Road Safety in Canada 2020

Transport Canada Transports Canada

Canada

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ISBN: 978-0-660-40528-5
Catalogue No.: T46-54/1-2021E-PDF

TP 15498E

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Executive Summary

In 2011, a Road Safety in Canada report was published by Transport Canada to recognize the Canadian Year of Road Safety, the beginning of the United Nations Decade of Action for Road Safety 2011-2020, and the launch of Road Safety Strategy 2015, Canada's third national road safety program.

This report looks at Canada's progress during the Decade of Action which ended in 2020. Its goal is to determine what progress Canada has made toward the Road Safety 2025 (RSS2025) vision of zero fatalities and serious injuries and having the safest roads in the world. RSS2025 has a target of a continuous downward trend in fatalities and serious injuries year over year.

Data from the National Collision Database were used to determine the rates of fatalities and serious injuries from 2011 to 2020. Further, the following road safety topics were examined for this period to see whether there have been safety improvements: alcohol and drug impaired driving, seat belt use, distracted driving, speeding, young drivers, vulnerable road users, and heavy commercial vehicles. In addition to data from the National Collision Database (NCDB), data from coroner and medical examiners' offices as well as observational surveys were used to examine these indicators.

Fatality and serious injury rates per billion vehicle kilometres traveled declined by 22% and 35% respectively from 2011 to 2020. Canada's 2018 fatality rate was 12th among the 22 Organization for Economic Cooperation and Development (OECD) members for which data were available. The social cost of motor vehicle collisions in Canada was estimated at $36 billion for 2020.

The percentage of fatally injured drivers who had been drinking decreased from 34% in 2008 to 28% in 2016. In a 2018 British Columbia roadside survey, 4.9% of drivers had been drinking, a decrease from 2012, when 6.5% of drivers had been drinking. Ontario roadside surveys show that 4.4% of drivers had been drinking in 2017, which is comparable to the percentage observed in 2014 (4.0%).

With respect to the presence of drugs while driving, in 2016, coroners detected at least one psychodynamic drug (a legal or illegal drug that affects the mind, emotions and behaviour) other than alcohol in 47% of fatally injured drivers. This figure can be compared to 41% in 2008. Cannabis use among fatally injured drivers while driving increased from 18% in 2008 to 21% in 2016. In roadside surveys in British Columbia, 7.4% of drivers tested positive for drugs in 2012 compared to 8.5% in 2018. Similar surveys in Ontario found that 10.2% of drivers tested positive for drugs in 2014 and 14.2% tested positive in 2017.

In 2020, 21% of road fatalities involved distraction, the same as in 2010. Based on observational surveys, drivers talking on mobile devices increased from 2.3% in 2012-2013 to 2.9% in 2016-2017 and texting increased from 1.6% to 2.2% during the same period.

Fatal collision involvement rates of young drivers under 20 decreased 34% from 2011 to 2020. Pedestrian fatalities decreased by 11%, motorcyclist fatalities increased by 40%, and cyclist fatalities decreased by 9%. Fatalities involving heavy commercial vehicles also declined by 26%.

Between 2011 and 2020, road safety has improved in terms of overall rates of fatalities and serious injuries. In 2020, the leading contributing factors for fatalities were speeding (25%) and distracted driving (21%). While drinking and driving has decreased, the use of drugs associated with driving has increased, particularly cannabis.

This report also describes measures that have contributed to these observed improvements such as countermeasures focusing on distracted and impaired driving and safety for vulnerable road users as well as future challenges to improving road safety such as:

- Automated and connected vehicles and work being undertaken to ensure their safety
- Advanced driver assistance systems such as blind spot detection and emergency braking
- New vehicles related to low-speed electric vehicles and scooters
- Older drivers, a growing cohort
- Electronic data recorders that record and store sensor data when a crash happens
- Drug impaired driving and issues still to be addressed

Introduction

In 2011, a Road Safety in Canada report was published by Transport Canada to recognize the Canadian Year of Road Safety, the beginning of the United Nations Decade of Action for Road Safety 2011-2020, and the launch of Road Safety Strategy 2015, Canada's third national road safety program.

This report looks at Canada's progress during the Decade of Action which ended in 2020. Its goal is to determine what progress Canada has made toward the Road Safety 2025 vision of zero motor vehicle fatalities and serious injuries and having the safest roads in the world.

It also recognizes 2019 as the 50th anniversary of what was initially the Road Safety and Motor Vehicle Regulation Directorate at Transport Canada, the lead federal government agency for road safety in Canada.

Background

In Canada, road safety is a shared responsibility between federal, provincial/territorial and municipal governments.

The federal government is responsible for regulations that pertain to the manufacturing and importation of motor vehicles or equipment under the *Motor Vehicle Safety Act*, as well as the safety fitness of interprovincial and international motor carriers under the *Motor Vehicle Transport Act*. The Multimodal and Road Safety Programs Directorate of Transport Canada is responsible for administering these acts through the development of motor vehicle and motor carrier safety regulations and standards and their enforcement. It also:

- gathers data from provincial and territorial governments for the National Collision Database (NCDB)
- researches vehicle and road user safety
- conducts collision and defect investigations, and
- informs the public on improving their safety while traveling

The Department of Justice is responsible for the *Criminal Code of Canada* which includes sections on impaired driving.

Provinces, territories, and municipalities are responsible for:

- building and maintaining highways
- commercial vehicle operations within provinces and territories
- driver and vehicle licensing
- research on road infrastructure and road user safety, and
- developing and implementing jurisdictional road safety initiatives (e.g., legislation, regulation, enforcement, road infrastructure, public awareness, and education)

The Canadian Council of Motor Transport Administrators (CCMTA), along with key non-governmental agencies, such as the Canadian Association of Chiefs of Police, also play an important role in developing and delivering road safety programs in Canada. In addition, all levels of government participate in the Transportation Association of Canada, which is a

national not-for-profit, technical association that focuses on road and highway infrastructure, and urban transportation.

United Nations Decade of Action for Road Safety 2011-2020

The United Nations General Assembly passed a resolution in March 2010 to establish the Decade of Action for Road Safety 2011-2020. The decade has been led by the World Health Organization in order to "stabilize and then reduce the forecasted level of motor vehicle fatalities around the world by increasing activities conducted at national, regional and global levels" by 2020.

The principles guiding the Decade of Action are to:

- use a "safe system approach" to deal with traffic collisions
- have ownership for activities at the national and local level
- include governments, the private sector, and nongovernmental organizations in the development of improvements to road safety

Canada's Road Safety Strategy 2025

Launched in 2016 by the Council of Ministers Responsible for Transportation and Highway Safety[1], Road Safety Strategy 2025 is the fourth national initiative to improve road safety in Canada. The first three national strategies helped to reduce fatalities and serious injuries by 44% and 56% respectively between 1996 and 2015 (Jonah, 2018).

The vision of Road Safety Strategy 2025 is "Towards Zero - The safest roads in the world". The latter part of this vision is similar to previous strategies, but the new vision adds Towards Zero where deaths and serious injuries would eventually drop to zero (Canadian Council of Motor Transport Administrators, 2016).

Road Safety Strategy 2025 promotes Vision Zero, which is a multi-national traffic safety initiative based on the philosophy that no one should be killed or seriously injured within the road transport system.[2] Ultimately, the main goal of Vision Zero is to achieve zero fatalities or serious injuries on the road. In Canada, Parachute[3] has taken the national lead to co-ordinate and share best practices among all the municipalities and communities seeking to improve road safety." The CCMTA serves as the custodian of Road Safety Strategy 2025 by providing support and guidance where appropriate.

The objectives of Road Safety Strategy 2025 are to:

- raise public awareness and commitment to road safety
- improve communication, cooperation, and collaboration among stakeholders
- enhance legislation and enforcement of traffic laws
- improve road safety information in support of research and evaluation
- improve the safety of vehicles and road infrastructure, and

[1] PRESS RELEASE (comt.ca)
[2] Canada's Road Safety Strategy
[3] https://parachute.ca/en/program/vision-zero/

- leverage technology and innovation

The Road Safety Strategy 2025 identifies guiding principles, primary risk groups, contributing factors and best practices. All of these are intended to support each jurisdiction in identifying and developing programs to address local road safety issues. As of 2019, several jurisdictions have developed and implemented provincial road safety strategies (e.g., British Columbia, Alberta, and Manitoba).

Overall Level of Road Safety in Canada

This report examines changes in road safety by looking at data on motor vehicle fatalities and serious injuries from 2011 to 2020[4]. It also determines whether there have been any changes related to key road safety topics during that period.

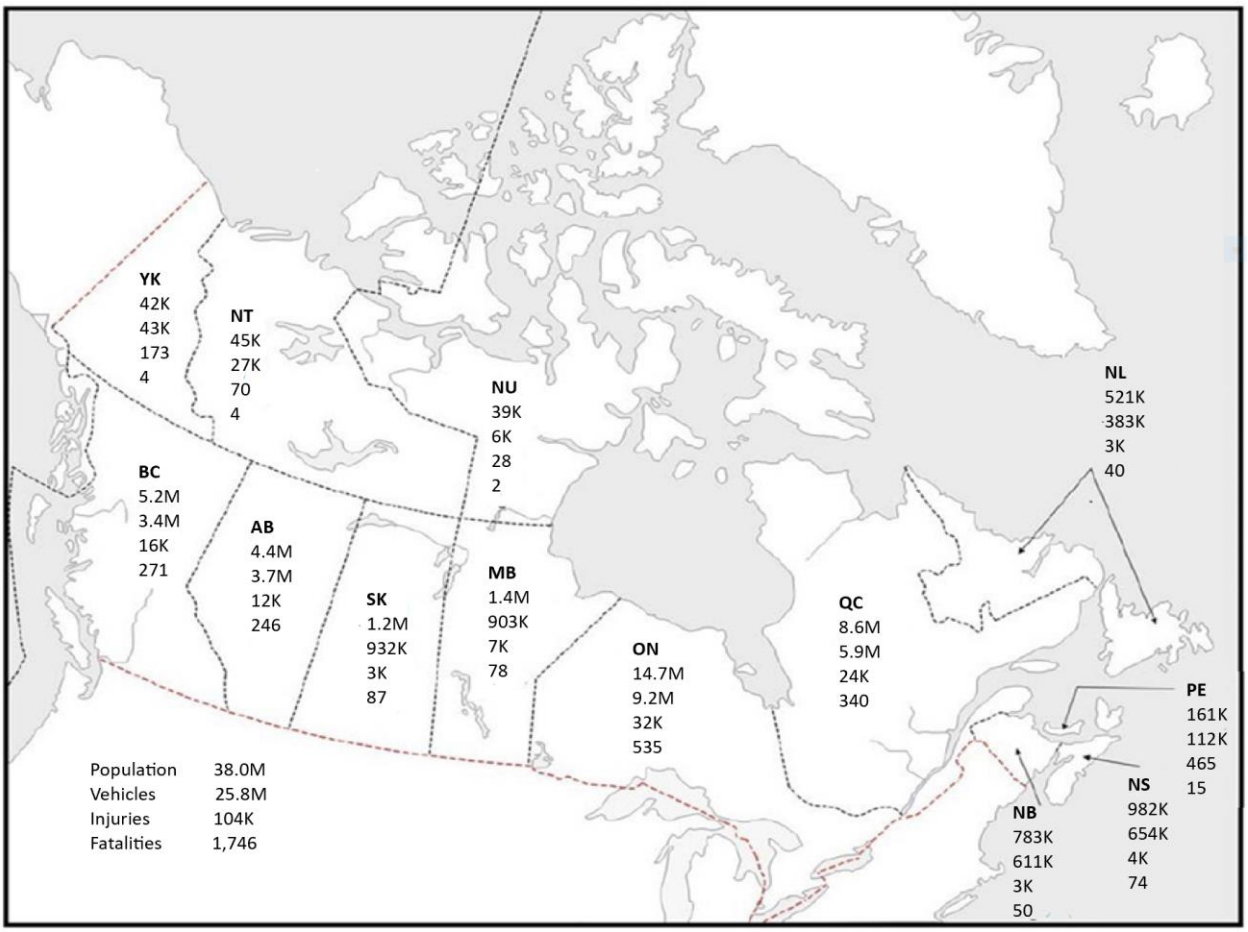
Motor vehicles are a fundamental means of commuting to work and help Canadians travel our vast geography. They also transport goods across both the country and North America. Canada has around 1.13 million two-lane equivalent kilometers of roadways. A lane kilometre measures the number of traffic lanes on each section of road (Transport Canada, 2021).

Figure 1 shows statistics on population, vehicles, collisions, and fatalities from 2020. These are grouped by province/territory and Canada as a whole.

In 2020, Canada's population was over 38 million, with close to 26 million registered vehicles. The collisions involving these vehicles resulted in an estimated 104,286 injured victims and 1,746 fatalities. In 2020, roughly 285 injured victims and 5 fatalities were reported on Canadian roads every day.

[4] The 2020 data are as provided by provinces or territories or estimated where needed.

