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PEDESTRIAN SAFETY INITIATIVES

The Transportation Services Committee recommends the adoption of the recommendation contained in the following report dated January 3, 2011, from the Commissioner of Transportation Services.

1. RECOMMENDATION

It is recommended that the Regional Clerk circulate this report to the Clerks of the local municipalities.

2. PURPOSE

This report advises Regional Council of continuing efforts to improve pedestrian safety on the Regional road system.

3. BACKGROUND

York Region Transportation Services staff work collaboratively with each local Municipality and York Regional Police to improve pedestrian safety

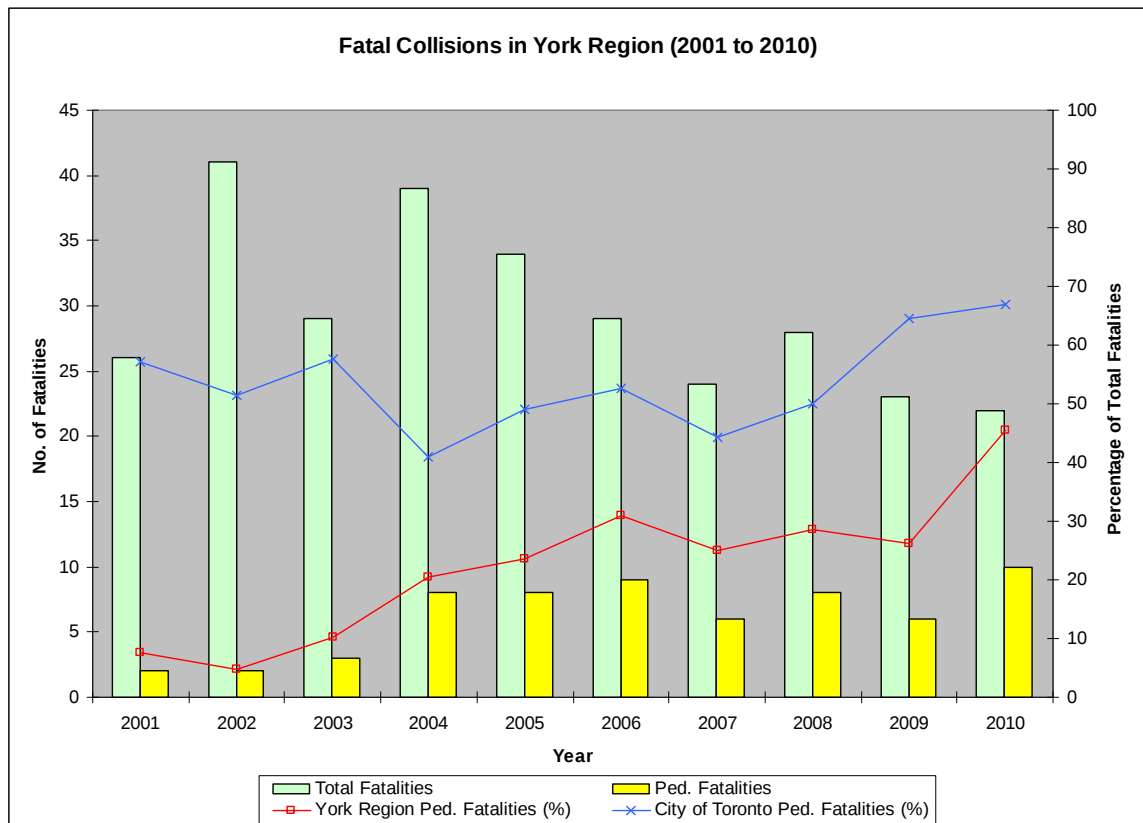
While we work collaboratively with each local municipality on project-specific pedestrian safety issues, Regional staff and York Regional Police are also currently working with the City of Vaughan on their Pedestrian/Street Safety Task Force. This Task Force reviews current policies and practices of both the City and the Region pertaining to environment and infrastructure. The Task Force will present findings to Vaughan Council as to a suggested course of action to deal with the increased number of traffic and pedestrian conflicts on roads in the City of Vaughan. In addition, York Region Transportation Services staff work closely with York Regional Police to set appropriate speed limits on Regional roads.

