

# **Intersection-Related Crashes in Canada: Driver Characteristics and Casualty Trends**

**Road Safety Directorate  
Transport Canada  
Summer 2007**

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## Executive Summary

Canada is still a long way from meeting its objective of a 20% reduction in intersection-related fatalities and serious injuries that is outlined in Road Safety Vision 2010.

During 2002-2004, an average of 809 persons were killed and 7996 persons were seriously injured per year in intersection-related crashes. This constituted a 6% decrease in fatalities and a 5.2% decrease in serious injuries from 1996-2001.

Although the trend is promising, it is clear that much more work needs to be done to reduce the casualty toll from intersection crashes.

An intersection poses challenges for all road users, and there are many possible reasons for intersection crashes. Misjudging the speed and proximity of oncoming or potentially conflicting vehicles, not being prepared to stop, not anticipating sudden changes in the environment, and not paying attention to pedestrians are a few of the errors that can result in a crash.

Intersection crashes have a high rate of driver infractions. About 40% of drivers in fatal or serious injury intersection crashes had committed a driving infraction that contributed to the crash. The most common were disobeying traffic controls and failing to yield the right of way.

Younger drivers (those aged 16-24 years) are more likely to commit an infraction than the average driver. About 50% of younger drivers in fatal or serious injury intersection crashes were cited for an infraction that contributed to the crash.

Older drivers are also much more likely to commit an infraction than the average driver. Seven out of ten drivers 75 years or older who were involved in a fatal intersection crash had committed an infraction, as had almost half of drivers 65-74 years old. The most common infraction was failing to yield the right of way. Older drivers involved in fatal or serious injury crashes failed to yield the right of way twice as often as the average driver.

Speeding is on the increase. Speed as a contributing factor increased between 1996-2001 and 2002-2004 in both fatal and serious injury intersection crashes. About 9% of drivers in fatal intersection crashes and 5% of drivers in serious injury crashes had been speeding.

Speeding is the top ranking offence for drivers under the age of 35 who were in fatal intersection crashes. Young drivers in particular were the ones who were most likely to be speeding or driving too fast for conditions. Twenty-one percent of drivers aged 16-19 who were in a fatal crash had been speeding, up from 14% in 1996-2001. Drivers aged 20-24 were almost as bad, with 21% of those involved in a fatal intersection crash cited for speeding, up from 17% in 1996-2001.

Alcohol use prior to an intersection crash is increasing. At least 12% of drivers in fatal intersection crashes had been drinking, an increase over 1996-2001. Since many crashes have multiple victims, alcohol-related crashes accounted for one in five intersection fatalities.

Drivers 16-24 were the worst offenders when it came to drinking and driving, accounting for one in three impaired drivers involved in a fatal intersection crash. Furthermore, between 1996-2001 and 2002-2004 the increase in alcohol use prior to a fatal crash was greater for this age group than for any other group.

Alcohol use is often associated with speeding. Close to 30% of drivers in fatal intersection crashes who had used alcohol were also cited for speeding, as were about 18% of drinking drivers in serious injury crashes.

Alcohol use by involved drivers is highest in urban locations. At least 13% of drivers in fatal urban intersection crashes had used alcohol, a slightly higher figure than for all types of locations combined, and an increase over 1996-2001.

Driver distraction as a contributing factor to intersection crashes is on the increase. Distraction was reported for about 12% of drivers in fatal crashes and 11% of drivers in serious injury crashes. Both figures were small increases over 1996-2001. The drivers most likely to be distracted were those aged 16-24 years, followed closely by drivers aged 55-64 years. Motorway intersection crashes have the highest incidence of distraction. About 20% of drivers in fatal or serious injury intersection crashes on motorways were reported as distracted.

Although one in five drivers in a fatal or serious injury intersection crash was aged 35-44 years, drivers 45 years and older are seeing more involvement in serious injury intersection crashes.

For drivers aged 55-64 years, the growth can be related to the rising number of licensed drivers. However, there is no obvious explanation for the 13% increase (between 1996-2001 and 2002-2004) in the number of drivers aged 45-54 years who were involved in serious injury crashes. Driver distraction may be a factor.

Drivers over 65 had a 12% decrease in involvement in fatal intersection crashes between 1996-2001 and 2002-2004, a greater decrease than most other age groups experienced. But when it came to serious injury crashes, senior drivers experienced a 7% increase in involvement, compared to a 1% growth in the number of licensed senior drivers.

Senior driver involvement is lowest in urban locations. Drivers aged 65 or older made up 13% of those involved in fatal urban intersection crashes, compared to 16% of involved drivers in rural and motorway areas. This age group also made up 11% of drivers in serious injury crashes, compared to 12% of drivers in rural and motorway locations.

Senior driver involvement is lower in urban locations than in rural or motorway locations because alternate means of travel are more readily available, reducing the need for driving.

Driver and passenger fatalities from intersection crashes are on the decline, thanks in part to new safety features in vehicles. Driver serious injuries decreased among most age groups between 1996-2001 and 2002-2004, but a 20% increase among drivers aged 55-64 years offset that decrease.

Contrary to the trend for drivers and passengers, intersection-related fatalities among vulnerable road users (motorcycle riders and pedestrians) are increasing.

Motorcyclist fatalities grew by 16% and motorcyclist serious injuries grew by 14% between 1996-2001 and 2002-2004, largely due to a substantial increase in motorcycle registrations. More than 50% of motorcyclists killed and 75% of motorcyclists injured in intersection crashes sustained their injuries in urban locations

Speed is a major contributing factor for motorcyclists. Almost 30% of motorcyclists involved in a fatal intersection crash were cited for excessive speed (compared to about 9% of all drivers involved). Serious injury intersection crashes showed a similar disparity: 14% of involved motorcyclists were reported to be speeding, compared to 5% of all involved drivers.

Casualties among middle-aged motorcycle riders are becoming more common. In fact, fatalities and serious injuries among motorcyclists under the age of 25 decreased, but the improvement was offset by the large casualty increases among middle-aged riders.

To be specific, the number of fatally injured motorcyclists aged 45-54 years increased by more than 60% and the number aged 55-64 years more than doubled between 1996-2001 and 2002-2004. Serious injuries within both age groups showed similar increases.

Furthermore, during 2002-2004, 30% of motorcyclists killed in intersection crashes were aged 45 years or older. By comparison, this age group accounted for about 18% of motorcyclist fatalities during 1996-2001. A similar trend was seen for motorcyclists seriously injured in intersection crashes.

