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REGIONAL MUNICIPALITY

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Info Item No. 3

Transportation Standing Committee
June 7, 2014

TO: Chair and Members of Transportation Standing Committee

SUBMITTED BY: Original signed

Kathleen Llewellyn-Thomas, P.Eng., A/Director, TPW

DATE: April 25, 2014

SUBJECT: **Crosswalk Safety Advisory Committee – Crosswalk Safety Work Plan**

INFORMATION REPORT

ORIGIN

Item 11.4.1 of the March 4, 2014 session of Halifax Regional Council:

MOVED by Councillor Dalrymple, seconded by Councillor Walker that Halifax Regional Council forward the work plan, attached to the January 30, 2014 Crosswalk Safety Advisory Committee report, to staff for analysis, budget implications and implementation.

MOTION PUT AND PASSED UNANIMOUSLY.

LEGISLATIVE AUTHORITY

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

BACKGROUND

The Crosswalk Safety Advisory Committee (CSAC) was established by Halifax Regional Council on March 5, 2013 with the following mandate:

The CSAC will serve as a forum to develop and present input and advice with respect to crosswalks, with the objective of improving the safety of pedestrians using crosswalks in HRM.

The CSAC will develop a report, along with action plans to improve the safety of pedestrians using crosswalks, both marked and unmarked.

Issues to be addressed in the report include, but are not limited to education, enforcement, traffic control measures and standards and consistency, as they relate to crosswalks, including budget implications.

DISCUSSION

The Crosswalk Safety Work Plan includes six goals, each outlining several actions. Staff has reviewed and assessed each action contained in the work plan and provide the following information in response to each.

Goal 1 – Educate public about crosswalk safety in HRM & NS

Action – Implement a Crosswalk Safety Campaign (e.g. Distractions Kill Campaign month long efforts)

As part of the recent Pedestrian Safety Action Plan submitted by staff to Halifax Regional Council, $170,000 was allocated in the 2014/2015 Capital Budget for an extended public awareness/education campaign to be carried out by Corporate Communications that will be implemented over two separate six-week periods during the year. It will also include/incorporate an evaluation component with pre and post campaign surveys to assess message recall and awareness.

Action – Create and implement an annual crosswalk safety awareness day campaign (cover marked/unmarked, traffic signals, flashing don't walk signs, awareness of existing crosswalks).

A discussion regarding this action item took place at the April 24th meeting of the Crosswalk Safety Advisory Committee (CSAC). Staff indicated that it would be beneficial to engage HRM Corporate Communications staff to assist with this task. Staff from Traffic and Right of Way (TROW), Police and Corporate Communications met on May 2nd to discuss public awareness/education activities, including this action item. Staff will work with the CSAC to help ensure this action item is achieved.

Action – Education about the installation of zebra markings through a news release.

At the start of the annual pavement marking program, staff released information related to the new zebra crosswalk markings via social media. A Twitter post was released on May 8th that linked back to a webpage (http://www.halifax.ca/traffic/reports/MarkedCrosswalks.html) showcasing images of the first crosswalk to receive the new markings along with information and Q & A's related to zebra crosswalks. Staff also took part in a media interview with CBC discussing the new zebra crosswalk markings.

Action – Identify other organizations that have on-going initiatives and interest in crosswalk safety.

This action item has been identified as being primarily the focus/responsibility of the Crosswalk Safety Advisory Committee. Staff will provide any required support to achieve this action item.

Goal 2 – Evaluation and Data – Target Enforcement based on Data/Evidence (location, time of year, days…)

Action – Improve data collection by developing partnerships among those already collecting data (HRP, Dal, RCMP, HRM Traffic, SNSMR, NSTIR, HRSB).

HRM TROW has had an on-going relationship with most of the organisations identified (HRP, RCMP, NSTIR, SNSMR) and has formed new relationships with the others (Dal, HRSB) recently through various initiatives. New systems and processes have been, and are being, put in place that will improve the timeliness and quality of data being collected and exchanged which will make it easier to target efforts (engineering, education and enforcement) toward those areas that require attention in a more proactive manner (as outlined in the recent Pedestrian Safety Action Plan). HRM staff from TROW, Police and Corporate Communications has already held an initial meeting (May 2nd) to discuss progress in data collection and how that data can be used to help focus the efforts of their respective groups in moving forward.

The HRP and RCMP have augmented the data collection procedures for 2014 and have completed the collation of the 2013 data. Analysts from TROW and the police are now meeting to review the data and will look to engage other agencies and organizations.

Action – Implement on-going dedication/prioritization of existing resources to be assigned to data collection issue.

The HRP and RCMP have introduced new reporting requirements and are extracting data on pedestrian collisions on a weekly level to add to the database. The data extraction is being conducted by Divisional Analysts and being reviewed centrally for analysis. The results of the analysis are being shared with TROW staff.

Action – Implement a process of data analysis, interpretation and reporting.

Halifax Regional Police have modified their Records Management System which allows for easier data capture/collection related to pedestrian/vehicle collisions and Divisional Crime Analysts are now responsible for tracking pedestrian/vehicle collisions on an on-going basis. Police then provide TROW with a monthly report on pedestrian related collisions which are used to assess the collision locations and identify any potential trends.

Halifax Regional Police have completed a review of all collisions from 2013 in order to extract those involving pedestrians. Preliminary analysis has been done on the data and the information compiled into a report and collision locations have been mapped (Attachment 1).

Once the new Accident Support Services Incorporated System is put into place, it will allow up-to-date and near real-time reporting and analysis of pedestrian/vehicle collision information.

Goal 3 – Evaluation and Research

Action* – *Research potential programs for community initiative; following which develop and implement a program for community volunteers (e.g. adopt a crosswalk initiative).

There could be difficulties in implementing initiatives as intended under this action item. There will likely be many issues surrounding safety, liability and legislation where private citizens would be involved with any activities associated with traffic control devices (crosswalks and signage) or enforcement. Staff solicited input through the TAC Traffic Operations and Management Standing Committee to determine if programs such as these might exist elsewhere across Canada. Based on the responses received, no such program exists however, staff will continue to work with CSAC to assist with any potential initiatives they may wish to explore.

Goal 4 – Enforcement – Increase non-monetary penalties

Action* – *Recommend the Province review the Motor Vehicle Act with respect to increasing the non-monetary penalties for pedestrian motor vehicle violations (e.g. increased points, defensive driving course, pedestrian safety course, and mandatory driving exam re-writes).

Initial reviews have not located evidence based programs to date. Discussions have begun on the feasibility of a "Crosswalk Infraction School" based on the "Noggin Knowledge" approach used for bicycle helmet safety. The basis of the program is to provide educational opportunities for persons charged with crosswalk offenses. Persons charged and who meet the criteria (i.e., no injuries or accident involvement for instance) can opt to attend a one day Crosswalk School and receive education on laws, safety, victim testimonials, from drivers and family, etc. Successful attendance then allows the ticket fine to be withdrawn. This would be used in combination with measurement pre and post on attitude and educational changes. As noted, this is in discussion phase at this time.

Action* – *Increase enforcement of crosswalk legislation at all crosswalks, including targeted enforcement at specific locations and times.

The HRP/RCMP Integrated Traffic Unit have been given direction to have Crosswalk Safety as a standing priority item each month in addition to the Monthly Traffic Safety Theme. Tickets issued are being monitored and reported with the following totals:

- January - 11
- February - 23
- March - 24
- April - 24

Information contained in the report included in Attachment 1 has been provided to Divisional Commanders and direction has been given to focus on the areas identified. Enforcement will take the form of regular patrol and proactive enforcement for both pedestrians and drivers.

Goal 5 – Standards – Appropriate standards in place to reflect differences local urban/suburban/rural areas

***Action* – Develop a mechanism for more community input through this committee.**

Staff recognize the importance of the Crosswalk Safety Advisory Committee as the primary source for public engagement and has identified the committee as providing the key public engagement piece feeding into The Pedestrian Safety Action Plan. Staff will continue to participate and support the committee in its on-going efforts.

***Action* – Recommend the Province re-define the role of the Traffic Authority to reflect modern transportation reality in HRM.**

According to the Nova Scotia Motor Vehicle Act (MVA), "traffic" includes pedestrians, herded animals, vehicles, street cars and other conveyances either singly or together while using any street for purposes of travel. It should also be noted that under the MVA, a "bicycle" is considered to be a vehicle.

The Traffic Authority is responsible for ensuring the safety of traffic operations on HRM's roadways according to the regulations as set out in the MVA and through the application of widely accepted engineering standards and practices and sound engineering judgement. The Province is continuing with a project to update and modernize the MVA through a major rewrite that will see the current Motor Vehicle Act replaced by the Road Safety Act and it is anticipated that the new Act will incorporate a definition of the role and responsibility of the Traffic Authority as it fits with the new Road Safety Act.

***Action* – In consultation with the CSAC revise the warrant system for installing and removing crosswalks to be tailored for urban vs. suburban/rural vs. school situations.**

TROW uses the Transportation Association of Canada (TAC) Pedestrian Crossing Control Guide, 2nd Edition (2012) when assessing requests for the installation of marked crosswalks or when assessing existing marked crosswalk locations for potential upgrade or removal. This guide was produced through extensive research into best practices followed by municipalities and jurisdictions across Canada with the main objective of promoting uniformity in the approach used when providing pedestrian crossing control, while improving road safety for pedestrians. This is done through the use of a decision support tool to aid in decision-making when establishing the need to control traffic so pedestrians are able to cross the roadway. The guide also aids in identifying the type of traffic control device that would be most suitable based on the geometry and cross section, vehicular exposure, and pedestrian demand at the crossing location. A marked crosswalk is used to indicate to drivers where to expect pedestrians, indicate to pedestrians where to cross and at mid-block locations, crosswalk markings legally establish the crosswalk.

The crosswalk warrants from the guide are more inclusive than the previous guide and take into account the different areas of municipalities. The new guidelines consider a marked crosswalk on roadways with a minimum of 1500 vehicles per day (a local residential road in HRM is expected to carry up to 3000 vehicles per day). Using the warrants in the latest guide, a local road may

meet the traffic volume criteria it wouldn't have in the past. The previous warrant considered traffic volumes per hour based on the need to create gaps for crossings; a two-lane road would need 800 vehicles per hour and a four-lane road would require 300 vehicles per hour. A local road would not have met the previous volume requirements; even some collector roads may not have met the previous requirements.

