



# THE ROAD SAFETY MONITOR 2010

## DISTRACTED DRIVING



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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# 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 and on-line 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](http://www.tirf.ca)) – the present one focuses on distracted driving.
- > Distracted driving is an important road safety issue that warrants our concern and attention. Distraction leads to performance decrements while driving and the level of risk of crashing increases as a result of distraction.
- > The majority of Canadians associate distracted driving with cell phones (72.2%) and the majority (74.4%) also think that cell phones are the most dangerous distraction while driving. This may suggest that Canadians do not fully appreciate the complete spectrum of behaviours that can be distracting.
- > Approximately three quarters (75.4%) of Canadians reported that distracted drivers in general are a very or extremely serious problem; 72% think that drivers using cell phones are a very or extremely serious problem; and, 90.2% think that drivers texting messages on their phones while driving are a very or extremely serious problem.
- > Canadians frequently engage in many activities that can be distracting while driving: 85.7% read road signs, 67% talk or interact with passengers, 54.8% think about things other than the driving task at hand, 45.8% change the radio stations or CDs, 40.9% read billboards or advertising, 32% eat or drink, 19.9% talk on their hands-free phone, 17.4% use GPS to navigate, 8% talk on their hand-held phone, 7.4% use technical devices such as blackberries, palm pilots, or laptops, 5.2% text message on their phone, and 3% read a newspaper, put on make-up or shave.
- > Canadians are using their cell phones more often today compared to results from 2001 through to 2006, but this increase was most notable for those using their cell phones for less than 10 minutes a week and there has been a decrease in those using their cell phones for over 30 minutes a week.
- > Few drivers admitted to being in a collision due to distractions within the last year with only 4.3% having been in a crash because of a distraction outside their vehicle and 2.7% because of a distraction inside their vehicle. More Canadians admitted they had to brake or steer to avoid being in a collision because they were distracted in the last month with 27.3% admitting having done so because of a distraction outside their vehicle and 12.6% because of a distraction inside their vehicle.
- > With regards to the use of various measures for dealing with the issue of distracted driving, 79.8% agreed that new drivers should be restricted from using cell phones while driving; 70% agreed that greater awareness and education efforts are needed to alert drivers to the problem of distracted driving; and, 67% agreed that the use of cell phones while driving should be banned.





# 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 2010 RSM regarding the issue of distracted driving. Past reports can be found at [www.tirf.ca](http://www.tirf.ca).



## METHOD

The tenth edition of the RSM contained 87 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.

A portion of all respondents were contacted by phone and the other portion on-line as part of a gradual transition to a complete on-line survey. Opinion Search Inc. fielded this survey in September, 2010 to a random sample of Canadian motor vehicle drivers who have driven in the past 30 days and have a valid driver's licence.

A portion of the survey was administered on-line. Among the 10,718 invitations to participate, 9,518 (89%) did not complete the survey. The other portion of the survey was administered by telephone. Among the 2,251 households contacted by phone in which a person was asked to participate, 1,696 (75%) refused and 154 (7%) were not qualified. Note that those who refused include respondent and household refusals as well as company refusals. These rates were similar to previous years.

A total of 401 drivers completed the telephone interview and a total of 1,200 drivers completed the on-line portion. The sample was stratified by province and weighted according to gender and age to avoid bias.

The data were analyzed taking account of the stratified and weighted sampling design (see StataCorp. 2010 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 2.5%, 19 times out of 20.



# REVIEW OF THE LITERATURE REGARDING DISTRACTED DRIVING

## Introduction

The increased use of cell-phones has resulted in a growing interest in driver distraction in recent years. However, while the use of cell-phones while operating a vehicle is leading to an increased risk in roadway safety, studies have found that there are other distractions that are also posing a significantly large risk (Hedlund 2006). Research has started to focus on identifying major sources of distraction, and different types of distractions involved in crashes.

The objective of this report is to present the current knowledge on driver distraction to better understand and address this problem through assessing attitudes, opinions, and behaviours. This literature review provides a background on distracted driving including the definition of distracted driving and the magnitude of the problem. Reasons for distractions and types of distraction are also discussed as well as the profile of distracted drivers. Finally, literature on the consequences of distracted driving, public concern about distracted driving and recommended countermeasures are presented. This is followed by a description of the results of the current study and a discussion of how these results relate to the literature.

## What is distracted driving?

Distracted driving is a diversion of the driver's attention while driving. When a driver participates in any non-driving activity, this has the potential to distract them from their primary task of driving (NHTSA 2010a). Taking attention away from driving may then increase the distracted driver's risk of crashing. Distracted driving can result both from distractions inside the vehicle (e.g., cell phone use, eating, drinking, smoking, talking with passengers, adjusting the radio/GPS, looking for an object), as well as outside the vehicle (e.g., looking at billboards, other drivers, admiring surroundings) (NHTSA 2010a).

While distracted driving has been defined in a number of different ways (Tasca 2005), one of the most widely accepted definitions in Canada is acknowledged in the proceedings from an international conference on distracted driving co-hosted by the Traffic Injury Research Foundation (TIRF) and the Canadian Automobile Association (CAA) in 2005. It states:

"Distraction involves a diversion of attention from driving, because the driver is temporarily focused on an object, person, task, or event not related to driving, which reduces the driver's awareness, decision-making, and/or performance, leading to an increased risk of corrective actions, near-crashes, or crashes" (Hedlund 2006; p.2).

## **Magnitude of the problem**

Distracted driving is a very difficult problem to measure and data sources are limited for a couple of reasons. People may under-report the extent to which they engage in distracting activities, distraction may not be reported to police or noted on crash reports, and distractions can be difficult to directly observe in traffic, particularly if they take place inside the vehicle. Due to differences in methodology and definitions of distraction, each study or survey conducted may arrive at different results and conclusions with respect to the involvement of driver distraction during a crash (NHTSA 2009a). Of importance, while it may be possible to identify distraction as a factor in a crash, it is more challenging to determine if it was a causal factor. As a consequence, estimates of the problem vary widely and more research into the causes of distraction and their consequences is needed.

Some evidence suggests that driver distraction is a significant traffic safety issue (Hedlund et al. 2006). For example, in the U.S., NHTSA estimated that about 25% of injury and property damage crashes are the result of driver distraction (Wang et al. 1996). Knipling et al. (1994; 1996) have similarly shown that driver distraction played a role in approximately 25% of all crash occurrences. Based on available research, it is generally believed that driver distraction is involved in 20-30% of road crashes (Hedlund 2006).

A NHTSA survey in the U.S. revealed that drivers reported making an estimated 4.2 billion one-way driving trips in a typical week where drivers admitted that they engaged in distracting behaviour on at least some portion of a driving trip (Royal 2003): 45% of all trips involved changing the radio station; 56% of all trips involved talking to passengers; almost 39% of trips involved the driver eating or drinking while driving; and other distractions included using a cell-phone (19%), dealing with children in the back seat (18%), personal grooming (8%), and looking at maps or directions (10%).

TIRF's 2002 RSM on distracted driving revealed that approximately 20% of Canadian drivers reported using a cell phone while driving in the past seven days. Many (57%) drivers who used the phone while driving did so sparingly – for ten minutes or less a week (Beirness et al. 2002). A follow up RSM on distracted driving in 2006 again revealed that the percentage of drivers reporting cell phone use in the past seven days had increased to 37%. The percentage of those using their phone while driving for ten minutes or less a week also increased to 69% (Vanlaar et al. 2007).

## **Why are people distracted?**

Driver distraction is a common occurrence. Drivers can be distracted by their thoughts, by objects or people in the road environment, or by a passenger or object in their vehicle (Smiley 2005). To understand why people can be distracted when they drive, it is important to first understand both the complexity of the driving task as well as how humans process information. "We are flooded with information that is visual, auditory, kinaesthetic, tactile, olfactory and taste" (Smiley 2005; p.4). However, humans are serial processors of information. They are only physically capable of consciously focusing their attention on one task at a time (Smiley 2005). The fact that people can rapidly switch their attention back and forth across

tasks leads many of them to believe that they can “multi-task”. In reality, people cannot multi-task, and, by trying to do so, neither task may receive optimal attention or focus. In fact, researchers that have studied the brain have identified what they call “reaction-time switching costs” or the measurable time it takes for the brain to shift its focus and attention back and forth across tasks. As the brain repeatedly makes this switch, the time spent on the actual individual tasks decreases (Dzubak 2007). Furthermore, Smiley (2005) noted that even if all our attention is on one task, we are still limited in how much new information we can process.

The way in which information is processed is important, particularly given that driving is a “divided attention” task that involves the interaction of manual, visual, and cognitive components. This means that drivers must be able to physically operate the vehicle controls at the same time they are observing the driving environment, recognizing hazards and deciding how to respond. For example, if another vehicle is going to enter a driver’s lane of traffic, the driver must first recognize the change in the driving environment that will occur, then decide if they will slow down/speed up or change lanes, and then execute that decision while taking proper safety precautions so as not to interfere with other vehicles on the road (Smiley 2005).

Another important concept to consider is situational awareness (SA). SA is a key concept in human factors that has been used to better understand attention and define driver distraction. SA refers to knowing and being aware of what is going on around you in the traffic environment (Tasca 2005).

Tasca (2005) identified three traffic components that are involved in SA. These components include: perceiving cues (e.g., traffic signs, brake lights); understanding what these cues mean (e.g., if you see the vehicle ahead of you braking, the vehicle is slowing down); and using this information to forecast future events in the traffic environment (e.g., given that the vehicle is slowing down, you may hit it unless you slow down yourself). These components all require that the driver be aware of space (how far vehicles and road users are from their vehicle) and time (how soon an event can occur, or how much time is needed to react). SA depends on factors such as: a driver’s training, experience, personality, cognitive ability, and physical ability. SA also depends on the vehicle’s capabilities (e.g., size, manoeuvrability, safety features, etc.), and the immediate road environment. In terms of the driver, they must have a situational awareness that involves decision-making and performance occurring in a continuous cycle, each affecting the other (Tasca 2005).

If a driver is distracted, they will not have the full cognitive functioning necessary to properly drive their vehicle. This can result in a slower reaction time if they need to brake, or change lanes. Therefore, a driver must have full situational awareness when driving. If a driver’s SA is impaired by other behaviours while driving, the driver will be unaware of what is going on around them in the traffic environment, which can result in an increased crash risk (Tasca 2005).

## Types of distraction

Strictly speaking, distraction is a subset of inattention, which includes fatigue, driver's physical and emotional conditions, and when the driver is otherwise "lost in thought". Some researchers classify driver drowsiness and daydreaming as inattention, while distraction is used to define a specific type of inattention that occurs when a driver diverts their attention from driving (NHTSA 2010a). This report will focus solely on the latter, driver distraction.