Pedestrians are increasingly at risk from intersection crashes, with fatalities growing by 7% between 1996-2001 and 2002-2004. Pedestrian involvement in intersection crashes is relatively high, with this road user group accounting for 19% of victims killed and 12% of victims seriously injured. When it comes to urban locations, the numbers are even higher. 32% of those killed and 18% of those seriously injured in urban intersection crashes were pedestrians.

It's becoming more likely that the driver is at fault when a pedestrian is seriously injured or killed in an intersection crash. During 2002-2004, 65% of pedestrians killed were considered to be not at fault, compared to 1996-2001 when 55% were not at fault, and a similar trend was seen for pedestrians who were seriously injured.

Pedestrians aged 65 years or older are the most vulnerable to injury, because seniors often have deficits in vision, hearing, and perception and may move more slowly than the average pedestrian. Seniors accounted for almost 50% of pedestrian fatalities in 2002-2004, compared to 44% during 1996-2001. In terms of numbers, older pedestrian fatalities increased by 12% between 1996-2001 and 2002-2004, while serious injuries increased by 20%.

Senior pedestrians are more at risk from a vehicle turning left than younger pedestrians. 25% of senior pedestrians killed and almost 40% of those seriously injured in an intersection crash were hit by a vehicle turning left. On average, 17% of pedestrians killed and 26% of pedestrians seriously injured were hit by a vehicle turning left.

Middle-aged road users (primarily motorcycle riders and vehicle drivers) are at increasing risk of fatal injury. Fatalities among road users aged 35-64 years increased between 1996-2001 and 2002-2004, the largest increase (about 12%) among road users aged 45-54 years.

On a positive note, intersection-related fatalities and serious injuries among children under the age of 16 decreased substantially. There were also significant intersection fatality reductions for young drivers and senior drivers. Fatalities among drivers 16-19 years dropped by almost 20% while fatalities among drivers aged 65 years or older decreased by about 15% between 1996-2001 and 2002-2004.

Urban locations are the site of most intersection-related fatal and serious injuries. About 54% of intersection fatalities and 72% of serious injuries occurred in urban locations during 2002-2004. However, motorway locations (primarily entrances and exits) are noteworthy for having the highest heavy vehicle involvement. 21% of vehicles involved in fatal intersection crashes and 12% of vehicles in serious injury intersection crashes were heavy trucks or buses.

Early mornings are becoming more dangerous for intersection crashes. More than one in five fatalities and serious injuries from intersection crashes occurred between 3 p.m. and 6 p.m., the typical afternoon rush hours. However, it was the morning hours that saw notable increases in fatal injuries between 1996-2001 and 2002-2004. For example, fatalities in the hours between 6 a.m. and 9 a.m. increased by 20%, while fatalities between 3 a.m. and 6 a.m. increased by about 13%.

While improvements in road safety are evident, Canada's quest to have the safest roads in the world will not be accomplished without an extra effort to reduce intersection-related fatalities and serious injuries.

## **Report Objectives**

The objective of this report is to examine the nature of fatal and serious injury intersection crashes during the years 2002 to 2004, including the drivers involved and the victims affected. Understanding the participants, victims, and possible causes of intersection crashes can be useful in planning crash reduction strategies.

## **Data Methodology**

Statistics in this report refer to the number of persons killed or seriously injured in intersection crashes, rather than to the number of intersection crash occurrences. (A single intersection crash can result in several casualties.)

Casualty and driver statistics from the study period of 2002-2004 are based on average annual figures to offset any year-to-year extremes. Statistics related to the years 1996-2001 are averaged in the same way.

Statistics refer to the 2002-2004 time frame unless otherwise noted.

The report examines elements from Transport Canada's national Traffic Accident Injury Database (TRAID) file in order to describe various characteristics of intersection crashes, crash victims, and involved drivers.

It was assumed that proportional distributions of known values for data elements described in this report were representative of those in jurisdictions where the information was not recorded or was reported as unknown.

## Introduction

National collision data collected from the jurisdictions has shown that intersection crashes are a major road safety issue in Canada. Consequently, one of the sub-targets in Road Safety Vision 2010 is a 20% reduction in fatalities and serious injuries resulting from intersection crashes. This reduction target is based on the average number of fatalities and serious injuries that occurred during the baseline period of 1996-2001.

During 1996-2001, an average of 860 persons per year were killed in intersection crashes, and another 8431 persons per year were seriously injured. This means that intersection crashes produced 29% of all fatalities and 43% of all serious injuries resulting from motor vehicle crashes.

Moving ahead to 2002-2004 (the most recent years for which data were available when the report was written), an average of 809 persons were killed and 7996 persons were seriously injured per year in intersection-related crashes. In other words, the average annual number of intersection crash fatalities decreased by about 6% and the average annual number of serious injuries decreased by about 5.2% between 1996-2001 and 2002-2004.

Although the trend is promising, Canada is still a long way from meeting its objective of a 20% reduction in intersection-related fatalities and serious injuries. It is clear that much more work needs to be done to reduce the casualty toll from intersection crashes.

Intersections pose significant challenges for road users. A driver must process many different pieces of information at the same time - the traffic signals, the movement of other vehicles, the entry of pedestrians into the intersection, and more. He or she must make quick judgments about where and when it is safe to move and be able to react in time to avoid any road hazards.

The causes of intersection crashes are many. Misjudging the speed and proximity of oncoming or potentially conflicting vehicles, not being prepared to stop, not obeying traffic signals, not yielding the right of way, not anticipating sudden changes in the environment, and not paying attention to pedestrians are all errors that can result in a crash. Congested roads, poor signage, lack of turning lanes, restricted views, and distracting visual elements may also contribute to the high number of collisions that occur at intersections.

This report examines the circumstances surrounding fatal and serious injury intersection crashes to identify the most likely participants and the most common problem areas, as revealed by national crash data.

## **Drivers Involved in Fatal and Serious Injury Intersection Crashes**

### ***One in five drivers involved was aged 35-44 years***

The largest segment of drivers implicated in intersection-related fatal or serious injury crashes were drivers aged 35-44 years, who made up about 21% of involved drivers. This age group experienced a small decrease in involvement between 1996-2001 and 2002-2004, so they are of less concern than some other age groups.

### ***Increased involvement of middle-aged and senior drivers***

Of more interest to road safety experts is the increasing intersection crash involvement of drivers 45 years of age or older. For drivers aged 55-64 years, the increase can be related to the rising number of licensed drivers. But additional involvement by drivers aged 45-54 years and drivers aged 65 years or older can't be explained that way because the increases are out of proportion to the growth in the number of licensed drivers within those age groups.

