



THE ROAD SAFETY MONITOR 2008

PEDESTRIANS AND BICYCLISTS



The knowledge source for safe driving

The Traffic Injury Research Foundation

The mission of the Traffic Injury Research Foundation (TIRF) is to reduce traffic-related deaths and injuries. TIRF is a national, independent, charitable road safety institute. Since its inception in 1964, TIRF has become internationally recognized for its accomplishments in a wide range of subject areas related to identifying the causes of road crashes and developing programs and policies to address them effectively.

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PEDESTRIANS AND BICYCLISTS

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EXECUTIVE SUMMARY

- > The Road Safety Monitor (RSM) is an annual public opinion survey conducted by the Traffic Injury Research Foundation (TIRF) and sponsored by Transport Canada and the Brewers Association of Canada. The survey takes the pulse of the nation on key road safety issues by means of a telephone survey of a random, representative sample of Canadian motor vehicle drivers.
- > The annual results of the *RSM* are released in a series of reports (available at: www.tirf.ca) – the present one focuses on pedestrians and bicyclists.
- > Pedestrians and bicyclists are vulnerable road users. In collisions with other road users they often suffer the most severe consequences because they are less protected.
- > The survey revealed that Canadians are not overly concerned about pedestrians and bicyclists behaving unsafely on the roads; these behaviours were only rated as second last and third last out of a list of 11 road safety behaviours. Furthermore, jaywalking was perceived as being the second least risky (37.4%) of all road behaviours.
- > In terms of self-reported pedestrian behaviour, 23.1% indicated that they frequently jaywalk, 12.2% indicated that they frequently cross the street while listening to an mp3 player or CD-player, or using a cell phone, and 11.8% frequently cross at a crosswalk when a vehicle has the right of way.
- > While the majority of respondents (87%) indicated that they do not think that pedestrians and bicyclists involved in collisions are frequently under the influence of alcohol, research shows that alcohol is a major contributing factor in pedestrian crashes.
- > Of the 1,201 survey respondents, 493 or 41.2% reported that they ride a bicycle. Of those, 8.9% of bicyclists admitted to frequently crossing the street while listening to an mp3 player or CD-player, or using a cell phone, 8.5% admitted to frequently weaving in and out of traffic while riding their bicycle on the road, and 8.3% ride their bike at night when they are not easily visible to traffic.
- > While only 1.5% of respondents reported having been in one or more collisions with a pedestrian or bicyclist in the last 12 months, 28.6% of respondents reported that they have come close to being involved in one or more such collisions.
- > 53.3% agreed that all pedestrians involved in serious crashes should be tested for drugs/alcohol; 29.3% agreed that there should be increased fines for jaywalking; and 28.4% agreed that there should be penalties for pedestrians who fail to walk toward oncoming traffic when there are no sidewalks.
- > In conclusion, Canadians are not overly concerned about the safety of vulnerable road users. However, crash data and self-reported behaviour from this RSM attest that concern is warranted. It seems there is room for improvement both on the part of drivers and vulnerable road users.

INTRODUCTION

The *Road Safety Monitor (RSM)* is an annual public opinion survey developed and conducted by the Traffic Injury Research Foundation (TIRF) to take the pulse of the nation on key road safety issues. The survey examines:

- > what Canadians see as priority road safety issues and how concerned they are about them;
- > their views about how to deal with these problems;
- > what they know and do not know about safe driving practices; and
- > how they behave on the highways.

The *RSM* includes a core set of questions that are asked each year to provide information on trends in attitudes, opinions and behaviours. This is supplemented each year by a set of questions that probe more deeply into special, topical, and emerging issues. This report describes the findings from the 2008 *RSM* regarding the issue of pedestrians and bicyclists.

METHOD

The eighth edition of the RSM contained 98 items designed to probe the knowledge, attitudes, and concerns of Canadians with respect to a range of road safety issues, and to obtain information on their driving practices. The survey required an average of approximately 15 minutes to complete.

The survey was administered by telephone to a random sample of Canadian motor vehicle drivers who have driven in the past 30 days and have a valid driver's licence. The sample was stratified by province and weighted according to gender and age to avoid bias. Opinion Search Inc. fielded this survey in September, 2008. Among the 7,563 households contacted in which a person was asked to participate, 5,874 (78%) refused and 488 (6.5%) were not qualified.

A total of 1,201 drivers completed the interview. The data were analyzed taking account of the stratified and weighted sampling design (see StataCorp. 2007 for information about the modeling procedures), using both univariate and multivariate approaches. Based on a sample of this size, on average, the results can be considered accurate within 2.9%, 19 times out of 20.

BACKGROUND

Pedestrians and bicyclists are among the most vulnerable road users. In collisions with other road users they suffer the most severe consequences because they are unable to protect themselves against the speed and mass of motor vehicles (ERSO, 2006). This is in contrast to drivers who are protected by an enclosed vehicle. Not only do pedestrians and bicyclists lack the protection of such an enclosed vehicle, they also do not benefit from any passenger car safety features such as seatbelts and airbags, so they are more likely to be injured or killed in the event of a collision. Because of this, they are typically described as vulnerable road users.

The social costs of vulnerable road user collisions include both physical and psychological consequences. These events place emotional and financial burdens on families including the financial costs of health care and rehabilitation, especially in the case of prolonged disability, and the personal grief and suffering due to the loss of family members and friends.

Despite the risks to pedestrians and bicyclists on the road, walking and bicycling should be encouraged, as they improve health and have environmental benefits. Increased physical fitness due to walking and bicycling could also result in savings in public health (ERSO, 2006). Therefore, ways to improve safety of vulnerable road users is even more important. This is the purpose of this report – to help improve the safety of vulnerable road users by studying opinions, attitudes and behaviours of the public regarding the issue.

Magnitude of the Problem

Fatality and injury prevalence

In Canada in 2006, there were 374 pedestrian fatalities accounting for 12.9% of all road user fatalities. In terms of serious injuries, pedestrians accounted for 12% corresponding to 1,833 pedestrians seriously injured in 2006 (Transport Canada, 2007). In 2003, 379 pedestrians were killed, and 13,340 were injured (both serious and non-serious injuries). This represents one pedestrian killed, and 37 pedestrians injured each day (Transport Canada, 2006).

As a comparison, in the U.S. in 2007, 4,654 pedestrians were killed in traffic crashes accounting for 11.3% of all traffic fatalities, and 70,000 were injured (both serious and non-serious injuries) accounting for 2.8% of all traffic injuries (NHTSA, 2008b). In the European Union in 2005, 3,683 pedestrians were fatally injured on the roads which accounted for 14.1% of all traffic fatalities (ERSO, 2008b).

In 2006, 73 bicyclists were killed on Canadian roads, accounting for 2.5% of all road user fatalities in that year. With regards to injury, bicyclists accounted for 3.3% of serious injuries corresponding to 504 bicyclists injured in 2006 (Transport Canada, 2007).

In 2007 in the U.S., 698 bicyclists were killed and 44,000 were injured accounting for 2% of all traffic fatalities and 2% of all traffic injuries (NHTSA, 2008a). In the European Union in 2005, a total of 1,214 bicyclists were killed accounting for 4.7% of all traffic fatalities (ERSO, 2008a).

Trends

Out of all road users killed on Canadian roads, the percentage of pedestrians killed increased from 12.6% (369) in 2002 to 13.7% (379) in 2003. It decreased to 13.3% (363) in 2004, to 11.8% (344) in 2005, and increased again to 12.9% (374) in 2006 (Transport Canada, 2007). No clear trend is evident in pedestrian fatalities as the percentage fluctuates from year to year.

Despite the absence of a clear trend in recent years, between 1992 and 2001, pedestrian fatalities in Canada decreased by 24.1%. For comparison, fatalities for all road users, including pedestrians, decreased by 20.7% from 1992 to 2001. During this same time period, pedestrian injuries also decreased by 10.2%. Injuries for all road users, including pedestrians, decreased by 11.5% (Transport Canada, 2004b). In the U.S., pedestrian fatalities decreased every year from 5,584 (13.4%) in 1995 to 4,763 (11.4%) in 2000 (Shankar, 2003; NHTSA, 2002). In the European Union, the number of pedestrian fatalities decreased every year from 1996 to 2005 with the exception of a relatively small increase of 1.2% in 2002 (ERSO, 2008b).

The large decline in pedestrian fatalities could possibly be explained by changes in pedestrian exposure to motor vehicle traffic. In other words, people may be walking less. Traffic engineering improvements could also have affected this decline; for example, separating pedestrians from vehicles through the use of overpasses and underpasses, refuge islands in the middle of busy two-way streets, and traffic signals that stop traffic while pedestrians cross the street. Other examples of engineering improvements include speed bumps and roadway lighting (IIHS, 2008).

With respect to bicyclists, the percentage killed on Canadian roads had decreased from 2.1% (63) in 2002 to 1.6% (45) in 2003, then increased to 2.1% (56) in 2004, decreased to 1.8% (52) in 2005, then increased again to 2.5% (73) in 2006 (Transport Canada, 2007). According to these data, no clear trend in bicyclist fatalities is evident for Canada. For comparison between 2000 and 2004, there was a 32% reduction in bicycle fatalities in the European Union with a 0.4% increase from 2004 to 2005 (ERSO, 2008a).

When looking at a longer time frame, in Canada between 1994 and 2003, there was an overall decrease of 49% in bicyclist fatalities and a decrease of 27% in bicyclist injuries. Bicyclist fatalities in Canada declined throughout the 1990s to a low of 40 in 2000, then rose to 60 in 2001, 63 in 2002, then dropped to 45 in 2003 (Transport Canada, 2006).