Given that there is no universally accepted definition of driver distraction researchers have acknowledged that distractions are made up of many factors. Distracted driving has been said to occur in three forms. The first is visual distraction, which involves the driver taking their eyes off the road. The second is manual distraction, which involves the driver taking their hands off of the wheel. Cognitive distraction is the third type of distraction where the driver is not thinking about the driving task. This third type is a less obvious form of distraction which includes daydreaming or dealing with strong emotions (NHTSA 2010b). For example, a National U.S. Survey conducted in 2009 found that 7.9% of drivers involved in crashes were inattentive because they were thinking about things not related to driving (NHTSA 2010c).

Stutts et al. (2001) further expanded these three types of distracted driving and categorized a list of 13 individual driver distractions:

- > eating or drinking;
- > pedestrians;
- > object or event outside of the vehicle;
- > adjusting radio, cassette, or DVD;
- > other occupants in the vehicle;
- > moving object in the vehicle;
- > smoking;
- > talking or listening on a cell phone; dialling on a cell phone;
- > using a device/object brought into the vehicle;
- > using a device/object integral to the vehicle; adjusting climate controls; and
- > other and unknown distractions.

It should be noted that there is some overlap between the types of distractions, as each term is not necessarily exclusive to each category. Such examples of inter-related concepts are secondary driving tasks, internal distractions and external distractions.



## Secondary tasks

It is important to recall that primary driving tasks consist of: steering; accelerating; braking; speed choice; lane choice; manoeuvring in traffic; navigation to destination; communicating with other road users, and scanning for hazards. Secondary tasks (also known as extra-driving tasks) are everything else drivers have been seen or reported to do while driving that is not directly related to manoeuvring their vehicle (Tasca 2005). Such secondary tasks are distractions that include: eating/drinking; grooming; using and adjusting in-vehicle technology devices; using a cell phone; conversation with passenger(s); tending to children and pets; smoking; observing pedestrians; etc. It should be noted that secondary tasks include both internal and external distractions which will be discussed below.

## Internal distractions

Internal distractions (or in-vehicle distractions) occur within the vehicle and can involve the driver performing a non-driving related task. Some examples of in-vehicle distractions include: talking to a passenger, consuming food or drink, smoking, or changing the radio. In 2006, a survey of Canadian drivers found that almost 10% of Canadians admitted they had to brake, or steer within the last month to avoid a collision because they were distracted by something within their vehicle (Vanlaar et al. 2007).

To examine the role of in-vehicle sources in distracted driving, a national study was conducted in the U.S. using data from an estimated 2,188,970 distracted driving crashes (NHTSA 2010b). The most frequently recorded distraction was “talking with a passenger” (about 16%), while other distractions were present in no more than 4% of the crashes (NHTSA 2010b). Phone use (talking, dialling, hanging up, and sending a text message) was the second most common distraction (3.4%). The statistics for other distractions show some subtle differences between performed activities. For example, retrieving objects from floor or seat (2%) was a more frequently recorded distraction as compared to retrieving objects from other locations (0.7%) (NHTSA 2010b). In addition, eating and drinking was more frequent (1.7%) than smoking (0.5%), and adjusting the radio or CD occurred more often (1.2%) compared to adjusting other vehicle controls (0.3%) (NHTSA 2010b).

## External distractions

External distractions or out-of-vehicle distractions can be anything that surrounds the vehicle’s external environment. The most common out-of-vehicle distractions include: roadway signs, construction zones, cyclists, billboards, accidents, animals and pedestrians, to name a few. In a Canadian survey conducted in 2006, 20.2% of drivers admitted they had to brake or steer to avoid a collision within the last month because they were distracted by something outside their vehicle (Vanlaar et al. 2007).

A Toronto study examined how video advertising signs affected the safety of downtown intersections. The study showed that the driver’s glances at the signs were brief. However, it was found that drivers’ glances at billboard signs were made in less safe conditions than were glances at electronic signs, in that, on

average drivers were closer to the vehicle in front when the glances were made. Reasons for this, however, were not found (Smiley 2005).

### **Technology-based distractions**

Potential hazards related to driver distractions are expected to escalate in the future as more in-vehicle technologies become available for use in personal vehicles (Stutts et al. 2001). “In-vehicle technology” refers to a device that may be used in a vehicle, whether it is a portable device carried into the vehicle or an installed device embedded in the vehicle (NHTSA 2008a). Cellular phones are the most common in-vehicle devices and the risk associated with their use while driving has been debated. Other in-vehicle devices, such as navigation systems and mp3 players, are becoming more common in new vehicles, raising concern about their effects on driver distraction (NHTSA 2008a).

### **Cell phone use**

Wireless technology is an integral part of Canadian life and there is an increasing number of cell phone users. To illustrate, a 2008 survey revealed that 72% of Canadian households report they have access to a wireless phone compared to 64% in 2006 (CWTA 2008). Wireless coverage is available to 99% of Canadians and, as of September 2009, there were approximately 22,500,000 wireless phone subscribers in Canada according to the Canadian Wireless Telecommunications Association (CWTA 2009) while the total population of Canada was estimated to be 34,108,800 as of July 1, 2010 (Statistics Canada 2010). Thus, approximately 66% of the Canadian population are wireless phone subscribers. As a result of this increased use of cell-phones, cell phone use while driving is among the leading driver distractions that are causing concerns for road users, and officials alike.

An observational study conducted across Canada found that 2.8% of drivers in rural areas were observed using a cell phone in 2006, and 5.9% of drivers in urban communities were observed using a cell phone in 2007 (Transport Canada 2008). In the U.S., in 2008, the percentage of drivers visibly manipulating hand-held devices had reached 1%, the percentage of drivers with visible headsets was 0.6%, and drivers holding cell phones to their ears was 6% (NHTSA 2009b). This translates into an estimated 11% of vehicles whose drivers were using some type of phone (hand-held or hands-free) during the day (NHTSA 2009b).

In terms of self-report data, a 2006 Canadian survey found that 37% of drivers reported using a cell phone while driving in the past week (Vanlaar et al. 2007). In the U.S., data from two national opinion polls in 2007/2008 revealed that more than 50% of drivers reported using a cell phone while driving at least some of the time and of these, approximately 16% said they did so regularly (AAAFTS 2008). To place these findings in context, in 2010, 93% of the U.S. population was estimated to have a cell phone subscription (CTIA 2010).

A considerable body of research has been published to understand the effects of cellular phone use on driving behaviour and safety. A Toronto study conducted in 1994/1995 comparing the time on cell phone bills with the time of the crash found that drivers’ use of a cell phone up to 10 minutes before the crash

was associated with an increased likelihood of being involved in a crash (Redelmeier and Tibshirani 1997). In terms of driver performance, a 2006 meta-analysis found that phone use negatively affected both response time and driving within the designated lane. Interestingly, it was also found that hands-free phone use did not reduce these costs. Thus, the authors concluded that the main effect of phone use was the cognitive distraction and that both hand-held and hands-free phones involve comparable risks (Horrey and Wickens 2006). Caird et al. (2008) also found similar performance decrement results with using a hands-free device compared to using a hand-held device.

Interestingly, there is some evidence that phone conversations are more disruptive than having a conversation with passengers, manipulating the radio, or changing a CD (McCartt et al. 2006). However, other studies have found that conversations with passengers were just as detrimental to driving performance as cell phone conversations were (Caird et al. 2008; Horrey and Wickens 2006).

Presently, there is evidence which suggest that the associated problems with cell phone use while driving may increase. First is the continually increasing number of cell phone users. Second is the fact that phones are now being used for numerous other activities such as texting, downloading, playing games. Moreover, Trezise et al. (2006) found that younger people are predominantly performing these secondary tasks on their cell phones, which may increase their risk of collision due to weaker driving abilities. A simulator study examining the effects of text messaging on young novice drivers found that drivers were more likely to drive outside the lane boundaries and were less likely to respond appropriately to traffic signs while texting. It was also found that texting drivers spent approximately 40% of the time looking away from the road when driving, versus 10% when not texting (Hosking et al. 2006).

### ***Navigation systems and music players***

Few studies have specifically studied the distracting effects of operating vehicle radios or other entertainment systems (e.g., cassette, CD) because these secondary tasks are generally considered harmless. However, studies that have looked at in-vehicle technologies have demonstrated that turning on or simply listening to the radio while driving can distract a driver and degrade driving performance. Research has also suggested that operating a CD player while driving is more distracting than dialling a mobile phone or eating (Young et al. 2003).

In-vehicle route-guidance or navigation systems (e.g., GPS) are designed to guide drivers to a specified destination. While such systems may be helpful to drivers in unfamiliar locations, they have the potential to distract drivers in several ways. These include the physical distraction and visual distraction when looking at the display while entering a destination or viewing a map or directions; the aural distraction when listening to auditory turn-by-turn instructions; and also the cognitive distraction when the driver thinks about the information presented by the system. Entering the destination into the system is considered the most distracting component of using in-vehicle navigation systems (Young et al. 2003).

Tijerina et al. (1998) examined the effects of destination entry using four route guidance systems on driving performance. They found that destination entry using the visual/manual systems had a generally higher potential for distraction than the voice activated system. This was evidenced by longer completion times, more frequent glances at the device, longer eyes-off-road times, and a greater number of lane changes (Tijerina et al. 1998).

Drivers may not consider that listening to music, or looking at a GPS while driving can affect their driving performance. However, the literature has shown that using in-vehicle technology while driving increases the risk of a collision. With education, drivers can be made aware of the risks these devices create if used while driving.

## **Profile of distracted drivers**

### **Gender**

In Canada, 43% of males reported they used their cell-phone while driving in the last week, compared to only 32% of females (Vanlaar et al. 2007). Male drivers were more often found to be focused on in-vehicle distractions, eating or drinking, retrieving objects from floor or seat, and adjusting radio or CD player than female drivers. Conversely, in the U.S., the percentage of female drivers engaged in conversations on a cell-phone, with a passenger, and looking at movements or actions of others were higher compared to male drivers (NHTSA 2010c). Therefore, the data suggest that gender may not play a major role in distracted driving.

It is estimated that a bit more than half (54%) of all crash-involved drivers in the U.S. in 2009 were male drivers (NHTSA 2010b). Even though the female drivers had a smaller percentage (46%) among crash-involved drivers than male drivers (54%), both groups had the same percentage (about 17%) among those distracted from at least one internal source (NHTSA 2010b). In addition, the female drivers in each age group had a higher frequency of drivers who were conversing with a passenger as compared to their male counterparts (NHTSA 2010b).