### ***Increased involvement by drivers 55-64 years explained by demographics***

Drivers aged 55-64 years accounted for about 10% of involved drivers in fatal and serious injury crashes during 2002-2004. Although this group was less frequently involved than most age groups, their involvement in fatal and serious injury crashes increased more between 1996-2001 and 2002-2004 than that of any other group of drivers. This growth can be explained by a 17% increase in the number of licensed drivers aged 55-64 years between 2001 and 2004, which closely corresponds to the increase in driver involvement in serious injury crashes and is much higher than the increased involvement in fatal crashes.

### ***Increased involvement by drivers 45-54 is largely unexplained***

On the other hand, drivers aged 45-54 showed a more disturbing trend. Accounting for about 17% of drivers in both fatal and serious injury intersection crashes, this age group saw a large increase in serious injury crash involvement (13%) from 1996-2001 to 2002-2004. It also experienced a small increase in fatal crash involvement (2%), bucking the trend for most age groups of decreased fatal crash involvement.

The number of licensed drivers in this age group increased by only 7%, which doesn't account for the growth in driver involvement. There was no increase in reported speeding or alcohol use. Distraction, however, may be a contributor. The percent of drivers aged 45-54 years who were distracted increased from 7% to 9.3% for those in fatal crashes and from 7.1% to 9.7% for those in serious injury crashes.

### *Involvement of senior drivers is a future concern*

Drivers over 65 years of age are another group of interest. This demographic made up about 14% of drivers in fatal intersection crashes and 11% of drivers in serious injury crashes. On the positive side, drivers over 65 had a 12% decrease in involvement in fatal intersection crashes between 1996-2001 and 2002-2004, better than most other age groups. But when it came to serious injury crashes, senior drivers experienced a 7% increase in involvement, compared to a 1% growth in the number of licensed senior drivers.

The number of senior drivers who get into intersection crashes is likely to increase substantially, simply because the baby boomer generation is close to turning 65 years of age. Factor in the trend of driver crash involvement increasing faster the number of licensed drivers, and we may soon see an alarming number of senior drivers getting into serious intersection collisions.

There is little evidence to suggest that the next wave of senior drivers will be any safer or any more skilled than the current one, so crash-reduction measures that target this age group will be very important.

## **Fatally and Seriously Injured Victims of Intersection Crashes by Road User Type**

### *Driver and passenger fatalities from intersection crashes on the decline*

About seven out of ten road users fatally or seriously injured in intersection crashes were drivers or passengers. Fatalities among these road users declined between 1996-2001 and 2002-2004. On the other hand, driver serious injuries rose during this time (while passenger serious injuries decreased).

New safety features in vehicles like advanced airbags are at least partly responsible for the decrease in occupant fatalities. Vehicle technology is mitigating crash outcomes, turning what would have been fatal injuries into less severe injuries.

### *Motorcyclists and pedestrians only road users with increased fatalities*

Motorcyclists and pedestrians were the only two road user groups to go against the trend of declining intersection-related fatalities. Between 1996-2001 and 2002-2004, motorcyclist fatalities increased by about 16%, while pedestrian fatalities increased by about 7%.

Motorcycle registrations have increased substantially, leading to a higher number of motorcyclist casualties. Both motorcyclists and pedestrians suffer from a lack of conspicuity. In the visually complex environment of an intersection, vehicle drivers may

fail to perceive and react to less visible road users. With traffic congestion increasing, the problem of conspicuity will continue to affect motorcyclists and pedestrians. Furthermore, while new vehicle safety features have helped reduce fatalities for vehicle occupants, motorcyclists and pedestrians don't benefit from vehicle occupant protection and therefore have not seen corresponding fatality reductions.

### ***Motorcyclist serious injuries increasing***

In addition to a higher annual number of fatalities, motorcyclists also experienced a 14% increase in serious injuries from intersection crashes between 1996-2001 and 2002-2004. Serious injuries among bicyclists also increased slightly between 1996-2001 and 2002-2004.

On the other hand, pedestrian serious injuries resulting from intersection collisions went down about 2% between 1996-2001 and 2002-2004. However, this statistic isn't particularly reassuring, given the increase in pedestrian fatalities.

## **Fatally and Seriously Injured Victims of Intersection Crashes by Age**

### ***Middle-aged road users at increasing risk of fatal injury from intersection crashes***

The average annual number of persons aged 35-64 years who were killed in intersection crashes was higher during 2002-2004 than during the 1996-2001 period, even though all other age groups saw a decline in fatalities. The largest increase (about 12%) was among road users aged 45-54 years.

### ***Intersection-related casualties among children declining***

Exhibiting a positive trend, intersection-related fatalities and serious injuries among children 16 years and younger decreased substantially.

## **Fatally and Seriously Injured Victims of Intersection Crashes By Road User Type and Age**

### ***Middle-aged driver casualties increasing***

Although intersection-related driver fatalities in general decreased, drivers aged 45-54 bucked the trend, with fatalities increasing by about 7% between 1996-2001 and 2002-2004. Serious injuries in this age group also increased by about 8%.

### ***Significant fatality reductions among young drivers and senior drivers***

Fatalities among drivers 16-19 years dropped by almost 20% between 1996-2001 and 2002-2004. The graduated licensing programs in most jurisdictions can be credited for some of that improvement.

There were 22% fewer fatalities among drivers 65-74 years and 9% fewer fatalities among drivers 75 years and older in 2002-2004 compared to 1996-2001. Although this is a hopeful trend, it could very well reverse within a few years when baby boomer drivers become senior drivers.

Serious injuries increased by almost 20% among drivers 55-64 years between 1996-2001 and 2002-2004. To put it another way, the small overall increase in driver serious injuries was almost entirely due to the increase in serious injuries among drivers aged 55-64, which offset the improvement within other age groups. (However, the number of fatalities among drivers aged 55-64 years did stay constant between 1996-2001 and 2002-2004.)

### ***Motorcyclist fatalities among middle-aged riders on the increase***

Fatalities and serious injuries among motorcyclists under the age of 25 decreased, but the improvement was more than offset by the large casualty increases among middle-aged riders.

Fatalities tripled and serious injuries more than doubled for motorcyclists aged 55-64 years. Fatalities were up by 60% and serious injuries were up by 40% among motorcyclists aged 45-54 years. Motorcycle ridership among middle-aged persons is growing, but unfortunately this is translating into considerably more crash victims from this age group.

### ***Child pedestrian fatalities from intersection crashes decreased substantially***

Although pedestrian fatalities increased between 1996-2001 and 2002-2004, improvement was seen for young pedestrians. Fatalities and serious injuries both declined by 30% among pedestrians under the age of 16.