This decrease in bicyclist fatalities could be attributed to helmet use, but could also be explained by reduced bicycling frequency resulting from compulsory helmet laws (ERSO, 2006; Robinson, 1996; 2007; Macpherson, 2002).

Types of crashes

In Canada, 40% of fatalities and more than 50% of serious injuries among pedestrians occurred at intersections while about 60% of fatal injuries and approximately 45% of serious injuries among pedestrians occurred at non-intersections (Transport Canada, 2004a). As a comparison, in 2007 in the U.S., 77% of pedestrian fatalities occurred at non-intersections (NHTSA, 2008b). Non-intersections may be more dangerous for pedestrians. At locations other than intersections vehicle speeds may be higher, and drivers may not expect to have to stop, hence, pedestrian fatalities are more likely (IIHS, 2008).

Most pedestrian crashes with motor vehicles occur when pedestrians are crossing the road (Hatfield et al., 2007; ERSO, 2006). For fatal pedestrian collisions in Canada, 57% occurred with automobiles, 25% with light trucks and vans, 10% with heavy trucks, and 3% with buses. For injuries, 75% occurred with automobiles, 17% with light trucks and vans, 2% with heavy trucks, and 2% with buses (Transport Canada, 2004b). In general, half of all pedestrians killed or seriously injured in collisions involving motor vehicles are at fault (Transport Canada, 2004a). However, the likelihood of the driver being at fault rather than the pedestrian increased from 1996-2001 to 2002-2004 which may suggest increased carelessness among drivers (Transport Canada, 2008).

In the U.S., improper crossing of the roadway or intersection was a major factor in pedestrian fatalities with about 30% of fatalities involving this behaviour. Walking, playing or working on the roadway was a factor in over 25% of pedestrian fatalities, failure to yield right of way was a factor in 15%, and darting or running out onto the road was a factor in 14% (Shankar, 2003).

A recent study in Alberta found that for bicyclist injuries, only 14% of bicycle-related hospital admissions in Alberta involved a collision with a vehicle, and the remaining 86% were the result of falling from the bicycle (Alberta Centre for Injury Control & Research, 2009). Bicycle incidents which do not involve another vehicle, where either the bicyclist fell, or collided with another object, are largely underreported (ERSO, 2006). According to police data from Sweden, for example, over three quarters of bicycle injury cases are unreported. Only in collisions with motor vehicles are the police informed (Eilert-Petersson and Schelp, 1997). This may be true for Canada.

Profile of Victims

The pedestrian fatality rate of males exceeds that of females (Evans, 2004). In Canada, males accounted for 59.2% of all pedestrian deaths (Mayhew, 2009). For comparison, about 70% of all road user fatalities in Canada were male in 2003 (Transport Canada, 2006b). In 2007 in the U.S., 70% of fatally injured

pedestrians were male (NHTSA, 2008b). In the European Union, males account for 66% of pedestrian fatalities and 77% of all traffic fatalities. For bicyclists in Canada, 82.4% of all fatalities were males (TIRF, 2006). In the U.S., 88% of bicyclist fatalities, and 83% of injured bicyclists were males (NHTSA, 2008a). In the European Union 80% of fatally injured bicyclists were male (ERSO, 2008a).

Elderly pedestrians are overrepresented in pedestrian fatalities. Of all fatally injured pedestrians in 2003 in Canada, 31.4% were aged 65 and older; however this age group only represented 12.8% of the population (Transport Canada, 2006). In the European Union in 2005, the highest percentage of pedestrian fatalities was among adults aged 65 and older (40%), and children under the age of 10 (35%). Note that these age groups were about twice as high as the average percentages for other age groups (ERSO, 2006).

For bicyclists, 23% of fatalities in Canada in 2003 were over the age of 55, 20% were between 35 and 44 years of age, 14% were between 10 and 14 years, 11% were between 45 and 54 years, 9% were between 15 and 19 years, and 7% were in each of the following age categories: 5 to 9, 20 to 24 and 25 to 34 (Transport Canada, 2006). In 2005 in the European Union, 44% (859) of bicyclist fatalities were above 60 years of age (ERSO, 2008a).

Elderly people are at a greater risk of being killed on impact when struck by a vehicle due to their increased fragility. They are also at a greater risk due to slower movement, decrease in muscle tone, coordination and manoeuvrability, as well as decreased perceptual skills, for example, decreased sight, hearing, and alertness, and have more difficulty keeping balance when reacting to sudden changes (Transport Canada, 2008; IIHS, 2008; ERSO, 2006). Additionally, they are at a greater risk due to increased exposure related to driving less (ERSO, 2006; Evans, 2004). A comparable trend due to fragility can be seen in elderly drivers who are also overrepresented in crash statistics and are more likely to die in a crash (Robertson and Vanlaar, 2008).

Factors Associated with Fatality and Injury

Area (urban vs. rural)

The majority of pedestrian fatalities happen in urban areas, where there are more pedestrians and where drivers are likely focussed on traffic signals and vehicle traffic, and may fail to notice pedestrians (Transport Canada, 2008). In Canada, 70% of pedestrian fatalities and 56% of bicyclist fatalities occurred in urban areas. In terms of serious injuries, 90% of pedestrians and 85% of bicyclists were injured in urban areas with posted speed limits of 70km/h or less (Transport Canada, 2004a). For comparison, in 2007 in the U.S., 73% of pedestrian fatalities (NHTSA, 2008b), and 72% of bicyclist fatalities occurred in urban areas (NHTSA, 2008a). In 2005, in the European Union, 53% of all bicycle fatalities occurred in urban areas (ERSO, 2008a).

Time of day

Pedestrian fatalities occur more often at night when there is poor visibility and alcohol is more likely to be a factor for both drivers and pedestrians (Heinonen and Eck, 2007; Lee and Abdel-Aty, 2005). More than half of pedestrian fatalities (55%) and almost 40% of serious injuries in Canada occurred at night or under dark conditions with artificial lighting (Transport Canada, 2004a) — it warrants mentioning that there are fewer pedestrians at night so pedestrian fatalities at night are truly overrepresented.

For bicyclists, 30% of fatally injured bicycle crashes occur at night or in dark but lighted conditions (Transport Canada, 2004a). In 2007 in the U.S., 67% of pedestrian fatalities occurred at night (NHTSA, 2008b) with the majority occurring between 6pm and midnight (IIHS, 2008). Specifically, over 45% of pedestrian fatalities occurred between 6pm and midnight with about 25% occurring between 6pm and 9pm and 20% between 9pm and midnight (Shankar, 2003). For bicyclists, 26% of fatalities occurred between 5pm and 9pm (NHTSA, 2008a). In the European Union, pedestrians are at a greater risk during night time hours, with 45.5% of fatalities occurring in darkness (ERSO, 2008b) — note that in the European Union also there are fewer pedestrians out on the road at night so with 45.5% of all pedestrians fatalities occurring at night these fatalities are overrepresented due to the increased risk.

Alcohol

Alcohol is a major contributing factor in pedestrian crashes (Evans, 2004; Mayhew et al., 2009; Shankar, 2003; ERSO, 2006). Pedestrians under the influence of alcohol accounted for 12.3% (129) of alcohol related road deaths in Canada in 2006. Among all pedestrian fatalities in 2006 in Canada 59.5% were tested for alcohol. Of those tested for alcohol, 41.9% had been drinking. Of concern, over one quarter of those who tested positive for alcohol (27%) had blood alcohol concentration (BAC) levels of .16% or higher (Mayhew et al., 2009) – note that the legal limit for driving a motor vehicle is 0.08%.

In the U.S. in 2007, 35% of fatally injured pedestrians had a BAC of 0.08% or higher compared to a rate of only 14% for drivers involved in fatal crashes (NHTSA, 2008b). For bicyclists, 31% of fatally injured bicyclists had a BAC above .01%, and 25% had a BAC above .08%. Note that there is some overlap between these two groups, as some of those who had a BAC above .01% could have also had a BAC above .08% (NHTSA, 2008a). There is no similar information available about the alcohol impairment of bicyclists involved in traffic collisions for Canada.

Cell phones

Crossing the road safely requires pedestrians to pay attention to approaching traffic as well as traffic signs and signals. When preparing to cross at unsignalized intersections pedestrians must also judge the distance of vehicles and vehicle speed to determine if it is safe to cross. In addition, there are many auditory cues that indicate to pedestrians that a vehicle or bicycle may be approaching. Such cues may be missed if the pedestrian is having a conversation or listening to messages on a mobile phone, and even more so if the pedestrian is listening to music while walking (Hatfield and Murphy, 2007). To illustrate, a study in

Australia observed 140 (76.9%) pedestrians talking on a handheld mobile phone and found that six (3.3%) were talking on hands-free mobile phones, and 36 (19.8%) were text messaging. More unsafe crossing behaviours were noted for pedestrians using cell phones than those who were not (Hatfield and Murphy, 2007).

Driver factors

Speed is an important factor in collisions involving vulnerable road users (Heinonen and Eck, 2007). The chance of a pedestrian being hit by a vehicle increases as speed increases, as drivers are less likely to see and react, and are less likely to stop in time. As speed increases the amount of energy that is released during a collision also increases. Because vulnerable road users are largely unprotected, part of this energy will be absorbed by the human body. If this force exceeds the physical thresholds of the human body, severe or fatal injury will occur. Additionally, collision energy is mainly absorbed by the lighter object in the event of a crash, so as speed increases, injury severity also increases (ERSO, 2006; Lee and Abdel-Aty, 2005). To illustrate, a pedestrian struck by a vehicle moving at approximately 32 km/h has a 5% chance of being killed; at about 48 km/h the likelihood of being killed is 45%; and at around 64 km/h the likelihood of being killed is 85% (Zegeer et al., 2004).