The new guide also requires a certain number of pedestrian crossings before installing a marked crosswalk, a minimum of 15 equivalent adult units (EAUs) per hour, for seven (7) hours. An adult would be considered one (1) EAU, a child under 12 is two (2) EAUs, a senior is 1.5 EAUs and a pedestrian with a physical impairment is two (2) EAUs. The pedestrian volume threshold may be more difficult to reach in rural areas however these locations also typically have lower traffic volumes and so there would be minimal/no delays when crossing the road. The previous warrant required at least 20 EAUs cross in the peak hour.

Seven guiding principles were developed to help aid professionals in the assessment and decision making process when determining the need for, and type of, pedestrian crossing control at a particular location:

- Safety – the key objective and relates to the fundamental requirement that a road system protect pedestrians and other vulnerable road users by achieving a high level of compliance by all road users.

- Delay – requires careful management to ensure pedestrian delay does not become so great that it results in pedestrians making risky or non-compliant crossings.

- Equity – ensures the demographics of the pedestrian population as well as the mix of road users at different time periods are considered when assessing a particular location.

- Expectancy – ensures that the placement of a pedestrian crossing treatment is not done in such a way, or at a location, that would violate a driver's expectation to encounter a pedestrian. This increases the likelihood of drivers responding to situations correctly and quickly.

- Consistency – helps ensure crossing control installations and devices are recognized, comprehended and used effectively by all road users through a consistent and uniform approach to installation of crossing control measures across the entire transportation system.

- Connectivity – ensures effective crossing opportunities are provided for pedestrians within the transportation system while also considering driver workload and expectation, proximity to other crossings and safety. This principle involves understanding and monitoring pedestrian desire lines which are a function of land use, location of pedestrian generators/attractors and proximity to existing crossing facilities.

- Pragmatism – ensures professionals consider the practical issues or consequences associated with provision of a particular crossing control at a particular location. This requires that selection of a particular device, or deciding whether or not to install a

device, is based on all factors including costs, effectiveness of the device in local conditions, ease of installation and maintenance of the device (particularly in winter when maintenance due to snow and ice can be challenging).

By applying the above principles as outlined in the guide, the warrant procedure does not favour any one type of location over any other simply based on whether it is urban, suburban, rural or other and instead focuses on site specific information as it relates to nearby facilities, roadway characteristics and pedestrian and vehicle volumes; providing an objective assessment of the location being investigated based on conditions and resulting requirements.

Because of the extensive research encompassing input from engineers, planners and other practitioners from jurisdictions across the country that went into the production of the guide and its methodologies, HRM being one of the contributors, TROW staff do not see the benefit of "revising" these warrants as they already provide for an appropriate and objective evaluation of potential and existing crosswalk locations.

Goal 6 – Traffic Control Measures – Improve Traffic Control Measures

Action* – *Use zebra markings at crosswalks (uncontrolled, marked crosswalks)

Funding for this action was approved by Council in the 2014/2015 operating budget and painting of zebra markings at marked, uncontrolled crosswalks. Installation of zebra markings has begun and will be completed at all marked, uncontrolled crosswalks in conjunction with the 2014 Pavement Marking Program.

RA-5 Crosswalk, Lower Water Street at Sackville Street (Before & After Installation of Zebra Crosswalk Markings)

<u>Action</u> – Increase efforts of crosswalk painting maintenance; to review current practices and explore ways to improve services.

The current service standard is that crosswalks in HRM are repainted once a year (typically between May and October). Federal environmental regulations introduced in 2012 stipulate the use of paint products that have a low volatile organic compound (VOC) concentration. In order to be in compliance with the regulations, HRM was required to switch from solvent-based to water-based traffic marking paint. Water-based traffic marking paint presents some challenges in application as this material is more sensitive to temperature and humidity during application. Minimum application temperature to ensure acceptable performance is higher than solvent-based paint products and maximum humidity levels are lower, resulting in a narrower window when appropriate painting conditions exist and effectively shortening the available painting season. In addition to the challenges associated with application, water-based paint is also less durable and susceptible to increased wear from road salt/sand abrasion during winter maintenance operations and in-service conditions.

In order to gain insight into other jurisdictions' experience with pavement marking maintenance and to assess the potential for alternate paint products, staff contacted a pavement marking contractor operating in Western Canada. They provided the following information obtained from their municipal customers:

<u>Waterborne Paint</u>

Both Saskatchewan and Alberta have successfully used waterborne paint for highway long line application for over five years. The quality and durability of the product has proven equal to alkyd materials, however caution must still be taken when applying the material when the humidity is high and the temperatures are low.

British Colombia has not had the same level of success as the other provinces. Typically, BC experiences higher humidity and more frequent rain than the prairies which prompted the operations department to look for alternative products. That being said BC has had reasonable success with waterborne paint for highway application.

When it comes to municipal work almost without exception every municipality has complained about both the application and durability of waterborne paint. It is difficult to put down and does not last. The Cities of Saskatoon and Regina had almost no paint lines survive through this past winter. Both are out painting almost a month early in advance of their sweeping program trying to put lines on major roadways.

<u>Low VOC – Alkyd Based Paint</u>

This product has been tested but has not appeared on the Alberta Transportation approved products list but the 'Alaska' formulation can be used in British Columbia. The painting contractor will be testing this product in BC in the next few weeks. The City of Calgary has been asking about the product and it appears that a number of people are looking at it but no one has any experience with either its application or performance.

Low VOC – Acetone Based Paint

This product showed great promise. The paint contractor has used quite a bit in BC for highway application with reasonable results. The largest municipal user of this product was the City of Calgary. They used this product in 2012 and 2013 for all their paint applications. They work at night when temperatures drop and the humidity rises and they found that application went well. However, this spring (2014), after a tough winter for them, they have very few markings left and are unhappy with the results.

Although Calgary has had durability issues over the past winter with this type of paint, it should be noted that their climate conditions vary considerably from those in HRM. Also, because of the colder winter temperatures, Calgary tends to use sand instead of salt during its winter maintenance operations which could result in much more abrasion and scouring conditions which would impact durability.

There has been limited use of low VOC acetone paint in HRM and the results show some promise in the area of durability as well as providing more flexibility in application conditions thereby extending the timeframe available for painting. Based on this, HRM will be moving forward with this type of paint in the 2014 painting season.

TROW staff continue to investigate alternative materials for use in the application of pavement markings in order to achieve the best possible end product while remaining compliant with Environment Canada regulations respecting VOCs. Paint manufacturers are well aware of jurisdictional concerns with respect to the durability of low VOC paint and are attempting to provide new products. Also, permanent markings (cold plastic, thermoplastic, etc.) are an alternative to painted pavement markings such as crosswalk lines or zebra markings. Although typically more durable, they tend to cost six to eight times the average cost of painted markings.

In addition to using a low VOC acetone paint this year, staff will continue to investigate the use of alternative materials for future pavement marking programs. Also, staff intend to re-paint crosswalks in the high pedestrian, downtown areas in the fall as part of the 2014 pavement marking program.

***Action* – Use pedestrian friendly designs at intersections (such as bump-outs to make pedestrians more visible at crosswalks).**

As part of HRM's capital projects, TROW staff works in conjunction with Design and Construction Services to identify opportunities to improve pedestrian facilities by introducing pedestrian ramps and/or other infrastructure to reduce pedestrian crossing distances and make pedestrians more visible at intersections where work is being undertaken. Pedestrian ramps are required to be included at all locations, but assessment is also done to determine where measures such as curb bump-outs or refuge islands can be used to improve pedestrian visibility and reduce the crossing distance and exposure for a pedestrian. A recent example of this can be seen at the intersection of Devonshire Ave/Duffus St/Novalea Drive where both a curb bump-out and a refuge island were installed during a traffic signal upgrade project. The current North Park Roundabout project is also incorporating opportunities to include bump-outs at the roundabout

entries in order to minimize pedestrian crossing distances and place pedestrians in a more visible location at crossings.

Action – Increase pedestrian visibility such as identifying poles that block pedestrians at RA-5 locations and address pruning of vegetation at crosswalks.

As noted in the 2014 Pedestrian Safety Action Plan, TROW staff will be assessing and prioritizing all 180 RA-5 locations in 2014 in order to identify which are still warranted and which may require removal. For those locations that are shown to still be warranted, an evaluation will be done to determine what changes may be required at the crossing locations. Staff will be identifying the need for such things as the addition of pedestrian activated beacons, accessibility upgrades (relocation of the push-button lower on the pole, addition/modification of pedestrian ramps, ensuring a hard surface exists right up to the pole), relocation of poles to improve visibility or potentially relocation of the entire crosswalk.

Pruning of vegetation at crosswalks is done by Municipal Operations (MOPS) based on resident complaints or staff review. TROW staff will be assessing all uncontrolled, marked crosswalk locations and during the assessments, any required pruning of vegetation will be identified and reported.

Action – Approving the use of crosswalk flags in HRM at crosswalks where the community takes on the responsibility of installing and maintaining them.

Some US municipalities have experimented with crosswalk flags at marked crosswalks. The following information identifies several US cities and their general experience with these devices.

Salt Lake City (Utah)

Crosswalk flags have been in use for a number of years. When the crosswalk flag program first started, approximately 11% of pedestrians used the flags. A media and marketing campaign was carried out to raise awareness of the crosswalk flag program and the proper use of the flags and resulted in an increase in flag usage to approximately 14%.

Kirkland Lake (Washington)

A crosswalk flag program was implemented in 1995. A study done in 2007 showed that only 8.6% of individual pedestrians were using a flag. When groups of pedestrians were crossing, flag usage was slightly higher; 11.8%, for at least one person in a group carrying a crosswalk flag.

Berkeley (California)

The City of Berkeley undertook a 3 year study of its crosswalk flag program which resulted in the cancellation of the program as it was found that the flags were not used as intended, only 2% of pedestrians used the flags and flag use did not have a noticeable effect upon driver behaviour.

