately \$60,000 for initial installation and \$30,000 for re-painting.

A third option would be to paint zebra crosswalk markings only at those crossing locations that are designated school crossings, which is the recommended treatment according to the TAC Pedestrian Crossing Control Guide. There are about 95 of these locations and the additional cost would be approximately \$30,000 for the initial installation and \$15,000 for re-painting.

A survey of the use of zebra crosswalk markings was undertaken through the Traffic Operations and Management Standing Committee (a committee of TAC) which is made up of traffic operations professionals, from both the public and private sectors, across Canada. The survey asked the following questions:

1. Does your jurisdiction use zebra crosswalk markings?
2. If zebra crosswalk markings are used, is there a criteria followed to determine where they are used?
3. Where zebra crosswalk markings have been installed, either as a new installation or to replace standard parallel-line crosswalks, have you assessed the crossing location after installation for changes to driver and pedestrian compliance or behaviour?
4. What sort of materials do you use when placing the zebra markings (paint, permanent markings, etc.) and have you had any issues with the treatment creating slipping/skid problems for vehicles (especially bicycles / motorcycles) or pedestrians?

Responses were received from 12 jurisdictions and are summarized below.

Government of Yukon

Zebra crosswalks are in use. There are no formal criteria used to determine where they are placed at this time, although they are considering making zebra crosswalks a requirement as part of their local guidelines. Both paint and thermoplastic have been used in placing the zebra markings and there have been no reports of slipping/skidding issues. There has been no assessment of pedestrian/driver compliance or behaviour at any of the locations where zebra crosswalks have been installed.

Ministry of Transportation of Ontario (MTO)

From the perspective of the Provincial road network in Ontario, the use of zebra crosswalks is primarily dictated by the Municipalities who operate and maintain the portions of the road network within their jurisdictions. It was indicated that Toronto uses zebra crosswalk markings everywhere, while the Region of Durham does not use them at all even when MTO sees their use as beneficial. Zebra markings are used at some isolated locations driven by active transportation or pedestrian safety concerns. Also, the use of zebra markings is required at supervised school crossings (except at signalised intersection or at pedestrian cross-overs). Traditional pavement marking paint, thermoplastic or cold plastic are used in the installation of zebra markings and there was no information provided regarding issues related to slipping/skidding due to the pavement markings. There was also no information provided regarding the assessment of pedestrian and driver behaviour/compliance after installation of the zebra markings.

Ministere des Transports du Quebec (MTQ)

Quebec allows zebra crosswalk markings to be used for marked pedestrian crossings at signalised and stop controlled intersections and requires their use at all mid-block locations. Markings are applied using paint, permanent marking materials and other materials. No information was provided regarding slipping/skidding issues. Since zebra markings are used in most applications in Quebec, there are no assessments done in relation to effect on driver/pedestrian behaviour or compliance.

Edmonton, Alberta

The City of Edmonton uses zebra markings for mid-block crossing locations, trail crossing locations, crossings to pork-chop islands (turn channels) and in the past they were used at crossings of roadways with more than four lanes where only standard crosswalks were warranted. Zebra markings are installed using inlaid permanent plastic with glass bead treatment (for reflectivity) and then maintained with MMA spray. There have been no complaints related to slipping or skidding. Crosswalk locations are not typically assessed for driver / pedestrian behaviour or compliance. Assessments are only typically done if there is a request for an increased level of pedestrian control, such as an active device.

Strathcona County, Alberta

Strathcona County uses zebra crosswalk markings at mid-block crossings, on the uncontrolled leg of an intersection and across right-turn channels to pork-chop islands. In general, TAC guidelines are followed for the installation of warranted crosswalks. Materials used for installation include paint and thermoplastic (surface applied and inlaid). There have been no slipping/skidding issues associated with the paint applications. Early installations of the thermoplastic materials did result in slip issues for pedestrians and cyclists, however newer thermoplastic products have performed better in mitigating slip issues. The size and spacing of the zebra bars has been modified from the TAC guideline to create vehicle wheel paths in the layout in order to reduce wear and improve maintenance aspects. There have been no assessments related to pedestrian or driver behaviour/compliance after installation.

Cambridge, Ontario

The City of Cambridge installs zebra crosswalks at all school crossing locations and other locations on a case by case basis where safety is deemed to warrant enhanced markings. Zebra style markings are only installed in locations under free flow conditions (uncontrolled). Both paint and cold plastic are used to install the zebra markings and there have been no complaints or instances where slipping has been an issue. There have been no assessments related to pedestrian or driver behaviour / compliance.