Figure 1: Population, registered vehicles, injuries and fatalities, Canada, 2020

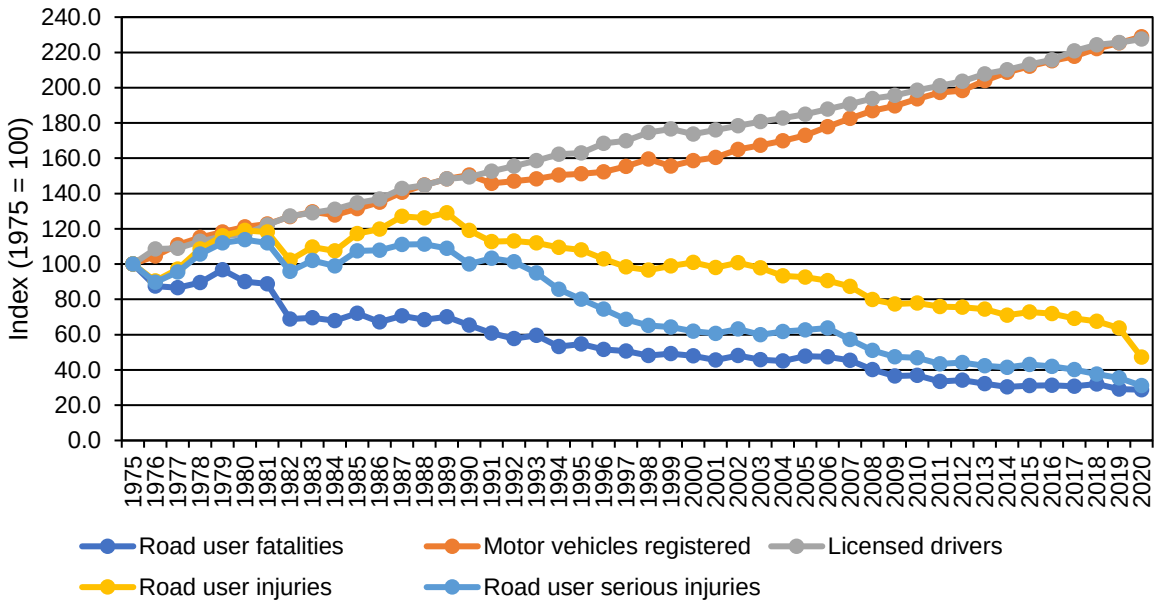


The long-term trend in fatalities and injuries, registered vehicles and licensed drivers is shown in **Figure 2**.

The most recent NCDB data available are from 2020. Compared to 1975, Canada's population has increased by 64%, the number of licensed drivers has grown by 128%, and the number of registered vehicles is up by 129%.

Despite this growth, there were 71% fewer motor vehicle related fatalities, 53% fewer total injuries, and 69% fewer serious injuries (those that require overnight treatment in hospital).

Figure 2: Number of registered motor vehicles, licensed drivers, road user injuries serious injuries and fatalities by year, from 1975 to 2020



As shown in **Figure 3**, nine provinces or territories saw fewer fatalities per 100,000 licensed drivers between 2011 and 2020.

The motor vehicle fatality rate for Canada decreased almost 24% between 2011 and 2020. Seven provinces and territories saw decreases that were greater than the national average and they include Prince Edward Island, Quebec, Manitoba, Saskatchewan, Alberta, Yukon, and Nunavut.

Figure 3: Fatalities per 100,000 licensed drivers by province/territory in 2011 and 2020[5]

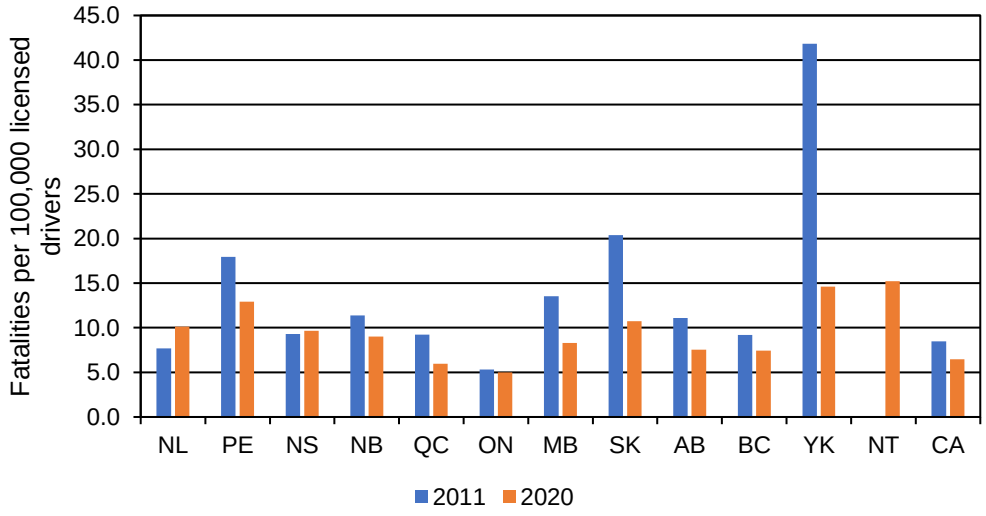
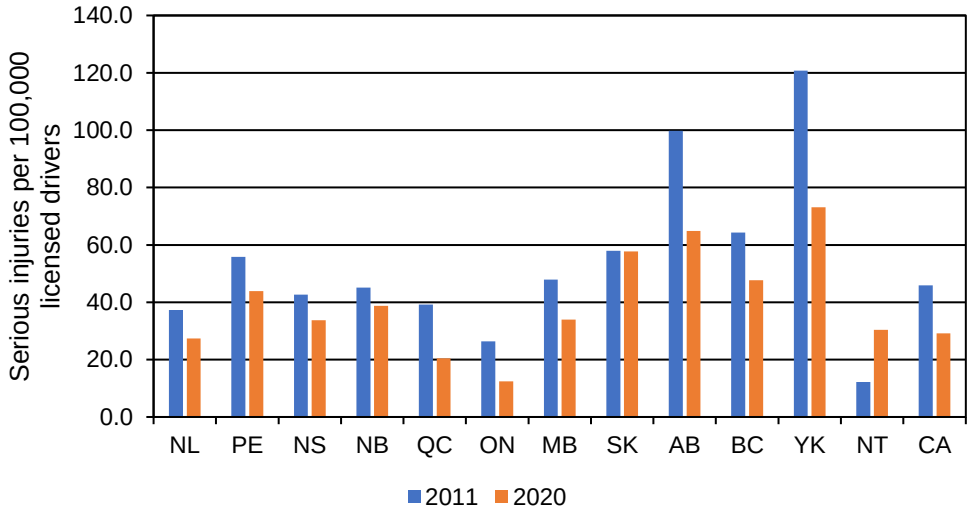


Figure 4 shows that between 2011 and 2020, the rate of serious injuries per 100,000 licensed drivers declined in all jurisdictions except the Northwest Territories.

The serious injury rate for Canada decreased by more than 36% during that period. Four provinces and territories saw decreases that were greater than the national average: Quebec, Ontario, Yukon, and Nunavut.

[5] Nunavut has very few fatalities, with a rate of 49.9 in 2011, and 18.3 in 2020. These data were omitted to avoid obscuring the fatality rates for the other jurisdictions.

Figure 4: Serious injuries per 100,000 licensed drivers by province/territory in 2011 and 2020[6]



The number of fatalities per billion vehicle kilometers travelled (VKT) are shown in **Figure 5**.

In 2020, the motor vehicle fatality rates were lower compared to 2011 in ten jurisdictions. The national fatality rate per billion vehicle kilometers travelled decreased by 22%.

New Brunswick, Quebec, Manitoba, Saskatchewan, Alberta, British Columbia, Yukon, and Nunavut showed percentage decreases in fatalities per billion VKTs that were greater than the national average.

[6] Nunavut has few serious injuries and with a serious injury rate in 2011 of 199.6 and in 2020 of 9.2 was omitted to avoid obscuring the serious injury rates for the other jurisdictions.

Figure 5: Fatalities per billion vehicle kilometers travelled by province/territory in 2011 and 2020[7]

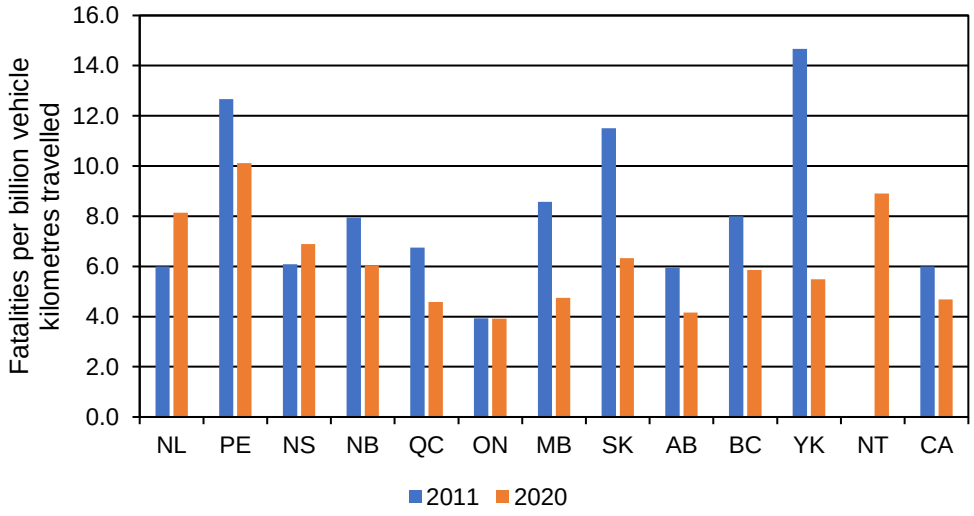
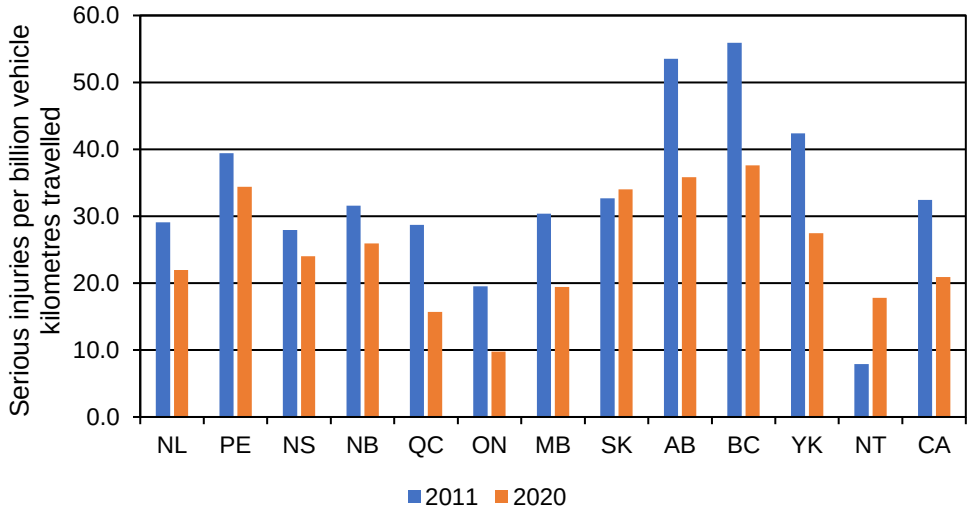


Figure 6 shows that between 2011 and 2020, the number of serious injuries per billion vehicle kilometers travelled decreased for all jurisdictions, except Saskatchewan and Northwest Territories.

The national serious injury rate decreased by 35% during that 10-year period. Quebec, Ontario, Manitoba, and Nunavut showed percentage decreases in serious injuries per billion VKTs that were greater than the national average.

[7] Nunavut has very few fatalities and with a fatality rate in 2011 of 81.3 and in 2020 of 45.7, was omitted to avoid obscuring the fatality rates for the other jurisdictions.

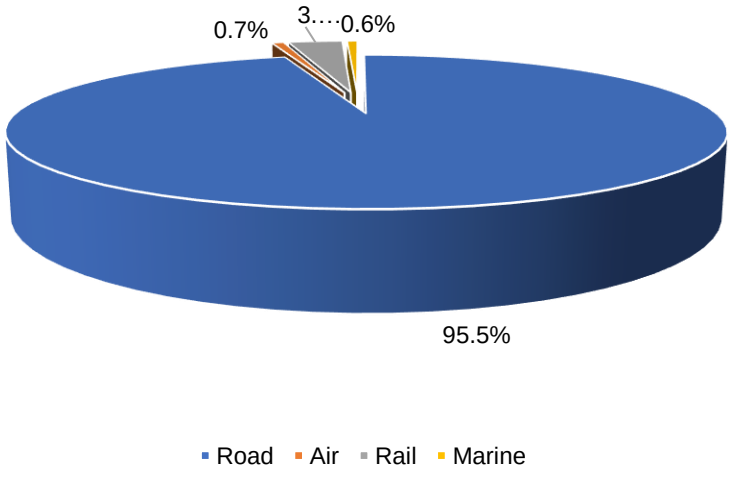
Figure 6: Serious injuries per billion vehicle kilometers travelled by province/territory in 2011 and 2020[8]



Despite major safety improvements, these numbers are a solemn reminder of the price that Canadians pay for their mobility.

Due to the sheer number of users, compared with other modes of transportation, **Figure 7** shows that motor vehicle fatalities made up around 96% of transportation fatalities in 2020.

Figure 7: Comparison of fatalities by mode of transportation, 2020



[8] Nunavut has few serious injuries and with a serious injury rate in 2011 of 325.1 and in 2020 of 22.8, was omitted to avoid obscuring the serious injury rates for the other jurisdictions.

Characteristics of motor vehicle collisions

Table 1 shows that in 2020:

- 46.5% of fatal collisions involved passenger cars
- 25.0% involved light trucks and vans, and
- 11.5% involved tractor trailers or straight trucks over 4,536 kg

With respect to injury collisions:

- 66.1% involved passenger cars
- 20.6% involved light trucks and vans, and
- 3.6% involved tractor trailers or straight trucks

Table 1: Percentage of vehicles involved in motor vehicle collisions by vehicle type and collision severity, 2020

Type of vehicle	Fatal collisions	All Injury collisions	Property damage collisions	Total vehicles
Passenger cars	46.5%	66.1%	61.3%	62.2%
Light trucks and vans	25.0%	20.6%	26.8%	25.6%
School buses	0.3%	0.1%	0.2%	0.2%
Transit buses	0.3%	0.4%	0.3%	0.3%
Intercity buses	0.1%	0.1%	0.1%	0.1%
Buses, unspecified	0.1%	0.1%	0.1%	0.1%
Motorcycles	9.5%	3.1%	0.2%	0.8%
Mopeds	0.2%	0.4%	0.0%	0.1%
Bicycles	2.1%	3.1%	0.2%	0.7%
Straight trucks > 4,536 kg	4.6%	2.1%	2.8%	2.7%
Tractor trailers	6.9%	1.5%	1.8%	1.8%
Motorhomes	0.3%	0.1%	0.1%	0.1%
Farm and construction equipment	0.7%	0.3%	0.4%	0.4%
Off-road vehicles	1.4%	0.2%	0.0%	0.1%
Streetcars	0.0%	0.0%	0.0%	0.0%
Others	1.9%	1.7%	5.8%	5.0%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Between 2011 and 2020, single-vehicle collisions made up roughly 51% of all fatal collisions, 33% of injury collisions and 29% of property damage collisions. Around 65% of fatal collisions happened on rural roads. Most injury collisions happened on urban roads (71%), while 29% occurred on rural roads.