### ***Older pedestrians at increased risk of fatal and serious injury from intersection crashes***

However, older pedestrians were much less fortunate. Pedestrian fatalities among those aged 55-64 years increased by 12%, while serious injuries increased by 30%. Pedestrian fatalities among persons aged 65 or older increased by 12% between 1996-2001 and 2002-2004, while serious injuries increased by 20%.

### ***A growing percentage of intersection-related pedestrian fatalities are seniors***

Seniors (persons aged 65 years or older) accounted for almost 50% of pedestrian fatalities in 2002-2004, compared to 44% during 1996-2001. As the population ages, this percentage will most likely get higher. Furthermore, since the number of senior pedestrians will rise dramatically as the baby boomer generation turns 65, we can expect the unfortunate growth in pedestrian fatalities to continue. Given these facts, improving intersection safety for senior pedestrians should become a high priority among road safety program and policy advocates.

## **Driver Factors that Contribute to Intersection Crashes**

### ***Intersection crashes have high rate of driver infractions***

About 40% of drivers in fatal or serious injury intersection crashes had committed a driving infraction that contributed to the crash.

### ***Disobeying traffic controls and failing to yield right of way relatively frequent infractions in intersection crashes***

Certain infractions like disobeying traffic controls and failing to yield the right of way were more common in intersection crashes than in non-intersection crashes. Of drivers involved in fatal intersection crashes, about 13% were cited for disobeying traffic controls and 13% were cited for failure to yield the right of way.

### ***Alarming rate of infractions by elderly drivers in intersection crashes***

Elderly drivers were the worst offenders. Almost 70% of drivers 75 years or older who were involved in fatal intersection crashes were cited for a driving infraction.

### ***Elderly drivers most likely to fail to yield the right of way***

When it came to elderly drivers (drivers aged 75 years or older), 32% of those involved in fatal intersection crashes had failed to yield the right of way.

### ***Younger drivers have higher than average rate of infractions***

Younger drivers were frequent offenders as well. More than 50% of drivers aged 16-24 years who were in fatal intersection crashes were reported for a contributing driver action. A similar percentage of drivers from this age group who were involved in serious injury crashes had also committed driving infractions.

### ***Speeding on the increase in intersection crashes***

Speeding as a contributing factor increased between 1996-2001 and 2002-2004 in both fatal and serious injury intersection crashes. About 9% of drivers in fatal intersection crashes and 5% of drivers in serious injury crashes had been speeding.

### ***Speeding most common infraction by drivers under 35***

Speeding was the top ranking offence for drivers under the age of 35 who were in fatal intersection crashes, whereas drivers 35 years of age or older were more likely to fail to yield the right of way or disobey traffic controls.

### ***More drivers under 45 are speeding***

All driver age groups under 45 years who were involved in fatal intersection crashes showed increases in speeding between 1996-2001 and 2002-2004. Young drivers in particular were the ones who were most likely to be speeding or driving too fast for conditions.

Twenty-one percent of drivers aged 16-19 who were in a fatal crash had been speeding, up from 14% in 1996-2001. Drivers aged 20-24 were almost as bad, with 20% of those involved in a fatal intersection crash cited for speeding, up from 17% in 1996-2001.

Drivers under 45 also showed increases in speeding related to serious injury intersection crashes, though to a smaller degree than for those involved in fatal crashes.

### ***Drinking and driving prior to an intersection crash has increased***

At least 12% of drivers in fatal intersection crashes had been drinking, an increase over 1996-2001. These drivers were responsible for about 20% of intersection fatalities during 2002-2004.

### ***Young drivers worst drinking and driving offenders***

Drivers 16-24 accounted for one in three impaired drivers involved in a fatal intersection crash. Between 1996-2001 and 2002-2004, alcohol use among young drivers also increased more than it did among other drivers involved in fatal crashes.

### ***Alcohol use linked to speeding***

Close to 30% of drivers in fatal intersection crashes who had used alcohol were also cited for speeding, as were about 18% of drinking drivers in serious injury crashes.

### ***Driver distraction on the increase***

Distraction as a contributing factor was reported for about 12% of drivers in fatal intersection crashes and 11% of drivers in serious injury intersection crashes. Both figures were small increases over 1996-2001.

The drivers in fatal or serious injury crashes who most likely to be distracted were those aged 16-24 years, followed closely by drivers aged 55-64 years. The drivers who were least likely to be reported as distracted were those aged 25-44 years.

## **Circumstantial Risk Factors in Intersection Crashes**

### ***Serious intersection crashes are not caused by poor driving conditions***

Poor lighting, weather, and road conditions were not significant contributing factors in intersection crashes. In fact, fatal and serious injury crashes at intersections were more likely to occur in good driving conditions and during daylight hours than fatal and serious injury crashes in general.

However, time of day and urban locations were identified as risk factors in intersection crashes.

### ***Weekends and early mornings becoming more dangerous***

More than one in five fatalities and serious injuries from intersection crashes occurred between 3 p.m. and 6 p.m., the typical afternoon rush hours.

Intersection fatalities decreased during most time periods. However, fatalities occurring between 3 a.m. and 6 a.m. increased by about 13% between 1996-2001 and 2002-2004. Furthermore, over 40% of fatalities in this time period occurred on a Saturday or Sunday morning. This suggests that intersection fatalities are increasingly likely to occur for several hours after bars and clubs close.

The hours between 6 a.m. and 9 a.m., generally associated with going-to-work traffic, are also of interest. Fatalities grew by 20% between 1996-2001 and 2002-2004, distributed fairly evenly throughout the week. The increase in fatalities might be caused by growing traffic volumes in the morning or more carelessness and distraction among morning commuters.

### ***Traffic control data is unreliable***

The type of traffic control at the scene is an important factor in understanding intersection crashes. However, this data element is not well reported in the national database. While some jurisdictions collect traffic control for each vehicle separately, which is ideal, the

national database can only record one traffic control per collision. Compounding the problem, the unknown values as reported by jurisdictions are increasing. The next generation of the national database will allow for the collection of one traffic control per vehicle, and it is hoped that the change will improve the quality of traffic control data.

Having said that, the available data indicates that 25% of intersection fatalities occurred at locations with traffic signals, and another 26% occurred at locations with stop signs. Almost 40% of fatalities and a slightly smaller number of serious injuries occurred at locations with no reported traffic control. One type of intersection that typically has no traffic control is the intersection of a public road with a lane or driveway. About 10% of fatalities and about 8% of serious injuries resulting from intersections occurred at this kind of intersection.

***Majority of intersection casualties occurred in urban locations***

About 54% of intersection fatalities and 72% of serious injuries occurred in urban locations during 2002-2004. From 1996-2001 to 2002-2004, the percentage of intersection casualties occurring in urban locations increased, while the percentage that occurred in rural and motorway locations decreased slightly.