Furthermore, the type of vehicle will also influence injury severity and chance of death (Heinonen and Eck, 2007). Injury severity is higher when a larger vehicle strikes a pedestrian (Lee and Abdel-Aty, 2005). Larger vehicles are taller and can strike a pedestrian at a higher place on the body, so pedestrians are more likely to be thrown to the ground instead of onto the hood of the vehicle (IIHS, 2008). The combination of speed and size can be a deadly one for vulnerable road users (Evans, 2004).

Solutions and Countermeasures

Ways to reduce casualties include increasing visibility, using bicycle helmets, and educating pedestrians, bicyclists, and drivers about safe road user behaviour. New technologies have also been developed to help reduce or prevent pedestrian and bicyclist fatalities and injuries.

Visibility

Vulnerable road users are not easily detected in traffic due to their size and this is especially true when lighting is absent or weak during dusk, dawn, and at night. Motor vehicle operators tend to look for other vehicles, but may not expect to see bicyclists or pedestrians on the road (ERSO, 2006).

Increasing the visibility of pedestrians and bicyclists through the use of, for example, reflective or fluorescent clothing, and light or bright coloured helmets for bicyclists, could help drivers detect these road users more easily and potentially decrease crash risk (Transport Canada, 2004b; Zegeer et al., 2004; ERSO, 2006). Bicyclists should be equipped with a light and a reflector on the front, a reflecting device or red

light on the rear, and reflectors on the wheels and pedals (ERSO, 2006). Other ways to increase pedestrian visibility include increasing the amount or intensity of roadway lighting (IIHS, 2008).

Observations of pedestrians and bicyclists in Edmonton, Alberta revealed that the use of visibility aids is very low among these road users. Bright clothing worn on the trunk of the body was observed for 12.7% to 14.7% of pedestrians and on the legs it was observed for only 3% (Hagel et al., 2007). For bicyclists, about one third of those observed wore bright colours on the trunk of the body, and for the legs, it was less than 11%. For those wearing a hat or helmet, the major colours observed were orange, red, yellow, or white. About one quarter of the bicyclists observed had a front light, and about half had a rear reflector and between 55% and 56% used spoke reflectors (Hagel et al., 2007).

Bicycle helmets

To date, there is no consensus among researchers about the benefits of bicycle helmets. Some time-series studies have shown reduced injury due to helmets (Macpherson et al., 2002; Lee et al., 2005; Scuffham et al., 2000), but others have not (Ji et al., 2006; Curnow, 2005). Case-control studies have shown general reductions in head injury (Curnow, 2005; Attewell et al., 2001).

Bicycle helmets are the only protective device available to pedestrians and bicyclists (ERSO, 2006). In Canada, six provinces have introduced mandatory helmet use legislation. The use of bicycle helmets is mandatory for all bicyclists in New Brunswick, Nova Scotia and Prince Edward Island regardless of age. In both Ontario and Alberta the use of bicycle helmets is mandatory for all those under 18 years of age and for British Columbia those under 16 years of age.

In Canada, between 1994 and 1998, a significantly greater decline in head injuries was noted for provinces that introduced bicycle helmet legislation (45%) compared to the provinces with no helmet legislation (27%). Information on actual helmet use, however, was not included in the study. Moreover, there was a general decline in all bicycle related injuries over this time period (Macpherson et al., 2002).

It has been argued that reductions in bicyclist fatalities attributed to helmet legislation could also be explained by reduced bicycling resulting from these laws (ERSO, 2006). It is also possible that helmets make the bicyclists more visible which may have contributed to their increased safety (Cameron et al., 1994). Furthermore, bicyclists who wear helmets may be more careful than those who do not wear helmets. On the other hand, those that wear helmets may take more risks due to a greater feeling of safety (Curnow, 2005).

Helmets are only protective against head injuries not other types of injuries, and if not properly worn, can actually increase the risk of head injury. Depending on the definition of proper helmet use, prevalence ranges from 46% to 100% (Lee et al., 2009). Furthermore, the effectiveness of helmets in collisions with motor vehicles is reduced at vehicle speeds higher than 30km/h (Taylor and Scuffham, 2002). Interestingly,

countries with the lowest helmet wearing rates also have the lowest fatality rates per bicycle-kilometre (Robinson, 2007).

Some bicyclists may feel that helmets are unsightly, uncomfortable and unnecessary for short trips, and others feel it provides good protection. However, the promotion of bicycle helmets, linking bicycling and danger, could lead to a decrease in bicycling which is an activity that has many health benefits (ERSO, 2006; Robinson, 1996). Benefits of helmet legislation should be greater than the costs (Robinson, 2007). Despite the lack of consensus among researchers about the benefits of helmets, in the European Union, decreases in fatalities due to head injuries have been attributed to helmet use (ERSO, 2006).

Education

Public awareness campaigns can be aimed at drivers and pedestrians to increase knowledge and motivate changes in behaviour (Zegeer et al., 2004). Public education programs have generally been shown to be ineffective in reducing pedestrian collisions; however, safety education with children, for example, teaching children where and how to cross the street safely, has had positive effects (IIHS, 2008). In Florida, the combination of long-term pedestrian safety programs targeted to specific ages and ethnic groups was associated with a significant reduction in pedestrian crashes. Programs included education, pedestrian safety messages, public service announcements, and pedestrian safety workshops for children and older populations (Zegeer et al., 2008).

Both pedestrians and drivers have a responsibility to obey the law, and in the event of a collision, the person who breaks the law is judged to be at fault. However, because the driver can cause more serious harm to the pedestrian, increased care should be taken when pedestrians are near (Evans, 2004). In addition to the finding that drivers were increasingly found to be at fault between 1996 and 2004 in Canada, one study in Hawaii revealed that drivers are 13.8 times more likely than pedestrians to be at fault in motor vehicle crashes. This suggests that enforcement and education efforts should be directed towards drivers also (Kim and Yamashita, 2008).

Technology

Safe walking environments lower the risk of injury or death (Zegeer et al., 2004). For example, pedestrian crossing devices guide pedestrian behaviour by indicating what is right and wrong, thus allowing the pedestrian to appropriately judge the safest walking route (Heinonen and Eck, 2007). In Florida, adding flashers to yield signs at crosswalks was shown to reduce pedestrian-vehicle conflicts (Van Houten et al., 2008). Pedestrian countdown signals have also been shown to be beneficial (IIHS, 2008). In Dublin, after the introduction of countdown timers informing pedestrians of how long they would have to wait until the walk signal turned on reduced the number of pedestrians who crossed during the “do not walk” signal (Keegan and O’Mahony, 2003).

When crossing at signalized intersections, older pedestrians with canes or walkers have to increase their walking speed by much more than other pedestrians (Arango and Montufar, 2008). If crosswalk times are set for the average pedestrian, slower pedestrians such as the elderly, parents with children, and people with movement limitations, may not have enough time to cross the street safely before traffic starts again (Heinonen and Eck, 2007). Longer pedestrian walk signals would allow more time for slower pedestrians to cross safely (Transport Canada, 2008; 2004b) and could also reduce pedestrian crashes with motor vehicles (IIHS, 2008).

In the event of a collision, vehicle design could influence the type and severity of pedestrian injuries (IIHS, 2008). The majority of pedestrians involved in crashes are struck by the front of the vehicle. Thus, modifying the front of passenger vehicles is one solution for reducing the severity of pedestrian crashes. Vehicle manufacturers in the European Union must meet government regulations to lessen pedestrian injuries. In order to meet these requirements, manufacturers are installing pop-up hoods to soften head impacts, leaving more room between the hood and engine, or designing flatter, more flexible bumpers that absorb more energy on impact (IIHS, 2008).

Conclusion

Pedestrians and bicyclists are largely unprotected on the roads and are more likely to be killed or injured due to their vulnerability. In Canada in 2006, there were 374 pedestrian fatalities and 73 bicyclist fatalities accounting for 12.9% and 2.5% of all road user fatalities in that year. In terms of serious injuries, pedestrians accounted for 12% corresponding to 1,833 pedestrians seriously injured, and bicyclists accounted for 3.3% of serious injuries corresponding to 504 bicyclists injured in 2006.

Both pedestrian and bicyclist fatalities declined throughout the 1990's. After 2001, however, the percentage of fatalities for both pedestrians and bicyclists fluctuates from year to year, thus no clear trend is evident in more recent years.

Most pedestrian crashes with motor vehicles occur when pedestrians are crossing the road. In general, half of all pedestrians killed or seriously injured in collisions involving motor vehicles are at fault. In terms of gender differences, the pedestrian fatality rate of males exceeds that of females. With regards to age, older pedestrians, 65 years old and above, are overrepresented in pedestrian crashes.

The majority of pedestrian and bicyclist fatalities happen in urban areas and occur more often at night. Alcohol is a major contributing factor in pedestrian crashes as well; however, little is known about the involvement of alcohol in bicyclist crashes. Cell phones may also increase the risk of pedestrian and bicyclist collisions. Finally, the speed and mass of motor-vehicles are important factors in collisions involving vulnerable road users. As speed and mass increase, crash severity also increases.

Ways to reduce pedestrian and bicyclist casualties include increasing visibility, using bicycle helmets, and educating pedestrians, bicyclists, and drivers about safe road user behaviour. New technologies have also been developed to help reduce or prevent pedestrian and bicyclist fatalities and injuries.