In the last 10 years, more collisions happened on Friday than on any other day of the week. The number of fatal collisions peaked during the weekend. Saturday was the day of the week with the most fatal collisions, followed by Friday and Sunday. Tuesday saw the fewest fatal collisions.

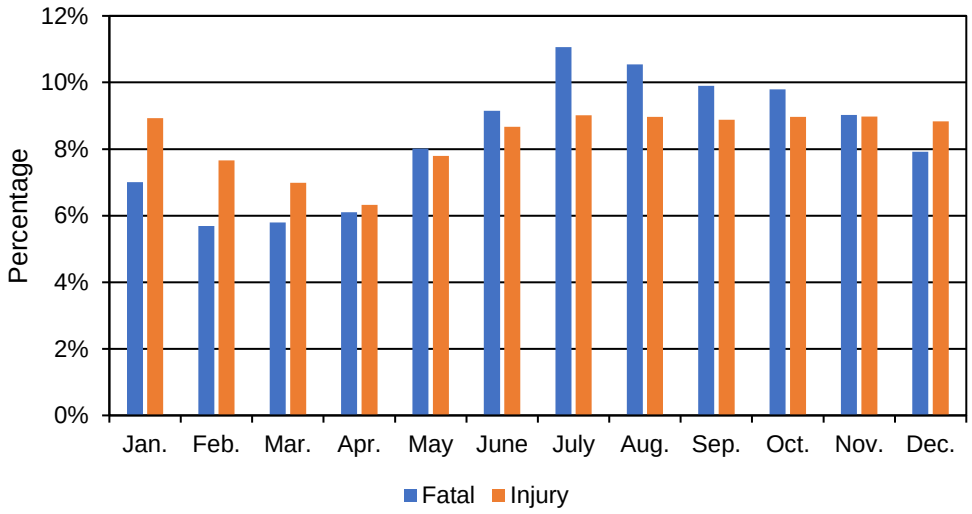
Looking at the time of day of the collisions (divided in three-hour periods), the highest risk periods for fatal collisions were:

- Tuesdays from 3 pm to 6 pm
- Fridays from 3 pm to 6 pm, and
- Fridays from 6 pm to 9 pm

Injury collisions peaked from 3 pm to 6 pm each day, except for Saturdays. Friday from 3 pm to 6 pm was the highest risk period.

Figure 8 shows that fatal collisions peaked during the summer, with July and August having the highest percentage. While injury collisions were distributed more evenly, they peaked in July, August, October, and November. Fatal and injury collisions that involved two vehicles peaked from July to September. Fatal collisions that involved a single vehicle peaked from July to October while injury collisions that involved a single vehicle peaked in November and December.

Figure 8: Percentage distribution of fatal and injury collisions by month from 2011 to 2020 (10-year average)



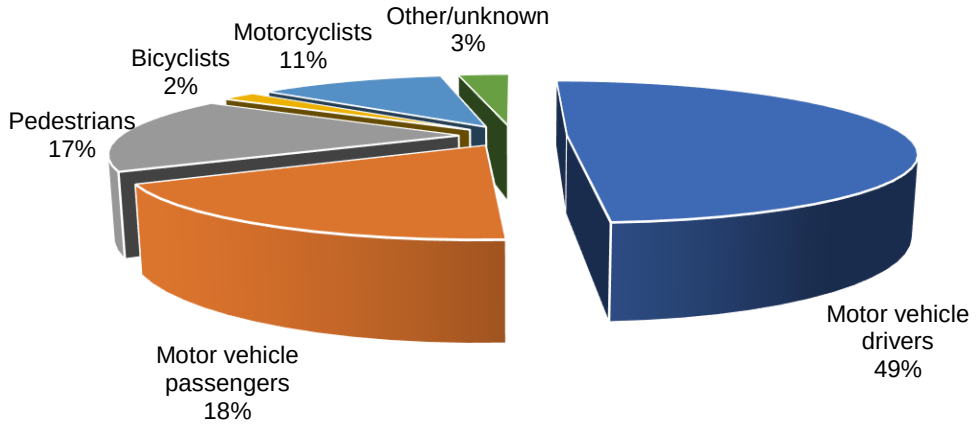
Characteristics of crash victims

As shown in **Figure 9**:

- In 2020, 67% of road user fatalities were occupants of motor vehicles
  - 49% were drivers and 18% were passengers

- Vulnerable road users made up 30% of fatalities
  - Pedestrians were the largest class of vulnerable road users at 17%
  - Followed by motorcyclists at 11% and cyclists at 2%

Figure 9: 2020 motor vehicle fatalities by road user class



In 2020, males made up about 72% of all road user fatalities. In 2020, roughly 51% of licensed drivers in Canada were males, but they accounted for 77% of fatally injured drivers.

Figure 10 shows that in 2020, 63% of seriously injured road users were occupants of motor vehicles. 45% were drivers and 18% were passengers. Vulnerable road users made up 33% of the serious injuries. Pedestrians and motorcyclists were the largest vulnerable road user classes at 14%, followed by cyclists at 5%.

Males made up close to 63% of seriously injured persons, and 65% of seriously injured drivers.

Figure 10: 2020 motor vehicle serious injuries by road user class

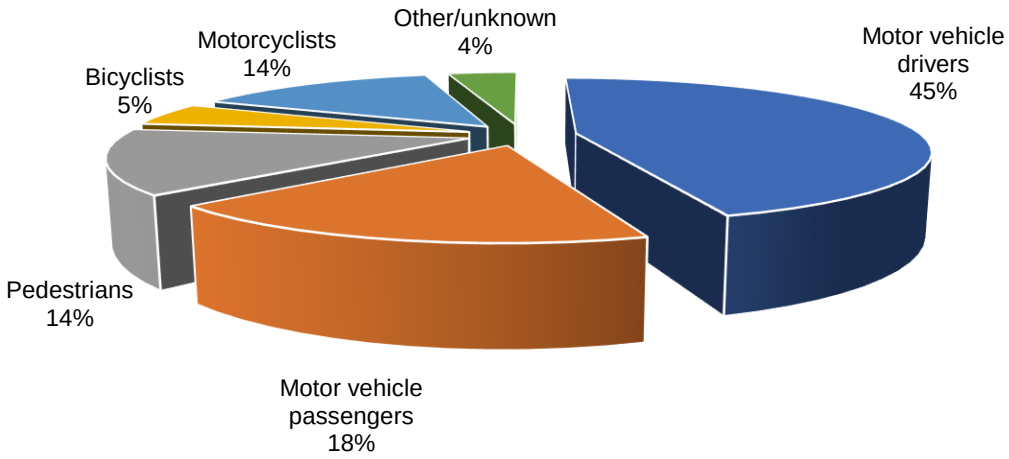


Figure 11 shows that in 2020 there were fewer fatalities than in 2011 across all age groups except for adults 55 to 64, both sexes combined.

Most age groups saw fewer fatalities within this ten-year period. The number of fatalities for:

- children aged 0 to 4 years decreased by 13%
- children aged 5 to 9 years decreased by 18%
- youth aged 10 to 14 years decreased by 38%
- youth aged 15 to 19 years decreased by 45%
- adults aged 20 to 24 years decreased by 28%
- adults aged 25 to 34 years decreased by 2%
- adults aged 35 to 44 years decreased by 10%
- adults aged 45 to 54 years decreased by 13%
- adults aged 65 years and older decreased by 12%

Adults 55 to 64 saw a 13% increase in the number of fatalities in 2020 compared to 2011.

Fatalities were the highest for adults 65 and over, which may reflect the increasing size of the population and/or the age group's frailty.

Figure 11: Fatalities in motor vehicle traffic collisions by age group, both sexes combined, 2011 and 2020

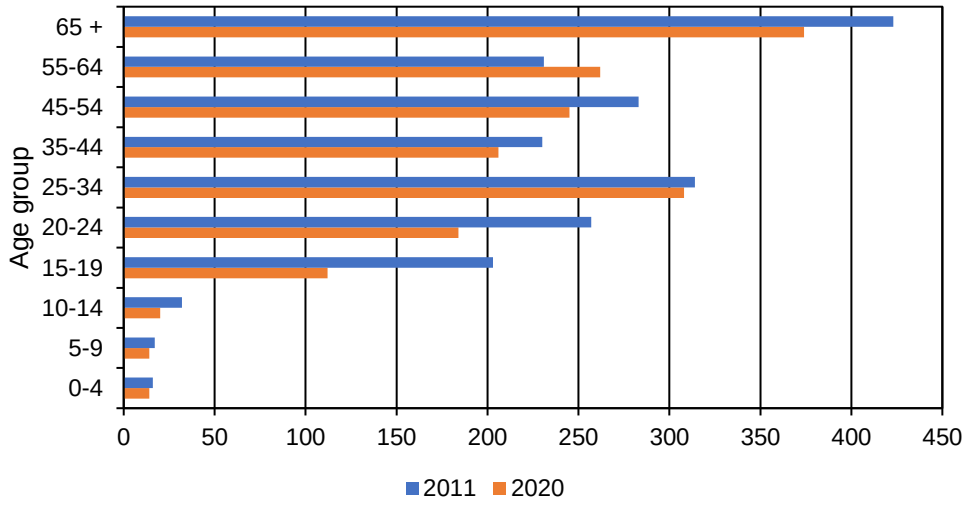


Figure 12 shows that in 2020, there were fewer serious injuries as a result of motor vehicle collision compared to in 2011 for all age groups, both sexes combined.

The number of serious injuries for:

- children aged 0 to 4 years decreased by 23%
- children aged 5 to 9 years decreased by 48%
- youth aged 10 to 14 years decreased by 40%

- youth aged 15 to 19 years decreased by 48%
- adults aged 20 to 24 years decreased by 37%
- adults aged 25 to 34 years decreased by 24%
- adults aged 35 to 44 years decreased by 21%
- adults aged 45 to 54 years decreased by 35%
- adults aged 55 to 64 years decreased by 15%
- adults aged 65 years and older decreased by 12%

The decreases for children aged 0-4 and adults aged 25-34, 35-44 and 55-64 were less than the national average.

Figure 12: Serious injuries in motor vehicle traffic collisions by age group, both sexes combined, 2011 and 2020

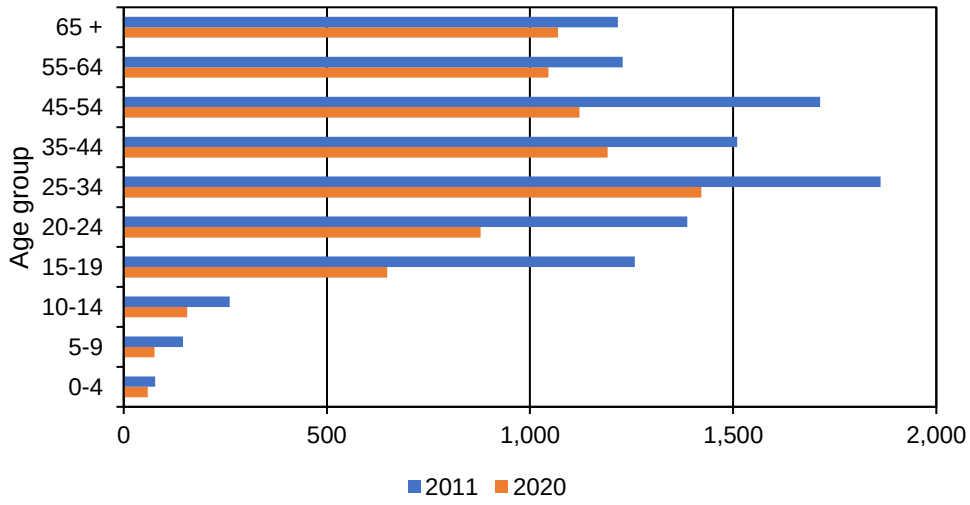


Table 2 shows that persons 15 to 19 years, 20 to 24 years, and 25 to 34 years were overrepresented in fatalities, serious injuries and injuries compared to the proportion of the population they represented.

While these age groups represented 26% of Canada's population, they made up approximately 35% of traffic fatalities, 38% of traffic serious injuries and 39% of all traffic injuries. Fatalities of adults 65 and over were also overrepresented in comparison to the population they represented. These differences are also shown in **Figure 13**.