Seattle (Washington)

The City of Seattle Washington no longer installs any new crosswalk flag locations except if community sponsors or neighbourhood organizations provide crossing flags and meet the City's guidelines for their installation. The City noted that the flags do make pedestrians more visible however; there was not any consistent pattern of compliance by motorists. There was also an issue with frequent theft of the flags making it difficult to evaluate the intersections.

Astoria (Washington)

The City of Astoria initiated a crosswalk flag program in early 2013 as part of its new years' Council goals. After only four months, City Council voted to discontinue the program and remove the flags in response to a recommendation from the City's Traffic Safety Committee and a motion put forward by the Councilman who had originally been a proponent of the system. The reasons cited for the discontinuation of the program were that the flags weren't being used (only about 6% of pedestrians used the flags), they weren't seeing beneficial results from other jurisdictions around the state who had such programs and a high rate of theft. In the four month period when the program was in place, approximately 300 flags were stolen or damaged.

A major study done by US National Cooperative Highway Research Program also looked at the effectiveness of crosswalk flags and it found that when pedestrian crossings were staged, average driver compliance was 65%. When the study looked at the general population using flags, average driver compliance was 74%. However, many of the locations that had crosswalk flags were installed on low volume two-lane roadways. While flags may have potential to improve safety, the report also found that the percentage of the general population who used the flags was only 17%. Of this percentage, only 8% of users correctly used the flags while crossing, the other 9% used the flags but did not wait to cross properly.

As part of the research carried out in producing the current TAC Pedestrian Crossing Control Guide (December 2012), there was a review of crosswalk flag programs. Results of the research for US jurisdictions indicated similar findings to what has been provided above (low usage rates and programs being discontinued).

With such low usage by pedestrians and limited information to support any noticeable change in driver behaviour, there does not appear to be any significant benefit to the use of crosswalk flags. There could also be liability issues for HRM should community groups be allowed to install and maintain crosswalk flags within the municipal right of way, therefore, staff do not support the use/installation of crosswalk flags.

Action* – *Installation of reflective tape on all crosswalk sign poles.

The RA-4 crosswalk signs installed at marked crosswalks are 60cm x 75cm and employ a high grade of retro-reflective material for signs, providing a reflective area of $0.45m^2$. The proposed reflective tape, which should be of equivalent retro reflectivity to the sign, would be approximately 2cm x 2m, providing approximately $.04m^2$ of reflective area (only about a 10% increase of overall reflective area).

The addition of reflective tape to crosswalk poles appears to provide only a minimal benefit. As an alternative, staff will be moving forward with several initiatives as outlined in the 2014 Pedestrian Safety Action Plan that will provide a significant improvement to the visibility at uncontrolled, marked crosswalks. Some of these initiatives include:

- Replacement of old, side mounted RA-4 crosswalk signs to ensure maximum reflectivity
- Upgrading down-lighting at overhead RA-5 crosswalks to brighter LED lighting
- Installing side mounted flashing beacons in addition to the overhead beacons at certain RA-5 crosswalk locations

The RA-5 crosswalk on Cole Harbour Road at Bissett Road was recently upgraded with all three of the above items. The following photos illustrate the improvement achieved through the noted upgrades.

RA-5 Crosswalk on Cole Harbour Road at Bissett Road – Before and After Lighting and Signage Upgrades

<u>Action</u> – Install new signs facing the pedestrian at crosswalks as a pilot at certain sites (e.g. cautioning pedestrians).

HRM currently has signs at signalized crosswalks advising pedestrians on the proper interpretation of the pedestrian signal displays and safe crossing procedure. Other pedestrian oriented signage also exists at several other locations, based on specific conditions at the particular location, in order to advise the pedestrian of particular conditions that require additional attention or guidance. Below are some examples of existing pedestrian related signage currently being used on HRM roads. To move forward with the widespread installation of generic pedestrian oriented signage at all crosswalks would not provide any real benefit because unless there is a specific condition associated with the sign, it will simply become unnoticed background clutter shortly after the initial installation. Staff will however, continue to install signage, similar to that shown below, at specific locations where it has been determined a condition exists that requires additional guidance for pedestrians and/or drivers. If the intent behind this particular action item is for the signage to provide general education (i.e., reminding pedestrians to look both ways), then this would be better dealt with through formalized public education campaigns, not through the posting of signs. As indicated above, signage providing general education messages would quickly become ineffective and unnoticed background clutter.

Pedestrian Signage Used at Signalized Intersections and Pedestrian Half Signals

Signage Used at a Pedestrian Half Signal on Quinpool Road at Beech Street (left) and RA-5 Crosswalk on Wyse Road at Dartmouth Sportsplex (right)

Signage Installed at the Connaught Avenue / Windsor Street Intersection

<u>Action</u> – Contingent on Province's decision to decrease speed limits, allow speed reduction on certain streets where deemed necessary.

Lower operating speeds have been shown to reduce injury collisions and fatalities. In Nova Scotia the lowest maximum speed that can be posted is 50km/h or 30km/h in a school zone. Research into lower speed limits has found that simply posting a lower speed does not always lead to a decrease in operating speeds. HRM cost-shared a project with NSTIR to conduct a 40km/h pilot study in 2003/2004 on several streets in Rockingham. The study concluded that operating speeds did not decrease as a result of the new lower posted speed limits even with Police conducting checks on 16 occasions. A study by the US Federal Highway Administration (FHWA) looked at raising and lowering the speed limit at sites in 22 States. They concluded that raising or lowering the speed limit had little effect on the operating speed; the average speed and 85^{th} percentile speed did not change by more than 3.2km/h. In addition, when speed limits were lowered, the compliance to the posted speed limit decreased.

TROW staff is awaiting the recommendations/outcome of the Province's reduced speed limit study. Once the study has been concluded and the results have been made available by the Provincial Road Safety Advisory Committee, staff will review and determine the applicability of implementation on HRM roadways.

<u>Action</u> – Increase the use of advanced yield to pedestrian lines when deemed necessary.

Advanced yield lines are pavement markings that are placed approximately 10m from a marked crosswalk, along with accompanying signage, advising motorists to yield to pedestrians at a position in advance of the crosswalk and have been shown to be effective in reducing pedestrian collisions on multilane roadways. Use of advance yield lines helps to ensure drivers do not yield too closely to the crosswalk which can place pedestrians at risk by blocking the view of oncoming traffic in the adjacent lane(s).

On multilane roads with no median, signage could only be installed at the curb side and which may make it difficult to convey the "yield here" message to drivers in the centre lane(s), unless they are aware of the meaning of the pavement marking. An education campaign or PSA would be required to inform drivers who may not be familiar with this type of marking.

As part of the review of RA-5 crosswalks outlined in the 2014 Pedestrian Safety Action Plan, staff will also identify the applicability of advanced yield to pedestrian lines at each location.

<u>Action</u> – Continue to investigate and define use of solar pole flashing beacons to increase additional visibility of crosswalks.

The Transportation Association of Canada is currently reviewing rapid rectangular flashing beacons (RRFB) as a crosswalk treatment to bridge the gap between standard marked crosswalks and special crosswalks (overhead flashing RA-5 and pedestrian half signals) in terms of structure and cost. The study has not yet been completed, but initial information contained in an interim report indicates very good rates for compliance of drivers yielding to pedestrians at locations where a standard crosswalk has been upgraded to included RRFB modules. The study is also looking at assessing the effectiveness of different power sources (solar, connection to street

lighting and AC hard-wiring). Initial testing at trial locations in Calgary have identified issues related to the reliability of solar power (battery failures, increased maintenance requirements for the solar panels and water damage) and potential difficulties in tying in to hard-wired power sources. At this point in the study, recommendations are also being made regarding the need to come up with a warrant system for determining the conditions under which to augment standard crosswalks with the RRFB equipment.

Staff is not confident in the reliability of the solar powered beacons at this point and is awaiting the recommendations of the study upon its completion which is anticipated to be the Fall of 2014. At that time staff will review the recommendations related to installation of the beacons and power sources in order to determine how best to proceed with potential installations within HRM.

Crosswalk Upgraded with RRFB in Calgary

***Action** – Investigate and define the use of in-road crosswalk signs at appropriate locations.*

The TAC Pedestrian Crossing Control Guide identifies in-road crosswalk signs as an optional treatment. Optional treatments are defined as components which may be implemented if resources are available and there is a desire to improve the conspicuity of the selected crosswalk system. The guide indicates that this type of treatment should only be used for marked, uncontrolled school crosswalks, placed in conjunction with zebra crosswalk markings and is to be temporary in nature (removed when school children are not present). Both the Pedestrian Crossing Control Guide and the Manual of Uniform Traffic Control Devices for Canada (MUTCDC) indicate that these signs should only be used at key locations which may include: high pedestrian volume crosswalks; locations with higher than usual collision frequencies; or locations with sight obstructions.

Since the in-road crosswalk signs are identified in the MUTCDC as a regulatory sign (RA-8), they will need to be included in the Provincial Schedule of Official Highway Signs (not included at this time) and erected by a Traffic Authority in order to be used.

Benefits of these signs may be limited given that locations that would qualify to be considered for use of the sign will already be school crosswalks that have been upgraded with zebra markings, are likely to have a crossing guard and likely be located within a school area that would be subject to the reduced 30 km/h speed limit when children are present. Also, given the temporary nature of the sign, it would only be permitted to be in place when school children are present so requirements to continually install and remove the sign multiple times per school day could prove cumbersome and be difficult to implement.

Action – Recommend to the Province the use of neon coloured signs to identify crosswalks.

All traffic control signs, including RA-4 crosswalk signs, are governed by section 88 of the Nova Scotia Motor Vehicle Act (MVA). The MVA specifies that an RA-4 pedestrian crosswalk sign "must have a black symbol of a pedestrian on a white background" which is in keeping with national standards as outlined in the MUTCDC. A change to the MVA and the national standard (MUTCDC) would be required to permit the usage of neon or fluorescent coloured RA-4 signs.

Fluorescent yellow-green signs are used in the US for some warning signs and are included in the US MUTCD. NSTIR has been engaged and they are understandably reluctant to include this format as an approved sign without it first being assessed and approved as a nationally accepted standard. Staff will be submitting a project initiation form to the Transportation Association of Canada to study the potential use of fluorescent yellow-green crosswalk signage as part of the national standard in the Canadian MUTCD.