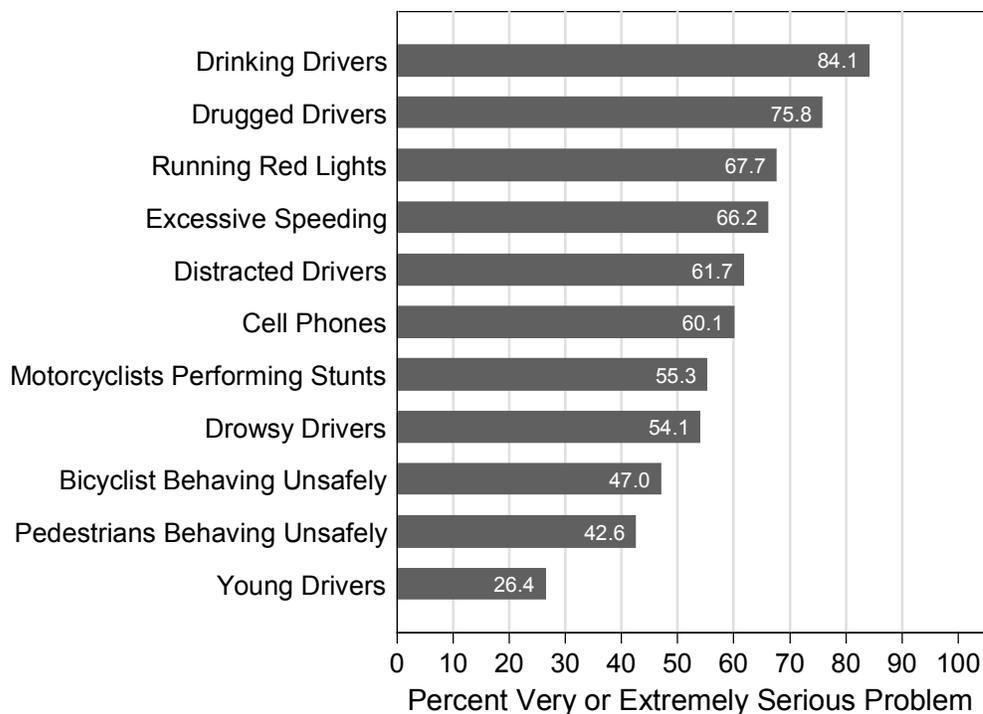
Despite the risks to pedestrians and bicyclists on the road, walking and bicycling should be encouraged, as they improve health and also reduce pollution. Therefore, ways to improve safety of vulnerable road users is important.

CONCERN ABOUT PEDESTRIANS AND BICYCLISTS

Are pedestrians and bicyclists behaving unsafely on public roads a major road safety concern for Canadians?

Canadians were asked about a series of specific road safety concerns and how serious they perceive those problems to be. Figure 1 shows the percentage of respondents who said they were concerned about these various issues, rated on a scale from 1 (not at all concerned) to 6 (extremely concerned); for scoring purposes, respondents were coded as being concerned about an issue if he or she chose a five or six.

Figure 1. Percentage very or extremely concerned about various road safety issues

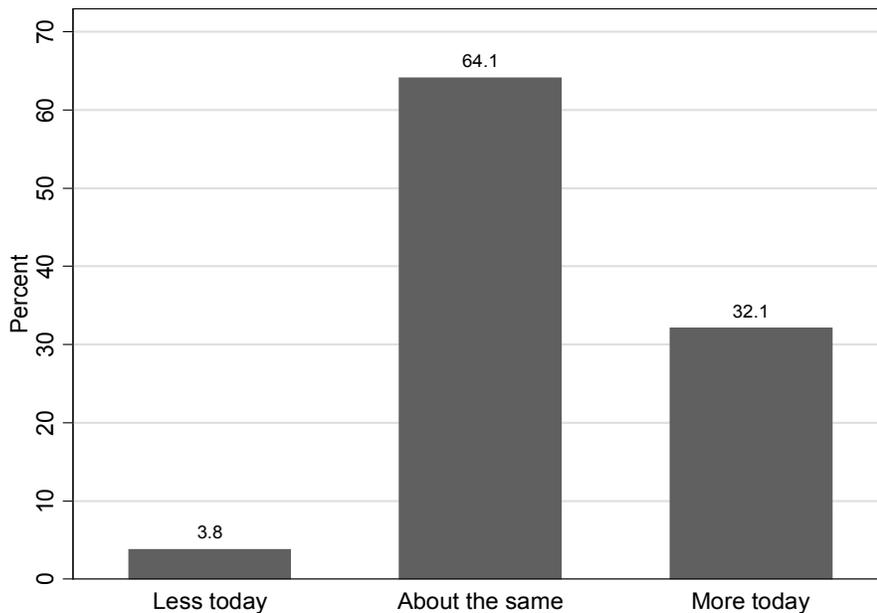


As can be seen in Figure 1, 47% of respondents are very or extremely concerned about bicyclists behaving unsafely on the road; the 95% confidence interval (95%-CI) was 43.6%-50.4%. Figure 1 further shows that 42.6% are very or extremely concerned about pedestrians behaving unsafely on the road (95%-CI: 39.3%-46.1%). These issues received the second and third last ratings of concern, before young drivers (26.4%; 95%-CI: 23.4%-29.3%). The highest rating of concern was for drinking drivers (84.1%; 95%-CI: 81.5%-86.5%), followed by drugged drivers (75.8%; 95%-CI: 72.8%-78.8%), running red lights (67.7%; 95%-CI: 64.4%-70.8%), excessive speeding (66.2%; 95%-CI: 62.8%-69.4%), distracted drivers (61.7%; 95%-CI: 58.3%-65%), the use of (hand-held or hands-free) cellular telephones while driving (60.1%; 95%-CI: 56.5%-63.4%), motorcyclists performing stunts on public roads (55.3%; 95%-CI: 51.9%-58.7%) and drowsy drivers (54.1%; 95%-CI: 50.6%-57.5%).

Are pedestrians more aggressive today than five years ago?

Canadians were asked whether they thought that pedestrians are more aggressive today compared to five years ago, less aggressive than five years ago, or about the same. As presented in Figure 2, the majority of Canadians (64.1%) feel that pedestrians are about the same in terms of aggressiveness today compared to five years ago. Almost one third of respondents (32.1%) feel that pedestrians are more aggressive today compared to five years ago, while only 3.8% feel that pedestrians are less aggressive today than five years ago.

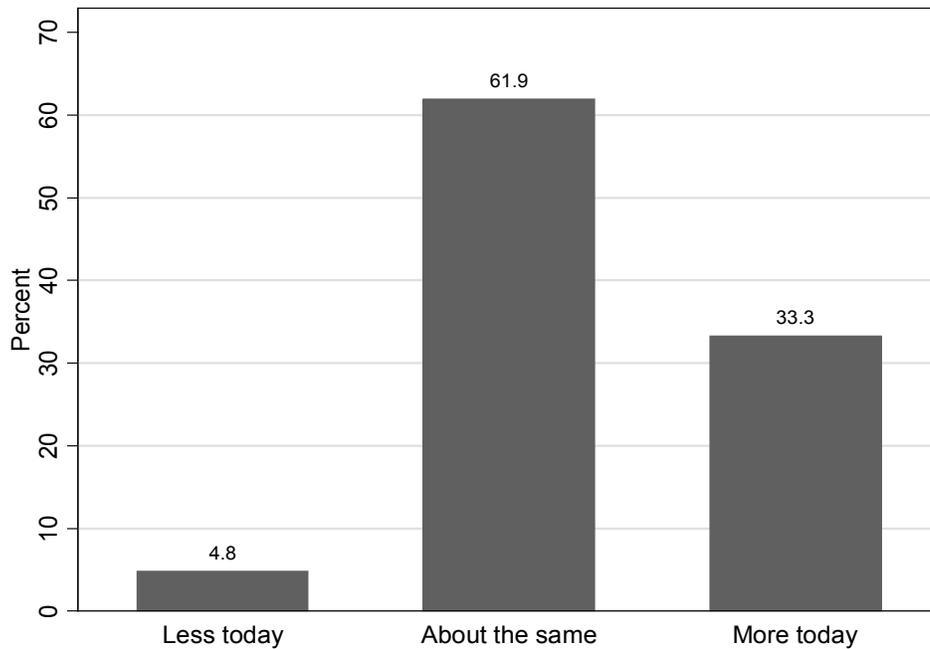
Figure 2. Pedestrian aggressiveness: today versus five years ago



Are bicyclists more aggressive today than five years ago?

Canadians were also asked what they thought about the level of aggressiveness of bicyclists today compared to five years ago. As can be seen in Figure 3, the majority of Canadians (61.9%) feel that bicyclists are about the same in terms of aggressiveness today compared to five years ago. One third of Canadians (33.3%) feel that bicyclists are more aggressive today compared to five years ago, while only 4.8% feel that bicyclists are less aggressive today than five years ago.