Collision statistics identify the need to improve pedestrian safety in York Region, as well as in other jurisdictions across the Greater Toronto Area

A review of the Region's 2001 to 2010 collision statistics shows that the number of roadway fatalities has remained relatively constant over the past 10 years. As reported in the media last winter, there was a spike in pedestrian fatalities across the Greater Toronto Area in early 2010. While such a cluster of incidents at first seems alarming, a review of past occurrences such as this indicates that such sudden spikes are random events. There are no particular factors that led to last winter's numerous pedestrian fatalities in the

Greater Toronto Area. However, an analysis of our own data does show the percentage of fatalities involving pedestrians have been on the rise in York Region over the last decade (see Figure 1).

Figure 1
2001 to 2010 Fatal Collision Statistics



The trend identified in Figure 1 is consistent with statistics from the City of Toronto, which are also shown in the figure. In fact, studies conducted by the Insurance Institute for Highway Safety (IIHS) suggest that this type of trend is mainly attributable to the following:

- Increases in pedestrian activity – as the Region continues to urbanize, more trips are being made on foot. The increased interaction between pedestrians and vehicles unfortunately increases the likelihood of collisions. Growing transit usage also means more people walking on our streets because transit riders are always also pedestrians.
- Improvements in vehicle safety – advancements in vehicle design and new technology have reduced the likelihood of fatalities for drivers and passengers. Unfortunately, there are few options to provide pedestrians with the same safety benefits.

- c) The aging population – a large proportion of pedestrian fatalities involve seniors who are more susceptible to serious injury or death in the event of a vehicle-pedestrian collision. A 2004 Transport Canada study that analyzed collision statistics over a 10-year period indicated 26.9% of male pedestrian fatalities and 38.6% of female pedestrian fatalities involved pedestrians over the age of 65. Figures 2 and 3 summarize the pedestrian fatality and injury data from the Transport Canada study.

Figure 2
Male Pedestrian Fatalities and Injuries

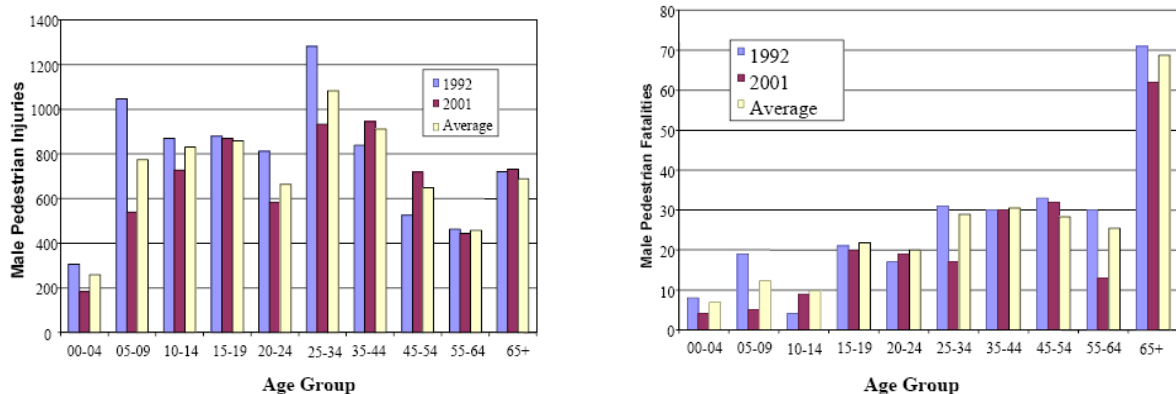
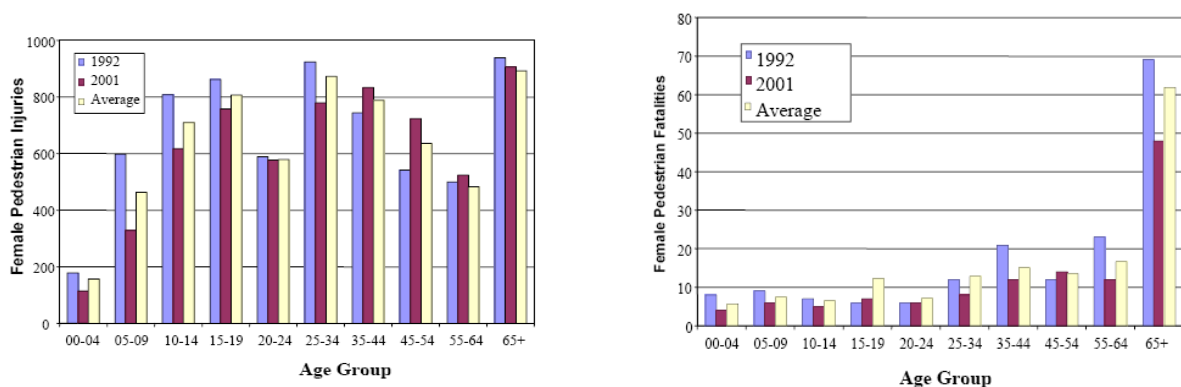