FINANCIAL IMPLICATIONS

There are no financial implications associated with this report. Items identified as being delivered can be funded in the current 2014/2015 operating budget.

Items being investigated and associated budget implications will be included in the 2015/2016 Pedestrian Safety Action Plan for Council's consideration.

COMMUNITY ENGAGEMENT

Community engagement was not required as this report is in response to a report submitted by the Crosswalk Safety Advisory Committee which is made up of, and receives input from members of the community.

ATTACHMENT

Attachment 1 – 2013 Pedestrian Collision Statistics

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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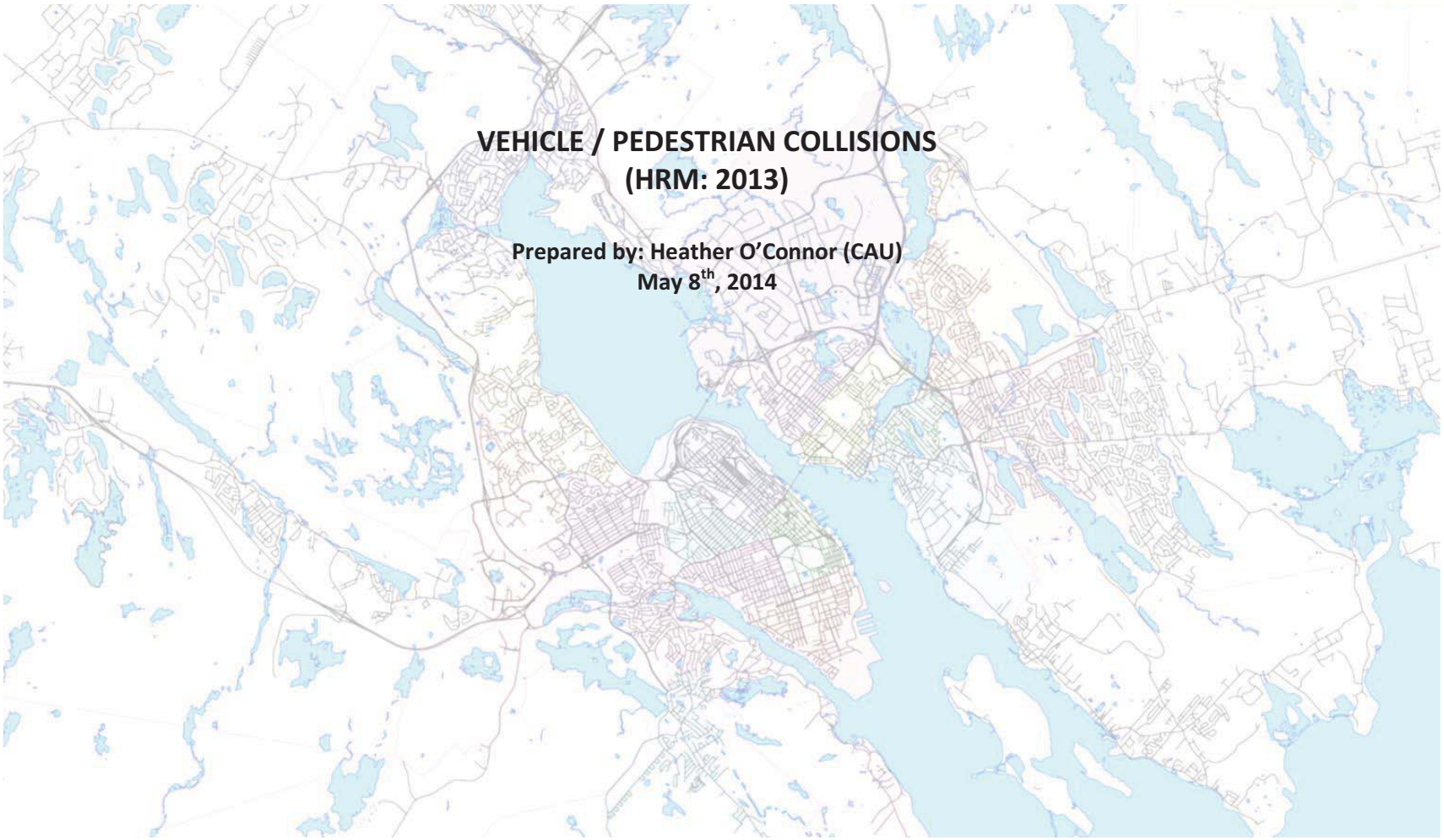
Original signed

Bill Moore, O.O.M., Deputy Chief, Halifax Regional Police, 490-7138

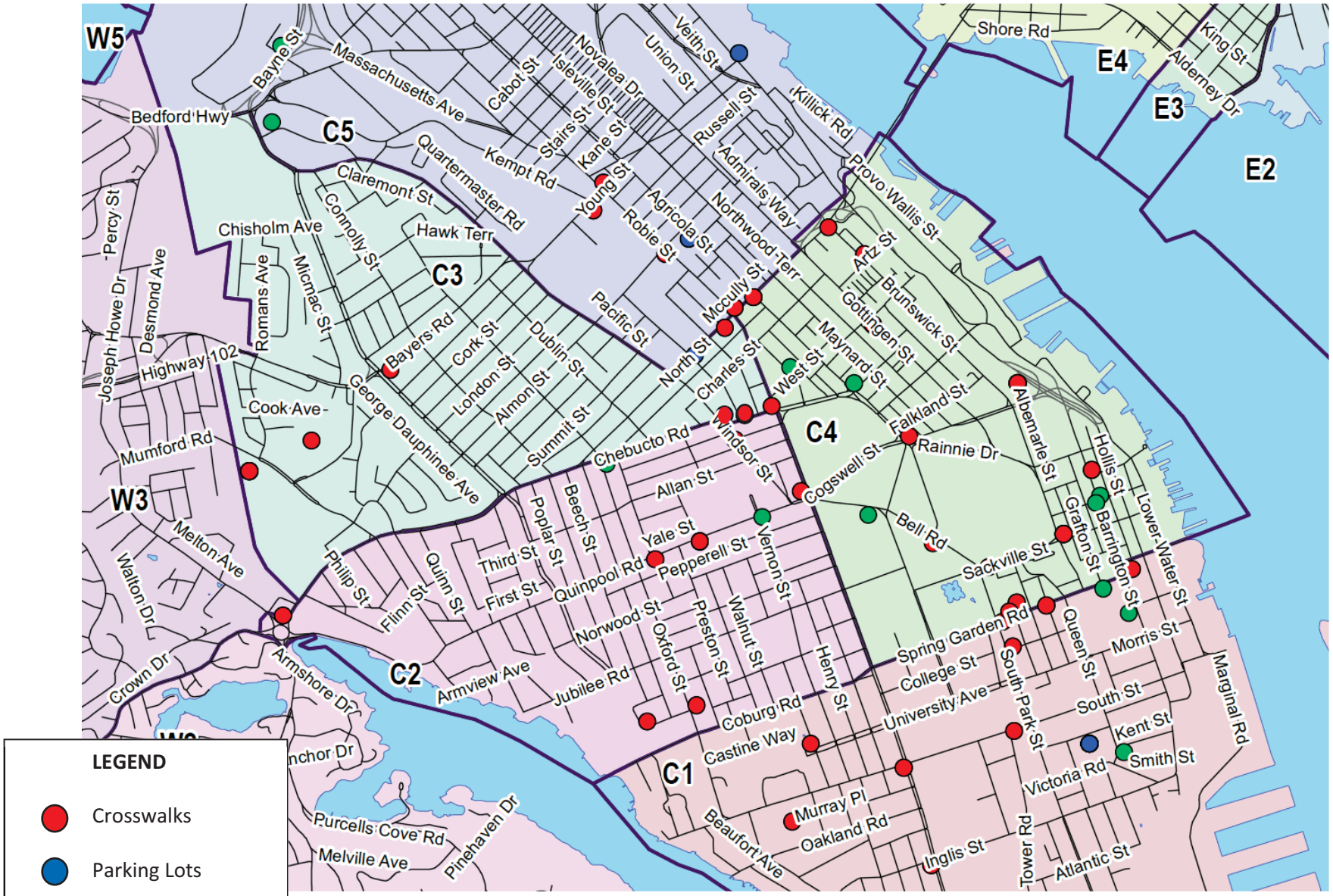


VEHICLE / PEDESTRIAN COLLISIONS
(HRM: 2013)

Prepared by: Heather O'Connor (CAU)
May 8th, 2014

Note: Multiple collisions that occurred in a single location are only represented by a single pin.

CENTRAL DIVISION



CENTRAL DIVISION

Spring Garden Road Area

There were six vehicle/pedestrian collisions on Spring Garden Road, five of which occurred in crosswalks.

Location	Circumstances
Spring Garden Rd / Barrington St	Bus driver failed to yield to pedestrian whilst crossing at walk light. SOT issued.
Spring Garden Rd / Brenton St	Driver stopped for a pedestrian to cross the road. Once that pedestrian crossed the driver failed to notice a second also in the crosswalk, who was struck. SOT issued
Spring Garden Rd / South Park St	Driver failed to yield to pedestrian whilst crossing at walk light. Unable to locate driver.
Spring Garden Rd / Robie St	Bus driver failed to yield to pedestrian whilst crossing at walk light. SOT issued.
Winsby's	Driver stopped for a pedestrian to cross the road but failed to notice second pedestrian in the crosswalk, who was struck. SOT issued.
Court House	Outside of crosswalk, driver slowed to yield to pedestrian j-walking and did not notice a second pedestrian, who was struck. Victim dressed in dark clothing on dark/wet night. SOT issued.

1120 Queen Street (Sobeys parking lot)

Three collisions were reported in the Sobeys parking lot area on Queen Street, two of which took place whilst vehicles were exiting the parking lot.

Location	Circumstances
1120 Queen St	Pedestrian struck while driver was exiting parking lot; driver's visibility reduced due to parked trucks on either side of vehicle. No SOT issued.
1120 Queen St	Pedestrian struck in marked crosswalk while driver was exiting parking lot. SOT issued.
1120 Queen St	Vehicle reversed out of parking spot and struck pedestrian. No SOT issued.

North Street Area
Six collisions took place at intersections on North Street, four of which were in crosswalks.