### **Age**

Much of the literature shows that regardless of gender, incidences of distracted driving decrease as age increases, though the trend is clearer in the case of male drivers (NHTSA 2010c). Driver age and gender can have a joint effect on the likelihood of being distracted while driving. The incidence of distraction from one or more sources was the highest (24.4%) among male drivers 16 to 25 and the lowest (12.7%) among male drivers 65 and older (NHTSA 2010b).

Vanlaar et al. (2007) found a relationship between age and having to steer or brake to avoid a collision because of in-vehicle distractions. The younger the driver, the more likely they were to have to steer or brake to avoid a collision. This relationship was not found for external distractions (Vanlaar et al. 2007).

Many studies on distracted driving have concluded that young drivers make up an extremely large number of distracted drivers involved in crashes. In the U.S., about 985,000 drivers under the age of 21 were involved in a distracted-driving related crash within the last five years (NHTSA 2010b). This is 13% of all drivers involved in a crash, yet young drivers make up just 6% of the driving population. Similarly, about 1.7 million drivers (23%) in their twenties, compared to all other age groups, had a distracted-related crash. In comparison, 592,000 drivers over the age 64 were reported to be involved in a crash caused by distracted driving (NHTSA 2010b). Moreover, drivers under 16 had the highest frequency (36.8%) of being distracted, while drivers 65 and older had the lowest percentage (12.3%) of being distracted (NHTSA 2010b).

In addition, an older study by Treat et al. (1979) found that drivers under age 30 were significantly more likely to have been in a crash they attribute to distracted driving (about 6%), with involvement in such a crash decreasing with age to less than 2% of drivers 65 or older.

In conclusion, while younger drivers are most likely to have a crash because of a distraction, adults seem to have more distractions to deal with while they drive. Such distractions include: taking care of children in the back seat, or thinking about marital, family or financial problems, compared to younger drivers who may not have these same issues to think about.

## **Consequences of distracted driving**

Research shows that distracted drivers commit a variety of driving errors:

- > following too close;
- > failing to maintain lane position (wandering or weaving);
- > irregular speed;
- > red-light running;
- > delayed reaction times; and,
- > less visual scanning (miss environmental cues).

These driving errors make it more likely that drivers eventually will need to take corrective action, resulting in near-misses, or crashes. Distracted drivers are more likely to be involved in rear-end crashes or single vehicle crashes and approximately 70% of distracted driver crashes involved one of these two crash types (Ranney 2008). Most of the other crashes involved angle collisions, many of which involved turns. In addition, crash studies show that distracted drivers are 50% more likely to have been killed or seriously injured in crashes as compared to attentive drivers (Ranney 2008).

Using the 100-Car Naturalistic Driving Study data, Klauer et al. (2006) showed that in general, some form of driver inattention was present in nearly 80% of distraction-related crashes. It should be noted however,

that there are limitations to this study including the small number of actual crash events. If crashes involved minor damage, this data would be missing from police reports (Klauer et al. 2006). A similar study revealed that distraction resulting from a secondary task was reported in 33% of crashes and 27% of near-crashes (NHTSA 2008b). Using these data to calculate the relative risk of crashing, researchers concluded that performing a complex secondary task (e.g., reaching for an object, applying makeup or dialling) exposed drivers to approximately three times the risk of involvement in a crash or near-crash; moderate secondary tasks (talking/listening, eating, inserting a CD) were approximately twice the risk, and for simple secondary tasks (e.g., adjusting radio, drinking, smoking) there was no appreciable increase in risk (NHTSA 2008b).

Fatality data provides a different window on the problem. In Canada, few jurisdictions include a category for driver distraction in police reported crash data, although some do include “driver inattention”. Hence, data on the number of fatalities and injuries in Canada due to distracted driving are limited.

However, as of 1995 in the U.S., a growing amount of data has been collected on driver distraction (NHTSA 2008b). The following are recent statistics on the occurrence of fatalities and injuries due to distracted driving within the U.S.:

- > 5,474 people were killed in crashes because of driver distraction. This represents 16% of all traffic fatalities in 2009 (NHTSA 2010d).
- > An estimated 20% of 1,517,000 injury crashes were reported to have involved distracted driving in 2009 (NHTSA 2010d).
- > Fatalities caused by driver distraction increased from 10% in 2005 to 16% in 2009. During that time, fatal crashes with reported driver distraction also increased from 10% to 16% (NHTSA 2010d).
- > Of all distraction-related crashes, cell phone use was reported in 18% of fatalities and 5% of injuries (NHTSA 2010a).

In fatal crashes, young drivers under the age of 20 accounted for the greatest proportion of distracted drivers. To illustrate, driver distraction accounted for 16% of all fatal crashes involving drivers under age 20. Of those drivers involved in fatal crashes who were reportedly distracted, 30-39 year olds had the highest proportion of cell phone involvement (NHTSA 2010a).

## **Public concern about driver distraction**

Interest in and concern about distracted driving in Canada has grown over the past decade. As evidence of this, TIRF’s 2002 RSM showed that almost 40% of Canadian drivers believed that driver distraction was a serious road safety problem. Cell phone use, however, was of greater concern with two-thirds reporting that cell phone use by drivers is a serious or extremely serious problem (Beirness et al. 2002). A following RSM on distracted driving in 2006 revealed a substantial increase in the number of Canadians (69%) concerned about distracted driving (Vanlaar et al. 2007).

In November 2010 a Canadian poll showed that distracted driving had for the first time surpassed impaired driving as the number one road safety concern with 85% reporting concern (CAA 2010). The 2010 RSM on drinking and driving confirmed that texting while driving (90.2%) has indeed surpassed drinking and driving (84.5%) as the most serious road safety problem according to Canadians (Vanlaar et al. 2010). However, concern about distraction in general is 75.4%, which is lower than concern about young drinking drivers (83%); young drugged drivers (78.3%), and; running a red light (75%) (Vanlaar et al. 2010).

Similar polls conducted in the U.S., focusing specifically on cell phone usage, also reveal high levels of public concern about distracted driving. The two polls 2007/2008 show that four out of five drivers consider cell phone use a serious or extremely serious problem and more than half agree that it is unacceptable (AAAFTS 2008).

## **Recommended countermeasures**

There is no single study design that can answer all of our questions about the magnitude of the distracted driving problem, or its characteristics. However, a wide range of research studies have provided many different windows on the distracted driving problem. No single design can provide all the information needed to inform decision-making. Ultimately, decisions regarding needed actions should be based upon a strong convergence of evidence from many different types of studies (Bellavance 2005). It is challenging to measure driver distraction in the natural driving environment which contributes to imprecise estimates of the problem. As a consequence, more research is needed to better understand the causes of distraction and their consequences.

The primary response to distracted driving in Canada as well as in the U.S. has been the passage of laws – many of which center on hand-held cell phone use. Some jurisdictions have also pursued the development of educational strategies targeting the general public, employers and young drivers. A brief description of legislation and programs underway in Canada and the U.S. is provided below.

For many years, all jurisdictions in Canada have had the general offence of “driving without due care and attention”. Penalties can be quite hefty (court appearance; fines; demerits) (Wilson 2005). More recently, in response to public concern, almost all Canadian jurisdictions have passed legislation banning hand-held devices as of December 2010. Jurisdictions that have yet to do so include Yukon (introduced legislation) and the Northwest Territories and Nunavut (no action). New Brunswick has introduced legislation to allow a ban on the use of hand-held cell phones while driving. This will take effect June 2011 (GNB 2011). British Columbia and Saskatchewan have also banned hands-free devices, but only among novice drivers (Transport Canada 2010: <http://www.tc.gc.ca/eng/roadsafety/safedrivers-distractions-current-legislation-1074.htm>).



The main limitation of legislation targeting hand-held phone use is that it gives a false impression that using a hands-free phone is safe (Tromblay 2010). To illustrate, U.S. surveys conducted by AAAFTS revealed that two out of three drivers believe that using a hands-free phone while driving is safer than using a hand-held phone (AAAFTS 2008). Of greater concern, such laws do nothing to address the many other sources of distraction which are more prevalent. In addition, several jurisdictions are implementing public awareness activities and conducting or planning an evaluation of legislation or initiatives.

Legislation has been implemented in the U.S. as well, although, much of it emphasizes the prohibition of hand-held phone use and texting. According to the National Conference of State Legislatures, as of 2010:

- > hand-held phone bans for all drivers are in place in eight states and DC;
- > hand-held and hands-free phone ban for school bus drivers in 18 states and DC;
- > hand-held and hands-free phone ban for teen drivers in 28 states and DC;
- > texting ban for all drivers in 30 states and DC;
- > primary laws for texting for all drivers in 27 states; and,
- > crash data collection in 36 states, U.S. Virgin Islands and DC.

According to a 2010 survey of distracted driving programs conducted by the Governors Highway Safety Association, many jurisdictions are also taking action:

- > 27 states, DC. and Guam have included distracted driving in their state highway safety plan;
- > 7 states have held a summit or convened a task force on this issue;
- > More than 40 states collect distracted driving data on police and/or crash reports; only 34 states collect cell phone use data that meets minimum model criteria;
- > 23 states have created special materials for teen drivers on distraction; 37 states and D.C. have public education programs; in addition 8 states are delivering distracted driving education to the judiciary;
- > 15 states and D.C. are using social media to promote anti-distracted driving messages; and,
- > 35 states report partnerships with state agencies or private employers to target distracted driving.

The first U.S. state law to ban hand-held phones was implemented in New York in November 2001. Changes in phone use rates in NY were compared to the neighbouring state of Connecticut which had no such law. Findings showed that the amount of drivers observed using hand-held phones declined by about half following the implementation of the law. However these declines were eroded approximately one year after implementation (McCartt and Geary 2004). A similar study conducted in DC revealed similar declines; however these reductions were still evident one year later. These differences are a result of more pronounced enforcement of the law in DC as compared to NY (McCartt and Hellinga 2007).

Another study in North Carolina that banned the use of any type of phone by drivers under age 18 showed few effects. Actually, phone use among this population slightly increased following the implementation



of the law. Follow up interviews revealed that neither teenagers nor parents felt that the law was steadily enforced (Foss et al. 2008).

A study re-examined the effectiveness of these hand-held bans several years after the laws' implementation in NY, CT and DC in 2009. The study concluded that there were significant declines in the use of hand-held phones among drivers immediately after the laws were implemented. Observations taken several years later revealed that usage was still lower than what would have been expected with no such law. However, the size of the reductions did vary across the three jurisdictions. In DC the law produced an estimated 41% reduction following implementation of the law; an estimated reduction of 43% was evident five years later. In NY, seven years following the law the observed phone use rate was 24% lower than previous years. In CT, a ban was implemented in 2005.