Table 2: Road user fatalities, serious injuries and injuries by age group compared to Canada's population, 2020

Age group	Fatalities	% of fatalities	Serious injuries	% of serious injuries	Injuries	% of injuries	Population	% of population
0-4	14	0.8	59	0.7	1,345	1.3	1,919,827	5.0
5-9	14	0.8	76	1.0	1,531	1.5	2,047,366	5.4
10-14	20	1.2	156	2.0	2,228	2.1	2,074,540	5.5
15-19	112	6.4	648	8.3	9,120	8.7	2,102,402	5.5
20-24	184	10.5	878	11.2	11,828	11.3	2,484,313	6.5
25-34	308	17.7	1,422	18.2	19814	19.0	5,312,199	14.0
35-44	206	11.8	1,191	15.3	16,145	15.5	5,097,961	13.4
45-54	245	14.0	1,122	14.4	14,739	14.1	4,844,644	12.7
55-64	262	15.0	1,045	13.4	13,189	12.7	5,308,450	14.0
65 +	374	21.4	1,069	13.7	12,187	11.7	6,845,702	18.0
Unknown	7	0.4	141	1.8	2,160	2.1	0	0.0
Total	**1,746**	**100.0**	**7,807**	**100.0**	**104,286**	**100.0**	**38,037,204**	**100.0**

Figure 13: Comparison of percentage distributions of population, fatalities, serious injuries, and injuries by age group, 2020

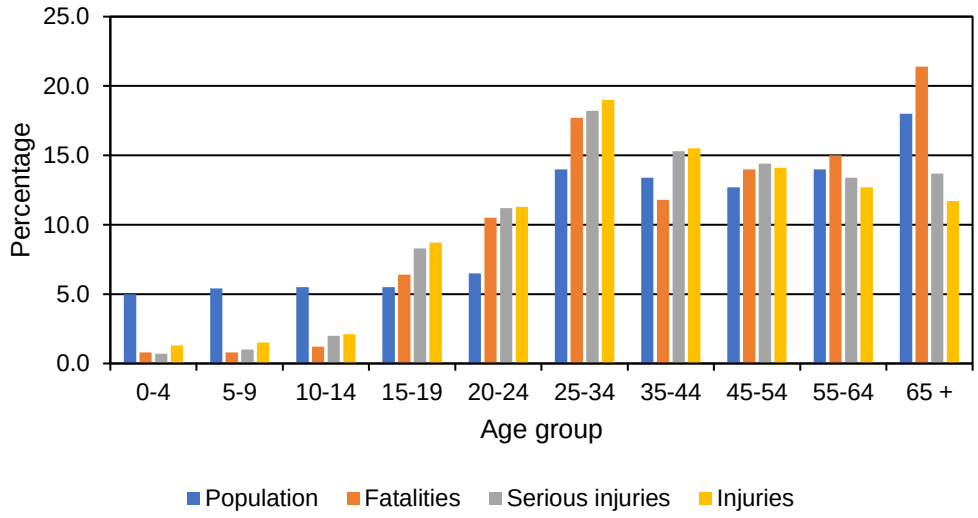


Figure 14 shows the 2011 and 2020 fatality rates per 100,000 population by age group. The fatality rate declined for all age groups.

Figure 14: Motor vehicle fatalities per 100,000 population by age group, both sexes combined, 2011 and 2020

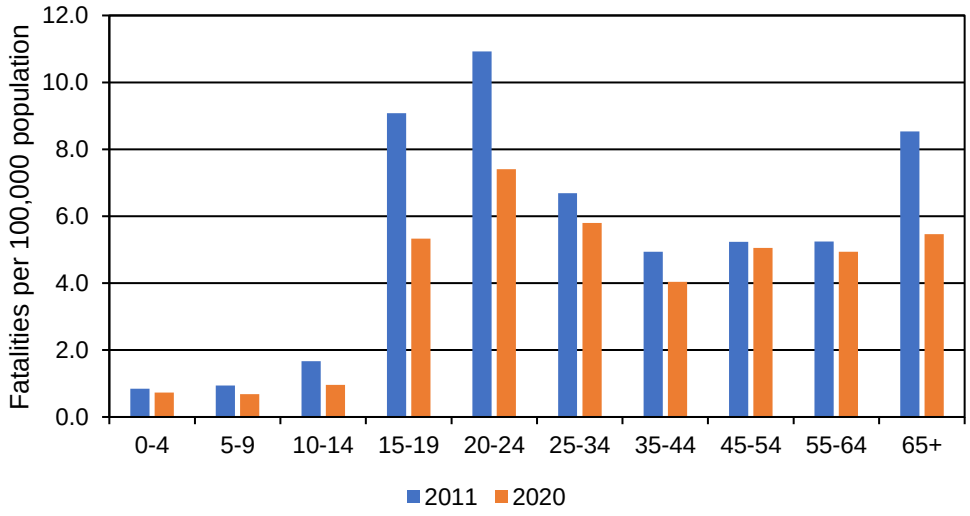


Figure 15 shows that for males, the fatality rate decreased for all age groups from 2011 to 2020

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Figure 15: Motor vehicle fatalities per 100,000 population by age group, males, 2011 and 2020

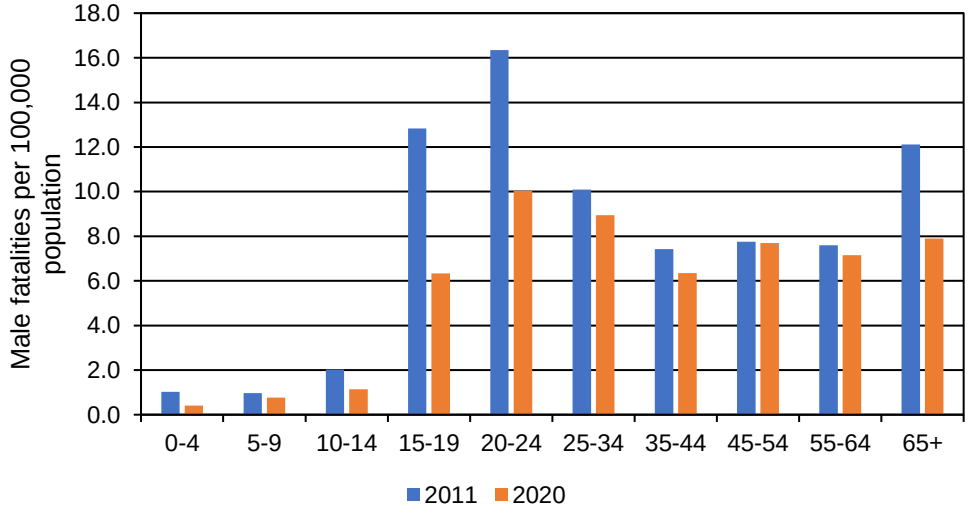
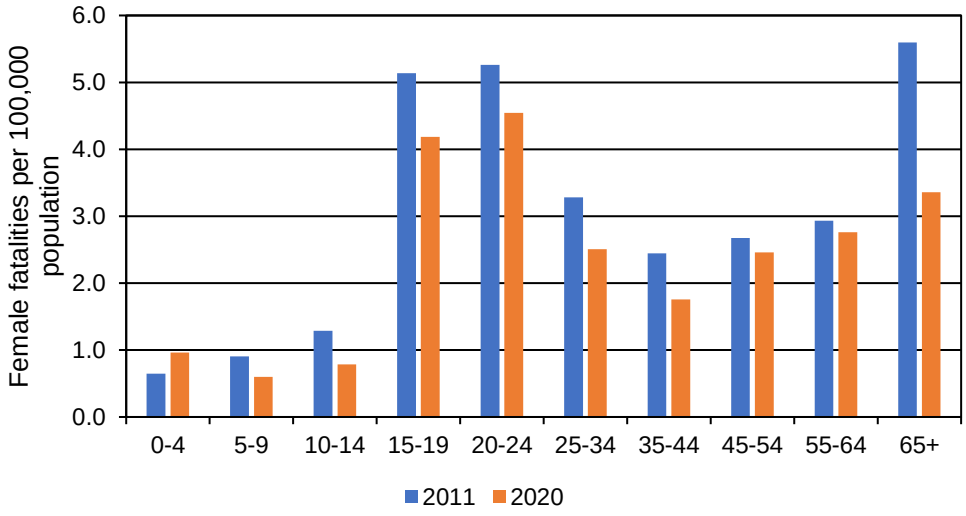


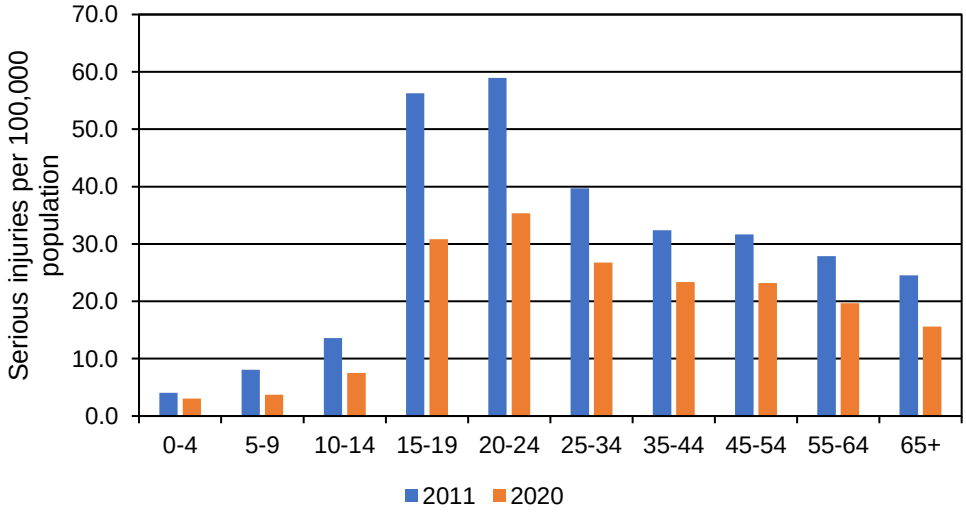
Figure 16 shows that for females, the fatality rate also decreased for all age groups, except children aged 0 to 4 years.

Figure 16: Motor vehicle fatalities per 100,000 population by age group, females, 2011 and 2020



The serious injury rate decreased for all age groups, as shown in **Figure 17**.

Figure 17: Motor vehicle serious injuries per 100,000 population, both sexes combined, by age group, 2011 and 2020



Figures 18 and 19 show that there were decreases for males and females of all age groups.

Figure 18: Motor vehicle serious injuries per 100,000 population by age group, males, 2011 and 2020

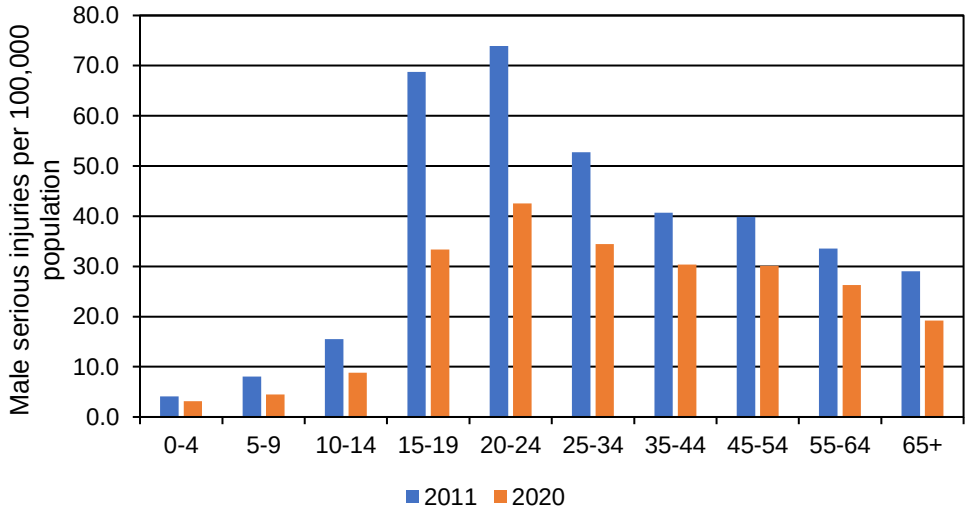
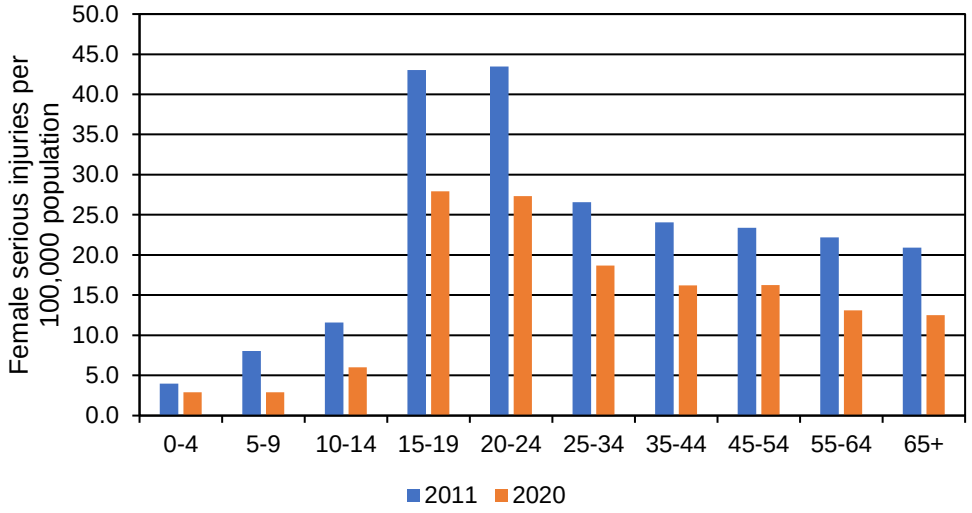


Figure 19: **Motor vehicle serious injuries per 100,000 population by age group, females, 2011 and 2020**



Social cost of collisions

The social cost of collisions includes two major elements: human costs and other costs. These are defined as:

- **Human costs** are casualty-based, so they include the cost of fatalities, disabilities, and non-disabling injuries from motor vehicle collisions

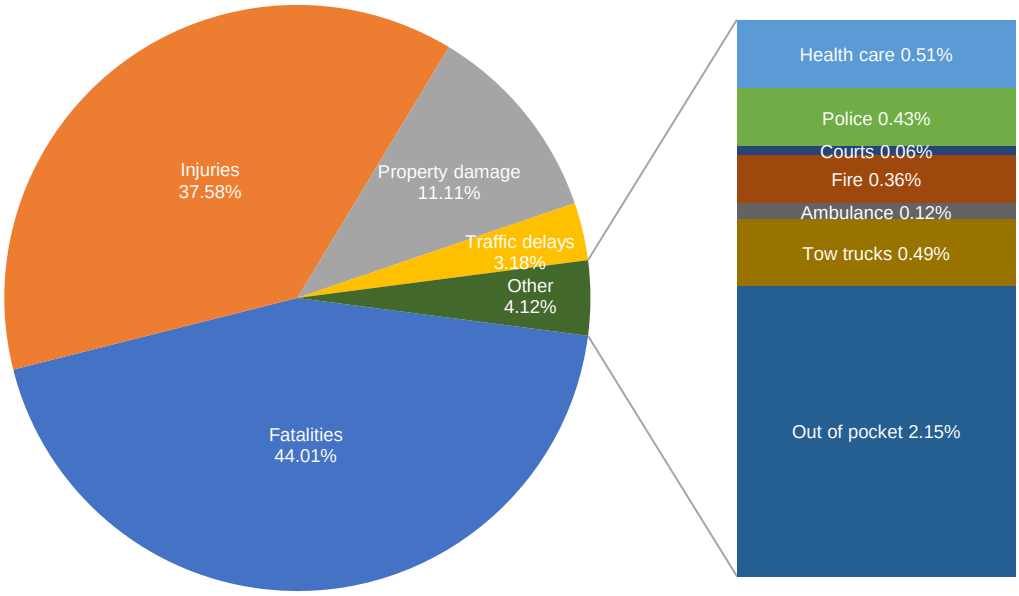
- **Other costs** include vehicle damage, health care, emergency vehicles, out of pocket expenses, and traffic delay (extra travel time and related pollution) from motor vehicle collisions

In 2020, the social cost of Canadian motor vehicle collisions was estimated at approximately $36 billion, or around $99 million each day (in 2010 dollars).