Figure 3
Female Pedestrian Fatalities and Injuries



While the Region compares favourably to the City of Toronto, we need to be aware that as areas of the Region urbanize, we will face the common challenge of accommodating higher volumes of pedestrians and motorists as safely as possible.

4. ANALYSIS AND OPTIONS

This report outlines the pedestrian safety actions taken to date by Regional Council, including those actions which are still in progress and new activities which will be put before Council for consideration during this term.

Pedestrian safety actions which have been approved by Regional Council that are currently underway are:

- Pedestrian countdown signal installations
- Increased pedestrian crossing time at traffic signals
- Public education campaigns

The activities which will be brought forward to Regional Council during this year are:

- Revised speed limit policy
- Audible pedestrian warning system pilot project on YRT/VIVA buses
- Zebra crosswalk marking installations

PEDESTRIAN SAFETY ACTIONS CURRENTLY UNDERWAY

Pedestrian Countdown Signal Installations

The installation of countdown signals at signalized intersections provides additional information and comfort for pedestrians

The pedestrian countdown signal is a supplement to the pedestrian signal that provides a visual indication of the time remaining to cross the street. A descending numerical countdown in seconds is provided once the “Don’t Walk” flashing red outline of a hand starts. The countdown indicates how many seconds are available for pedestrians to safely cross an intersection before the amber vehicle signal appears. The pedestrian countdown signal is shown in Figure 4.

Figure 4
Pedestrian Countdown Signal



Countdown pedestrian signals are intended to aid pedestrians in completing their crossing before they would be exposed to the danger of oncoming motor vehicles. A countdown signal can reassure a pedestrian currently in the crosswalk when the flashing Don't Walk phase appears that he or she still has time to finish crossing and does not need to panic, run to the opposite side, return to the starting side, or stop in the middle of the street.

Since 2007, pedestrian countdown signals have been installed at all new signalized intersections as well as existing signals with high volumes of pedestrians.

In 2010, the Region installed pedestrian countdown signals at 500 signalized intersections. There are approximately 200 intersections that are not currently equipped with pedestrian countdown signals. Over the next couple of years, all signalized intersections in York Region will be equipped with pedestrian countdown signals in conjunction with scheduled intersection improvements.

Increased Pedestrian Crossing Time

Providing additional pedestrian crossing time at signalized intersections will protect pedestrians in the crosswalk

When determining the overall timing and phasing at an intersection, there must be enough traffic signal green time provided to ensure pedestrians are able to cross the street safely and comfortably.

The Ontario Traffic Manual suggests the standard walking speed of 1.2 metres per second for adults or a reduced walking speed of 1.0 metre per second at other intersections which are frequently used by children, senior citizens or other persons with a limited gait. This lower walking speed helps ensure these vulnerable road users are allocated enough green time to comfortably cross the street.

Over the past year, in response to some comments from the public and as part of our signal timing optimization reviews, staff found the existing pedestrian crossing times at all signalized intersections had been based on the faster walking speed of 1.2 metres per second. This walking speed would have been used in the past on Regional roads when the emphasis on minimizing vehicular delay was a higher traffic operational priority than accommodating pedestrians. However, with Regional Council's Official Plan commitments to active transportation and emphasis on walking as an important mode of transportation, Regional staff are now using a standard walking speed of 1.0 metre per second at all signalized intersections; thereby giving more time to pedestrians to comfortably cross the street. This walking speed will provide sufficient crossing time for all pedestrians, including children, senior citizens and other persons with a limited gait.