Most studies examining the effects of laws to ban hand-held phones evaluate the effectiveness in reducing the use of hand-held phones while driving. They provide no indication of whether these types of laws actually reduce crashes. Such laws require both education and sustained enforcement to produce the desired change in driver behaviour in the long-term and to achieve high levels of compliance with these types of laws.

A recent study examining social influences among young drivers using mobile phones while driving was conducted in Kuwait. The findings of the study suggest that perceptions of how other people behave can affect a driver's intention to continue using a phone while driving, and the actions of law enforcement play an important role. So, when drivers believe that relevant others believe the behaviour is acceptable and that there will be no consequences (e.g., they will not be stopped or fines will be low), they will continue to engage in the behaviour (Riquelme et al. 2010). While this pilot study was limited, it concluded that "In practice, social marketing is likely to encounter difficulty in changing behaviour because the descriptive norm appears to be that talking on the phone while driving is acceptable behaviour. Campaigns must therefore try and convince the target audience that this is a false norm..." (Riquelme et al. 2010; p.131). Indeed, Vanlaar et al. (2008) showed that people are more concerned about unsafe driving behaviour when they believe others are concerned. Thus, through social marketing and focussing on feelings of concern, a bandwagon effect can be created that could help rectify this false norm (Vanlaar et al. 2008).

While many of the initiatives to reduce distracted driving have centered on cell phone use, potential hazards related to driver inattention and distractions are expected to escalate in the future as more in-vehicle technologies become available for use in personal vehicles (Stutts et al. 2001). Cellular phones are the most familiar and common example of in-vehicle devices. However, other in-vehicle devices such as navigation systems and mp3 players are becoming increasingly available in new vehicles. This is raising concern about their effects on distracting drivers. As such, this topic is a growing subject of serious debate regarding the use of and needs for regulation.

As evidence of this, the Association of International Motor Vehicle Manufacturers in Canada and the Canadian Vehicle Manufacturers Association made a presentation to the Canadian Council of Motor Transport Administrators (CCMTA) Road Safety and Research Policy Committee at the November 2010 meeting. Their focus was on the responsibility of the auto industry in introducing technology in the vehicle to minimize distractions.

Their main concern centered on the need for industry to be aware of whether the relevant provincial/territorial Ministries are considering the implementation of distraction-related laws or regulations that would affect existing or upcoming in-vehicle technologies. Uniformity in provincial regulation regarding driver distraction and the prohibition of the use of devices with display screens and hand-held communication and entertainment devices across jurisdictions is essential to manufacturers. As such, they recommended that any new legislation or regulations accommodate such original equipment systems that are designed for and installed in vehicles, and, instead, solely focus on “add-on” and portable consumer electronics and equipment (CCMTA 2010).

## Summary

Distracted driving has been defined in a number of different ways. In general, distracted driving is a diversion of the driver’s attention while driving. When a driver participates in any non-driving activity, this has the potential to distract them from their primary task of driving which increases the likelihood of being in a collision.

Driver distraction is a common occurrence and there are many different types of distraction. Drivers can be distracted by many different things, including events, objects, activities or people both within and outside of the vehicle. In addition, as more in-vehicle technologies become available for use in personal vehicles, potential hazards related to driver distractions are expected to escalate. Cellular phones are the most familiar and common example of in-vehicle devices. However, other in-vehicle devices such as navigation systems and mp3 players are becoming increasingly available in new vehicles. This is raising concern about their effects with respect to distracting drivers.

With regards to the profile of distracted drivers, the data suggest that gender may not play a major role in distracted driving. Generally, regardless of gender, incidences of distracted driving decrease as age increases, though the trend is clearer in the case of male drivers. In addition, while younger drivers are most likely to have a crash because of a distraction, adults seem to have more distractions to deal with while they drive.

In Canada, few jurisdictions have included a category for driver distraction in police reported crash data, although some do include “driver inattention”. Hence, data on the number of fatalities and injuries in Canada due to distracted driving are limited. In the U.S. in 2009, 5,474 people were killed in crashes

because of driver distraction representing 16% of all traffic fatalities for that year (NHTSA 2010d). Estimates of the problem of distracted driving, however, vary widely and more research into the causes of distraction and their consequences is needed. It is generally believed that driver distraction is involved in 20-30% of road crashes (Hedlund 2006).

Interest in and concern about distracted driving in Canada has grown. As evidence of this, TIRF's 2002 RSM showed that almost 40% of Canadian drivers believed that driver distraction was a serious road safety problem (Beirness et al. 2002). A following RSM on distracted driving in 2006 revealed a substantial increase in the number of Canadians (69%) concerned about distracted driving (Vanlaar et al. 2007). Finally, in 2010, the RSM on drinking and driving showed that concern about distraction in general had increased again to 76.6% (Vanlaar et al. 2010).

The primary response to distracted driving in Canada and the U.S. has been the passage of laws – many of which center on hand-held cell phone use. The main limitation of legislation targeting hand-held phone use is that it gives a false impression that using a hands-free phone is safe (Trombley 2010). Furthermore, most studies examining the effects of laws to ban hand-held phones evaluate the effectiveness in reducing the use of hand-held phones while driving. They provide no indication of whether these types of laws actually reduce crashes. Unfortunately, little is being done to address hands-free phone use as well as many other sources of distraction.



# FACTORS THAT CANADIANS CONSIDER DISTRACTING

## When asked about distracted driving, what factors come to mind?

To gauge what Canadians associate with distracted driving, respondents were asked to list two distractions while driving that they can think of. Answers from respondents were condensed into 28 categories. The most frequent distraction that was listed first was cell phones (72.2%) with 44.8% listing cell phones in general, followed by 16.4% listing talking on a cell phone specifically, and 11% listing texting.

Other distractions listed were as follows: eating or drinking (4%), passengers (3.4%), other drivers on the road (2.9%), changing the radio station or CDs (2.8%), music or other noise (2.1%), pedestrians or bicyclists (2.1%), kids in the vehicle (2%), technical devices (1.6%), smoking (1.1%), signs on the road (1.1%), accidents on the side of the road (0.7%), sightseeing (0.6%), other distractions (0.6%), personal grooming (0.4%), inattention (0.4%), doing things other than the driving task at hand (0.4%), alcohol or drugs (0.3%), fatigue (0.3%), weather (0.3%), animals on the side of the road (0.2%), animals in the vehicle (0.2%), and impatience (0.02%).

In general, the majority of Canadians (72.2%) think about cell phones first when asked about distracted driving, which suggests that they have a limited view of what distracted driving is. Logistic regression was used to investigate the profile of those who think of cell phones when asked about distracted driving compared to those who do not. No significant effects were found except for one variable, marital status. However, these results were not meaningful (of those who were married, 76.4% listed cell phones; of those who were single, 69.2% listed cell phones; of those who were separated, 72.6% listed cell phones; and of those who were widowed, 69.8% listed cell phones). Based on the data available it was not possible to identify useful characteristics to distinguish between people who spontaneously associate distracted driving with cell phones versus people who do not.

## What distractions do Canadians think are the most dangerous?

Canadians were also asked to list two distractions while driving that they think are the most dangerous. Again, the majority of Canadians listed cell phones first (74.4%) with 37.1% listing cell phones in general, 20.3% listing texting, and 17% listing talking on a cell phone specifically.

Other distractions listed as the most dangerous were as follows: alcohol or drugs (4.5%), other drivers on the road (3.9%), eating or drinking (2%), passengers (1.6%), technical devices (1.4%), pedestrians or bicyclists (1.3%), changing the radio station or CDs (1.2%), doing things other than the driving task at hand (1.2%), personal grooming (1.1%), kids in the vehicle (0.9%), inattention (0.8%), fatigue (0.8%), other distractions (0.8%), signs on the road (0.7%), animals in the vehicle (0.6%), animals on the side of

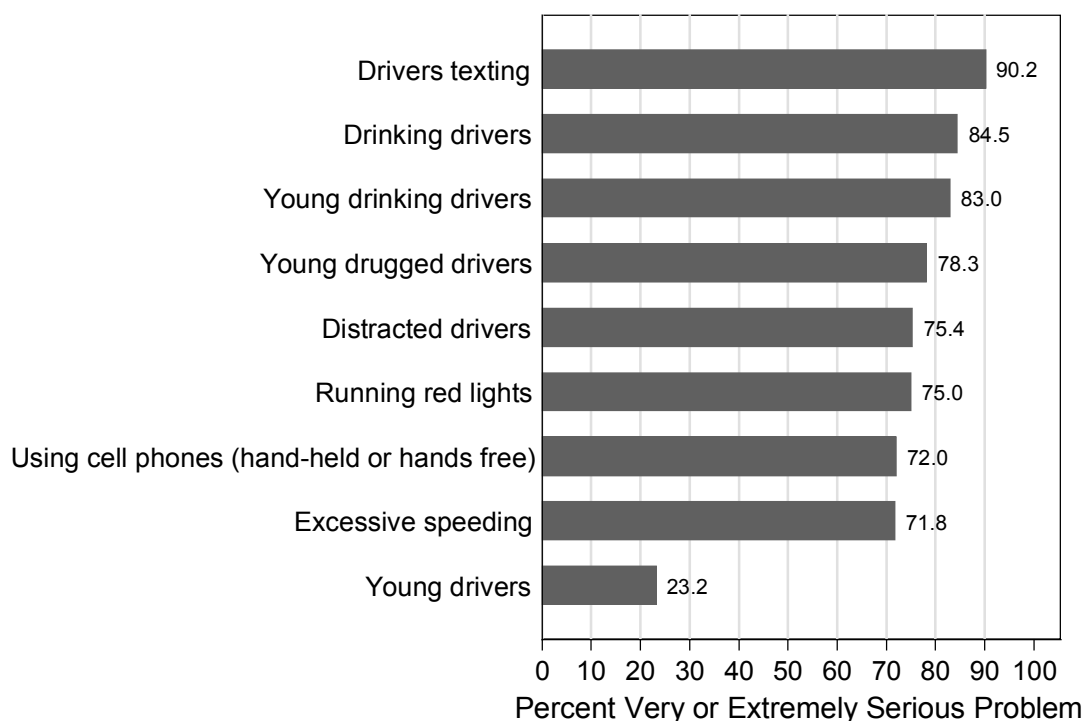
the road (0.5%), smoking (0.4%), accidents on the side of the road (0.4%), music or other noise (0.3%), weather (0.3%), and impatience (0.02%).