Figure 3. Bicyclist aggressiveness: today versus five years ago

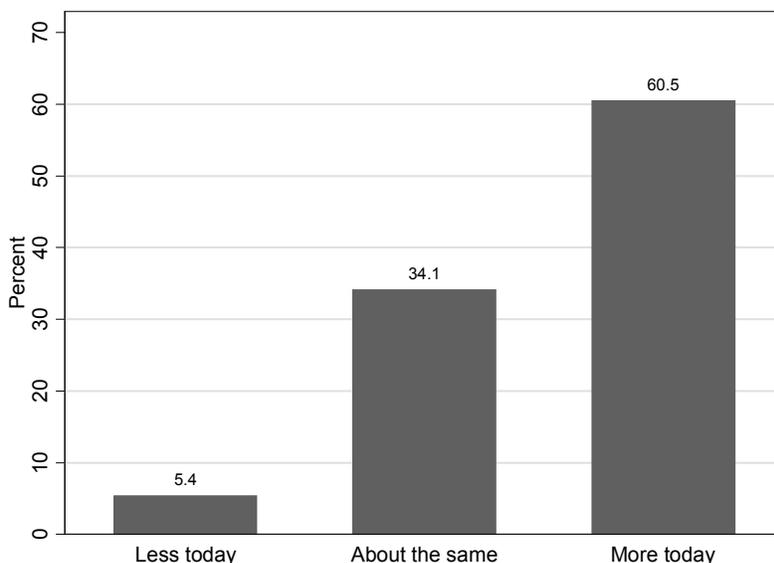


According to pedestrians and bicyclists, are drivers more aggressive today than five years ago?

Respondents were asked, as a pedestrian or bicyclist, whether they thought that drivers are more aggressive today compared to five years ago, less aggressive than five years ago, or about the same. As can be seen in Figure 4, the majority of Canadians (60.5%) feel that drivers are more aggressive today compared to five years ago. Over one third (34.1%) of Canadians feel that drivers are about the same in terms of aggressiveness today compared to five years ago, while only 5.4% feel that drivers are less aggressive today than five years ago.

The 2006 RSM on aggressive driving asked a similar question. More precisely, respondents were asked whether they thought there is more or less aggressive driving today compared to five years ago, and it was found that 88% believed there is more aggressive driving today than five years ago (Vanlaar et al., 2006). This difference (60.5% vs. 88%) could perhaps be due to the different way in which this question was asked in 2006 compared to today. In the previous RSM, all drivers were asked whether they thought there is more or less aggressive driving today compared to five years ago; and in this RSM, respondents were asked, *as a pedestrian or bicyclist*, whether they thought that *drivers* are more aggressive today compared to five years ago.

Figure 4. Driver aggressiveness: today versus five years ago



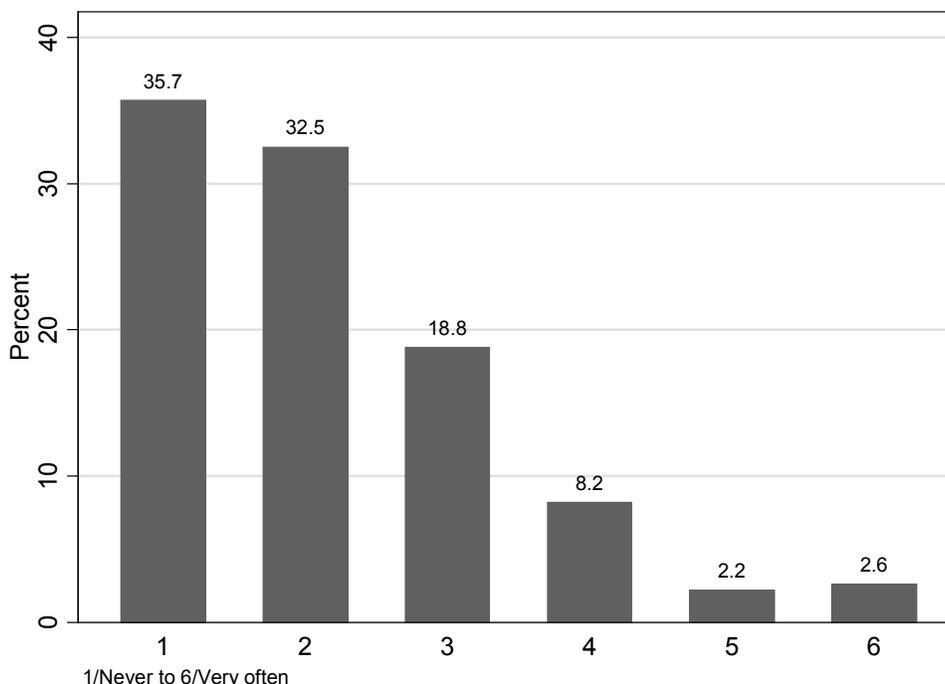
Who do Canadians think is more often at fault in collisions involving pedestrians and bicyclists?

When a driver of a vehicle is involved in a collision with a pedestrian or bicyclist, Canadians were asked who they think is more often at fault. The majority of respondents (57.8%; 95%-CI: 53.8%-61.8%) reported that they think the driver is more often at fault. Nevertheless, a substantial minority (42.2%; 95%-CI: 38.2%-46.2%) think that it is the pedestrian or bicyclist who is more often at fault.

How often do Canadians think that pedestrians and bicyclists involved in collisions are under the influence of alcohol?

For collisions involving pedestrians and bicyclists, Canadians were asked how often they think that the pedestrian or bicyclist is under the influence of alcohol using a scale from 1 (never) to 6 (very often). As shown in Figure 5, the majority of respondents (87%; 95%-CI: 84.5%-89.5%) indicated that they think pedestrians and bicyclists involved in collisions are *not* frequently under the influence of alcohol (selecting a score of one to three). The remaining 13% selected a score of four to six indicating that for collisions involving pedestrians and bicyclists they think the pedestrian or bicyclist is frequently under the influence of alcohol (95%-CI: 10.5%-15.5%).

Figure 5. Perceived alcohol involvement among pedestrians and bicyclists involved in collisions

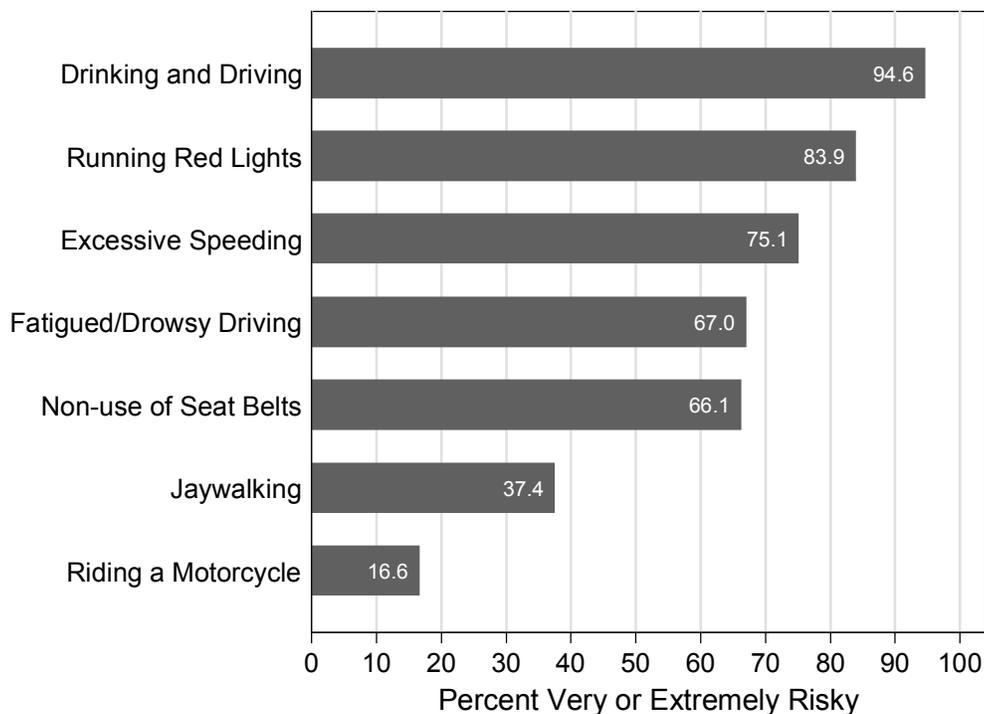


How risky is jaywalking to Canadians?

To gauge Canadians' attitudes towards jaywalking, the *RSM* polled Canadians on the perceived risk associated with a variety of road safety issues. Figure 6 shows the percentage of respondents who felt that various road safety issues were risky, rated on a scale from 1 (not at all risky) to 6 (extremely risky); for scoring purposes, respondents were coded as feeling a behaviour was very or extremely risky if he or she chose a five or six.

Jaywalking was perceived as being the second least risky of all the road behaviours in question (37.4%; 95%-CI: 34.4%-40.8%). As can be seen in Figure 6, the vast majority of Canadians perceived drinking and driving to be a very or extremely risky behaviour (94.6%; 95%-CI: 93.3%-96.3%) followed by running red lights (83.9%; 95%-CI: 81.3%-86.3%), excessive speeding (75.1%; 95%-CI: 72.3%-78.3%), fatigued or drowsy driving (67%; 95%-CI: 63.7%-70.3%), the non-use of seat belts (66.1%; 95%-CI: 63%-69.6%), jaywalking and riding a motorcycle (16.6%; 95%-CI: 13.8%-19%).