This walking speed methodology for traffic signal timing design is emerging as a best practice for pedestrian safety and has also been adopted by the City of Ottawa, the City of Toronto and the Region of Waterloo.

Public Education Campaigns

Public education campaigns targeting children, teens and seniors are essential tools to reduce pedestrian injuries and fatalities

The Region has conducted public education campaigns to inform the public about pedestrian safety in partnership with York Region Police, Public Health and EMS. Some events have taken place at the Community Safety Village where there is a combined police and fire education classroom with working traffic signals and a fully equipped apartment where students learn to plan and execute a safe escape in case of an emergency. In 2010, the Region's public education campaigns included the Road, Rail & Community Safety Day and the National Public Works Week Family Fun Day in May and the Pedestrian Day on Main Street, Markham in August (see Figures 5 and 6). These events provide great opportunities for staff to interactively communicate with the public, especially children, regarding pedestrian safety. Along with a traffic safety brochure titled "*How to Cross the Street Safely – A Guide for Kids*" (see Attachment 1), valuable pedestrian safety tips have been provided to the public.

Figure 5
Road, Rail & Community Safety Day
Community Safety Village



Figure 6
Pedestrian Day
Main Street Markham



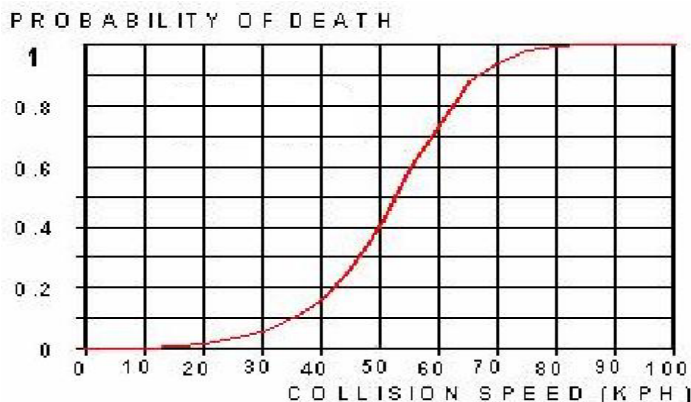
PROPOSED PEDESTRIAN SAFETY ACTIONS FOR FUTURE COUNCIL CONSIDERATION

Revised Speed Limit Policy

Vehicle speeds are directly related to the probability of pedestrian injury or death in collisions

In the case of a collision involving a vehicle with a pedestrian, the probability of pedestrian death or severe injury is directly related to the speed of the vehicle at the time of collision. Doubling a vehicle's speed results in a stopping distance four times as long and four times as much kinetic energy absorbed during an impact. As a result, a small increase in vehicle speed results in a disproportionately large increase in pedestrian fatalities. When a pedestrian is struck, the probability of death increases substantially with vehicle speed (see Figure 7).

Figure 7
The probability of pedestrian injury and death increases substantially with vehicle speed



Source: Wegman, F.C.M. & Aarts, L.T. (eds.) (2006). *Advancing sustainable safety; National Road Safety Outlook for 2005-2020*. SWOV, Leidschendam.

The proposed speed limit policy supports increased pedestrian safety

On February 3, 2010, Regional staff presented an update to the new speed limit policy to Regional Council, entitled “*Policy Update – Establishing Speed Limits on Regional Roads*”, to address different requirements for urban and rural roads in the Region. The policy proposed a method for setting speed limits that depended on the land use contained in the Official Plan, rather than the Region’s current speed limit policy of setting the speed limit at the 85th percentile speed.

The policy proposed is to use adjacent land use as a means to determine lower speed limits (60 kilometres per hour and under) in urban areas where streets are shared by motorists, cyclists, pedestrians, and transit customers, and higher speeds in rural areas that are dominated by motorists. In this approach, land use is used as an indicator of the

potential for high pedestrian and cycling activity in the area. The proposed speed limit policy can improve safety for all vulnerable road users, while providing consistency across all streets.

During 2010, in accordance with Regional Council's direction, York Region staff presented the proposed speed limit policy to each of the nine local municipalities to elicit their feedback. Staff have also received responses from York Regional Police on the proposed speed limit policy. A revised speed limit policy will be presented to Regional Council for consideration in 2011 incorporating the comments received from all nine local municipalities and York Regional Police.