Figure 20 shows that around 82% of the cost of collisions are “human costs” (e.g. cost of lost productivity, hospital stays and rehab) due to fatalities and all injuries. Vehicle property damage makes up about 11% of the cost.

Between 2011 and 2020, the social cost of collisions decreased by approximately 19%.

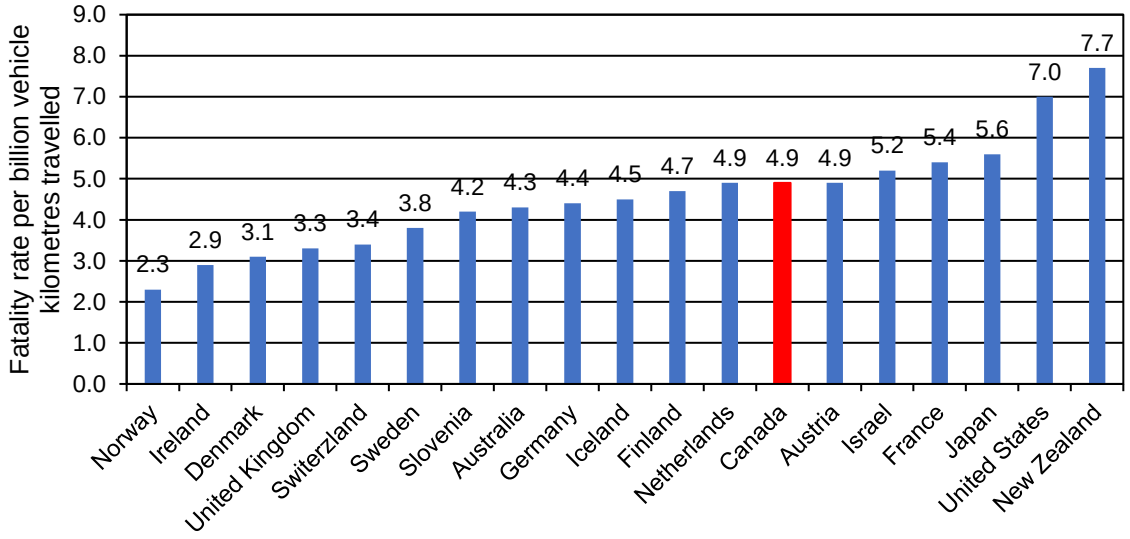
Figure 20: Social costs of collisions, 2020



International comparison

Part of the vision of Road Safety Strategy 2025 is to have the safest roads in the world. In 2018, Canada was ranked 12th in terms of fatalities per billion vehicle kilometers travelled compared to other member countries of the Organization for Economic Cooperation and Development, as shown in **Figure 21** (IRTAD, 2020).

Figure 21: Canada's 2018 road safety ranking among OECD member countries



Key road safety topics

This section looks at key road safety topics based on contributing factors and high-risk groups identified in the Road Safety Strategy 2025. Some high-risk behaviours (such as impaired driving, not using seat belts, distracted driving, aggressive behaviour, including excessive speed) pose serious threats on Canadian roads and put all road users at risk.

The safety of young and inexperienced drivers remains a concern as they are overrepresented in collisions. Vulnerable road users (pedestrians, bicyclists, and motorcyclists) are also an important population as they represent almost one-third of motor vehicle fatalities. The involvement of heavy commercial vehicles in collisions is an ongoing safety concern as collisions involving vehicles of this size are more likely to produce serious consequences, including more serious consequences on average than for other vehicle types.

Trends for these contributing factors and high-risk groups have been examined as well as some of the countermeasures that have been used to improve overall safety. While the data presented relates mostly to the number of fatalities, the trends for serious injuries are also similar.

Alcohol-impaired driving

Three types of data are used to show the prevalence of alcohol-impaired driving: collision data from the National Collision Database (NCDB), death data from Coroners and Medical Examiners in each province and territory and roadside surveys in select provinces and territories.

Collision data

The NCDB shows that alcohol remains a contributing factor in a significant number of fatal collisions as determined by an investigating police officer.

As shown in **Figure 22**, the percentage of fatalities that involved a driver being under the influence of alcohol as a contributing factor, has decreased from 26% in 2011 to 18% in 2020, a drop of approximately 29%.[9]

Figure 22: Percentage of motor vehicle fatalities involving a driver being under the influence of alcohol as a contributing factor from 2011 to 2020

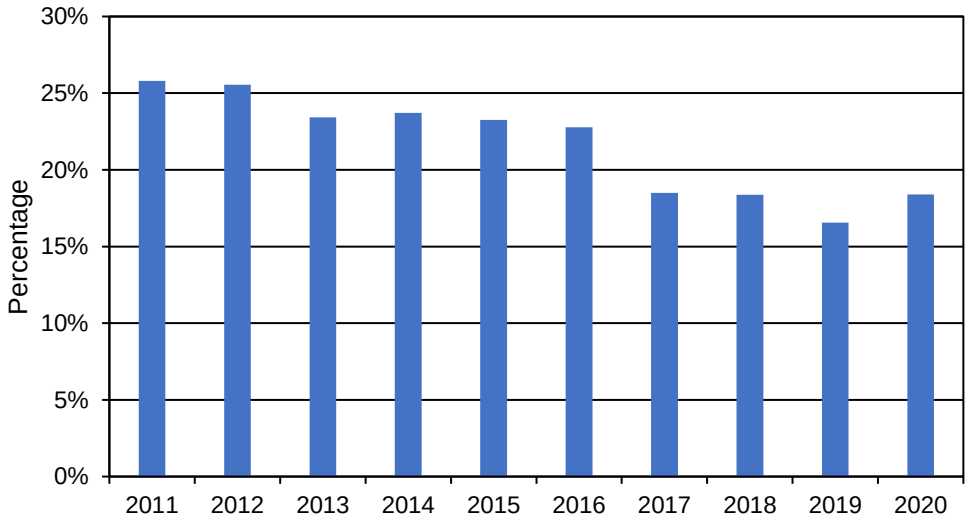


Table 3 shows the percentage of fatally injured drivers for which being under the influence of alcohol was a contributing factor. The data are grouped by age, from 2011 to 2020.

Alcohol was a contributing factor more often for adults aged 20 to 44. It should be noted that in this period, the presence of alcohol as a contributing factor decreased across all age groups, except those aged 65 and older.

[9] The data from the National Collision Database on the number of drivers under the influence of alcohol may differ from other sources.

Table 3: Percentage of fatally injured drivers for which being under the influence of alcohol is a contributing factor by age group from 2011 to 2020

Age group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
< 20	22.2	26.4	21.5	21.5	29.7	11.1	19.1	20.3	17.0	21.8
20-24	34.2	28.9	31.5	27.7	37.5	37.3	22.4	28.1	19.6	27.7
25-34	36.7	45.9	29.2	38.3	32.5	31.0	27.7	24.6	26.0	19.8
35-44	38.3	30.9	32.7	27.8	23.3	35.6	25.3	24.8	23.7	26.4
45-54	27.1	23.0	30.7	26.8	27.2	27.6	18.3	19.5	16.9	17.9
55-64	13.9	17.4	17.6	16.8	23.8	16.7	13.4	12.7	11.6	10.3
65 +	5.3	7.2	9,3	8.2	5.0	6.8	6.6	5.5	8.0	9.5
Total	**25.3**	**26.4**	**24.4**	**23.7**	**24.2**	**23.5**	**18.7**	**18.3**	**16.7**	**17.7**

Coroner data

According to the Traffic Injury Research Foundation (Brown, Vanlaar, and Robertson, 2018), in 2016, coroners determined that 32% of drivers killed in fatal collisions had been drinking, as shown in **Figure 23**.

The presence of alcohol was the highest in Prince Edward Island (50%) and New Brunswick (44%), and lowest in Newfoundland and Labrador (21%) although only a small number of drivers were tested.

Of those drinking drivers, 79% had blood alcohol concentrations over the Criminal Code's limit of 80 mg%.

Figure 23: Blood alcohol concentrations among fatally injured drivers, 2016[10] [11]

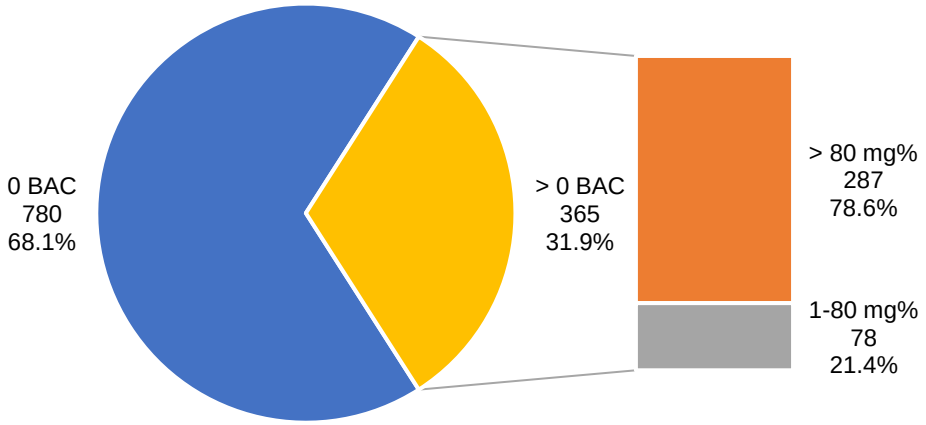


Figure 24 shows the percentage of fatally injured drivers in 2016 who had blood alcohol concentrations of zero, one to 80 mg%, or more than 80 mg%. The data are grouped by age.

Drivers aged 20 to 25 were the most likely to have been drinking (49%) followed by drivers aged 36 to 45 (48%) and aged 26 to 35 (42%). By contrast, only 13% of tested drivers over the age of 55 had been drinking.

The percentages of fatally injured drivers with blood alcohol concentrations over the legal limit were highest for:

- Adults aged 36 to 45 years (44%)
- Adults aged 20 to 25 years (43%)
- Adults aged 26 to 35 years (33%)

Age groups with the fewest drivers with blood alcohol concentrations over 80 mg% were:

- Youth aged 16 to 19 years (17%)
- Adults aged 46 to 55 years 23%)
- Adults over 55 years (7%)

Fatally injured male drivers were more likely to have been drinking (35%) and have blood alcohol concentration over 80 mg% (27%) compared to females (22% and 19% respectively). Fatally injured light truck drivers were most likely to have been drinking (41%)

[10] Source: Traffic Injury Research Foundation (2018). The Alcohol and Drug-Crash Problems in Canada: 2016 Report.
[11] Numbers are estimated based on the blood alcohol concentration distribution of drivers tested for alcohol.

and be over 80 mg% (32%). Drivers fatally injured in single vehicle collisions were more likely to have been drinking (52%) and have blood alcohol over 80 mg% (44%). It's worth noting that 33% of fatally injured pedestrians had been drinking and most of these had blood alcohol concentrations over 80 mg%.

Figure 24: Percentage of fatally injured drinking drivers by age group, 2016[12]

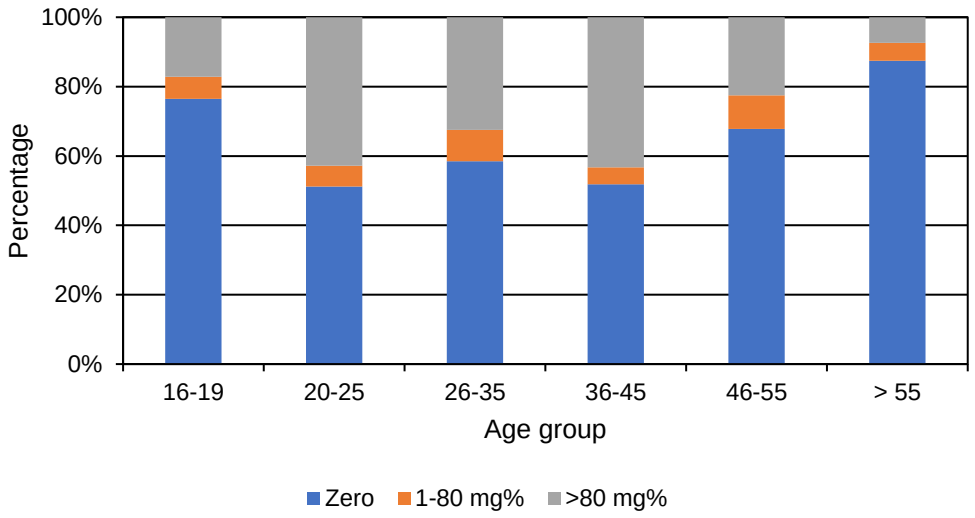
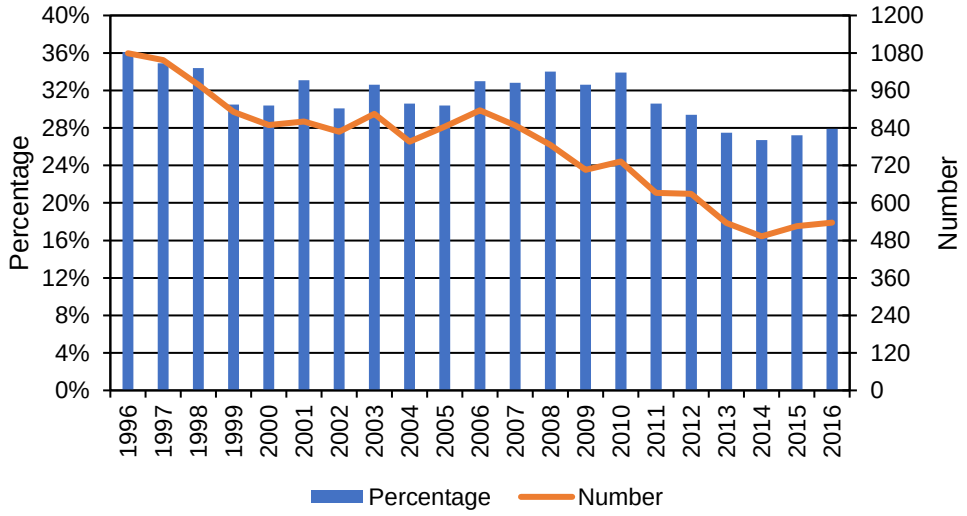


Figure 25 shows the number and percentage of deaths that involved a drinking driver from 1996 to 2016.