Location	Circumstances
North St / Agricola St	Driver failed to yield to pedestrian whilst crossing at walk light. SOT issued.
North St / Agricola St	Two pedestrians hit on sidewalk as a result of a two vehicle collision.
North St / Gladstone St	Pedestrian hit in parking lot. Dark and rainy conditions. No SOT issued.
North St / King St	Driver failed to yield to pedestrian whilst crossing in crosswalk. Unable to locate driver.
North St / Robie St	Driver failed to yield to pedestrian whilst crossing at walk light. No SOT issued due to complainant unwilling to provide statement.
North St / Barrington St	Driver failed to yield to pedestrian whilst crossing at walk light (on ramp to McDonald Bridge). SOT issued.

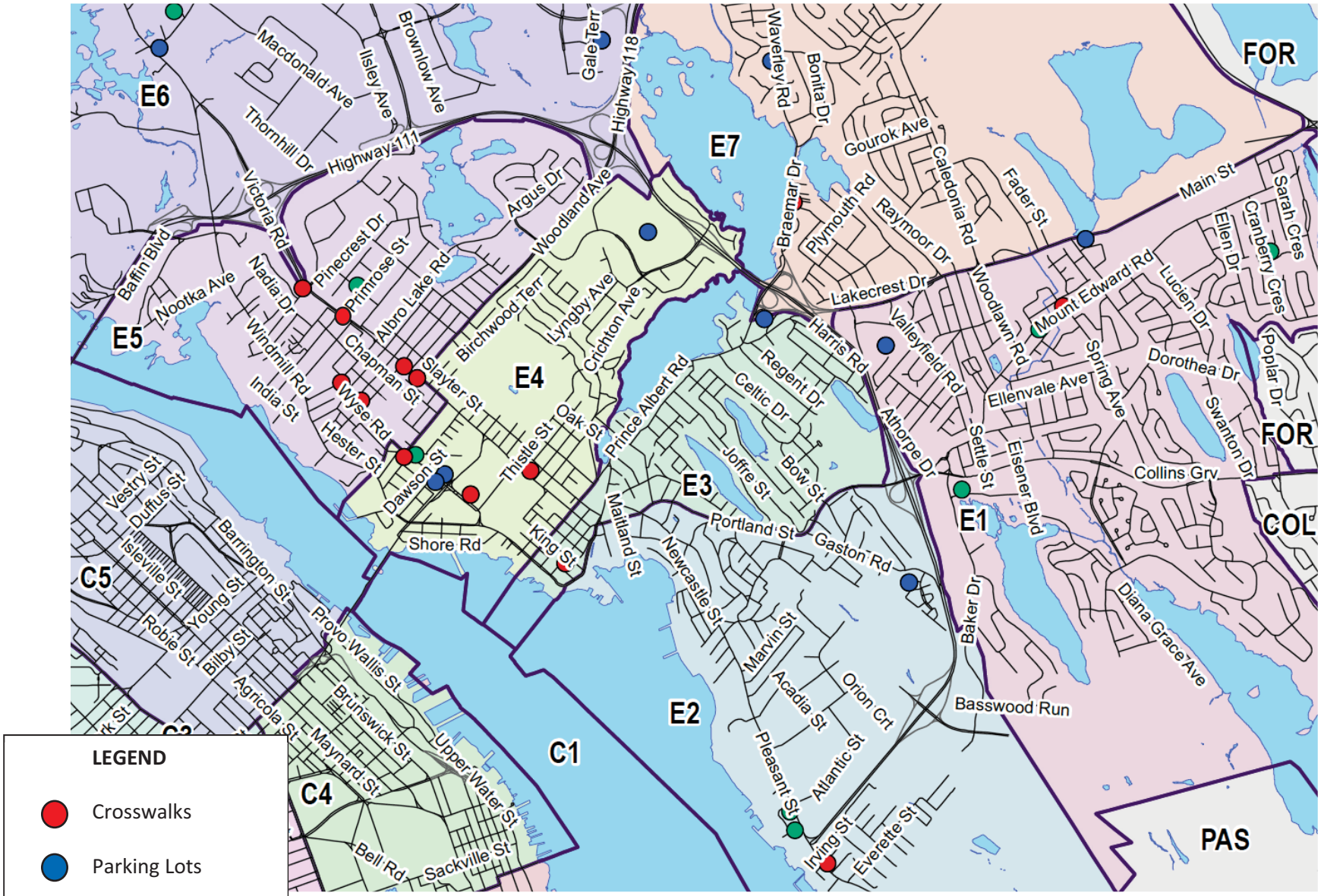
Quinpool Road Area
There were five vehicle/pedestrian collisions on Quinpool Road, four of which took place in crosswalks. Two of these collisions were at the Quinpool Road / Monastery Lane intersection.

Location	Circumstances
Quinpool Rd / Monastery Ln	Driver failed to yield to pedestrian whilst crossing in marked crosswalk. SOT issued.
Quinpool Rd / Monastery Ln	Driver failed to yield to pedestrian whilst crossing in marked crosswalk. SOT issued.
Quinpool Rd / Vernon St	Intoxicated pedestrian ran in front of vehicle and was struck. No SOT issued.
Quinpool Rd / Robie St	Pedestrian ran in front of vehicle in crosswalk whilst crosswalk light was red. No SOT issued due to unknown identity of victim.
Quinpool Rd / Harvard St	Driver failed to yield to pedestrian whilst crossing in marked crosswalk. SOT issued.

Cunard Street Area
Three collisions took place in crosswalks in the Cunard Street area.

Location	Circumstances
Cunard St / Robie St	Driver failed to yield to pedestrian whilst crossing at walk light. SOT issued.
Long & McQuade	Pedestrian hit by reversing snow plow. No SOT issued due to unknown identity of driver.
Chebucto Rd / Windsor St	Driver failed to yield to pedestrian whilst crossing at walk light. No SOT issued.

EAST DIVISION



EAST DIVISION

Victoria Road Area

Four vehicle/pedestrian collision occurred in the Victoria Road area, all of which took place in crosswalks. In two of the incidents the pedestrians were issued with SOTs.

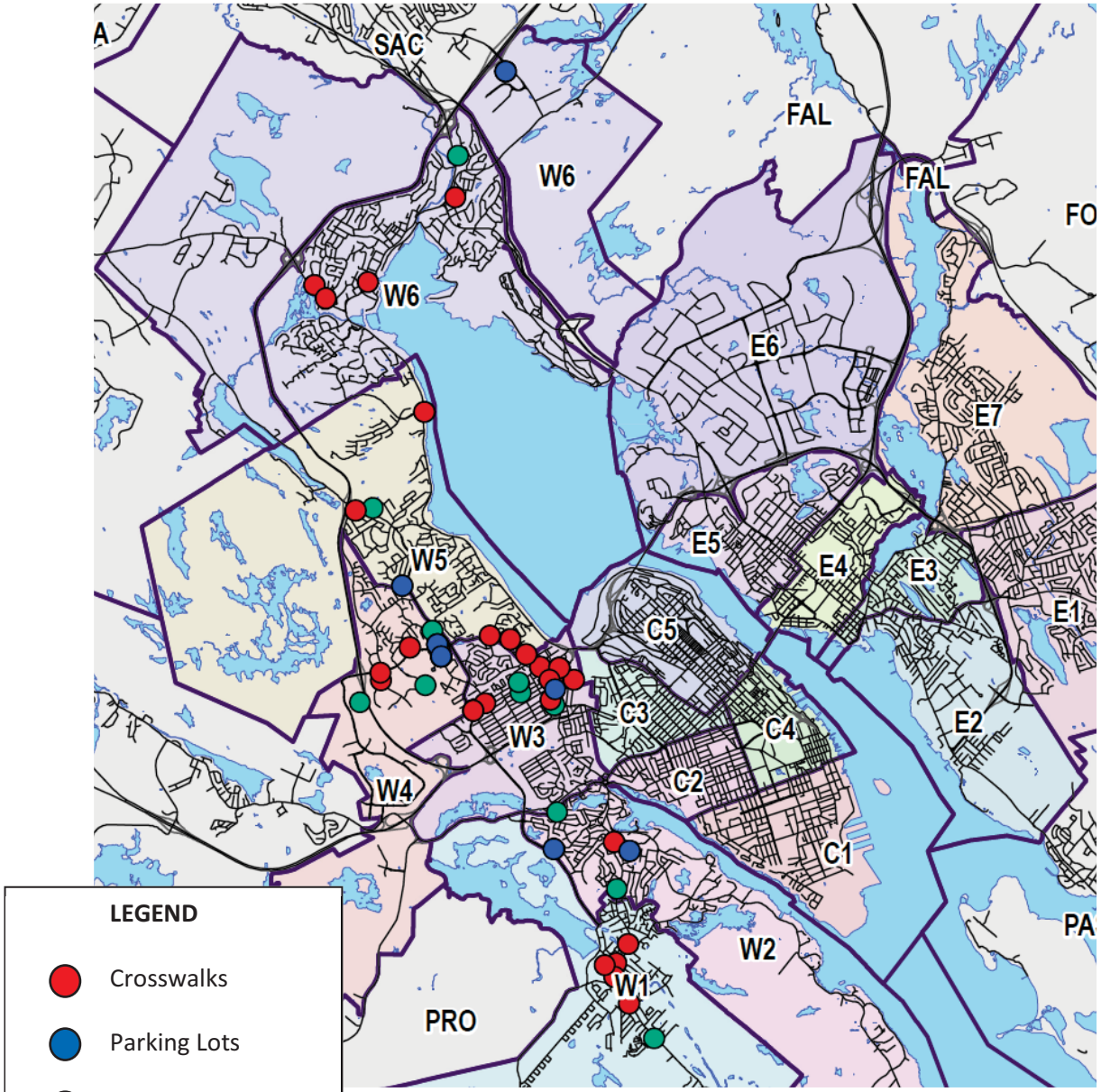
Location	Circumstances
Victoria Rd / Woodland Ave	Driver failed to yield to pedestrian whilst crossing at walk light. SOT issued.
Victoria Rd / Symonds St	Driver failed to yield to pedestrian whilst crossing in marked crosswalk. No SOT issued due to unknown identity of driver.
Victoria Rd / Primrose St	Pedestrian talking on cell phone stepped out in front of vehicle whilst crosswalk light was red and was struck. SOT issued to pedestrian.
Victoria Rd / Highfield Park Dr	Intoxicated pedestrian ran in front of vehicle whilst crosswalk light was red and was struck. SOT issued to pedestrian.