Audible Pedestrian Warning System Pilot Project on YRT/VIVA Buses

A pilot project is being conducted to install Audible Pedestrian Warning System equipment on YRT/VIVA buses

Regional staff is performing a three-month pilot program of an audible pedestrian warning system on five buses in 2011.

The audible pedestrian warning system is a device on the bus that warns pedestrians that the bus is making a right or left-hand turn. When the bus begins to turn, a signal is sent from the sensors in the steering wheel. When the turning radius reaches 45 degrees, an audible warning announcement will be made. An exterior mounted speaker system is used to make the automated announcement. The pedestrian warning message is factory set to "Caution bus turning, pedestrians look both ways". The audible level is based on ambient noise sampling rate, and can be adjusted to be quieter in residential neighbourhoods.

The audible pedestrian warning system for public transit vehicles is expected to have several benefits. It reduces risk and provides advance warning for pedestrians that a bus is turning. The criteria for success of the pilot will be based on the performance and reliability of the system and will be designed to also test for community acceptance. The outcome of the pilot project will determine whether staff will recommend outfitting the entire Regional bus fleet of approximately 430 buses. Either way, the outcome of the pilot will be reported to Regional Council.

Zebra Crosswalk Marking Installations

The installation of zebra crosswalk markings at signalized intersections has reduced vehicle-pedestrian conflicts in some jurisdictions

The primary purpose of crosswalk markings is to guide pedestrians to the most appropriate crossing location and to advise drivers where to stop for pedestrians. Zebra crosswalk markings have several benefits over traditional crosswalks marked with only two parallel lines. Zebra markings increase the crosswalk marking from seven percent of

the crosswalk area using conventional parallel crosswalk line markings to forty percent of the crosswalk area. The increased coverage of the reflective pavement marking material increases the conspicuity and visibility of the pedestrian crosswalk area for both drivers and pedestrians during both day time and night time conditions (see Figures 8 and 9).

Figure 8
Driver View



Without Zebra Crosswalk Markings



With Zebra Crosswalk Markings

Figure 9
Pedestrian View



Without Zebra Crosswalk Markings



With Zebra Crosswalk Markings

Studies from other jurisdictions have shown that zebra markings can reduce the frequency of vehicle/pedestrian collisions particularly between right turning vehicles and pedestrians within the crosswalk area. The jurisdictions who have considered zebra marking are the City of Brampton (2010), the City of Toronto (2006) and the Region of Waterloo (2008)

In February 2010, the City of Brampton adopted a report, entitled “*Pedestrian Safety Plan*” which identified zebra crosswalk markings as a valuable method of providing heightened driver awareness of pedestrian crossings and an increase of the crosswalk visibility.

In 2005, City of Toronto conducted an evaluation of zebra crossings at seven consecutive signalized intersections along both Mount Pleasant Road and Bathurst Street, to evaluate their effectiveness in reducing the frequency of motor vehicle-pedestrian conflicts and collisions through field-testing, pedestrian surveys and on-site observations. Before and after survey results indicate pedestrians felt safer, more comfortable and more visible to drivers when they cross at intersections with zebra markings. City of Toronto staff also reported pedestrians were more likely to use a zebra marked crosswalk, instead of walking outside of the marked crosswalk area. The survey suggested there is higher pedestrian level of comfort and sense of security with zebra marking crosswalks.

In September 2006, City of Toronto Council adopted the zebra crosswalk policy as the standard crosswalk marking treatment for all signalized intersections and pedestrian crossovers.

In January 2008, the Region of Waterloo also adopted a similar special crosswalk treatment policy to recommend zebra crosswalks because of their increased visibility to the driver.

York Region residents will benefit from the installation of zebra crosswalk markings

In September 2010, the first zebra crosswalk markings in York Region were installed at the intersection of Highway 7 and Kipling Avenue as a pilot project.

As part of the 2011 capital budget submission, which will be presented to Regional Council in February 2011, Regional staff are requesting \$2.5 million per year from 2011 to 2015, inclusive, to support the installation of zebra markings. If approved, the Region will install zebra markings at all signalized intersections and pedestrian signals in conjunction with road reconstruction and resurfacing projects, and new traffic control signal and pedestrian signal installations. In addition, zebra markings will be installed at all existing pedestrian signal locations and signalized intersections with a combination of high pedestrian exposure and/or history of pedestrian collisions.