**Pedestrians Killed and Seriously Injured in Intersection Crashes**

***Pedestrian involvement in intersection crashes is relatively high***

Pedestrians accounted for 19% of victims killed and 12% of victims seriously injured in intersection crashes, compared to 11% and 8%, respectively, for non-intersection crashes. Considering the high level of involvement, a closer look at this road use group is warranted.

***Vast majority of pedestrian casualties occur in urban locations***

Not surprisingly, 88% of pedestrian fatalities and 97% of pedestrian serious injuries from intersection crashes occurred in urban locations.

***Most fatally or seriously injured pedestrians hit by a car travelling straight***

62% of pedestrians killed in an intersection crash were hit by a car going straight ahead, as were 55% of pedestrians who were seriously injured.

***Older pedestrians at particular risk from vehicles turning left***

On average, 17% of pedestrians killed and 26% of pedestrians seriously injured were hit by a vehicle turning left. However, older pedestrians were more vulnerable to a vehicle

turning left than younger pedestrians. Looking at pedestrians aged 65 years or older, 25% of those killed and almost 40% of those seriously injured in an intersection crash were hit by a vehicle turning left.

Why the high number of older pedestrian victims? For one thing, seniors often have deficiencies in vision, hearing, and perception. They are less likely to notice vehicles turning left towards them and may take longer to react to the danger.

In addition, older pedestrians may move more slowly than the average pedestrian. A driver who doesn't take this into account can misjudge the turning opportunity and come into conflict with oncoming traffic and the pedestrian.

### ***Pedestrians at fault less frequently***

In an intersection crash where a pedestrian was killed, about 65% of those pedestrians were considered to be not at fault. By comparison, during 1996-2001, about 55% of pedestrians killed were not at fault.

A similar trend was seen for pedestrians who were seriously injured in intersection crashes. 58% were described as not at fault, compared to 52% in 1996-2001.

To put it another way, it's becoming less likely that the pedestrian is at fault and more likely that the driver is to blame when a pedestrian is seriously injured or killed in an intersection crash.

### ***Older pedestrians more likely to be not at fault in an intersection crash***

About 70% of pedestrians aged 55 or older who were killed or seriously injured in an intersection crash were not at fault.

### ***Pedestrians not at greater risk from young drivers or senior drivers***

Although one might think that young drivers or older drivers would be more likely to hit a pedestrian during an intersection crash, this didn't seem to be the case.

75% of pedestrians killed and 72% of pedestrians seriously injured were hit by a driver aged 25-64 years. These figures are a little higher than one might expect, based on how many drivers in this age range were involved in intersection crashes.

### ***As driver age increases, so does the frequency of striking a pedestrian during left turn***

Although older drivers were not more likely to strike a pedestrian, they were more likely than younger drivers to be turning left on those occasions when they did. About 35% of drivers 55 years of age or older who struck and seriously injured a pedestrian were turning left at the time of the intersection crash, compared to 17-30% of drivers in younger age groups.

## **Motorcyclists Killed and Seriously Injured in Intersection Crashes**

### ***The majority of motorcyclist casualties from intersection crashes occurred in urban areas***

More than 50% of motorcyclists killed and 75% of motorcyclists injured in intersection crashes sustained their injuries in urban locations

### ***Speed a significant contributing factor for motorcyclists***

Almost 30% of motorcyclists involved in a fatal intersection crash were cited for excessive speed (compared to about 9% of all drivers involved). Serious injury intersection crashes showed a similar disparity: 14% of involved motorcyclists were reported to be speeding, compared to 5% of all involved drivers.

### ***Intersection-related casualties growing among older motorcyclists***

During 2002-2004, 30% of motorcyclists killed in intersection crashes were aged 45 years or older. By comparison, this age group accounted for about 18% of motorcyclist fatalities during 1996-2001. A similar trend was seen for motorcyclists seriously injured in intersection crashes.

In terms of growth, the number of fatally injured motorcyclists aged 45-54 years increased by more than 60% and the number aged 55-64 years more than doubled between 1996-2001 and 2002-2004. Serious injuries within both age groups showed similar increases.

## **Urban Intersection-related Fatalities and Serious Injuries**

The term “urban” in this study refers to locations where the posted speed limit is 70 km/h or lower. During 2002-2004, urban crashes accounted for 54% of fatalities and 72% of serious injuries from intersection crashes.

### ***Pedestrians at higher risk in urban areas***

Pedestrians made up a larger share of casualties in urban locations than in rural or motorway locations. 32% of those killed and 18% of those seriously injured in urban intersection crashes were pedestrians. Clearly, pedestrians in urban areas are at great risk from intersection crashes.

***Not-at-fault pedestrian casualties on the increase.***

Careless drivers pose an increasing risk to pedestrians walking in urban areas. The number of pedestrians killed in urban intersection crashes who were considered not at fault grew by 11% between 1996-2001 and 2002-2004, while the number seriously injured grew by 7%. The figures suggest that pedestrians should pay attention to vehicle movement even when they are crossing with the right of way.

***Senior driver involvement lowest in urban locations***

Drivers aged 65 or older made up 13% of those involved in fatal urban intersection crashes, compared to 16% of involved drivers in rural and motorway areas. This age group also made up 11% of drivers in serious injury crashes, compared to 12% of drivers in rural and motorway locations.

Senior driver involvement is lower in urban areas than in rural or motorway locations because alternate means of travel (bus, taxi, walking) are more readily available, reducing the need to drive. Creating additional transportation options for seniors in urban and rural areas would reduce driver crash involvement by older drivers, while improving the quality of life for the senior population.

***Alcohol use highest in urban locations***

At least 13% of drivers in fatal urban intersection crashes had used alcohol, a slightly higher figure than for all types of locations combined, and an increase over 1996-2001.

***Motorcyclist serious injuries from intersection crashes on the increase in urban locations***

Motorcyclist serious injuries from urban intersection crashes grew by 18% between 1996-2001 and 2002-2004, although motorcyclist fatalities decreased somewhat. About 50% of motorcyclist fatalities and 75% of motorcyclist serious injuries from intersection crashes occurred in urban locations.

**Rural Intersection-related Fatalities and Serious Injuries**

The term “rural” in this study refers to locations with a posted speed limit of 80-90 km/h. Rural crashes accounted for 39% of fatalities and 24% of serious injuries resulting from intersection crashes during 2002-2004.

Statistics for rural locations tend to fall between those of urban and motorway locations, so there were few results that stood out.