Wyse Road Area

Seven vehicle/pedestrian collisions were reported in the Wyse Rd area, two in parking lots. In one of the collisions the pedestrian crossed outside of a crosswalk zone, the remaining collisions took place in crosswalks.

Location	Circumstances
Wyse Rd / Thistle St	Bus driver failed to yield to pedestrian whilst crossing at walk light. SOT issued.
Esso Station	Pedestrian 'clipped' in gas station forecourt. No SOT issued due to unknown identity of driver.
135 Wyse Rd parking lot	Pedestrian struck by vehicle reversing out of parking spot. Pedestrian inattentive, driver's view obstructed by adjacent parked vehicle. No SOT issued.
180 Wyse Rd	Pedestrian attempted to cross road outside of crosswalk zone. SOT issued to pedestrian.
Wyse Rd / Boland Rd	Driver failed to yield to pedestrian whilst crossing at walk light. SOT issued.
Wyse Rd / Symonds St	Two drivers failed to yield to pedestrian in marked crosswalk, one of which struck pedestrian. No SOT issued due to unknown identity of driver.
Wyse Rd / Albro Lake Rd	Pedestrian struck in marked crosswalk; unable to ascertain whether pedestrian or vehicle had right of way due to conflicting versions of whether pedestrian light was walk or don't walk. No SOT issued.

WEST DIVISION

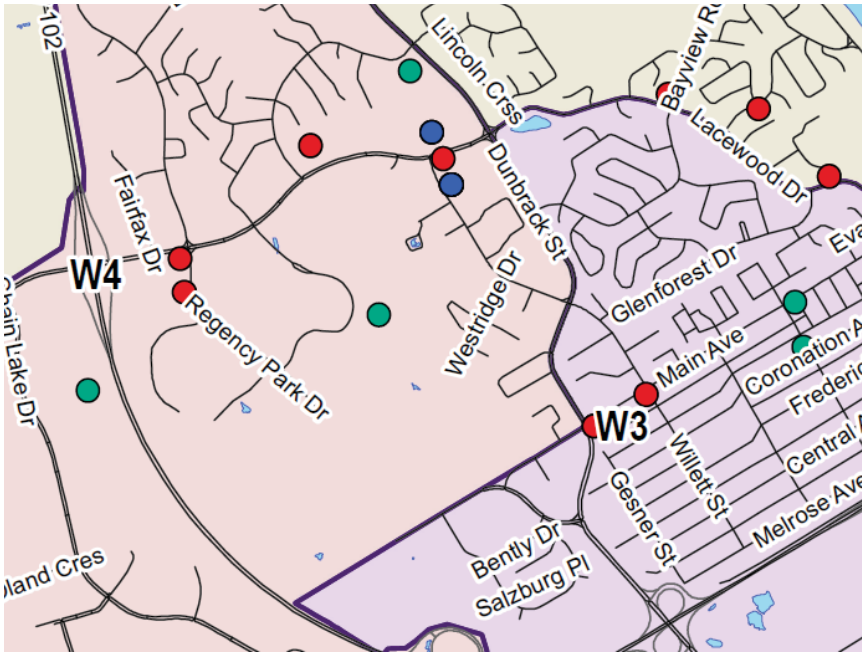


WEST DIVISION

Clayton Park Shopping Centres

There were five reported vehicle/pedestrian collisions at Clayton Park Shopping Centres on Lacewood Drive, four of which occurred at 278 Lacewood Drive (vicinity of McDonald's Restaurant). One was reported to have taken place at 287 Lacewood Drive (vicinity of Sobeys).

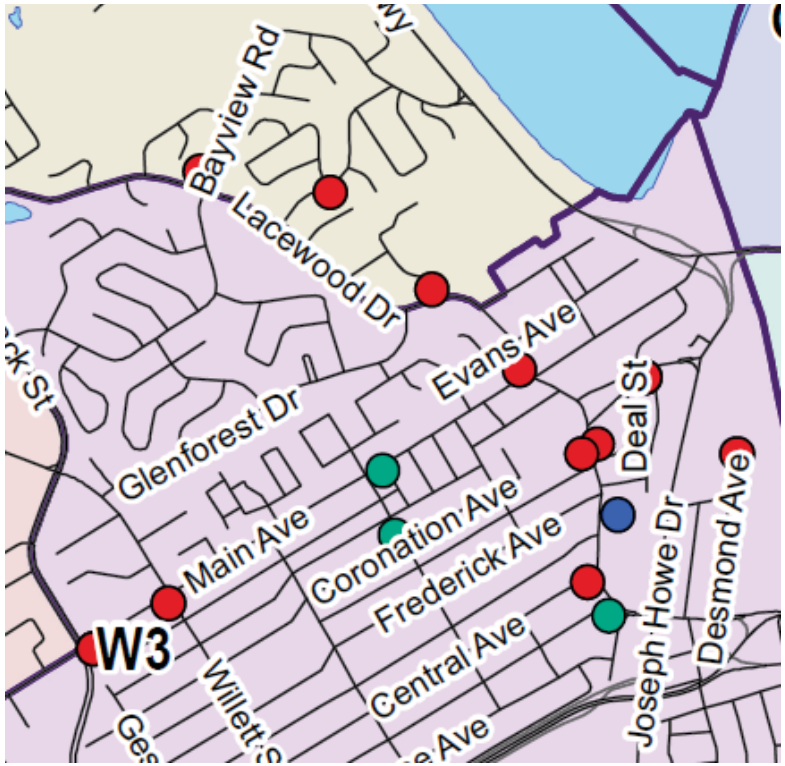
Location	Circumstances
278 Lacewood Dr	Driver reversed in parking lot striking 2 pedestrians. No SOT issued.
278 Lacewood Dr	Driver failed to yield for pedestrian in parking lot crosswalk. SOT issued.
278 Lacewood Dr	Pedestrian struck in parking lot outside of crosswalk zone. No SOT issued.
278 Lacewood Dr	Pedestrian struck in parking lot outside of crosswalk zone. No SOT issued.
287 Lacewood Dr	Driver reversed over pedestrian in parking lot. Sun blinded driver, pedestrian had stopped and bent over to light a cigarette. No SOT issued.



Dutch Village Road Area

There were seven vehicle/pedestrian collisions in the Dutch Village Road area, including two at the intersection at Alma Crescent. Five of the seven collisions occurred in marked crosswalks.

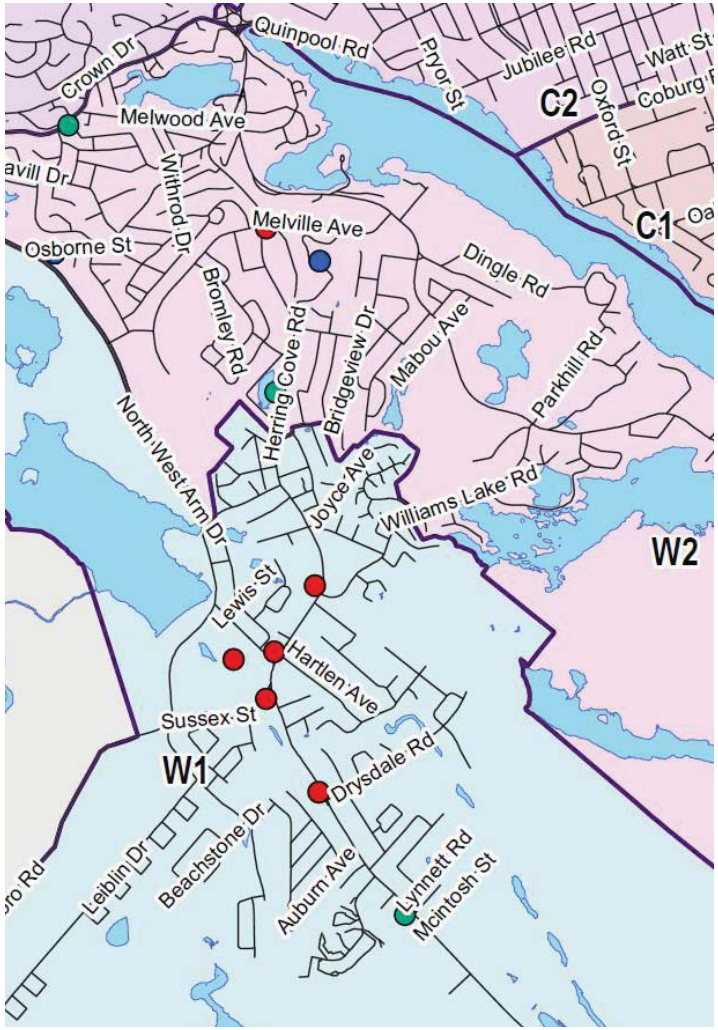
Location	Circumstances
Dutch Village Rd / Alma Cres	Driver failed to yield to pedestrian whilst crossing in a marked crosswalk. SOT issued.
Dutch Village Rd / Alma Cres	Driver failed to yield to 2 pedestrians whilst crossing in a marked crosswalk. SOT issued.
Dutch Village Rd / Deal St	Driver failed to yield to pedestrian whilst crossing in a marked crosswalk. SOT issued.
Dutch Village Rd / Rufus Ave	Driver failed to yield to pedestrian whilst crossing in a marked crosswalk. SOT issued.
3515 Dutch Village Rd	Pedestrian struck on sidewalk as vehicle was exiting parking lot. No SOT issued.
Dutch Village Rd / Central Ave	Pedestrian struck in marked crosswalk, however vehicle already in crosswalk at the time. No SOT issued.
Dutch Village Rd / Sunnybrae Ave	Pedestrian struck whilst walking on side of road (no sidewalk). No SOT issued due to unknown identity of driver.