The majority of Canadians view the use of cell phones while driving as the most dangerous distraction (74.4%). Logistic regression was also used to investigate the profile of those who think cell phones are the most dangerous distraction while driving in comparison to those who listed other distractions. It was found that being concerned about drivers using cell phones (either hand-held or hands-free) and being concerned about drivers texting messages on their phones while driving significantly increased the likelihood of listing cell phones while driving as the most dangerous distraction. To illustrate, of those who thought drivers using cell phones was a serious or very serious problem, 74.9% listed cell phones as the most dangerous distraction compared to 65.6% for those who did not think drivers using cell phones was a serious problem; and, of those who thought drivers texting was a serious or very serious problem, 73.9% listed cell phones as the most dangerous distraction compared to 59.2% for those who did not think drivers texting was a serious problem.

# CONCERN ABOUT DRIVER DISTRACTION

## Are Canadians concerned about driver distraction?

Canadians were asked about a series of specific road safety concerns and about how serious they perceive those problems to be, ranging from 1 (not a problem at all) to 6 (an extremely serious problem); for scoring purposes, respondents were coded as being concerned about an issue if he or she chose a five or six.



**Figure 1.** Percentage of road safety issues that are perceived as a very or extremely serious problem

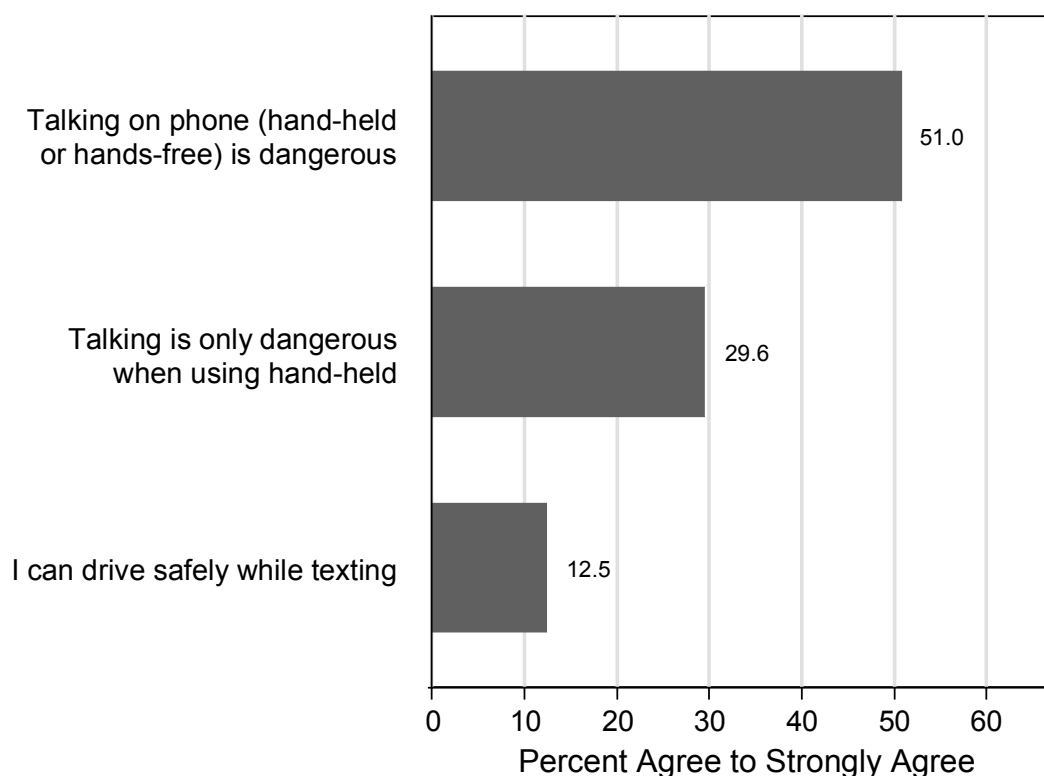
As can be seen in Figure 1, 75.4% of respondents think distracted drivers are a very or extremely serious problem; the 95% confidence interval (95%-CI) was 72.9%-78%. Also, this year, for the first time ever, drinking and driving is no longer at the top of the list. The issue that most Canadians consider to be the most serious traffic safety issue is texting while driving with 90.2% (95%-CI: 88.3%-92%) rating this as a very or extremely serious problem. Of interest, a recent poll by the Canadian Automobile Association (CAA) also found that texting while driving has risen to the top of Canadians' road safety concerns. Figure 1 further shows that 72% (95%-CI: 69.3%-74.7%) of respondents think that drivers using cell phones (either hand-held or hands-free) is a very or extremely serious problem.

The second highest rating of concern was for drinking drivers (84.5%; 95%-CI: 82.2%-86.7%) followed by young drinking drivers (83%; 95%-CI: 80.8%-85.4%), young drugged drivers (78.3%; 95%-CI: 75.7%-80.7%), and running red lights (75%; 95%-CI: 72.3%-77.5%). The second last and last ratings of concern

were for excessive speeding (71.8%; 95%-CI: 69.0%-74.4%) and young drivers (23.2%; 95%-CI: 20.6%-25.7%). Note that the difference between those who think that distracted drivers are a very or extremely serious problem and all other road safety issues was significant with the exception of the difference between distracted drivers and young drugged drivers, and the difference between distracted drivers and running red lights.

### Do Canadians think that cell phone use is dangerous while driving?

To gauge Canadians' attitudes towards cell phone use, respondents were asked about the extent to which they agree or disagree with various statements regarding the use of cell phones while driving. Figure 2 shows the percentage of respondents who said they agreed with various statements, rated on a scale from 1 (strongly disagree) to 6 (strongly agree); for scoring purposes, respondents were coded as agreeing with an issue if he or she chose a five or six.



**Figure 2.** Percentage who agree with various statements about distracted driving

As can be seen in Figure 2, about half (51%; 95%-CI: 48%-54%) of all respondents agree that talking on your phone while driving is dangerous regardless of whether you use a hand-held or a hands-free device. Interestingly, less than a third (29.6%; 95%-CI: 26.9%-32.4%) agree that talking on your phone while driving is only dangerous when using a hand-held device. Just under 13% (12.5%; 95%-CI: 10.5%-14.5%) of respondents agree that they can drive safely while texting on their phone. While it appears that



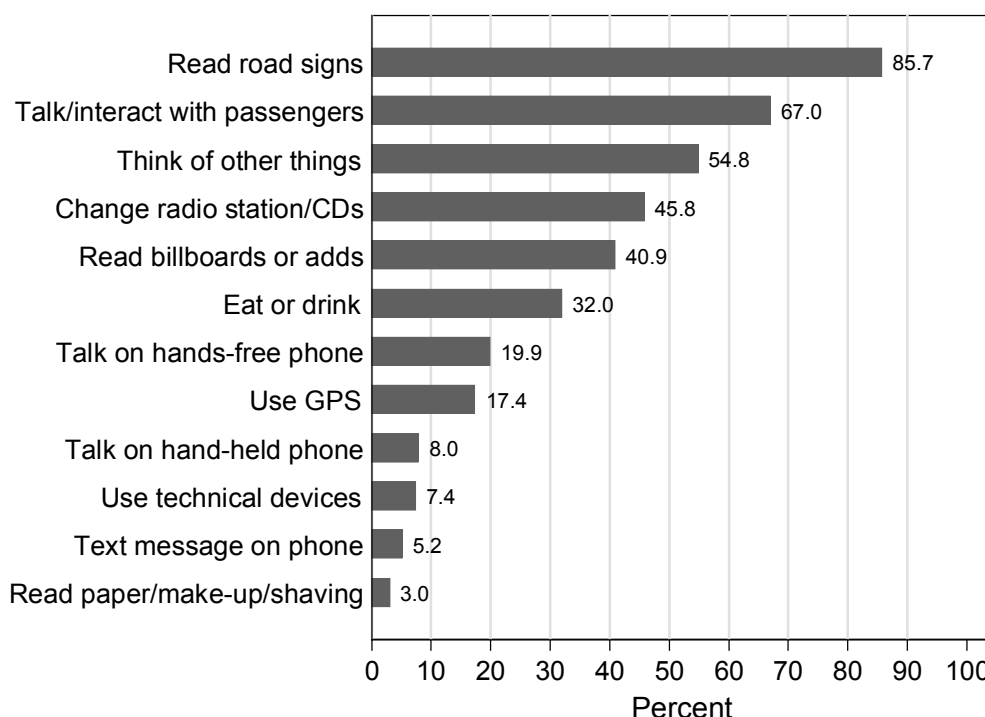
more Canadians agree that any type of cell phone use is dangerous, rather than just hand-held phone use while driving, it is concerning to see that 12.5% believe they can drive safely while texting.



# MAGNITUDE OF THE PROBLEM OF DRIVER DISTRACTION

## How often do Canadians engage in distracted driving activities?

Canadians were asked on a scale from 1 (never) to 6 (very often), how often they engage in various activities while driving that can be distracting; for scoring purposes, respondents were coded as frequently engaging in distracted driving activities while driving if he or she chose a four, five or six.



**Figure 3.** Percentage who reported engaging in distracted driving activities

As shown in Figure 3, not surprisingly, the majority of respondents (85.7%; 95%-CI: 83.6%-87.8%) reported that they frequently read road signs while driving. This was followed by those who reported they frequently talk or interact with passengers, either adults or children, while driving (67%; 95%-CI: 64.2%-70%) followed by thinking about things other than the driving task at hand while driving (54.8%; 95%-CI: 51.8%-57.8%), change the radio stations or CDs while driving (45.8%; 95%-CI: 42.8%-48.8%), read billboards or advertising while driving (40.9%; 95%-CI: 38%-43.8%), eat or drink while driving (32%; 95%-CI: 29.2%-34.8%), talk on their hands-free phone while driving (19.9%; 95%-CI: 17.4%-22.4%), use GPS to navigate while driving (17.4%; 95%-CI: 15.1%-19.8%), talk on their hand-held phone while driving (8%; 95%-CI: 6.5%-9.4%), use technical devices such as blackberries, palm pilots, laptops or

vehicle designed systems such as ONSTAR while driving (7.4%; 95%-CI: 5.8%-8.9%), text message on their phone while driving (5.2%; 95%-CI: 4%-6.3%), and perform activities while driving such as reading a newspaper, putting on make-up or shaving (3%; 95%-CI: 2.1%-3.9%).

Logistic regression was used to investigate the profile of those who use cell phones while driving, specifically those who reported that they talk on their hands-free phone while driving, talk on their hand-held phone while driving, and those who text message on their phone while driving.