Percentages fluctuated from 1996 to 2010, declined from 2011 to 2014 and then increased slightly in 2015 and 2016. However, they decreased from 34% in 2008 to 28% in 2016, a drop of about 18%.

[12] Source: Traffic Injury Research Foundation (2018). The Alcohol and Drug-Crash Problems in Canada: 2016 Report.

Figure 25: Number and percentage of deaths involving a drinking driver from 1996 to 2016[13]



Roadside surveys

In 2017 and 2018, night-time roadside surveys were conducted in British Columbia, the Northwest Territories, Yukon, Manitoba, and Ontario. A report that combines the results from these surveys has been prepared for the Canadian Council of Motor Transport Administrators (Beirness, 2020).

Across these five jurisdictions, 7,265 vehicles were randomly sampled for the survey. Of these, 81% of drivers agreed to participate in the survey and about 95% of these drivers agreed to provide a breath sample. 90% provided a sample of oral fluid to test for the presence of drugs.

Figure 26 shows that 4.4% of breath-tested drivers tested positive for alcohol:

- 2.9% had blood alcohol concentrations under 50 mg%
- 0.8% had blood alcohol concentrations between 50 and 80 mg%, and
- 0.7% had blood alcohol concentrations over 80 mg%

Males were more likely to test positive for alcohol (5.2%), compared to females (2.7%).

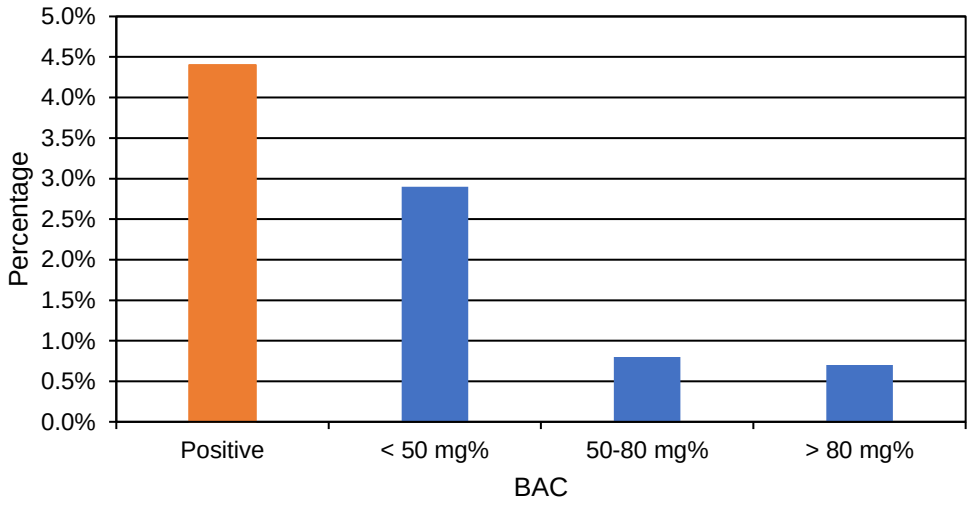
Drivers aged 16 to 19 were the least likely to test positive for alcohol (2.1%) and drivers aged 25 to 34 were most likely to have been drinking (5.1%).

Drivers aged 20 to 24 had the highest percentage of blood alcohol concentrations over 50 mg% (2.3%). However, these age differences were not statistically significant.

[13] Source: Traffic Injury Research Foundation (2018). The Alcohol and Drug-Crash Problems in Canada: 2016 Report.

Drinking and driving was most common on Saturday nights (6.2%) and between 2 and 3 am (6.7%). Pickup truck drivers were most likely to have been drinking (6.1%) as were drivers coming from a bar, pub, club, or tavern (8.2%).

Figure 26: Roadside surveys distribution of blood alcohol concentrations among drivers, 2017-2018



British Columbia conducted roadside surveys in 2012 and 2018. Comparing the results of the two surveys indicates that 6.5% of drivers had been drinking in 2012, which decreased to 4.9% in 2018.

In 2012, 0.9% of the drivers were over the 80 mg% legal limit and 1.1% had blood alcohol concentrations between 50 and 80 mg%. In 2018, the percentage of drivers over the 80 mg% limit decreased to 0.3%. Those with blood alcohol concentrations between 50 and 80 mg% decreased to 0.5%.

Ontario conducted roadside surveys in 2014 and in 2017. The results show that 4.0% of drivers had been drinking in 2014, which increased slightly to 4.4% in 2017.

In 2017, drivers with blood alcohol concentrations over 50 mg% increased from 1.3% to 1.8%.

Measures to combat alcohol-impaired driving

There are a number of factors likely contributing to the decline in drinking and driving.

Canada has a tiered system to deal with alcohol-impaired driving that includes requirements for young/novice drivers, administrative penalties for lower blood alcohol concentrations and the *Criminal Code of Canada*. As noted earlier, some jurisdictions have a zero-tolerance policy for drivers under 21 (e.g., Ontario and Quebec) or new drivers. Most jurisdictions have

administrative licence suspensions for drivers with blood alcohol concentrations between 50 mg% (40 mg% in Saskatchewan) and 80 mg%.

Suspensions range from three to seven days for a first offence, and 30 days to four months for subsequent offences depending on the jurisdiction. There are also licence reinstatement fees. In some jurisdictions, such as Manitoba and Saskatchewan, a driver's vehicle can also be impounded. There are also offences under the *Criminal Code of Canada*. (https://www.justice.gc.ca/eng/cj-jp/sidl-rlcfa/)

Further, 2018 changes to the *Criminal Code* have strengthened the legal framework by limiting the use of defense arguments of "intervening drinks" where a driver claims to have had a post-crash drink to steady their nerves, or "bolus drinking" where a driver claims they just left a bar and that their drinking didn't affect them at the time of the crash.

The changes also allow mandatory breath testing for alcohol. This allows police officers to test drivers without suspecting that a crime has taken place. Drivers convicted of impaired driving face steep fines, licence suspensions, criminal records, and in some cases, lengthy prison sentences in cases of fatalities or injuries.

With respect to enforcement, police conduct regular sobriety checkpoints for alcohol-impaired driving. For example, in the summer of 2019, police in British Columbia conducted over 65 Counter Attack road checks. These checks were advertised on provincial radio and digital signs.

Having completed their licence suspensions, drivers may be required to install alcohol ignition interlocks in their vehicle for up to a year in order to have their licence reinstated.

In Quebec, repeat impaired drivers must only drive a vehicle equipped with an alcohol ignition interlock device, for the rest of their lives. In all jurisdictions, impaired drivers must complete assessment and treatment programs before having their licence reinstated. While some drivers take educational programs on alcohol and driving, drivers deemed to have an alcohol addiction must seek counselling.

Over the last few decades governments and organizations such as Mothers Against Drunk Driving (MADD) and "Arrive Alive, Drive Sober" have carried out various awareness and educational programs about drinking and driving. The Northwest Territories' Department of Infrastructure is building on their current strategy by developing a "Strategy to Reduce Impaired Driving 2.0".

Drug impaired driving

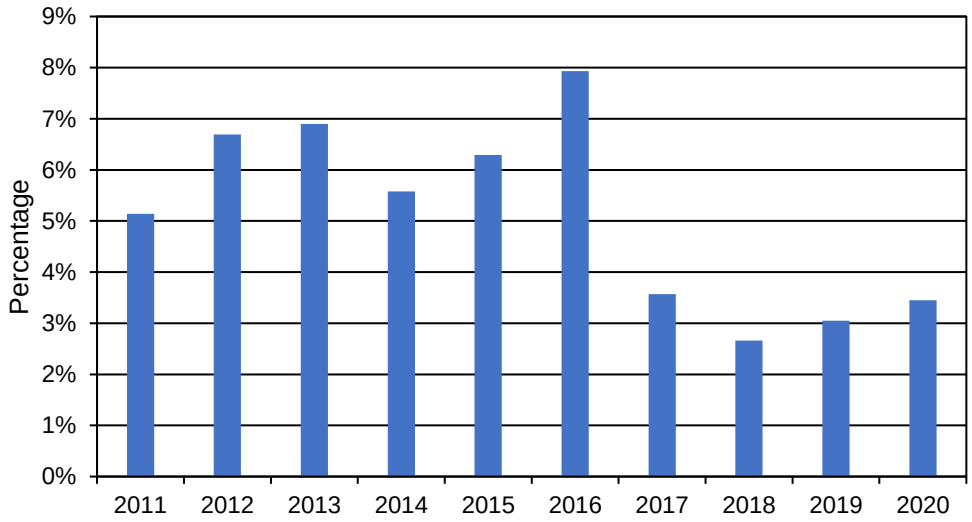
Three types of data are used to show the prevalence of drug-impaired driving: collision data from the National Collision Database (NCDB), death data from Coroners and Medical Examiners in each province and territory and roadside surveys in select provinces and territories. It should be noted that most of the collision data were collected before the legalization of cannabis in October 2018, and that the presence of drugs is more difficult for police to detect.

Motor vehicle collision data

Figure 27 shows that 5.1% of the fatalities in 2011 involved a driver for which being under the influence of drugs was a contributing factor.

The percentage of fatalities in this category peaked at 7.9% in 2016 but decreased to 3.5% by 2020. Therefore, the percentage of fatalities involving a driver being under the influence of drugs as a contributing factor was lower than in 2011.

Figure 27: Percentage of fatalities involving a driver being under the influence of drugs as a contributing factor from 2011 to 2020



The percentage of fatally injured drivers for which being under the influence of drugs was a contributing factor varies between age groups, as shown in **Table 4**.

Between 2011 and 2020, the percentage of drivers in this category was usually highest for drivers aged 20 to 34. The percentage was often lowest for drivers aged 65 or more.

Table 4: Percentage of fatally injured drivers for which being under the influence of drugs is a contributing factor by age group from 2011 to 2020

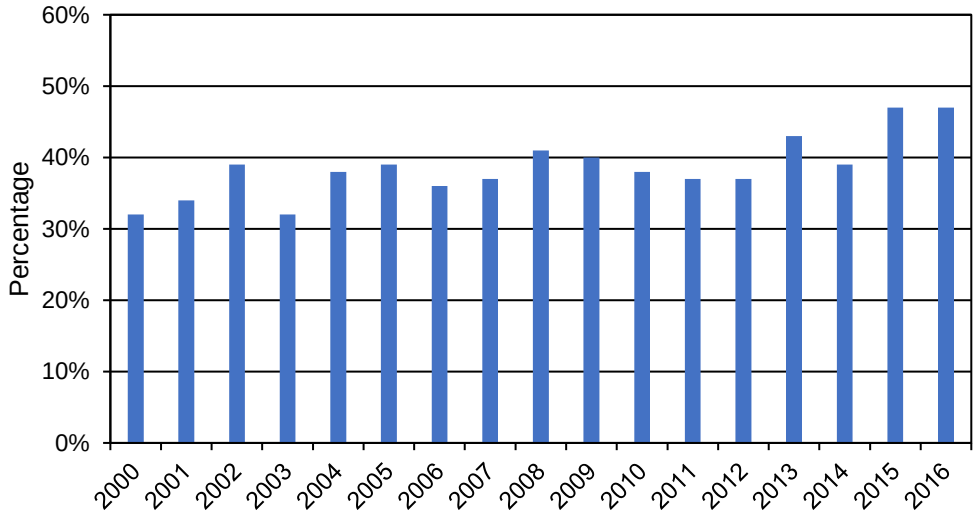
Age group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
< 20	9.1	7.5	10.1	2.5	10.8	13.9	7.4	1.4	1.9	0.0
20-24	10.5	9.4	10.1	15.8	11.6	11.8	3.7	4.4	5.4	6.9
25-34	7.1	7.2	11.2	12.6	14.1	10.3	6.3	3.2	5.3	4.1
35-44	6.5	5.6	10.2	4.8	9.3	11.1	3.7	4.2	3.6	6.4
45-54	6.8	9.8	10.0	10.4	6.8	12.8	7.7	4.7	4.4	4.0
55-64	6.9	8.3	6.1	4.9	6.1	8.3	3.2	1.9	1.8	1.9
65 +	5.3	8.8	3.6	2.2	1.0	4.7	0.0	0.0	0.5	1.1
Total	**7.2**	**8.1**	**8.6**	**7.6**	**8.1**	**9.8**	**4.2**	**2.7**	**3.1**	**3.5**

Coroner data

Figure 28 shows that in 2016, coroners detected one or more psychodynamic drugs in 47% of the fatally injured drivers they tested compared to 41% in 2008 (Brown et al., 2018).