Figure 6. Percentage who think various road safety issues are very or extremely risky

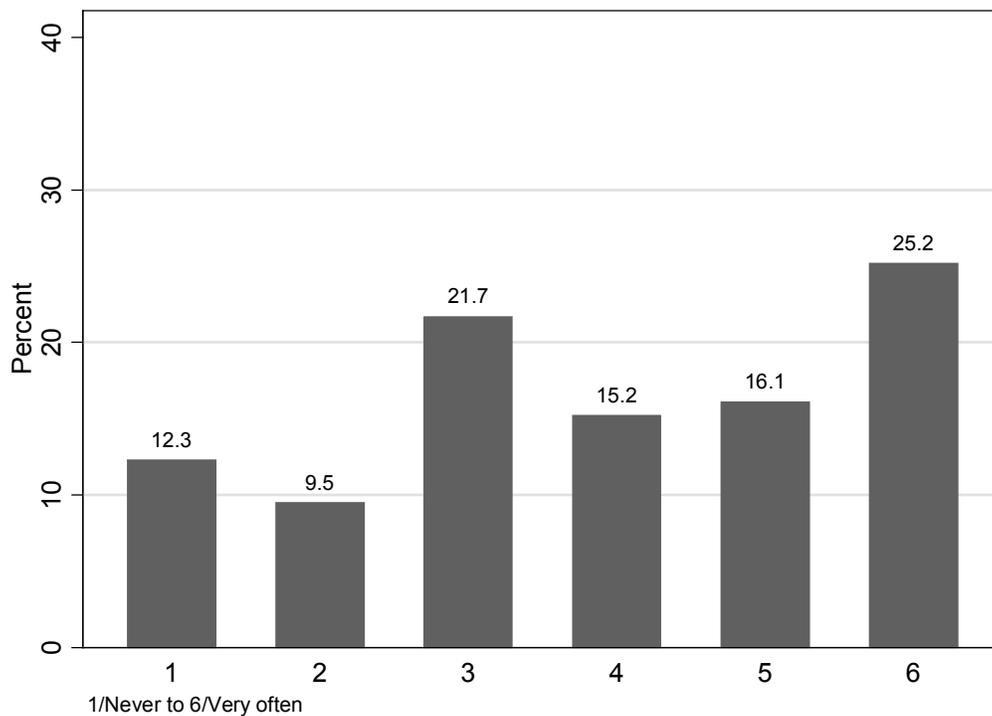


Do Canadians feel they have enough time to cross the street at intersections with a stop light?

Canadians were asked, on a scale from 1 (never) to 6 (very often), as a pedestrian, how often they feel that they have enough time to cross the street at an intersection with a stop light. As can be seen in Figure 7, 43.5% of respondents feel that they do *not* have enough time to cross the street at an intersection with a stop light (selecting a score of one to three; 95%-CI: 40.1%-47%), while 56.5% feel that they do have enough time (selecting a score of four to six; 95%-CI: 53.1%-60%).

Logistic regression was used to further investigate the profile of those who feel that they have enough time to cross the street at an intersection with a stop light, but no meaningful results were found.

Figure 7. How often do you feel that you have enough time to cross the street at an intersection with a stop light?



PREVALENCE OF RISKY BEHAVIOURS

How often do pedestrians engage in risky behaviour?

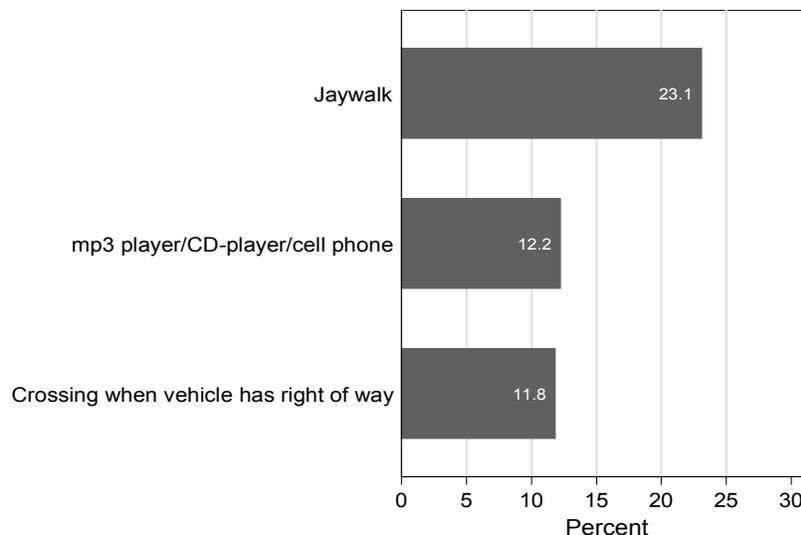
Jaywalking is any form of illegal street crossing by a pedestrian which includes crossing the street where there is no crosswalk (Heinonen and Eck, 2007). Respondents were asked, as a pedestrian, how often they jaywalk on a scale from 1 (never) to 6 (very often). As can be seen in Figure 8, 23.1% of respondents selected a score of four to six, indicating that they frequently jaywalk (95%-CI: 20%-26.1%).

In response to how often Canadian pedestrians cross the street while listening to an mp3 player or CD-player, or using a cell phone, 12.2% selected a score of four to six, indicating that they frequently do this while crossing the street (95%-CI: 9.7%-14.7%).

Respondents were also asked, as a pedestrian, how often they cross at a crosswalk when a vehicle has the right of way on a scale from 1 (never) to 6 (very often). As shown in Figure 8, 11.8% of Canadian pedestrians frequently do this (selecting a score of four to six; 95%-CI: 9.5%-14.2%).

Note that the difference between pedestrians who report frequently jaywalking and those who report frequently crossing the street while listening to an mp3 player or CD-player, or using a cell phone was significant. The difference between those who report frequently jaywalking and those who report frequently crossing at a crosswalk when a vehicle has the right of way was also significant.

Figure 8. Percentage who reported engaging in risky pedestrian behaviour



How often do Canadians see pedestrians engaging in risky behaviour?

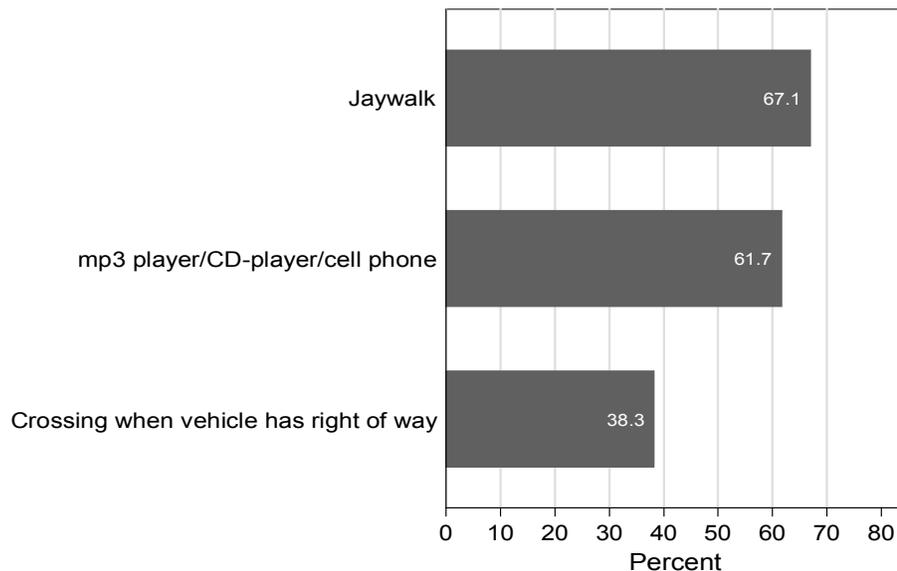
Canadians were asked, on a scale from 1 (never) to 6 (very often), how often they see a pedestrian jaywalking. As can be seen in Figure 9, a majority of respondents (67.1%; 95%-CI: 63.9%-70.2%) indicated that they frequently see pedestrians jaywalking (selecting a score of four to six).

In response to how often they see a pedestrian crossing the street while listening to an mp3 player or CD-player, or using a cell phone, 61.7% indicated that they often see this (95%-CI: 58.4%-65%).

Respondents were also asked how often they see a pedestrian crossing at a crosswalk when a vehicle has the right of way. Over a third of Canadians (38.3%; 95%-CI: 34.9%-41.7%) reported that they frequently see pedestrians crossing at a crosswalk when a vehicle has the right of way.

The difference between those who frequently see pedestrians jaywalking and those who frequently see pedestrians crossing the street when a vehicle has the right of way was significant. The difference between those who frequently see pedestrians jaywalking and those who frequently see pedestrians crossing the street while listening to an mp3 player CD-player, or using a cell phone was also significant. The difference between those who frequently see pedestrians crossing the street when a vehicle has the right of way and those who frequently see pedestrians crossing the street while listening to an mp3 player, CD-player, or using a cell phone was significant as well.

Figure 9. Percentage who see risky pedestrian behaviour



How often do bicyclists engage in risky behaviour?