With respect to talking on a hands-free phone while driving, it was found that as age increased, it was significantly less likely to report talking on a hands-free phone while driving. It was also found that being male significantly increased the likelihood of self-reported hands-free phone use while driving, as well as being married. Living in an urban area also increased the likelihood of self-reported hands-free phone use while driving. In addition, respondents who reported being very or extremely concerned about drivers using cell phones (either hand-held or hands-free) were significantly less likely to report using a hands-free phone while driving. This supports the notion that concern can also influence behaviour, as observed by Vanlaar et al. (2008).

As for those who talk on their hand-held phone while driving, the logistic regression revealed that driving more kilometers in a typical month significantly increases the likelihood of self-reported hand-held phone use while driving. Having ever been injured in a motor vehicle accident decreased the likelihood of reporting talking on a hand-held phone while driving. As with self-reported hands-free phone users, respondents who reported being very or extremely concerned about drivers using cell phones (either hand-held or hands-free) were significantly less likely to report using a hand-held phone while driving.

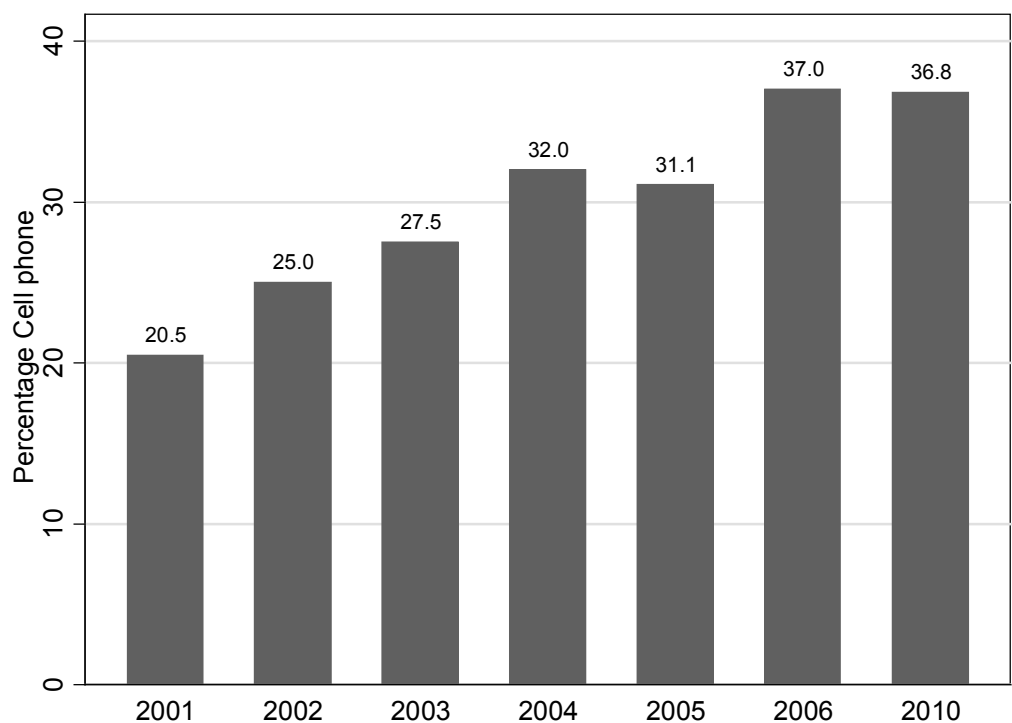
Finally, with regards to those who reported that they text message on their phone while driving, it was found that as age increased, it was significantly less likely for respondents to report texting while driving. Driving more kilometers in a typical month increased the likelihood of self-reported texting while driving. It was also found that respondents who reported being very or extremely concerned about drivers texting messages on their phones while driving were significantly less likely to report texting while driving.

In sum, the profile of someone talking on their hands-free phone while driving is a younger driver who is male, married, lives in an urban area and has low levels of concern about drivers using cell phones. As for those who reported using a hand-held phone while driving, the profile is a driver who drives more kilometers in a typical month, has not been in a motor vehicle collision, and has low levels of concern about drivers using cell phones. With regards to those who reported that they text message on their phone while driving, the profile is a younger driver who drives more kilometers in a typical month and has low levels of concern about drivers texting messages on their phones while driving. It is interesting that each time a strong relationship was found between levels of concern and self reported behaviour, which

supports the notion of using concern as a lever to influence behaviour as suggested by Vanlaar et al. (2008).

### How often do drivers use cell phones?

Respondents were also asked how many minutes they spent using a cell phone while driving during the past seven days. As can be seen in Figure 4, the majority (63.2%) reported that they had not used a cell phone while driving in the past seven days. Of the 36.8% of respondents who indicated they have used their cell phone while driving in the past seven days, the majority (52.2%) said they used it for 10 minutes or less in the past week. About a third (34.3%) of respondents indicated that they had used their cell phone for between 10 and 30 minutes and the remaining 13.5% used their cell phone for more than 30 minutes while driving in the past week.

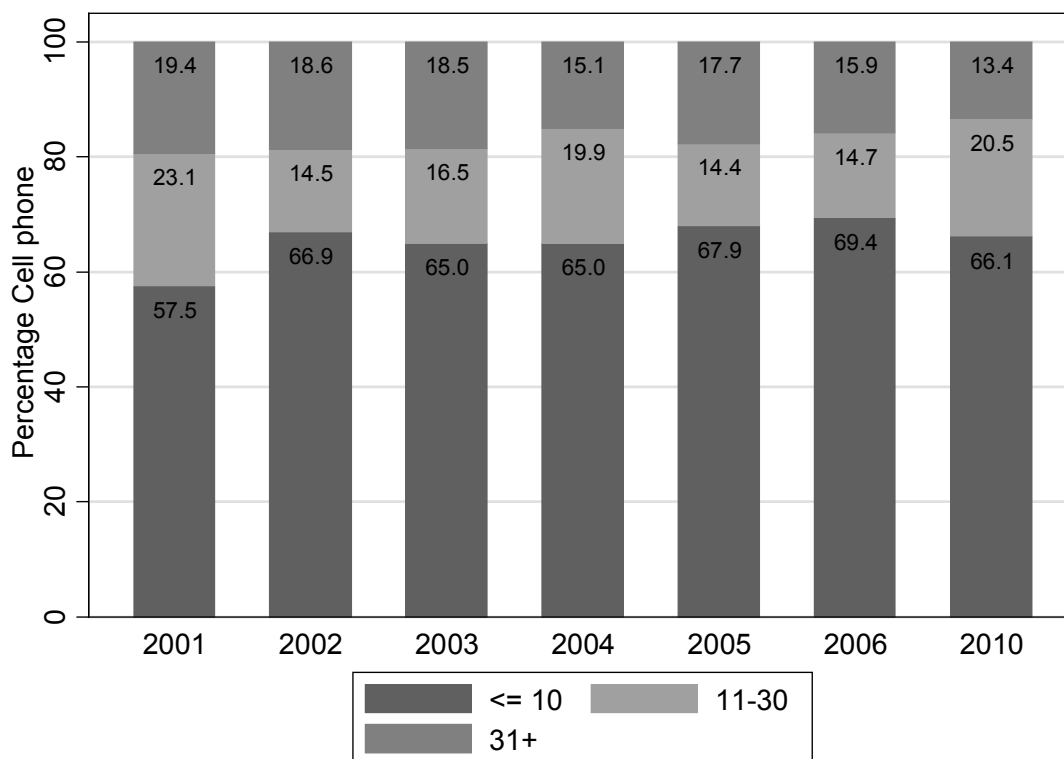


**Figure 4:** Percentage who used a cell phone while driving in last seven days by year

This question was also asked in previous RSM's from the years 2001 through to 2006. It appears from these data that reported cell phone use while driving during the past seven days had been slowly increasing from 2001 to 2006: in 2001, 20.5% of respondents indicated that they had used their cell phone while driving in the past seven days; in 2002, this percentage increased to 25%, then in 2003 to 27.5%, and in 2004 to 32%; it decreased slightly in 2005 to 31.1%, although this difference between 2004 and 2005 does not appear to be significant, and the increasing trend continues in 2006 to 37%. Unfortunately this information was not available for the years 2007 through to 2009, so it is not possible to say whether this

trend continued. However, in 2010 the percentage reporting cell phone used while driving within the last seven days (36.8%) was close to what was reported in 2006 (37%).

In terms of trends for frequency of use, there was some variation in the trend from 2001 to 2006 (see Figure 5). Of those who reported using their cell phone while driving during the last seven days, in 2001 57.5% used their cell phone for 10 minutes or less. This increased to 69.4% in 2006. In 2010, the percentage was lower at 66.1%. Overall, this represents an increase from 57.5% in 2001. Consistent with an overall increase in those using their cell phone for 10 minutes or less a week, there seems to be an overall decrease in those using their cell phones for more than 30 minutes from 2001 to 2006. In 2001 19.4% of respondents reported that they used their cell phone for more than 30 minutes in the previous week which decreased to 15.9% in 2006. In 2010, this percentage was even lower at 13.5%. There was no clear trend in the percentage of Canadians using their cell phones for between 11 and 30 minutes over this same time period.



**Figure 5:** Minutes of cell phone use while driving in past seven days by year

In sum, it appears that Canadians are using their cell phones more often, but this increase was most notable for those using their cell phones for 10 minutes or less a week and there has been a decrease in those using their cell phones for over 30 minutes a week. This trend, however, should be interpreted with caution as there are no data available from 2007 to 2009.

## How many Canadians have been involved in a collision because they were distracted?

Respondents were asked how many times, if any, they have been involved in a collision because they were engaging in distracting activities while driving in the last 12 months. Few drivers (4.3%; 95%-CI: 3.1%-5.5%) admitted that they were involved in a collision because they were distracted by something outside their vehicle, and even fewer (2.7%; 95%-CI: 1.7%-3.7%) said they were involved in a collision because they were distracted by something inside their vehicle in the last 12 months. With respect to other distracted driving activities, less than 1% of Canadians were involved in a collision because they were texting (0.4%; 95%-CI: 0.05%-0.8%) and only two respondents reported that they were in a collision because they were talking on their hand-held phone. None of the respondents indicated that they were in a collision because they were talking on their hands-free phone.

Of the 4.3% of those who reported that they were in a collision because they were distracted by something outside their vehicle, 61.8% reported that they were involved in a collision on one occasion, 22.8% were involved in a collision on two occasions, and 15.6% were involved in three to seven collisions.

Of the 2.7% of respondents who indicated that they were in a collision in the last 12 months because they were distracted by something inside their vehicle, 47.3% reported that they were involved in a collision on one occasion, 39.7% were involved in a collision on two occasions. The remaining 13% were involved in three to four collisions.