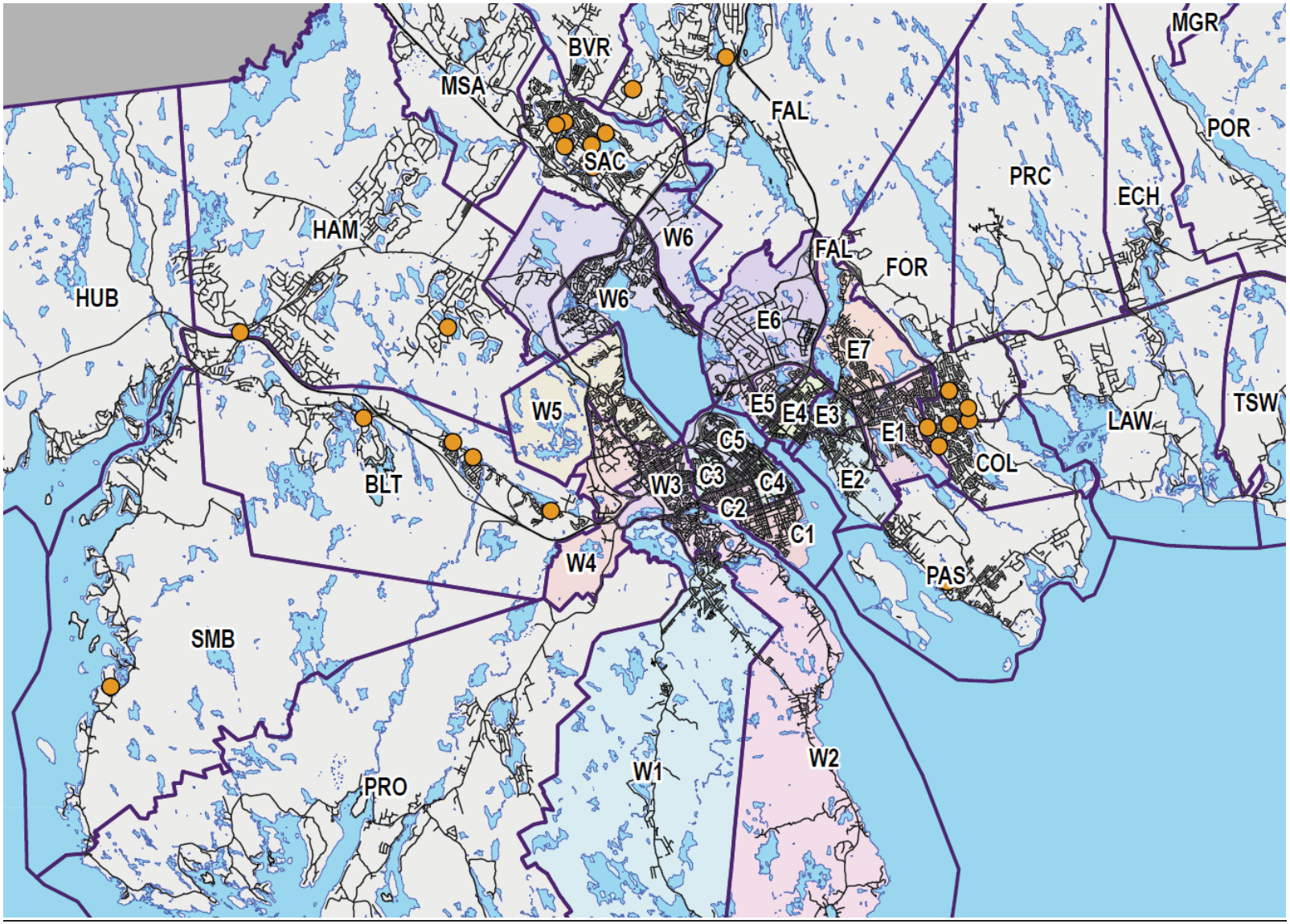
Herring Cove Road Area

A total of seven collisions were reported in the Herring Cove Road area. In two of these incidents pedestrians were crossing the road outside of a crosswalk zone.

Location	Circumstances
519 Herring Cove Rd	Pedestrian ran in front of vehicle outside of crosswalk zone (poor weather conditions). No SOT issued.
Herring Cove Rd / Drysdale Rd	Driver failed to yield to pedestrian whilst crossing in a marked crosswalk. SOT issued.
Herring Cove Rd / Sussex	Driver failed to yield to pedestrian whilst crossing in a marked crosswalk. SOT issued.
Herring Cove Rd / Dentith Rd	Pedestrian's foot run over in marked crosswalk. Unable to ascertain whether vehicle failed to yield to pedestrian or if pedestrian proceeded into crosswalk with vehicle already moving through it. No SOT issued.
Herring Cove Rd / Williams Lake Rd	Driver failed to yield to pedestrian whilst crossing in a marked crosswalk (dark/rainy/foggy weather conditions). No SOT issued due to complainant unwilling to provide proceed.
191 Herring Cove Rd	Pedestrian attempted to cross road outside of crosswalk zone. SOT issued to pedestrian.
Herring Cove Rd / Cowie Hill Rd	Driver failed to yield to pedestrian whilst crossing at walk light. SOT issued.



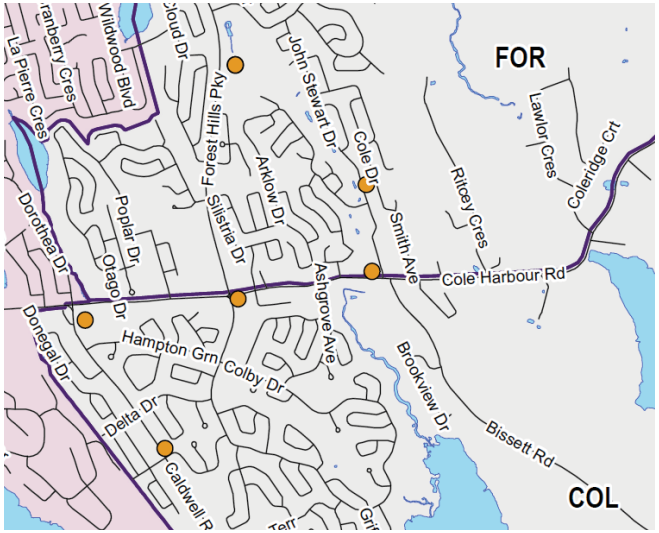
RCMP DIVISIONS



RCMP DIVISIONS

51 Forest Hills Parkway (Cole Harbour Place parking lot)
Three vehicle/pedestrian collisions were reported in the vicinity of Cole Harbour Place.

Location	Circumstances
51 Forest Hills Pkwy	Vehicle reversed into of parking spot and struck pedestrian. Pedestrian inattentive at time of incident. No SOT issued.
51 Forest Hills Pkwy	Driver failed to yield to pedestrian whilst crossing at walk light whilst exiting parking lot. SOT issued.
51 Forest Hills Pkwy	Child pedestrian ran into road without looking and was struck by vehicle outside Cole Harbour Place. No SOT issued.



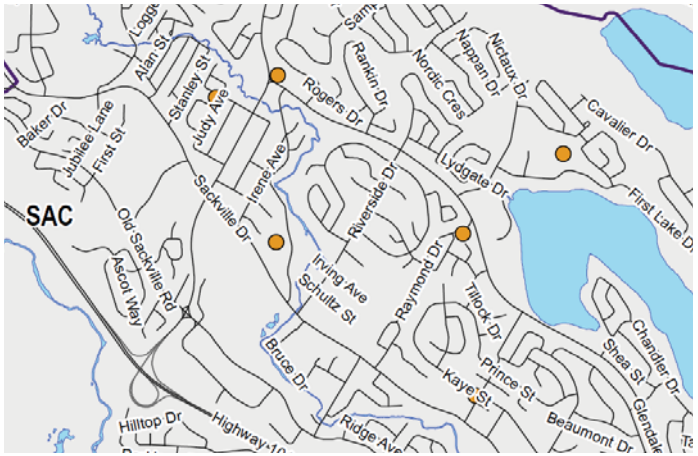
Cole Harbour Road Area
Three vehicle/pedestrian collision were reported on Cole Harbour Rd.

Location	Circumstances
900 Cole Harbour Rd	Driver failed to yield to pedestrian in parking lot crosswalk. No SOT issued since crosswalk is not maintained by the province.
Cole Harbour Rd / Cumberland Dr	Pedestrian entered crosswalk when crosswalk light was red (advance green for vehicles). No SOT issued.
1241 Cole Harbour Rd	Pedestrian struck on sidewalk as vehicle was entering parking lot. No SOT issued.

Sackville Area

There were six reported vehicle/pedestrian collisions in the Sackville area. A driver failed to yield to a pedestrian in a crosswalk in only one of these collisions.

Location	Circumstances
17 Pinehill Dr	Pedestrian 'clipped' whilst crossing the road outside of crosswalk zone. No SOT issued due to unknown identity of victim.
745 Sackville Dr	Pedestrian struck in parking lot when driver swerved to avoid collision with another car. No SOT issued.
Judy Ave / Gloria Ave	Pedestrian (child) on scooter struck at intersection. No SOT issued due to unknown identity of driver.
80 First Lake Dr	Skateboarder hit vehicle at high rate of speed in parking lot. No SOT issued.
Glendale Dr / Raymond Dr	Pedestrian attempted to cross road outside of crosswalk zone. No SOT issued.
Glendale Dr / Beaver Bank Rd	Two drivers failed to yield to pedestrian whilst crossing at walk light, one of which struck pedestrian. SOT issued.



VEHICLE / PEDESTRIAN COLLISIONS
(HRM: 2013)

Prepared by: Heather O'Connor (CAU)
May 6th, 2014

SUMMARY

There were a total of 214 vehicle/pedestrian/bicycle collisions reported to police in 2013, with a total of 219 victims in Halifax Regional Municipality. Of these collisions, 38 involved bicycles. The remaining 176 incidents were strictly vehicle/pedestrian collisions, with 181 victims.

Of the vehicle/pedestrian collisions, a large majority of victims (72%) did not experience an injury as a result of the collision. Victims were most commonly in the 10-30 age range. Male drivers accounted for 65% of drivers involved in vehicle/pedestrian collisions. There is a difference in age range between male and female drivers most commonly involved in collisions of this type: females were typically in the 41-60 years age range whereas the age range of males was wider spread (21-70 years, peaking in the 61-70 years age range).

Most vehicle/pedestrian collisions occurred mid-week, most commonly from 8-9am and 3-7pm. Summer months saw the lowest number of collisions, with incidents sharply increasing from September to December. Weather conditions were clear or sunny at the time of most collisions.