5. FINANCIAL IMPLICATIONS

The financial implications of the programs outlined in this report are listed in Table 1 below:

Table 1
Pedestrian Safety Countermeasures Budget Timeline

Countermeasure	Capital Budget	Operating Budget	Approval
Pedestrian Countdown Signals	Included in existing 2010 budget	No impact	Already approved
Pedestrian Crossing Timing	No impact	Included in existing 2010 budget	Already approved
Public Education Campaign	No impact	Included in existing 2010 budget	Already approved
Proposed Speed Limit Policy	No impact	Included in 2011 budget submission	Future report
Audible Pedestrian Warning System	\$25 thousand for 5 buses	No impact	Included in 2011 budget submission
Zebra Crosswalk Markings	\$2.5 million per year 2011 to 2015	\$500 thousand per year starting in 2016	Included in 2011 Budget submission

In addition to the above, the 2011 operating budget submission includes a request for a new staff position to support improvements to the Zebra Crosswalk Marking Program. Well-maintained pavement markings provide enhanced visibility, which will help improve pedestrian safety on the Regional road network.

6. LOCAL MUNICIPAL IMPACT

There is no direct impact on the local municipalities. This report will be forwarded to each of the local municipalities for their information. Regional staff will continue to work closely with staff from the local municipalities and York Regional Police to ensure pedestrian safety initiatives continue to be a priority in York Region.

7. CONCLUSION

Pedestrians are among the most vulnerable of road users, and as discussed the percentage of fatalities involving pedestrian has been steadily increasing. In order to reduce the number of collisions involving pedestrians, and ensure pedestrians and motorists share the road safely, there are various pedestrian safety activities that have been taken by

previous Council, or are currently underway; including public education campaigns, providing additional pedestrian crossing time, the installation of countdown signals, and the proposed speed limit policy.

New activities planned to be brought before Council include the installation of audible pedestrian warning system on YRT/VIVA buses and zebra crosswalk markings at signalized intersections. The Region will put forth continuing efforts to improve pedestrian safety on the Regional Road System.

For more information on this report, please contact Steven Kemp, Director, Traffic Management and Intelligent Transportation Systems at Ext. 5226.

The Senior Management Group has reviewed this report.

(The attachment referred to in this clause is attached to this report.)

Get Familiar with the Signs



RED



GREEN



AMBER



DON'T WALK



WALK



COUNTDOWN



SCHOOL AREA



PEDESTRIAN AHEAD



SCHOOL CROSSING

York Region

How to Cross the Street Safely

A GUIDE FOR KIDS



York Region

17250 Yonge Street
Newmarket, ON L3Y 6Z1
Toll Free: 1-877-464-9675
www.york.ca

There are laws and rules to help you safely walk on sidewalks and cross the streets. When there are no sidewalks to safely walk, you should always walk facing traffic on the shoulder of the road and stay as far away from the road as possible.

What About Crossing the Street?

When you cross the street at a corner with a traffic signal there are lines on the road called a *Crosswalk* for you to walk between. There are also special signals to tell you it is okay to cross the street. The *Walk Signal* has a button that you can press that will allow you to cross safely.

Tips to Help You Cross the Street Safely

- **Always** make eye contact with drivers before you cross the street.
- **Always** cross when the traffic has come to a complete stop.
- **Always** cross the street at cross walks with an adult.
- **Always** stand away from the road when you are waiting for the pedestrian light.
- **Always** Stop, Look and Listen before crossing.
- **Always** cross when you see the *Walk Signal*.
- **Always** look both ways before and while you cross the street, by looking left, right and left again to make sure no cars are coming or turning onto the *Crosswalk*.

The Walk Signal

The *Walk Signal* has a flashing hand or a number that counts down. This tells you how many seconds you have to cross safely.

- **Always** watch for cars that are turning and do not run.
- **Always** wear brightly coloured clothing so you can be seen.

DO NOT Start to Cross the Street When:

- The flashing hand and or the solid hand can be seen.
- If the Walk Signal is counting down, it is too late to start crossing the street. Press the *Walk Signal* button and wait for the next *Walk Signal* before crossing the street.