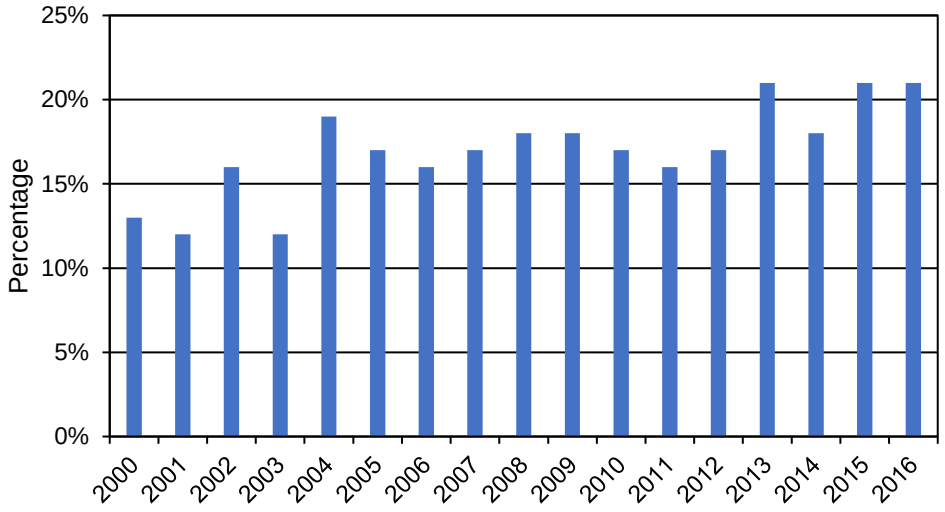
The prevalence of cannabis increased from 18% in 2008 to 21% in 2016, as shown in **Figure 29**.

Figure 28: Percentage of fatally injured drivers positive for drugs from 2000 to 2016[14]



[14] Source: Traffic Injury Research Foundation (2018). The Alcohol and Drug-Crash Problems in Canada: 2016 Report.

Figure 29: Percentage of fatally injured drivers positive for cannabis from 2000 to 2016[15]



In 2016, adults aged 36 to 45 had the highest percentage of drivers who tested positive for drugs (59%), followed by adults aged 20 to 25 (58%). Drivers over 55, were the least likely to test positive for drugs (36%).

Males (48%) tested positive for drugs more often than females (42%). Drivers of passenger cars and drivers of vans, minivans or sports utility vehicles had the highest percentage of drivers who tested positive (51%), followed by drivers of light trucks and heavy trucks (46%).

Drivers involved in single vehicle collisions were more likely to test positive for drugs (53%) than those involved in multiple vehicle collisions.

Among drivers who tested positive for drugs, 46% had been using cannabis and another 41% had taken central nervous system depressants.

In 2016, 20% of the fatally injured drivers who were tested for alcohol and drugs were positive for both. Prince Edward Island (43%) and New Brunswick (34%) had the highest percentages of fatally injured drivers who tested positive for both alcohol and drugs.

Roadside surveys

These data were also taken from the previously referenced 2020 study prepared for the Canadian Council of Motor Transport Administrators (Beirness et al., 2020).

In 2017 and 2018, for drivers who gave an oral fluid sample in five roadside surveys, 10.2% tested positive for the presence of at least one potentially impairing substance, other than alcohol and 7.6% tested positive for cannabis. The drivers who tested positive for cannabis represent 75% of drivers who had drugs present.

[15] Source: Traffic Injury Research Foundation (2018). The Alcohol and Drug-Crash Problems in Canada: 2016 Report.

The data also shows information about drivers who tested positive for drug use:

- 12.0% of male drivers tested positive for drugs
- 7.4% of female drivers tested positive for drugs
- 14% of drivers 20 to 24 years old tested positive for drugs, and this went down as drivers aged
- 5.3% of drivers over 55 years old tested positive for drugs

Younger drivers were more likely to test positive for cannabis with 12.7% of drivers 20 to 24 testing positive. Conversely, older drivers were least likely, with 2.0% of drivers over 55 years old testing positive.

The study also looked at what time of day and day of the week were most common for drug-impaired driving. It showed that:

- More drivers tested positive for drugs on Friday nights (11.8%) than any other day of the week. The differences across the days of the week were not statistically significant
- The presence of cannabis also did not change significantly based on the day of the week
- More drivers tested positive for drugs from 2 to 3 am (17.3%) than any other time of day
- More drivers tested positive for cannabis after 1:00 am (14.0%) than any other time of day

Additionally:

- 16.1% of pickup drivers tested positive for drugs, more often than for any other vehicle type
- 12.9% of pickup drivers tested positive for cannabis, more often than for any other vehicle type
- 13.9% of drivers coming from home or the home of a friend or relative tested positive for any drug
- 12.4% of drivers coming from home or the home of a friend or relative tested positive for cannabis

In the 2012 British Columbia survey, 7.4% of drivers tested positive for one or more drugs, and of these, 44% had been using cannabis. In 2018, 8.5% of drivers tested positive for one or more drugs. Of the drivers who tested positive for drugs, 71% had cannabis present.

In Ontario roadside surveys, drugs were detected in 10.2% of drivers in 2014. This increased to 14.2% in 2017. In 2014, 7.0% of drivers tested positive for cannabis which increased to 10.6% in 2017.

Measures to combat drug-impaired driving

Over the past decade, drinking and driving has decreased, but other drug use, especially cannabis, has increased considerably. With recreational use of cannabis now legal in Canada, the number of people driving after using cannabis may increase.

However, changes to the *Criminal Code* in 2018 added new offences addressing driving while drug-impaired:

- driving with THC levels over 2 ng is a simplicitor charge which results in a fine of $1,000
- driving with over 5 ng will result in an impaired driving charge
- driving with over 2.5 ng of THC and over 50 mg% alcohol will result in an impaired driving charge

If police suspect that a driver has been using drugs, a variety of tool are available. For example, the officer can demand an oral fluid screening roadside test to look for the presence of cannabis or cocaine. The police can also use the Standardized Field Sobriety Test to determine if the driver is impaired by alcohol or drugs. Once a driver is arrested, a Drug Recognition Evaluator can give them various physical, behavioural, or blood tests to look for the presence of a drug and its concentration.

Most Canadian jurisdictions have administrative laws that suspend the licence of drivers who test positive for drugs. This suspension can last from one to thirty days depending on jurisdiction. If the driver tests positive for drugs again, in some jurisdictions such as Manitoba, Saskatchewan and Prince Edward Island, the suspension will be longer.

In several jurisdictions (e.g., British Columbia, Alberta, and Yukon), police can also impound a driver's vehicle for one to seven days for their first offence. Saskatchewan impounds the driver's vehicle for seven days on their second offence.

In Manitoba and Newfoundland and Labrador, drivers must pay a licence reinstatement fee. In the Northwest Territories, drivers must pay a licence reinstatement fee for 90-day licence suspensions. In British Columbia, Alberta, Saskatchewan, Manitoba, and Newfoundland and Labrador, drivers with multiple infractions are required to attend an alcohol and drug assessment and treatment program.

Several jurisdictions have run awareness campaigns focused on drugs and driving. For example, Ontario's "Barely high is still too high to drive" campaign focused on cannabis. The campaign included videos, radio ads, messages, and digital shareables (images that can easily be shared via social media).

The federal department responsible, the Department of Public Safety also ran a "Don't Drive High" awareness campaign in 2018.

Quebec launched an awareness campaign on the web and at certain Quebec festivals from June to August 2019. They broadcasted a video message online and on social media and displayed posters at festivals. The campaign targeted drivers aged 18 to 44 in settings where alcohol and drugs were likely to be used.

In fall 2019, Saskatchewan ran a Driving High = DUI social campaign as a follow on to previous campaigns but with an increased awareness of edible impairment to complement 2 previous cannabis and driving campaigns. The goal was to increase awareness of impaired driving due to cannabis and drug consumption and establish a continuous presence in the minds of Saskatchewan drivers and the general population. Subsequent analysis indicated good recall of the campaign and the message was well understood and deemed relevant.

Occupant restraint use

Canada is among a number of Organization for Economic Cooperation and Development member countries with very high rates of seat belt use.[16]

In 2016 and 2017, the Canadian Council of Motor Transport Administrators measured seat belt use by front seat occupants in Canada. This was part of a survey of driver use of mobile devices conducted in both urban and rural areas (Canadian Council of Motor Transport Administrators, 2018).

Table 5 shows the results of the survey. The combined results for 2016-2017 show seat belt use rates were as follows:

- 97.2% of front seat occupants of light-duty vehicles
- 97.5% of front seat occupants in urban communities
- 95.6% of front seat occupants in rural communities

As well:

- Belt use was the highest in Prince Edward Island at 98.7%
- Belt use was slightly higher for female occupants (98.5%), than male occupants (97.9%)
- Occupants under 25 were less likely to be wearing seat belts (97.1%) compared to older occupants
- Most jurisdictions showed major increases in belt use between the 2006-2007 and 2016-2017 surveys

Even though seat belt use by front seat occupants reached 97% in 2016-2017, almost 35% of fatally injured motor vehicle occupants and nearly 15% of seriously injured occupants were unbelted at the time of the collision in 2020.

[16] Canada ranked seventh in front seat belt wearing rates according to the latest data available from the OECD International Transport Forum, Road Safety Annual Report 2017.

Table 5: Seat belt use by front seat occupants from 2002-2003 to 2016-2017

Province/territory	2002-2003	2004-2005	2006-2007	2009-2010	2016-2017
Newfoundland and Labrador	82.5	86.7	86.6	93.0	88.6
Prince Edward Island	78.1	81.9	97.8	90.0	98.7
Nova Scotia	89.4	88.7	92.3	90.3	91.8
New Brunswick	88.8	86.7	91.6	95.0	98.4
Quebec	93.3	91.1	93.1	96.3	98.6
Ontario	86.5	92.3	93.2	96.1	96.9
Manitoba	85.3	92.7	89.4	94.2	98.3
Saskatchewan	85.9	94.1	93.6	97.1	95.5
Alberta	84.9	82.8	89.2	92.2	97.4
British Columbia	83.2	91.9	94.9	97.3	98.2
Yukon Territory	85.1	81.4	83.4	77.2	92.0
Northwest Territories	77.3	75.6	88.5	84.9	92.9
Nunavut	21.8	n/a	n/a	n/a	n/a
Canada	**87.4**	**90.8**	**92.7**	**95.5**	**97.2**

The most recent observational survey of child restraint use conducted by Snowdon et al. (2010) estimated that nationally, 64% of children (up to the age of 14 years old) were correctly secured in restraints. The highest percentage of correct usage was in Yukon at 92% while the lowest was in Saskatchewan at 54%.

The survey also found that:

- 76% of infants under 1 year were correctly secured in a rear facing infant seat
- 14% were in a rear facing convertible seat
- Children aged 1 to 3 years were in forward facing convertible seats 82% of the time
- Children 4 to 8 years were either in booster seats (32%) or seat belts (48%)
- Children 9 to 14 years wore seat belts 92% of the time

It appears that there remains work to be done to reduce the number of children riding in vehicles unrestrained or in restraints that are not appropriate for their weight and height.

Measures to improve seat belt use

Over the years, jurisdictional legislation has required vehicle occupants to wear seat belts and place their children in restraints based on their size. This legislation has helped to raise belt use.

A variety of regulatory measures have been taken that are aimed at improving seat belt use and reducing injuries in the event of a collision. For example, since the 1970s, the *Motor Vehicle Safety Act* requires manufacturers to equip vehicles with technology that sounds a repetitive tone if a front seat occupant isn't wearing their seat belt. In addition, seat belt system design has been improved with pre-tensioners that remove slack from belts the moment an impact is detected. This helps to reduce injuries. Front and side air bags have been mandated, which work in unison with occupants being properly restrained to save lives and prevent serious injuries.

In the area of public awareness, periodic Selective Traffic Enforcement programs and awareness campaigns that increase and reinforce knowledge of seat belt requirements that people must wear seat belts to increase safety. Child restraint clinics have also been run to help parents install restraints properly. And, in June 2019, Saskatchewan launched "Buckle Bot", a new interactive robot used to help educate children at schools, community events and child restraint clinics on seat belt and car seat safety. Buckle Bot is about 1 meter tall, remote-controlled, and staff can speak into a headset microphone to control his voice, so he can talk with kids, resulting in a very engaging presentation.

Driver Distraction

Driver distraction is also a major contributing factor in traffic collisions. According to Road Safety Strategy 2025, distracted driving happens when a driver's attention is diverted from the driving task by secondary activities. Examples of secondary activities include eating, talking to passengers, talking, or texting on mobile devices such a cell phone or smartphone.

Two types of data are used to show the prevalence of distracted driving: collision data and observational survey data.

Collision data

Figure 30 shows data about distracted driving. In 2011, police found that 21% of fatalities happened in collisions that involved a driver who was distracted or inattentive. Between 2011 and 2020, the percentage of fatalities in this category reached a high of 23% in 2015 and decreased to 21% in 2020. It was the same in 2020 than in 2011.

Estimates based on data from four Canadian jurisdictions that track different types of distraction show that each year, roughly 2% of all fatal and injury collisions involve mobile device use as a contributing factor.