Pedestrians in crosswalks accounted for over half of vehicle/pedestrian collisions. At least one SOT was issued in 39% of collisions; however in 61% of collisions no SOT was issued.

TOTAL VEHICLE/PEDESTRIAN COLLISIONS IN HRM: 176
TOTAL VICTIMS OF VEHICLE/PEDESTRIAN COLLISIONS IN HRM: 181

DETAILED ANALYSIS – VEHICLE / PEDESTRIAN COLLISIONS

INJURIES

97% of pedestrian victims experienced either minor injuries or no injuries in 2013. There were 2 deaths as a result of a vehicle/pedestrian collision, both were elderly victims.

No injuries to drivers were reported.

Injury Type	#	%
No Injury	130	71.8%
Minor	46	25.4%
Serious	3	1.7%
Death	2	1.1%
TOTAL	**181**	

VICTIMS

A slightly higher proportion of victims were female (105, 58%) compared to males (76, 42%).

In all, the 21-30 age group had the highest proportion of victims (26.4% of victims), followed by the 10-20 age group (21.3% of victims). This trend is observable amongst males and females.

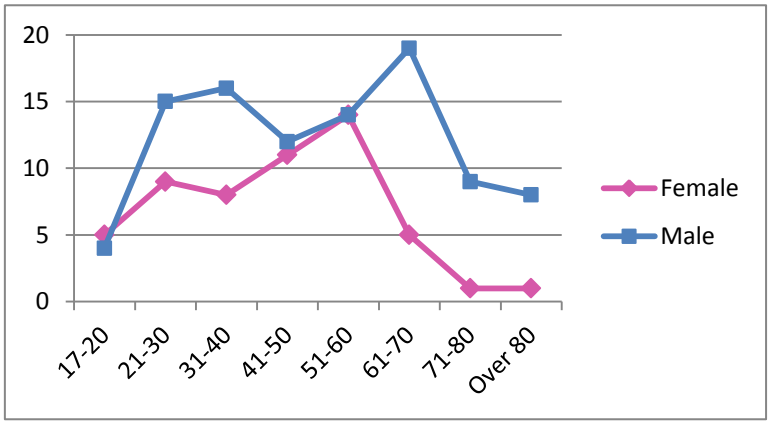
Victim Age Range	Males	Females	Total
Under 10	0.0%	0.0%	**0.0%**
10-20	23.0%	20.0%	**21.3%**
21-30	29.7%	24.0%	**26.4%**
31-40	9.5%	12.0%	**10.9%**
41-50	13.5%	11.0%	**12.1%**
51-60	12.2%	14.0%	**13.2%**
61-70	8.1%	9.0%	**8.6%**
71-80	4.1%	6.0%	**5.2%**
Over 80	0.0%	4.0%	**2.3%**

DRIVERS

Male drivers accounted for a much higher proportion of drivers involved in vehicle/pedestrian collisions.

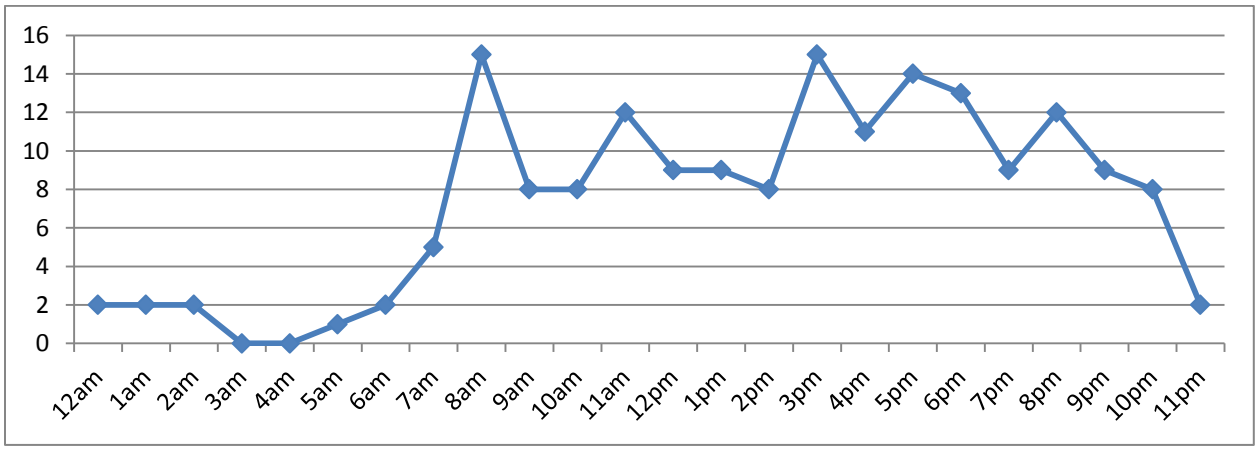
Driver Sex	#	%
Male	103	64.8%
Female	56	35.2%

Males aged between 61-70 years and females aged between 51-60 years were involved in more collisions compared to drivers in other age ranges (however due to small figures this difference is likely not significant). A much higher number of older male drivers were involved in collisions compared to females, particularly in the 61-70 years age range.

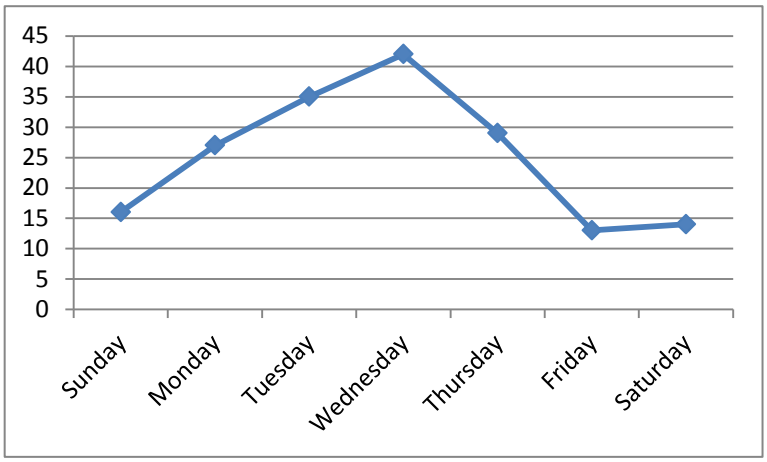


PEAK COLLISION TIMES

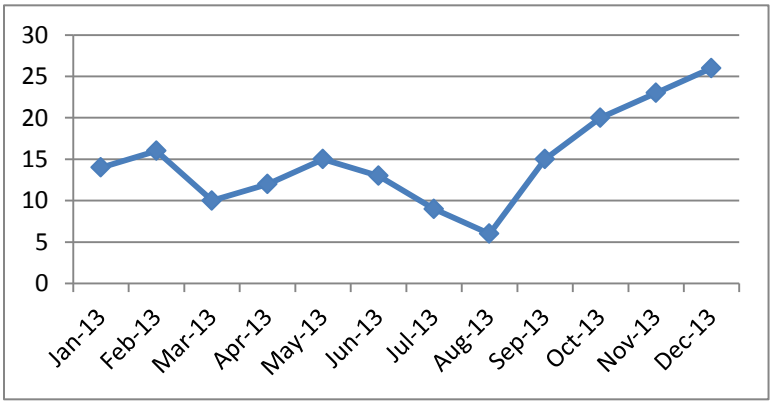
Early mornings (8:00-9:00am) and late afternoon/evenings (3:00pm-7:00pm) were the most common times for vehicle/pedestrian accidents, followed by the 11:00am-12:00pm and 8:00pm-9:00pm time periods.



Wednesdays saw the largest number of vehicle/pedestrian collisions (42). This accounts for nearly a quarter of the collisions (23.8%). The number of collisions that occurred on Tuesdays followed closely behind (35 collisions).



Vehicle/pedestrian collisions were at a consistent level at the start of 2013, ranging from 12 to 16 per month from January to June. Collisions were fewest during the summer months of July and August, with the lowest number recorded in August (six). The number of collisions gradually increased thereafter throughout the rest of the year, ending with 26 in December.



WEATHER CONDITIONS

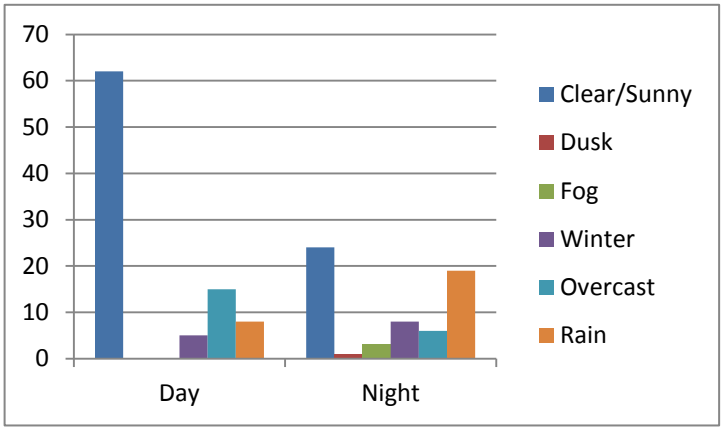
The majority of vehicle/pedestrian collisions in 2013 occurred during clear/sunny weather conditions (57%) Nearly 32% of collisions took place during overcast or rainy conditions.

Weather Conditions	#	%
Clear/Sunny	86	57.0%
Dusk	1	0.7%
Fog	3	2.0%
Winter	13	8.6%
Overcast	21	13.9%
Rain	27	17.9%
TOTAL	**151**	

Clear/sunny conditions were present for most day-time and night-time collisions (69% and 39% respectively).

Overcast was the second most common weather condition for day-time collisions (17%).

Rain was the second most common weather condition for night-time collisions (31%).



COLLISION TYPES

Over half of vehicle/pedestrian collisions occurred at crosswalks (94 collisions, 54%). A small proportion (34, 19%) occurred in parking lots.

Eight collisions involved buses.

SOTS

In 39% of vehicle/pedestrian collisions at least one SOT was issued. In 6 incidents multiple SOTs were issued (2 or 3).

In 108 incidents (61%), a SOT was not issued.

DISCLAIMER – The above analysis does not include figures recorded as 'unknown' at the data collection stage.