***Increased motorcyclist fatalities in rural intersection crashes***

Motorcyclist fatalities from rural intersection crashes increased by 14% between 1996-2001 and 2002-2004, although the actual number of fatalities occurring in rural areas was still lower than the number in urban areas (where fatalities decreased by 11% between 1996-2001 and 2002-2004).

***Substantially fewer young persons died in rural intersection crashes***

Fatalities among persons under the age of 25 dropped by 27% between 1996-2001 and 2002-2004. This was a bigger improvement than for urban or motorway locations.

***Decreased young driver involvement in fatal rural crashes***

Involvement of drivers aged 16-24 in fatal rural crashes decreased by 30% between 1996-2001 and 2002-2004, a bigger improvement than seen in urban or motorway locations.

***Decline in reported alcohol use in rural intersection crashes***

Alcohol use by drivers involved in fatal or serious injury rural intersection crashes declined between 1996-2001 and 2002-2004.

**Motorway Intersection-related Fatalities and Serious Injuries**

The term “motorway” in this study refers to locations with a posted speed limit of more than 90 km/h. Motorway locations accounted for 7% of fatalities and 4% of serious injuries resulting from intersection crashes during 2002-2004.

***Motorways had the highest percentage of heavy vehicle involvement***

21% of vehicles involved in fatal intersection crashes and 12% of vehicles in serious injury intersection crashes were heavy trucks or buses. Both figures were considerably higher than in urban or rural locations.

***Motorway intersection crashes had the highest incidence of distraction among drivers***

About 20% of drivers in fatal or serious injury intersection crashes on motorways were reported as distracted.

***Motorway intersection crashes had the lowest incidence of driver alcohol use***

About 7% of drivers in fatal crashes and 5% of drivers in serious injury crashes that took place on motorways had been using alcohol, both figures an improvement over 1996-2001.

## **Older Drivers in Fatal and Serious Injury Intersection Crashes**

For the purpose of this study, older drivers were defined as those aged 65 years or older unless otherwise stated.

### ***Most fatal and serious injury intersection crashes involving older drivers occurred in urban areas***

Almost 50% of older drivers in fatal intersection crashes and more than 70% of older drivers in serious injury intersection crashes experienced their crashes in an urban setting. With higher traffic density and more complex driving situations, urban locations are a more challenging environment for older drivers than rural or motorway locations.

### ***Majority of involved older drivers had crashes during day***

About three out of four older drivers involved in fatal or serious injury intersection crashes had their crashes between 9.a.m. and 6 p.m. In fact, 30% of drivers involved had their crashes between the hours of 12 p.m. and 3 p.m. alone. This is because older drivers often limit their driving to daylight hours and may also try to avoid rush hour traffic.

### ***Most older drivers involved in fatal or serious injury intersection crashes had committed an infraction***

Seven out of ten involved drivers 75+ who were involved in a fatal intersection crash had committed an infraction, as did almost half of drivers 65-74 years old. Numbers were almost as high for drivers involved in serious injury crashes.

### ***Failure to yield the right of way more of problem for senior drivers than for average driver***

Failure to yield the right of way was the most common driving infraction of seniors involved in fatal and serious injury intersection crashes, with 28% of those in fatal crashes and 24% of those in serious injury crashes cited.

Furthermore, older drivers involved in fatal or serious injury intersection crashes failed to yield the right of way twice as often as the average driver.

The incidence of this infraction among senior drivers was higher in rural areas than in urban areas. Failure to yield the right of way was cited for 34% of older drivers involved in fatal crashes in rural areas, compared to 29% in urban areas.

### *Left turns a significant problem for senior drivers*

About 28% of older drivers in fatal or serious injury intersection crashes were turning left at the time of the crash. Compared to the average driver, an older driver involved in a fatal crash were twice as likely to be turning left, while an older driver involved in a serious injury crash was about one and a half times as likely to be turning left.

## **Conclusion**

This study of the available data identified certain aspects of intersection crashes that need to be addressed in order to accomplish the objectives of Road Safety Vision 2010. The following are some ways to respond to those concerns and decrease the number of fatalities and serious injuries from intersection crashes.

Engineering strategies to simplify intersections could be beneficial. For example, more left turn lanes and more signal-controlled left turn opportunities would reduce the danger posed by this type of intersection manoeuvre. Roundabouts and traffic circles, which reduce the points of intersection conflict between vehicles, are a popular option put forth by engineers. However, public education and clear signage are necessary to prevent driver confusion about their use.

In general, intersections should be designed or improved in ways that increases safety for senior drivers and senior pedestrians. Targeting improvements towards these road users will also improve safety for other road users.

Senior pedestrians are a particularly vulnerable group at intersections and the problem is expected to worsen in the next few years. Seniors often need more time to cross the street and may have sight, hearing, or mental deficits that prevent them from noticing and reacting correctly to vehicle traffic. Installing longer pedestrian walk signals would be one helpful step.

Since speeding and alcohol use are frequently factors in intersection crashes, reducing these offences, particularly among younger drivers, would also reduce intersection crash casualties.

In light of the increasing congestion on our highways and the significant work pressures faced by truck drivers, additional training for vehicle operators would be a positive step toward reducing the involvement of heavy vehicles in motorway intersection crashes. As older, experienced truck drivers retire, and large numbers of less experienced drivers enter the industry, the need for training and skills development becomes even more urgent.

Considering the growing number of pedestrians injured while crossing with the right of way, drivers need to be re-educated about the rights of pedestrian road users. Traffic enforcement can also play a role in keeping pedestrians safe.

Refresher driving courses for older drivers may help to reduce the high rate of dangerous infractions committed by this group when at intersections. Drivers whose physical or cognitive impairments make them unsafe drivers should also be identified, and, if necessary, prevented from driving. Improved and expanded community transportation options would make it easier for seniors to give up driving.

The goals of Road Safety Vision 2010 and the quest for Canada to have the safest roads in the world cannot be accomplished without a focused and sustained effort to reduce intersection-related fatalities and serious injuries. There are many strategies that would yield positive results. Whether there is the political will and the public support to take action remains to be seen.