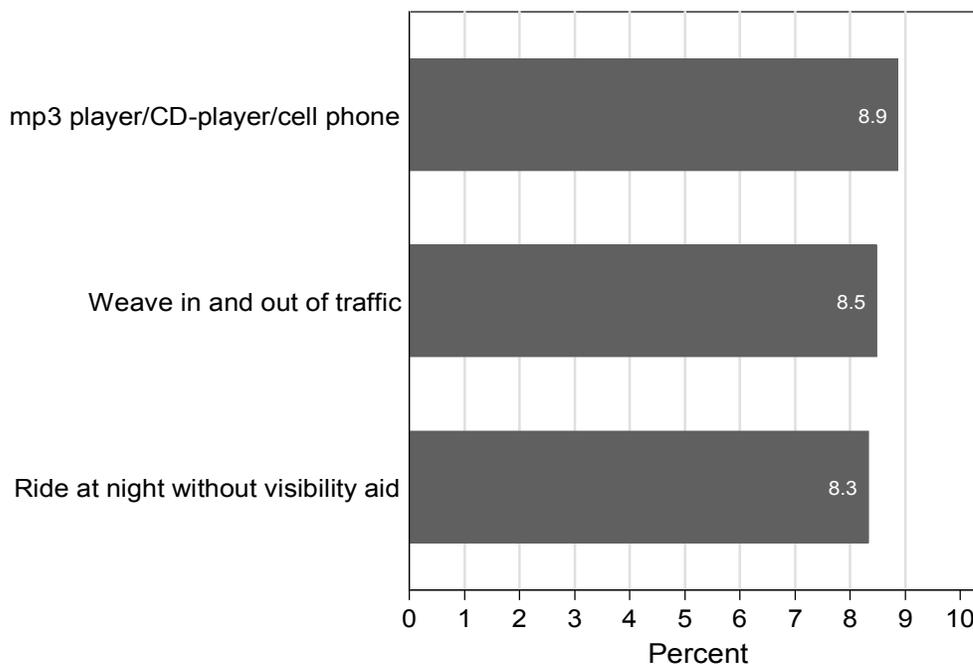
Of the 1,201 survey respondents, 493 or 41.2% reported that they ride a bicycle. Respondents who ride a bicycle were asked how often they cross the street while listening to an mp3 player or CD-player, or using a cell phone (see Figure 10), on a scale from 1 (never) to 6 (very often). Only 8.9% of bicyclists admitted to frequently doing this (selecting a score of four to six; 95%-CI: 5.4%-12.3%).

Canadian bicyclists were also asked how often they weave in and out of traffic while riding their bicycle on the road. Only 8.5% of those who ride a bicycle admitted to frequently engaging in this behaviour (95%-CI: 5.1%-11.9%).

With regards to how often bicyclists ride their bike at night when they are not easily visible to traffic; for example, without a light or reflectors, 8.3% of Canadian bicyclists admitted to frequently doing this (95%-CI: 5%-11.7%).

No significant differences were found between these three self-reported behaviours.

Figure 10. Percentage who engage in risky bicyclist behaviour



How often do Canadians see bicyclists engaging in risky behaviour?

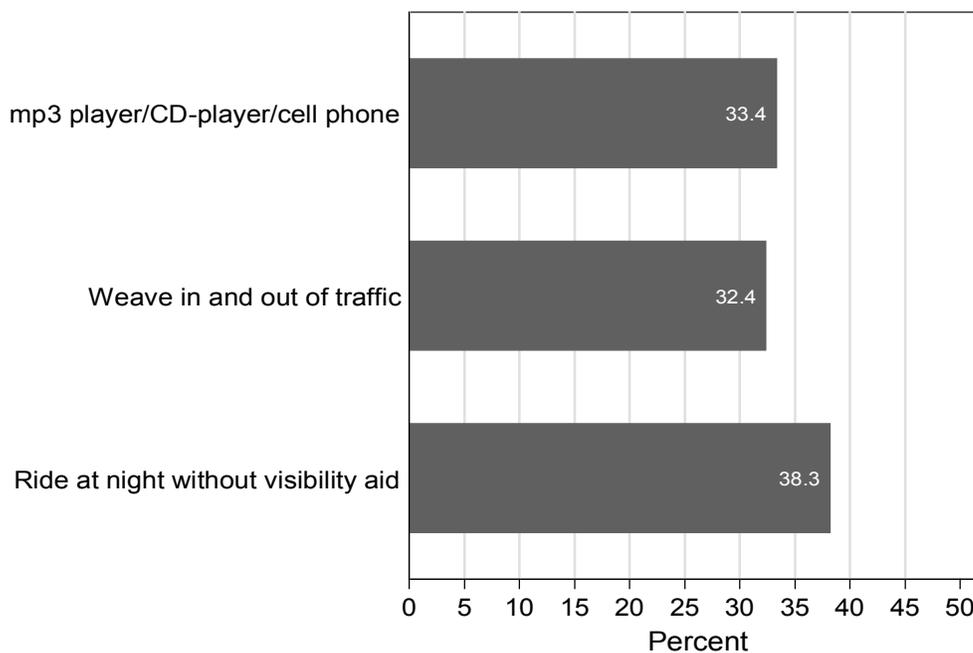
All survey respondents were asked how often they see a bicyclist engaging in various risky riding behaviours using a scale from 1 (never) to 6 (very often). As can be seen in Figure 11, 33.4% indicated that they frequently see a bicyclist crossing the street while listening to an mp3 player or CD-player, or using a cell phone (selecting a score of four to six; 95%-CI: 30.1%-36.7%).

Respondents were also asked how often they see a bicyclist weaving in and out of traffic while riding their bicycle on the road. Slightly less than one third of respondents (32.4%; 95%-CI: 29.3%-35.5%) reported that they frequently see this (selecting a score of four to six).

In response to how often they see bicyclists riding their bike at night when they are not easily visible to traffic, 38.3% of Canadians indicated that they often see this (95%-CI: 34.9%-41.6%).

Note that the difference between those who frequently see bicyclists weaving in and out of traffic and those who frequently see bicyclists riding their bike at night when they are not easily visible to traffic was significant. The difference between those who frequently see a bicyclist weaving in and out of traffic and those who frequently see a bicyclist crossing the street while listening to an mp3 player CD-player, or using a cell phone was also significant.

Figure 11. Percentage who see risky bicyclist behaviour



How many Canadians have been involved in a collision with a pedestrian or bicyclist?

Respondents were asked, as a driver, how many times, if any, they have been involved in a collision with a pedestrian or bicyclist in the last 12 months. A clear majority (98.5%) indicated that they have not been in a collision with a pedestrian or bicyclist in the last 12 months. The remaining 1.5% did report being in one or more such collisions within the last year.

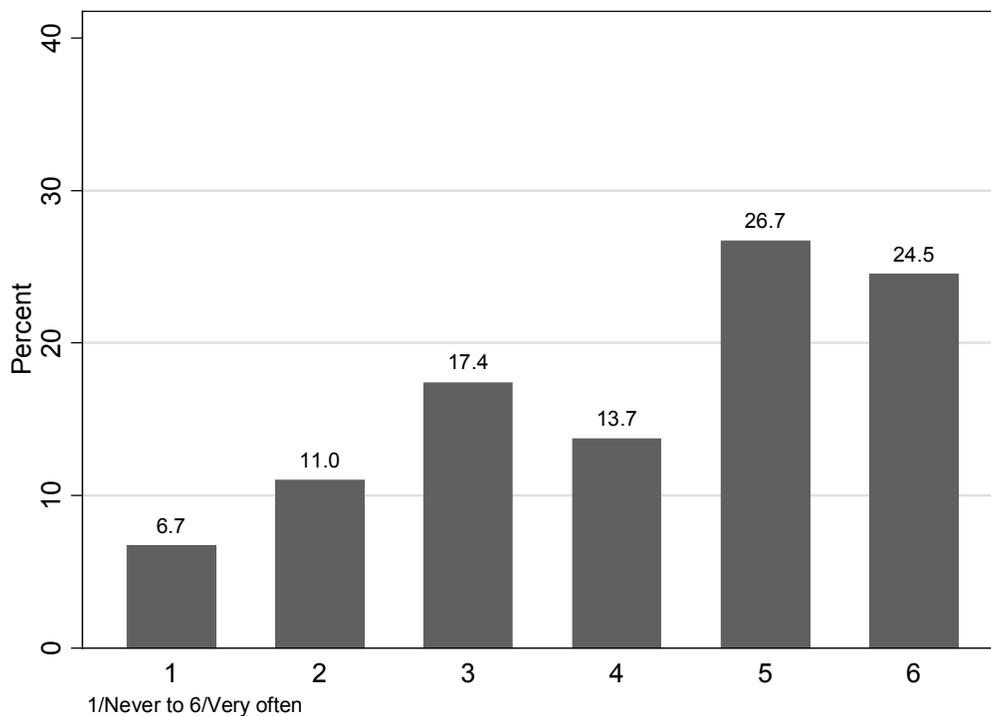
Respondents were also asked as a driver, how many times, if any, they have come close to being involved in a collision with a pedestrian or bicyclist in the last 12 months. The majority of respondents (71.4%)

indicated that they have not come close to being involved in a collision with a pedestrian or bicyclist in the last 12 months. Nevertheless, the remaining 28.6% reported coming close to being involved in such a collision between one and 20 times within the last year. More precisely, 13.1% of respondents reported that they have come close to being involved in a collision with a pedestrian or bicyclist on one occasion, and 15.5% have come close on two or more occasions in the last 12 months.

How often do Canadians see a driver waiting for a pedestrian to cross at a crosswalk?

Canadians were asked how often they see a driver waiting for a pedestrian to cross at a crosswalk, on a scale from 1 (never) to 6 (very often). As can be seen in Figure 12, 64.9% of respondents indicated that they frequently see this (selecting a score of four to six; 95%-CI: 61.7%-68.2%), while the remaining 35.1% indicated that they do not frequently see a driver waiting for a pedestrian to cross at a crosswalk (95%-CI: 31.8%-38.3%).

Figure 12. How often do Canadians see a driver waiting for a pedestrian to cross at a crosswalk?