With regards to those who reported that they were in a collision in the last 12 months because they were texting (0.4%), the majority (83.9%) reported that they were involved in a collision on one occasion, and the remaining 16.1% were involved in a collision on two occasions in the last 12 months.

## How often do Canadians who are distracted have to brake or steer to avoid a crash?

Respondents were also asked how many times, if any, they have had to brake or steer to avoid being in a collision because they were distracted in the last month. Over one quarter of respondents (27.3%; 95%-CI: 24.6%-30%) reported that they had to brake or steer to avoid being in a collision because they were distracted by something outside their vehicle in the last month and 12.6% (95%-CI: 10.6%-14.6%) reported that they had to brake or steer to avoid being in a collision because they were distracted by something inside their vehicle in the last month. With regards to the use of cell phones in the last month, 2.2% (95%-CI: 1.3%-3.1%) of respondents reported that they had to brake or steer because they were texting, 0.8% (95%-CI: 0.2%-1.4%) had to brake or steer because they were talking on a hand-held phone, and less than 0.1% (four respondents) had to brake or steer because they were talking on their hands-free phone.

Of the 27.3% of respondents who indicated that they had to brake or steer to avoid being in a collision in the last month because they were distracted by something outside their vehicle, 45.8% had to do so on

one occasion, 26.3% had to so on two occasions, and the remaining 27.9% had to brake or steer between three and 15 such occasions in the last month.

As for those who had to brake or steer to avoid being in a collision because they were distracted by something inside their vehicle (12.6%) in the last month, 53.7% had to do so on one occasion, 29.8% had to do so on two occasions, and 16.5% had to so between three and eight occasions in the last month.

Of the 2.2% of respondents who reported that they had to brake or steer to avoid being in a collision in the last month because they were texting, 45.4% had to do so on one occasion in the last month, 47.4% had to do so on two occasions and the remaining 7.2% had to do so on three occasions.

In sum, in the last 12 months, few drivers (4.3%) admitted that they were involved in a collision because they were distracted by something outside their vehicle, and even fewer (2.7%) said they were involved in a collision because they were distracted by something inside their vehicle. Less than 1% were involved in a collision because they were texting (0.4%) and only two respondents reported that they were in a collision because they were talking on their hand-held phone. With respect to near misses in the last month the percentages were much higher: 27.3% reported that they had to brake or steer to avoid being in a collision because they were distracted by something outside their vehicle and 12.6% had to brake or steer to avoid being in a collision because they were distracted by something inside their vehicle which is an increase from the 2006 RSM where 20.2% had to brake or steer to avoid a crash because of a distraction outside the vehicle and 9.5% because of a distraction inside the vehicle (Vanlaar et al. 2007). With regards to the use of cell phones, 2.2% reported that they had to brake or steer because they were texting, 0.8% had to brake or steer because they were talking on a hand-held phone, and less than 0.1% (four respondents) had to brake or steer because they were talking on their hands-free phone.

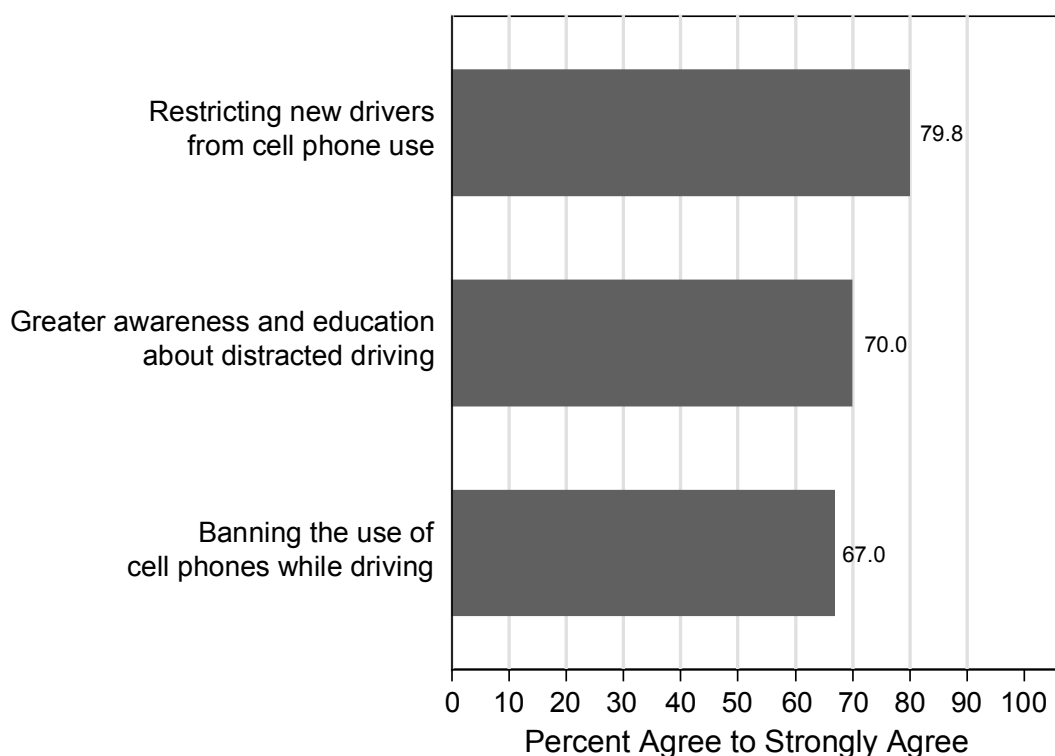


# PUBLIC SUPPORT FOR MEASURES TO INCREASE DRIVER SAFETY

Canadians were asked about the extent to which they agree with the use of various measures for dealing with distracted driving, on a scale from 1 (strongly disagree) to 6 (strongly agree). Responses from 5 to 6 were recoded as “supportive” of the measure in question .

As evident in Figure 6, the survey results indicate that:

- > 79.8% agreed that new drivers should be restricted from using cell phones while driving (95%-CI: 77.4%-82.2%).
- > 70% agreed that greater awareness and education efforts are needed to alert drivers to the problem of distracted driving (95%-CI: 67.3%-72.7%).
- > 67% agreed that the use of cell phones while driving should be banned (95%-CI: 64.2%-69.8%).



**Figure 6.** Percentage who agree with various methods for dealing with distracted driving



# CONCLUSIONS

Distracted driving is an important road safety issue that warrants our concern and attention. It is generally believed that driver distraction is involved in 20-30% of road crashes (Hedlund 2006). Although the estimates vary considerably, there is also clear evidence to suggest that the level of risk of crashing increases as a result of distraction.

To gauge what Canadians associate with distracted driving, respondents were asked to list two distractions they could think of while driving. Results showed that the first thing that comes to mind is most often cell phones (72.2%). This suggests that people have a limited view of what distracted driving is, more precisely, the majority equate it with cell phones. Moreover, the distraction that Canadians consider to be the most dangerous is cell phones (74.4%). However, what we know from the literature is that there are many other distractions while driving that are dangerous. Some research does suggest that other distractions are more frequently reported among crashes (Stutts et al. 2001).

Concern about distracted driving has risen over the past decade. Approximately three quarters (75.4%) of Canadians reported that they are very or extremely concerned about distracted driving in general which is up from 40% in the 2001 RSM (Beirness et al. 2002), and 68.7% in the 2006 RSM (Vanlaar et al. 2007). In terms of cell phones in particular, 72% of respondents are very or extremely concerned about drivers using cell phones (either hand-held or hands-free) which is an increase from 66% in 2001 (Beirness et al. 2002) and 65.9% in 2006 (Vanlaar et al. 2007). Moreover, in 2010, for the first time ever the issue that most Canadians express concern about is texting while driving (90.2%). Of interest, a recent poll by CAA also found that texting while driving has risen to the top of Canadians' road safety concerns. Canadians may not fully appreciate the complete spectrum of behaviours that can be distracting, but they certainly seem to be concerned about the issue, generally speaking.

While a smaller percentage of respondents admit to using cell phones and other technical devices while driving (less than 20%), many engage in other distracting activities, such as talking or interacting with passengers (67%) and changing the radio stations or CDs while driving (45.8%). This is concerning as the public may not fully appreciate the riskiness of these behaviours.

In terms of the perceived dangerousness of using cell phones while driving, 51% of Canadians agree that talking on your phone while driving is dangerous regardless of whether you use a hand-held or a hands-free device. However, less than a third (29.6%) agree that talking on your phone while driving is only dangerous when using a hand-held device. The fact that more people agree with the former may be indicative of the public beginning to understand that talking on your cell phone is dangerous regardless of whether you use a hand-held or hands-free phone.

Although many Canadians agree that the use of cell phones while driving is dangerous, some still admit to doing it themselves: 19.9% admitted that they often talk on their hands-free phone while driving; 8% admitted that they talk on their hand-held phone while driving; and, 5.2% admitted that they often text message on their phone while driving.

With regards to texting, 12.5% of respondents agree that they can drive safely while texting on their phone. This is concerning as research has shown that young drivers in particular were more likely to drive outside the lane boundaries and were less likely to respond appropriately to traffic signs while texting (Hosking et al. 2006).

With regards to the amount of time spent on a cell phone while driving, RSM data from 2001 to 2006 show that there was an overall increase in those who reported using their cell phone for less than 10 minutes a week, as well as an overall decrease in those reporting using their cell phones for more than 30 minutes a week. In 2010, this percentage was at its lowest at 13.5%. Thus, it appears that Canadians are using their cell phones more often, but for a shorter period of time. This trend, however, should be interpreted with caution as there is no data available from 2007 to 2009.

In terms of self-reported distracted driving collisions in the last 12 months, 4.3% reported being in one or more collisions because they were distracted by something outside their vehicle and 2.7% said they were involved in a collision because they were distracted by something inside their vehicle. With respect to other distracted driving activities, less than 1% of Canadians were involved in a collision because they were texting or because they were talking on their hand-held phone.

Although few Canadians were in a collision because of distraction in the last year, in the last month over one quarter of respondents (27.3%) reported that they had to brake or steer to avoid being in a collision because they were distracted by something outside their vehicle and 12.6% reported that they had to brake or steer to avoid being in a collision because they were distracted by something inside their vehicle. These percentages have increased from 20.2% and 9.5% respectively in 2006 (Vanlaar et al. 2007).

Finally, Canadians were asked to what extent they agree with various measures to increase driver safety. Results indicated that 79.8% agreed that new drivers should be restricted from using cell phones while driving; 70% agreed that greater awareness and education efforts are needed to alert drivers to the problem of distracted driving; and, 67% agreed that the use of cell phones while driving should be banned

In sum, there has been a growing concern about distracted driving in Canada. However, it appears that Canadians equate distracted driving with cell phone use, but there are many other sources of distraction in the driving environment. Furthermore, many Canadians also engage in many different driving behaviours that can be distracting. Given that it is known that engaging in such distracted driving behaviours increases the risk of crashing, this issue warrants our attention.