## Appendix of Tables

Table 1

Percent of Intersection Crash Victims Killed or Seriously Injured  
According to Age  
Selected Jurisdictions

Age	1996-2001 Average		2002-2004 Average	
	Injury Severity		Injury Severity	
	Killed	Seriously Injured	Killed	Seriously Injured
0-15 years	7.7%	10.7%	5.7%	9.6%
16-19 years	10.0%	11.1%	8.5%	10.8%
20-24 years	10.2%	12.2%	10.2%	12.3%
25-34 years	12.2%	17.6%	12.0%	16.4%
35-44 years	12.3%	15.8%	13.2%	15.4%
45-54 years	10.5%	12.2%	12.3%	13.5%
55-64 years	8.8%	7.5%	9.7%	8.9%
65-74 years	11.7%	6.8%	11.3%	6.5%
75+ years	16.7%	6.1%	17.1%	6.5%
Total	100.0%	100.0%	100.0%	100.0%

Table 2

Percent of Intersection Crash Victims Killed or Seriously Injured  
According to Road User Type  
Selected Jurisdictions

Road User Type	1996-2001 Average		2002-2004 Average	
	Injury Severity		Injury Severity	
	Killed	Seriously Injured	Killed	Seriously Injured
Driver	44.5%	46.6%	42.8%	46.9%
Passenger	26.3%	28.4%	25.0%	27.6%
Motorcyclist	6.9%	6.0%	8.2%	6.7%
Bicyclist	3.1%	4.8%	3.1%	4.9%
Pedestrian	16.8%	12.2%	18.5%	11.8%
Unknown	2.4%	2.0%	2.3%	2.1%
Total	100.0%	100.0%	100.0%	100.0%

Table 3

**Percent of Pedestrians Killed/Seriously Injured in Intersection Crashes  
According to Age  
Selected Jurisdictions**

Age	1996-2001 Average		2002-2004 Average	
	Injury Severity		Injury Severity	
	Killed	Seriously Injured	Killed	Seriously Injured
<b>0-15 years</b>	11.8%	23.1%	7.9%	16.7%
<b>16-19 years</b>	5.6%	8.5%	4.3%	7.8%
<b>20-24 years</b>	4.1%	7.2%	4.3%	8.1%
<b>25-34 years</b>	5.5%	10.9%	6.0%	10.1%
<b>35-44 years</b>	8.7%	11.5%	7.2%	11.5%
<b>45-54 years</b>	9.3%	11.6%	8.9%	11.8%
<b>55-64 years</b>	10.8%	8.7%	12.0%	11.5%
<b>65-74 years</b>	15.8%	8.9%	22.1%	10.1%
<b>75+ years</b>	28.5%	9.5%	27.2%	12.4%
<b>Total</b>	100.0%	100.0%	100.0%	100.0%

Table 4

**Percent of Motorcyclists Killed/Seriously Injured in Intersection Crashes  
According to Age  
Selected Jurisdictions**

Age	1996-2001 Average		2002-2004 Average	
	Injury Severity		Injury Severity	
	Killed	Seriously Injured	Killed	Seriously Injured
<b>0-15 years</b>	1.8%	5.0%	2.7%	4.8%
<b>16-19 years</b>	9.4%	11.6%	3.2%	8.1%
<b>20-24 years</b>	23.9%	18.2%	15.1%	15.4%
<b>25-34 years</b>	28.3%	25.5%	29.2%	22.6%
<b>35-44 years</b>	18.9%	20.3%	20.5%	20.3%
<b>45-54 years</b>	12.7%	14.3%	18.9%	18.5%
<b>55-64 years</b>	2.7%	3.6%	8.1%	8.0%
<b>65-74 years</b>	1.5%	1.2%	1.6%	1.9%
<b>75+ years</b>	0.9%	0.3%	0.5%	0.4%
<b>Total</b>	100.0%	100.0%	100.0%	100.0%

Table 5

**Percent of Drivers in Fatal/Serious Injury Intersection Crashes  
According to Driver Age  
Selected Jurisdictions**

Driver Age	1996-2001 Average		2002-2004 Average	
	Collision Severity		Collision Severity	
	Fatal	Serious Injury	Fatal	Serious Injury
<b>16-19 years</b>	9.1%	9.6%	7.7%	9.5%
<b>20-24 years</b>	11.9%	12.9%	11.5%	12.6%
<b>25-34 years</b>	19.6%	21.6%	18.8%	19.7%
<b>35-44 years</b>	19.5%	21.6%	20.8%	20.6%
<b>45-54 years</b>	15.4%	15.2%	16.5%	16.9%
<b>55-64 years</b>	9.4%	8.9%	10.6%	10.2%
<b>65-74 years</b>	7.6%	6.0%	6.4%	6.2%
<b>75+ years</b>	7.6%	4.1%	7.6%	4.4%
<b>Total</b>	100.0%	100.0%	100.0%	100.0%

Table 6

**Percent of Drivers in Fatal/Serious Injury Intersection Crashes  
According to Contributing Driver Action  
Selected Jurisdictions**

Driver Action	1996-2001 Average		2002-2004 Average	
	Collision Severity		Collision Severity	
	Fatal	Serious Injury	Fatal	Serious Injury
<b>Following too close</b>	0.7%	2.3%	0.6%	2.6%
<b>Improper turn</b>	2.9%	4.7%	2.2%	3.4%
<b>Speeding/too fast for conditions</b>	7.7%	4.0%	9.3%	4.7%
<b>Fail to yield ROW</b>	13.1%	12.6%	12.6%	13.0%
<b>Disobey traffic control</b>	13.7%	11.2%	13.1%	10.9%
<b>Lost control</b>	3.7%	4.2%	3.8%	3.0%
<b>Other actions</b>	2.7%	2.9%	3.5%	4.5%
<b>No driver infraction</b>	57.9%	59.0%	59.5%	59.0%

Table 7

**Percent of Drivers in Fatal/Serious Injury Intersection Crashes  
According to Contributing Driver Condition  
Selected Jurisdictions**

Driver Condition	1996-2001 Average		2002-2004 Average	
	Collision Severity		Collision Severity	
	Fatal	Serious Injury	Fatal	Serious Injury
<b>Distraction/inattention</b>	10.3%	8.2%	11.8%	11.0%
<b>Inexperience</b>	0.8%	0.8%	1.6%	1.2%
<b>Fatigue</b>	0.9%	0.8%	1.0%	0.6%
<b>Illness or medical condition</b>	1.1%	0.9%	1.1%	0.9%
<b>Alcohol</b>	11.1%	7.2%	12.2%	6.0%
<b>Drugs or unspecified impairment</b>	1.0%	0.2%	1.2%	0.5%
<b>No driver condition</b>	77.3%	82.7%	76.1%	81.0%

Table 8

**Percent of Drinking Drivers in Fatal/Serious Injury Intersection Crashes  
According to Driver Age  
Selected Jurisdictions**