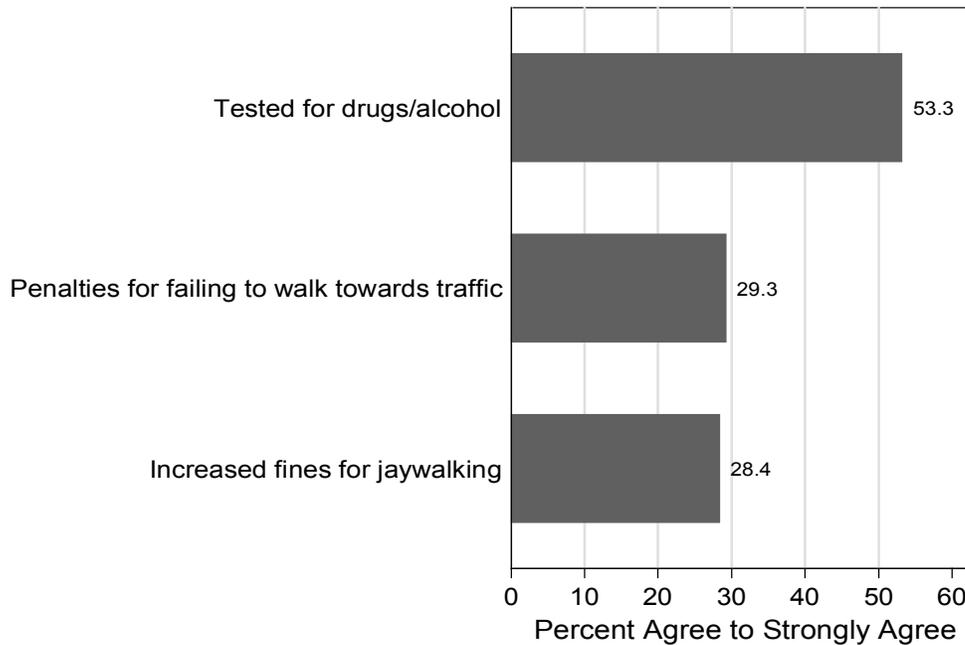
PUBLIC SUPPORT FOR MEASURES TO INCREASE PEDESTRIAN SAFETY

Canadians were asked about the extent to which they agree with the use of various measures for dealing with pedestrian related issues, on a scale from 1 (strongly disagree) to 6 (strongly agree). Responses from 1 to 4 were recoded as “not supportive”, while responses from 5 to 6 were recoded as “supportive” of the measure in question .

As evident in Figure 13, the survey results indicate that:

- > 53.3% agreed that all pedestrians involved in serious crashes should be tested for drugs/alcohol (95%-CI: 49.8%-56.7%).
- > 29.3% agreed that there should be penalties for pedestrians who fail to walk toward oncoming traffic when there are no sidewalks (95%-CI: 26.2%-32.4%).
- > 28.4% agreed that there should be increased fines for jaywalking (95%-CI: 25.4%-31.3%).

Figure 13. Percentage who agree with various methods for dealing with risky pedestrian behaviour



Logistic regression was used to further investigate the profile of those who agree with various measures to deal with risky pedestrian behaviour. It was found that older respondents are more likely to agree with all three of the above measures (pedestrians involved in crashes being tested for drugs/alcohol, increased fines for jaywalking, and penalties for failing to walk towards traffic in the absence of sidewalks).

It was also found that being from an urban area makes it less likely to agree that pedestrians involved in serious crashes should be tested for drugs/alcohol. To illustrate, of all those from an urban area, 51.4% agree with this measure, while out of all those from a rural area 60.7% agreed with this measure.

With regards to those who agreed that there should be penalties for pedestrians who fail to walk towards oncoming traffic when there are no sidewalks, being from an urban area makes it less likely to support this measure. Specifically, of those from an urban area, 27.9% are in agreement with this measure, while of all those from a rural area, 34.5% agreed with this measure. In addition, being married makes it less likely to agree with this measure. To illustrate, of those who were married, 27.4% agreed with this measure; of those who were single, 29.4% agreed with this measure; of those who were separated, 31.3% were in agreement with this measure; and of those who were widowed, 45% agreed with this measure.

SUMMARY AND CONCLUSIONS

Pedestrians and bicyclists are vulnerable road users. In collisions with other road users they suffer the most severe consequences due to their lack of protection. The purpose of this report is to help improve the safety of vulnerable road users by studying opinions, attitudes and behaviours of the public regarding the issue.

In general, Canadians are not concerned about pedestrians and bicyclists behaving unsafely on the roads. To illustrate, less than half of respondents (47%) are very or extremely concerned about bicyclists behaving unsafely on the road, and fewer (42.6%) are very or extremely concerned about pedestrians behaving unsafely on the road. These issues received the second and third last ratings of concern when comparing them to a variety of other road safety issues. Likewise, jaywalking was perceived as being a relatively low risk behaviour (37.4%) compared to other road behaviours. Furthermore, the majority of Canadians feel that pedestrians (64.1%) and bicyclists (61.9%) behave about the same in terms of aggressiveness today compared to five years ago, whereas the majority of pedestrians and bicyclists (60.5%) feel that drivers are more aggressive today compared to five years ago.

When a driver of a vehicle is involved in a collision, Canadians were asked who they think is more often at fault, the driver on the one hand, or the pedestrian or bicyclist on the other. The majority of respondents (57.8%) reported that they think the driver is more often at fault. Transport Canada data from 2001 reported that in general, half of all pedestrians killed or seriously injured in collisions involving motor vehicles are at fault (Transport Canada, 2004a). More recent information illustrated that the likelihood of the driver being at fault rather than the pedestrians has increased (Transport Canada, 2008), so the opinion of the majority of respondents is consistent with the literature.

In addition to this, the majority of respondents (87%) indicated that they do not think that pedestrians and bicyclists involved in collisions are frequently under the influence of alcohol. However, the research shows that alcohol is a major contributing factor in pedestrian crashes. To illustrate, of the fatally injured pedestrians in Canada who were tested for alcohol, 41.9% had been drinking. Furthermore, 27% of those tested had BAC levels over twice the legal limit for drivers (Mayhew et al., 2009).

With regards to self-reported risky pedestrian behaviour, less than one quarter of respondents (23.1%) indicated that they frequently jaywalk, 12.2% indicated that they frequently cross the street while listening to an mp3 player or CD-player, or using a cell phone, and 11.8% frequently cross at a crosswalk when a vehicle has the right of way. Although these behaviours may seem relatively infrequent, there is cause for concern, as most pedestrian crashes with motor vehicles occur when pedestrians are crossing the road (Hatfield et al., 2007; ERSO, 2006).

Perceptions of risky pedestrian behaviour were more negative with 67.1% of respondents indicating that they frequently see pedestrians jaywalking. Almost 62% (61.7%) frequently see pedestrians crossing the street while listening to an mp3 player or CD-player, or using a cell phone, and over a third of Canadians (38.3%) reported that they frequently see pedestrians crossing at a crosswalk when a vehicle has the right of way.

Of the 1,201 survey respondents, 493 or 41.2% reported that they ride a bicycle. Only 8.9% of bicyclists admitted to frequently crossing the street while listening to an mp3 player or CD-player, or using a cell phone, and 8.5% admitted to frequently weaving in and out of traffic while riding their bicycle on the road. With regards to how often bicyclists ride their bike at night when they are not easily visible to traffic, 8.3% of Canadian bicyclists admitted to frequently doing this. Although the percentage of those who ride their bike at night when they are not easily visible to traffic is relatively low, there is still cause for concern and room for improvement, as 30% of fatal bicycle crashes occur when visibility is poor (Transport Canada, 2004a).

Again, perceptions of risky bicyclist behaviours were more negative with 33.4% indicating that they frequently see a bicyclist crossing the street while listening to an mp3 player or CD-player, or using a cell phone. Slightly less than one third of respondents (32.4%) reported that they frequently see a bicyclist weaving in and out of traffic while riding their bicycle on the road and 38.3% indicated that they often see bicyclists riding their bike at night when they are not easily visible to traffic. Similarly, a study in Alberta found that the use of visibility aids was low among bicyclists (Hagel et al, 2007).

A clear majority of respondents (98.5%) indicated that they have not been in a collision with a pedestrian or bicyclist in the last 12 months. The remaining 1.5% did report being in one or more such collisions. Canadians were also asked about 'near misses' and it was found that nearly three quarters of respondents (71.4%) have not come close to being involved in a collision with a pedestrian or bicyclist in the last 12 months. Nevertheless, 13.1% of respondents reported that they have come close to being involved in a collision with a pedestrian or bicyclist on one occasion, and 15.5% have come close on two or more occasions in the last 12 months.

Canadians were asked how often they see a driver waiting for a pedestrian to cross at a crosswalk; 64.9% of respondents indicated that they frequently see this. Canadians were also asked, as a pedestrian, how often they feel that they have enough time to cross the street at an intersection with a stop light. Less than half of respondents (43.5%) feel that they do *not* have enough time to cross the street at an intersection with a stop light. Longer pedestrian walk signals would allow more time for slower pedestrians to cross safely (Transport Canada, 2008; 2004b) and could also reduce pedestrian crashes with motor vehicles (IIHS, 2008).

Finally, Canadians were asked to what extent they agree with various measures to increase pedestrian safety. Results indicated that 53.3% agreed that all pedestrians involved in serious crashes should be tested for drugs/alcohol; 29.3% agreed that there should be increased fines for jaywalking; and 28.4% agreed that there should be penalties for pedestrians who fail to walk toward oncoming traffic when there are no sidewalks.

In conclusion, Canadians are not overly concerned about the safety of vulnerable road users. However, crash data and self-reported behaviour from this RSM attest that concern is warranted. It seems there is room for improvement both on the part of drivers and vulnerable road users. Given the high number of near misses reported by drivers and the devastating damage they can do, regardless of whether they are at fault or not, being vigilant at all times and slowing down could go a long way in improving the safety of vulnerable road users. On the other hand, vulnerable road users themselves have to be prudent and respect traffic rules. As a vulnerable road user, you will always be in the weakest position when being involved in a crash and not being at fault will not change that.

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