Mississauga, Ontario

The City of Mississauga does allow the use of zebra crosswalks and have developed draft placement guidelines based on pedestrian and vehicle volumes. According to the guidelines, zebra crosswalks are only to be installed at locations controlled by traffic signals or stop signs and are not recommended at designated, uncontrolled mid-block school crossings. Cold plastic materials are used for installation and there have been no slipping issues. No formal assessment of driver and pedestrian behaviour and compliance have been undertaken, however, observations have been made by crossing guards that the zebra markings appear to have had an impact on driver recognition of the crosswalks.

Saskatchewan Ministry of Highways

The Saskatchewan Ministry of Highways uses zebra striping at uncontrolled crossing locations (mid-block crossings, locations where the speed limit is greater than 90 km/h, where overhead crosswalk signs are used and crosswalks with overhead flashers). Zebra markings are applied using paint and there have been no skid problems associated with the installations. There have been no assessments of pedestrian and driver behaviour/compliance.

Region of Waterloo, Ontario

The Region of Waterloo use zebra striping at crosswalk locations that meet the following criteria:

- Within a City Urban Area with a minimum of 1000 pedestrian crossings per day on all legs of the intersection, or 700 pedestrians in 8 hours;
- Within a Township Urban Area with a minimum of 400 pedestrian crossings per day on all legs of the intersection, or 280 pedestrians in 8 hours;
- Where the crosswalks are used regularly by visually impaired pedestrians;
- With high pedestrian collisions (minimum of 3 in 5 years);
- Near Central Transit Corridor express stations;
- Generally, crosswalks at roundabouts are all to have zebra markings, unless the pedestrian volume is very low (less than 20 pedestrians in 8 hours). Where pedestrian volumes are very low, twin-parallel line crosswalks are acceptable.

The policy also states that where zebra crosswalk markings are used at an intersection, all crosswalks at the location are to be done with zebra markings. Permanent plastic materials are used to install the zebra markings and there have been very few complaints regarding slipping. Use of the plastic materials is not seen as having manifested into any kind of widespread problem.

Vancouver, British Columbia

The City of Vancouver had previously used zebra crosswalks only at school crosswalks, mid-block crosswalks and across right-turn channels but are now moving toward the use of zebra markings for all unsignalized crosswalks. Zebra markings are installed using thermoplastic materials with no skidding issues. There have been no assessments of pedestrian and driver behaviour/compliance.

Chilliwack, British Columbia

The City of Chilliwack uses zebra crosswalks only at special crosswalk locations near schools. Thermoplastic is used for installing the markings and there have been few, if any, concerns raised about traction on the thermoplastic. There was no information provided regarding assessment of pedestrian and driver behaviour/compliance.

Winnipeg, Manitoba

The City of Winnipeg uses zebra crosswalks for pedestrian corridors/special crosswalks and for crosswalks at higher volume roundabouts. Zebra markings are placed using paint and are not aware of any slipping issues. They are also looking at using 3M permanent marking tape at a location to be built in 2014. There have been no assessments of pedestrian or driver behaviour/compliance.

Summary of Survey Results

Results of the information gathering survey indicated that zebra crosswalk markings are in relatively widespread use across Canada, with each jurisdiction using its own criteria to determine where they are used. As indicated by the responses received, assessment of the effectiveness of zebra crosswalk markings in changing driver or pedestrian behaviour or

compliance has not been done and would be difficult to do. A variety of materials are used in the placement of zebra markings such as standard traffic paint, thermoplastic and cold plastic permanent markings with none resulting in any significant slipping or skidding issues.

FINANCIAL IMPLICATIONS

There is currently no funding allocated for the painting of zebra crosswalk markings. In order to undertake the painting of zebra crosswalk markings at certain marked, uncontrolled crosswalks, the following, approximate, amounts would need to be included in future budgets:

	Initial Installation	Re-painting
All Marked, Uncontrolled Locations	\$155,000	\$85,000
Overhead RA-5 Locations Only	\$60,000	\$30,000
Marked, Uncontrolled School Crossings Only	\$30,000	\$15,000

COMMUNITY ENGAGEMENT

Community engagement was not deemed necessary as this report was a result of a request from the Crosswalk Safety Advisory Committee which is comprised mainly of members of the public who will receive the information contained herein.

A copy of this report can be obtained online at <http://www.halifax.ca/commcoun/index.html> then choose the appropriate Community Council and meeting date, or by contacting the Office of the Municipal Clerk at 490-4210, or Fax 490-4208.

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