Driver Age	1996-2001 Average		2002-2004 Average	
	Collision Severity		Collision Severity	
	Fatal	Serious Injury	Fatal	Serious Injury
<b>16-19 years</b>	12.1%	10.5%	11.2%	11.1%
<b>20-24 years</b>	22.4%	20.6%	23.3%	20.8%
<b>25-34 years</b>	26.4%	28.2%	23.0%	24.5%
<b>35-44 years</b>	20.5%	23.4%	20.1%	20.3%
<b>45-54 years</b>	12.1%	10.8%	11.8%	14.8%
<b>55-64 years</b>	3.9%	4.1%	5.6%	5.1%
<b>65-74 years</b>	1.5%	2.0%	2.9%	2.5%
<b>75+ years</b>	1.1%	0.4%	2.1%	1.1%
<b>Total</b>	100.0%	100.0%	100.0%	100.0%

Table 9

**Percent of Urban Intersection Crash Victims Killed or Seriously Injured  
According to Road User Type  
Selected Jurisdictions**

Road User Type	1996-2001 Average		2002-2004 Average	
	Injury Severity		Injury Severity	
	Killed	Seriously Injured	Killed	Seriously Injured
<b>Driver</b>	33.5%	41.2%	33.4%	41.5%
<b>Passenger</b>	19.8%	24.5%	19.9%	24.3%
<b>Motorcyclist</b>	8.7%	6.7%	8.1%	7.6%
<b>Bicyclist</b>	5.0%	7.0%	4.9%	6.9%
<b>Pedestrian</b>	31.1%	18.7%	31.6%	17.5%
<b>Unknown</b>	2.0%	1.9%	2.1%	2.1%
<b>Total</b>	100.0%	100.0%	100.0%	100.0%

Table 10

**Percent of Urban Intersection Crash Victims Killed or Seriously Injured  
According to Age  
Selected Jurisdictions**

Age	1996-2001 Average		2002-2004 Average	
	Injury Severity		Injury Severity	
	Killed	Seriously Injured	Killed	Seriously Injured
<b>0-15 years</b>	7.9%	11.8%	5.8%	10.5%
<b>16-19 years</b>	8.5%	10.2%	7.6%	9.5%
<b>20-24 years</b>	9.8%	12.0%	10.8%	12.2%
<b>25-34 years</b>	11.7%	17.2%	11.0%	16.5%
<b>35-44 years</b>	11.3%	15.7%	10.8%	15.2%
<b>45-54 years</b>	10.2%	12.2%	10.2%	13.5%
<b>55-64 years</b>	9.3%	7.8%	9.9%	9.0%
<b>65-74 years</b>	11.3%	6.7%	13.5%	6.6%
<b>75+ years</b>	20.0%	6.3%	20.4%	7.0%
<b>Total</b>	100.0%	100.0%	100.0%	100.0%

Table 11

**Percent of Rural Intersection Crash Victims Killed or Seriously Injured  
According to Age  
Selected Jurisdictions**

Age	1996-2001 Average		2002-2004 Average	
	Injury Severity		Injury Severity	
	Killed	Seriously Injured	Killed	Seriously Injured
<b>0-15 years</b>	7.1%	9.0%	5.0%	8.4%
<b>16-19 years</b>	11.4%	11.9%	8.9%	11.5%
<b>20-24 years</b>	11.0%	11.4%	9.7%	11.5%
<b>25-34 years</b>	12.2%	17.6%	13.6%	14.9%
<b>35-44 years</b>	13.4%	16.4%	15.7%	15.9%
<b>45-54 years</b>	11.5%	13.1%	13.7%	13.8%
<b>55-64 years</b>	8.9%	7.7%	10.3%	10.1%
<b>65-74 years</b>	12.2%	7.2%	9.3%	7.5%
<b>75+ years</b>	12.4%	5.7%	13.9%	6.5%
<b>Total</b>	100.0%	100.0%	100.0%	100.0%

Table 12

**Percent of Drivers in Fatal/Serious Injury Motorway Intersection Crashes  
According to Driver Age  
Selected Jurisdictions**

Driver Age	1996-2001 Average		2002-2004 Average	
	Collision Severity		Collision Severity	
	Fatal	Serious Injury	Fatal	Serious Injury
<b>16-19 years</b>	6.7%	9.7%	5.8%	7.3%
<b>20-24 years</b>	9.1%	12.3%	8.3%	12.8%
<b>25-34 years</b>	17.5%	22.3%	16.0%	18.4%
<b>35-44 years</b>	21.8%	19.9%	23.8%	21.4%
<b>45-54 years</b>	13.9%	15.8%	16.5%	17.5%
<b>55-64 years</b>	10.8%	7.3%	14.1%	11.0%
<b>65-74 years</b>	8.9%	6.6%	5.8%	6.8%
<b>75+ years</b>	11.5%	6.1%	9.7%	4.7%
<b>Total</b>	100.0%	100.0%	100.0%	100.0%

Table 13

**Percent of Vehicles Involved in Fatal/Serious Injury  
Motorway Intersection Crashes According to Vehicle Type  
Selected Jurisdictions**

Vehicle Type	1996-2001 Average		2002-2004 Average	
	Collision Severity		Collision Severity	
	Fatal	Serious Injury	Fatal	Serious Injury
<b>Car</b>	49.8%	57.5%	49.5%	57.7%
<b>Light truck</b>	26.9%	27.5%	24.8%	24.4%
<b>Heavy truck</b>	20.5%	10.8%	20.9%	11.6%
<b>Bus</b>	0.0%	0.1%	0.5%	0.7%
<b>Motorcycle/moped</b>	1.4%	2.8%	3.4%	5.0%
<b>Other</b>	1.4%	1.2%	1.0%	0.6%
<b>Total</b>	100.0%	100.0%	100.0%	100.0%

Table 14

**Percent of Older Drivers (Aged 65-99 Years) Involved in  
Fatal/Serious Injury Intersection Crashes According to Contributing Driver Action  
Selected Jurisdictions**

Driver Action	1996-2001 Average		2002-2004 Average	
	Collision Severity		Collision Severity	
	Fatal	Serious Injury	Fatal	Serious Injury
<b>Following too close</b>	0.8%	2.3%	1.0%	2.8%
<b>Improper turn</b>	7.3%	7.9%	2.5%	5.2%
<b>Speeding/too fast for conditions</b>	2.0%	1.3%	2.0%	1.4%
<b>Fail to yield ROW</b>	28.0%	21.5%	28.1%	23.6%
<b>Disobey traffic control</b>	19.7%	14.5%	17.1%	12.9%
<b>Lost control</b>	3.7%	3.2%	5.0%	3.3%
<b>Other actions</b>	3.3%	3.2%	5.5%	6.2%
<b>No driver infraction</b>	37.5%	47.0%	40.2%	46.4%