# BIBLIOGRAPHY

- AAA Foundation for Traffic Safety. (2008). Cell Phones and Driving: Research Update. Washington, DC.
- Beirness, D.J, Simpson, H.M, and Pak, A. (2002). Road Safety Monitor 2002: Distracted Driving. Traffic Injury Research Foundation. Ottawa, Canada.
- Bellavance, F. (2005). Linking data from different sources to estimate the risk of collision when using a cell phone while driving. Paper presented at the International Conference on Distracted Driving, Toronto, Canada, October 2-5.
- Caird, J.K., Willness, C.R., Steel, P., Scialfa, C. (2008). A meta-analysis of the effects of cell phones on driver performance. *Accident Analysis and Prevention*. 40. 1282-1293.
- Canadian Automobile Association. (November 15, 2010). CAA survey finds texting while driving has risen to the top of Canadians' driver safety concerns. Press Release. Retrieved from: <http://www.caa.ca/newsroom/newsroom-releases-details-e.cfm?newsItem=38&yearToShow=2010>.
- Canadian Council of Motor Transport Administrators (CCMTA).(2010) Road Safety Research and Policy Committee Agenda Item 6d. Fall Meeting 2010. Ottawa, Canada.
- Canadian Wireless Telecommunications Association (CWTA). (2008). 2008 Wireless Attitudes Study. September 12, 2008.
- Canadian Wireless Telecommunications Association (CWTA). (2009). Facts and Figures, 2009 <http://www.cwta.ca/CWTASite/english/industryfacts.html>
- CTIA-The Wireless Association. (2010) Retrieved from [http://www.ctia.org/media/industry\\_info/index.cfm/AID/10323](http://www.ctia.org/media/industry_info/index.cfm/AID/10323)
- Dzubak, C.M. (2007). Multitasking: The good, the bad, and the unknown. Association for the Tutoring Profession. Orlando, FL.
- Foss, R.D., Goodwin, A.H., McCartt, A.T, and Hellinga, L.A. (2008). Short-Term Effects of a Teenage Driver Cellphone Restriction. *Accident Analysis and Prevention*. 41: 419-424.
- Government of New Brunswick (GNB). (2011). Distracted driving ban to take effect in June. Department of Public Safety. News Release, April 15, 2011.
- Hedlund, J. (2006). International Conference on Distracted Driving. Summary of Proceedings and Recommendations. International Conference on Distracted Driving. October 2005.
- Horrey, W. J., and Wickens, C. D. (2006). Examining the impact of cell phone conversations on driving using meta-analytic techniques. *Human Factors*, 48, 196-205.
- Hosking, S., Young, K. L., and Regan, M. A. (2006). The effects of text messaging on young novice driver performance. Rep. No. 246. Victoria, Australia: Monash University Accident Research Centre.

- Klauer, S. G., Dingus, T. A., Neale, V. L., Sudweeks, J.D., and Ramsey, D. J. (2006). The Impact on Driver Inattention on Near-Crash/Crash Risk: An Analysis Using the 100-Car Naturalistic Driving Study Data (Report No. DOT HS 810 594). Washington, DC: National Highway Traffic Safety Administration.
- Knipling, R. R., and Wang, J. S. (1994). Crashes and Fatalities Related to Driver Drowsiness/Fatigue. Research Note. Washington, D.C.: National Highway Traffic Safety Administration.
- Knipling, R. R., Wang, J. S., and Kanianthra, J. N. (1996). Current NHTSA Drowsy Driver R&D, Melbourne, Australia: Fifth International Technical Conference on the Enhanced Safety of Vehicles.
- Laberge-Nadeau, C., Maag, U., Bellavance, F., Lapierre, S.D., Desjardins, D., Messier, S., Saïdi, A. (2003). Wireless telephones and the risk of road crashes. *Accident Analysis and Prevention*, 35(5): 649-660.
- McCartt, A.T., and Geary, L.L. (2004). Longer Term Effects of New York State's Law on Drivers' Hand-Held Cell Phone Use. *Traffic Injury Prevention*. 10: 11-15.
- McCartt, A. T., Hellinga, L. A., and Braitman, K. A. (2006). Cell phones and driving: Review of research. *Traffic Injury Prevention*, 7, 89-106.
- McCartt, A.T., and Hellinga, L.A., (2007). Longer term Effects of Washington, DC, Law on Drivers' Hand-Held Cell Phone Use. *Traffic Injury Prevention*. 8: 199-204. .
- National Highway Traffic Safety Association (NHTSA). (2008a). Driver Strategies for Engaging in Distracting Tasks Using In-Vehicle Technologies. March, 2008. HS DOT 810 919. National Highway Traffic Safety Administration. U.S Department of Transportation. Washington, DC.
- National Highway Traffic Safety Association (NHTSA). (2008b). Driver Distraction: A Review of the Current State-of-Knowledge. April 2008. DOT HS 810 787. National Highway Traffic Safety Administration. U.S Department of Transportation. Washington, DC.
- National Highway Traffic Safety Administration. (2009a). An examination of Driver Distraction as Recorded in NHTSA Databases. Traffic Safety Facts. Research Note. DOT HS 811 216. September 2009. Washington, DC.
- National Highway Traffic Safety Association (NHTSA). (2009b). Driver Electronic Device Use in 2008. Traffic Safety Facts. Research Note. September 2009. DOT HS 811 184. National Highway Traffic Safety Administration. U.S Department of Transportation. Washington, DC.
- National Highway Traffic Safety Association (NHTSA). (2010a). Driver Distraction Program. DOT HS 811 299. National Highway Traffic Safety Administration. U.S Department of Transportation. Washington, DC.
- National Highway Traffic Safety Association (NHTSA). (2010b). Distracted Driving and Driver, Roadway, and Environmental Factors. September 2010. DOT HS 811 380. National Highway Traffic Safety Administration. U.S Department of Transportation. Washington, DC.

- National Highway Traffic Safety Association (NHTSA). (2010c). Statistics and Facts About Distracted Driving. National Highway Traffic Safety Administration. U.S Department of Transportation. Washington, DC. <http://www.distracted.gov/stats-and-facts/#what>.
- National Highway Traffic Safety Association (NHTSA). (2010d). Distracted Driving 2009. Traffic Safety Facts. Research Note. National Highway Traffic Safety Administration. U.S Department of Transportation. Washington, DC.
- Ranney, T.A. (2008). Driver Distraction: A Review of the Current State of Knowledge. Technical Report DOT HS 810 787. National Highway Traffic Safety Administration. U.S Department of Transportation. Washington, DC.
- Redelmeier, D. A., and Tibshirani, R. J. (1997). Association between cellular telephone calls and motor vehicle collisions. *The New England Journal of Medicine*, 336, 453-458.
- Riquelme, H.E., Al-Sammak, F.S, Rios, R.E. (2010). Social Influences Among Young Drivers on Talking on the Mobile Phone While Driving. *Traffic Injury Prevention*. 11: 127-132.
- Royal, D. (2003). National Survey of Distracted and Drowsy Driving Attitudes and Behavior: 2002. Volume I - Findings Report. The Gallup Organization. Submitted to National Highway Traffic Safety Administration. Final Report - March 2003
- Smiley, A. (2005). What is Distraction? International Conference on Distracted Driving. Human Factors North Inc.
- Smiley, A., Caird, J.K., Smahel, T., Donderi, D.C., Chisolm, S., Lockhart, J., Teteris, E. (2008). The Effects of Cellphone and CD Use on Novice and Experienced Driver Performance. Executive Summary. Driver Distraction. Insurance Bureau of Canada.
- Statistics Canada. (2010). Annual Demographic Estimates: Canada, Provinces and Territories. Ottawa, Canada. September 2010. Catalogue no. 91-215-X.
- Stutts, J.C., Reinfurt, D.W., Staplin, L., Rodgman, E.A. (2001). The Role of Driver Distraction in Traffic Crashes. Washington DC. AAA Foundation for Traffic Safety.
- Tasca, L. (2005). Driver Distraction: Towards a Working Definition. International Conference on Distracted Driving. Toronto, Ontario. October 2-5, 2005.
- Tijerina, L., Parmer, E. And Goodman, M. (1998). Driver workload assessment of route guidance system destination entry while driving: A test track study. Seoul, Korea: Proceedings of the 5th ITS World Congress.
- Transport Canada. (2010). Driver Distraction: Current Legislation. October, 2010. Retrieved from: <http://www.tc.gc.ca/eng/roadsafety/safedrivers-distractions-current-legislation-1074.htm>.
- Treat, J.R., Tumbas, N.S., McDonald, S.T., Shinar, D., and Hume, R.D. (1979). Tri-Level Study of the Causes of Traffic Accidents. National Highway Traffic Safety Administration. Washington, D.C.

- Treize, I., Stoney, E. G., Bishop, B., Eren, J., Harkness, A., Langdon, C., and Mulder, T. (2006). Report of the road safety committee on the inquiry into driver distraction. Rep. No. 209. Melbourne, Victoria, Australia: Road Safety Committee, Parliament of Victoria.
- Tromblay, D. (2010). Understanding the Distracted Brain. Why Driving While Using Hands-Free Cell Phones is Risky Behavior. White Paper. March 2010. National Safety Council.
- Vanlaar, W., Marcoux, K., Robertson, R. (2010). The Road Safety Monitor 2010. Drinking and Driving. Traffic Injury Research Foundation. Ottawa, Canada.
- Vanlaar, W., Simpson, H., Mayhew, D., Roberston, R. (2007). The Road Safety Monitor 2006. Distracted Driving. Traffic Injury Research Foundation. Ottawa, Canada.
- Vanlaar, W., Simpson, H., Robertson, R., (2008). A perceptual map for understanding concern about unsafe driving behaviours. Accident Analysis and Prevention, Vol. 40: 1667-1673.
- Wang, J. S., Knipling, R. R., and Goodman, M.J. (1996). The role of driver inattention in crashes: New statistics from the 1995 crashworthiness data system. In 40th Annual Proceedings of the Association for the Advancement of Automotive Medicine, Vancouver, British Columbia.
- Wilson, J. (2005). Legislation and regulation in Canada with respect to driver distraction. Paper presented at the International Conference on Distracted Driving, Toronto, Canada, October 2-5.
- Young, K., Regan, M and Hammer, M. (2003). Driver Distraction: A Review of the Literature. Monash University Accident Research Centre. Report No. 206.