Table 6 shows the percentage of fatally injured drivers where distraction or being inattentive was a contributing factor. The data are grouped by age, from 2011 to 2020. The data show that:

- the highest percentages were for drivers 65 and older
- distracted or inattentive driving increased for drivers:
    - 20 to 24 years
    - 25 to 34 years
    - 65 years and older

Figure 30: Percentage of fatalities involving a driver for which being distracted or inattentive is a contributing factor from 2011 to 2020

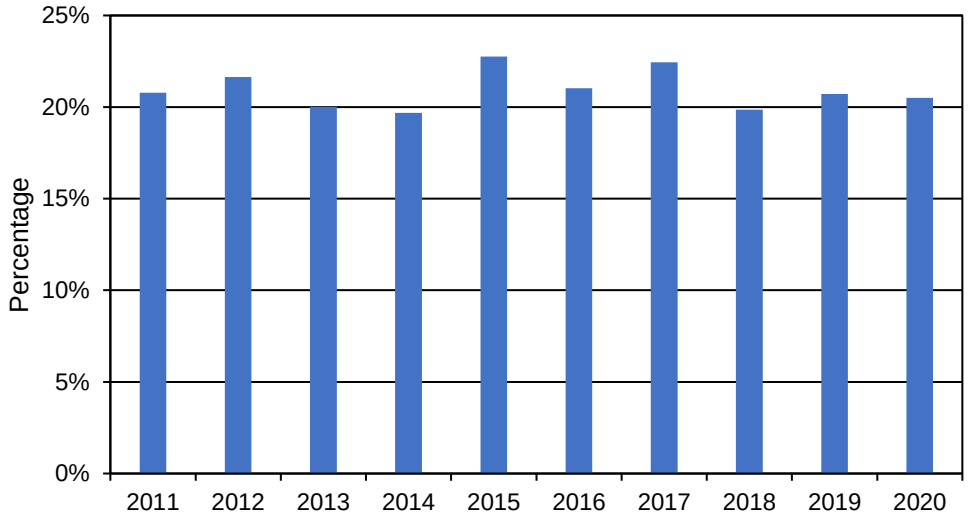


Table 6: Percentage of fatally injured drivers for which being distracted or inattentive is a contributing factor by age group from 2011 to 2020

Age group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
< 20	22.0	17.0	20.3	19.0	16.2	19.4	17.6	17.4	22.6	20.0
20-24	13.2	13.4	10.7	13.9	17.9	13.7	15.0	9.6	12.0	16.8
25-34	13.8	14.4	17.4	12.0	12.6	16.7	18.9	12.3	14.7	18.6
35-44	24.0	18.5	23.1	22.2	24.0	12.6	21.6	14.5	16.5	16.8
45-54	22.6	16.4	11.3	15.9	19.8	17.3	23.2	20.8	21.3	15.9
55-64	19.4	21.4	13.7	19.6	22.4	26.9	21.0	15.8	18.3	17.3
65 +	24.2	27.1	23.8	24.2	28.1	22.9	28.8	22.1	24.4	24.9
Total	**19.8**	**18.3**	**17.4**	**18.1**	**20.5**	**18.9**	**21.6**	**16.4**	**18.9**	**18.8**

Observational surveys

Distracted driving from use of mobile devices is a persistent issue. Transport Canada and the Canadian Council of Motor Transport Administrators have conducted surveys about this issue every few years since 2006-2007. (Canadian Council of Motor Transport Administrators, 2014, 2018; Transport Canada, 2008, 2011).

In the 2016 urban and 2017 rural surveys, around 7.2% of drivers were observed using mobile devices while driving. This use ranged from talking, texting, both talking and texting, or holding the device.

Roughly 7.9% of drivers in urban areas were seen using mobile devices, compared to 3.0% of drivers in rural areas. Of drivers in the 2016-2017 surveys, 2.9% were using mobile

devices for talking and 2.2% were using them for texting. Drivers under 25 were more likely to be using mobile devices (11.6%) than those aged 25 to 49 (6.8%), or 50 and older (3.4%). Female drivers were slightly more likely to be using mobile devices (7.0%), than male drivers (6.3%).

Table 7 shows the percentage of drivers found to be using mobile devices for talking while driving in four surveys. Mobile device use decreased from 5.5% in 2006-2007 to 3.3% in the 2009-2010 survey, and again to 2.3% in 2012-2013. Mobile device use increased to 2.9% in 2016-2017, a 26% increase.

Table 7: Estimates of mobile device use
Percentage of drivers talking on mobile devices from 2006-2007 to 2016-2017

Province/territory	2006-2007	2009-2010	2012-2013	2016-2017
Newfoundland and Labrador	4.2	3.5	3.3	1.7
Prince Edward Island	4.2	3.5	1.6	1.0
Nova Scotia	1.7	3.6	2.2	2.1
New Brunswick	2.1	1.8	1.6	1.1
Quebec	3.2	3.3	2.7	1.7
Ontario	6.8	3.3	2.3	4.7
Manitoba	4.4	1.8	0.9	2.1
Saskatchewan	2.8	1.8	0.8	2.6
Alberta	10.7	4.9	1.5	1.2
British Columbia	4.0	3.3	3.0	1.6
Yukon Territory	3.8	2.2	4.8	1.4
Northwest Territories	4.7	2.1	1.0	5.6
Canada	**5.5**	**3.3**	**2.3**	**2.9**

Table 8 shows that the percentage of drivers observed using a mobile device for texting increased from 1.6% in 2012-2013 to 2.2% in 2016-2017, a 38% increase.

Table 8: Estimates of mobile device use
Percentage of drivers texting on mobile devices from 2012-2013 to 2016-2017

Province/territory	2012-2013	2016-2017
Newfoundland and Labrador	0.8	2.1
Prince Edward Island	1.3	1.1
Nova Scotia	0.8	1.1
New Brunswick	0.4	1.0
Quebec	1.5	2.0
Ontario	2.3	3.2
Manitoba	0.4	2.1
Saskatchewan	0.8	1.8
Alberta	0.3	1.8
British Columbia	2.0	0.8
Yukon Territory	3.8	1.3
Northwest Territories	0.0	3.3
Canada	**1.6**	**2.2**

Measures to combat distracted driving

The decrease in mobile device usage between 2006-2007 and 2012-2013 may reflect new provincial and territorial legislation that bans the use of mobile devices while driving. In contrast, the increase in both talking and texting in 2016-2017 may reflect the growing popularity of using mobile devices, despite legislation, and could also reflect a belief by drivers that the police will have difficulty in detecting mobile device use and then successfully prosecuting the offence.

That being said, police have developed creative ways to detect mobile device use. Examples include using telescopes, riding on city buses, and looking down at drivers, posing as workmen on the roadway or riding motorcycles.

In terms of enforcement, many jurisdictions have increased fines and demerit points for drivers who are caught using mobile devices. In Ontario, a driver's first conviction can result in:

- a fine between $615 to $1000 (depending on whether the charge goes to court)
- three demerit points
- a three-day licence suspension (new drivers will receive a 30-day suspension)

In British Columbia, a driver's first conviction can result in:

- a fine of $368
- four demerit points
- $175 premium added to their vehicle insurance

In Saskatchewan a driver with two or more convictions within 12 months will have their vehicle impounded for seven days, regardless of who owns the vehicle. Saskatchewan also doesn't allow new drivers to use hands-free phones.

In 2015, Nova Scotia increased the fines for distracted driving to:

- $233.95 for the first offence
- $578.95 for a third offence, plus four demerit points if the driver is convicted

In New Brunswick, a driver charged with distracted driving can be:

- fined $172.50
- given 4 demerit points

A list of penalties in other jurisdictions can be found on the Canadian Automobile Association website.

Public education campaigns by government and non-governmental organizations play a significant role in addressing the risks of using mobile devices while driving. For example, in British Columbia, March and September 2019 were focused on reminding drivers not to use mobile devices while driving. These campaigns also used province-wide radio and social media ads to tell the public police would be increasing enforcement throughout the campaigns. In March 2019, police in British Columbia issued a total of 8,000 tickets for distracted driving offences.

After focusing on text messaging for many years, Quebec launched an awareness campaign that highlighted other risks of using a cell phone while driving such as surfing the web or watching a video. The campaign ran from September 9 to October 6, 2019 and shared messages on television, radio, Spotify (an online music streaming service), websites, social media, and at gas pumps.

Another public awareness campaign was Saskatchewan's "Distracted Driving Kills" that was launched at the end of May 2019. The campaign included a dramatic segment that featured a 16-year-old girl who was fatally injured when she drove into the path of a train because she was looking down at her phone. The campaign also used five online ads and radio ads. Each of the ads focused on a specific distraction, such as using a cellphone, putting on lipstick, or interacting with a child in the back seat. The campaign ran from June 3 to 30, 2019 and from October 7 to December 2, 2019.

The Canadian Council of Motor Transport Administrators operates the "Leave the Phone Alone" campaign. The campaign encouraged thousands of drivers to pledge that they would never use the phone while driving. Many municipalities have begun using the campaign.

Other interventions also play a role in addressing distracted driving. For example, some employers have policies that ban employees from using mobile devices while driving. These include Manitoba Public Insurance, the Ontario Ministry of Transportation and Transport Canada.

The Insurance Corporation of British Columbia is recruiting drivers who have four or less years of driving experience for a pilot project involving telematics. They will track the behaviour, crash experience and tickets issued to participating drivers.

Transport Canada has sponsored research[17] comparing the US and Canadian experience with distracted driving. It was noted that Canadian jurisdictions have stricter penalties for distracted driving than many US states. It was found that drivers in the US and Canada appear to have similar crash rates associated with secondary task engagement. In addition, while Canadian young adult drivers use handheld devices significantly less frequently than US young adults, Canadian teen drivers are very similar to US teen drivers in cell phone use, even in the presence of much stricter cell phone laws than those that currently exist in the US (Guo et al., 2017).

Speeding and aggressive driving

Aggressive driving includes behaviours such as speeding, running red lights, tailgating, weaving in and out of traffic and failing to yield the right of way.

Speeding

The National Collision Database defines speeding-related collisions as collisions where driving too fast for conditions was a contributing factor.

Figure 31 shows that:

- from 2011 to 2020, there was no clear trend for the percentage of fatalities in speeding-related collisions
- in 2020, the percentage was 25% and in 2011, it was 26%

These data suggests that the prevalence of speeding has not noticeably changed.

[17] Ehsani, J.P., Harbluk, J.L., Bärgman, J., et al. (2021) Naturalistic Driving Studies: An Overview and International Perspective. In: Vickerman, Roger (eds.) *International Encyclopedia of Transportation*. vol. 7, pp. 20-38.UK: Elsevier Ltd. http://dx.doi.org/10.1016/B978-0-08-102671-7.10651-

Figure 31: Percentage of fatalities in speeding-related collisions from 2011 to 2020

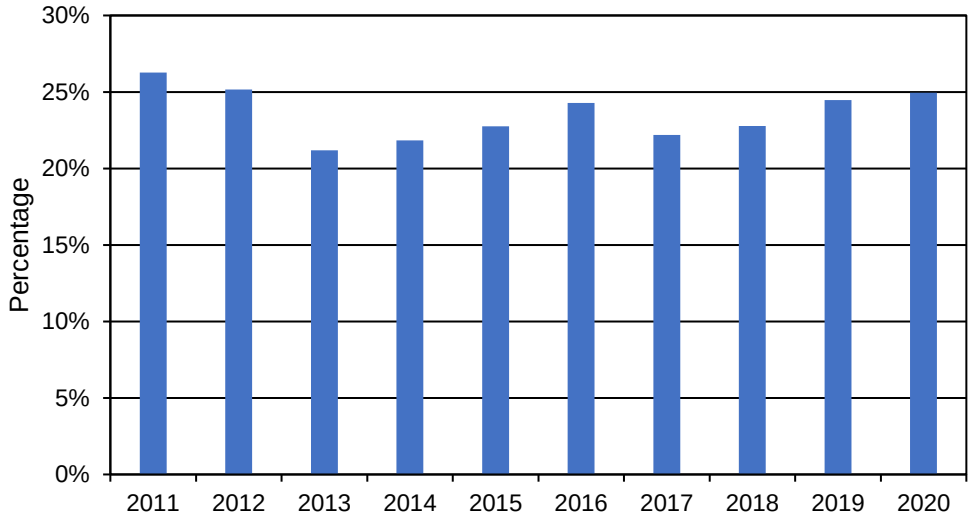


Table 9 shows the percentage of fatally injured drivers involved in speeding-related collisions. The data are grouped by age, for the years 2011 to 2020. The data show that the highest percentage of fatally injured drivers involved in speeding-related collisions were drivers under 20, 20 to 24 and 25 to 34. The percentage then mostly decreased with age with drivers aged 65 and older being the lowest each year.

As well:

- Around 83% of the speeding drivers involved in fatal collisions were males
- 93% of the drivers killed in speeding-related collisions were the ones that were speeding
- 76% of speeding-related fatalities happened in light-duty vehicles
- 28% of the speeding drivers involved in a fatal collision had under the influence of alcohol as being a contributing factor
- 13% of the speeding drivers had distraction or inattention as a contributing factor
- More than half of speeding-related fatalities happened in single vehicle crashes (54%) or at night (54%)
- 70% of the speeding-related fatalities happened on rural roads

Table 9: Percentage of fatally injured drivers in speeding-related collisions by age group from 2011 to 2020

Age group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
< 20	34.3	34.0	38.0	24.1	24.3	31.9	33.8	26.1	35.8	40.0
20-24	36.8	32.9	35.6	38.6	39.3	35.3	31.8	33.3	38.8	29.7
25-34	37.8	35.4	37.6	32.0	35.1	31.5	34.0	40.1	45.3	39.5
35-44	34.4	27.2	22.4	27.8	28.7	31.1	27.8	29.7	28.8	36.0
45-54	25.4	29.0	18.0	15.9	23.5	24.4	19.0	21.5	21.3	27.8
55-64	18.1	20.7	17.6	23.0	22.4	17.9	19.4	20.3	18.3	20.5
65 +	10.0	11.0	9.8	13.2	18.6	16.7	12.1	12.9	10.8	13.2
Total	**27.7**	**27.1**	**24.5**	**23.6**	**27.0**	**25.8**	**24.2**	**25.7**	**25.7**	**27.9**

These statistics indicate that speeding is an important contributing factor in collisions and that it has not decreased between 2011 and 2020. Research shows that a 5% increase in average speed leads to approximately a 10% increase in all injury collisions and a 20% increase in fatal collisions. Similarly, a 5% decrease in mean speed typically yields 10% fewer injury collisions and 20% fewer fatal collisions (Nilsson, 2004).

Other aggressive behaviours

In addition to speeding, there are other aggressive driving behaviours that pose a risk of collisions.

Statistics show that 27% of fatalities happened at intersections and that 39% of these fatalities happened in locations that don't have a traffic control device.

Statistics also show the percentage of fatalities that happened:

- during daytime (63%)
- on roads with a posted speed limit of 60 km/h or less (55%)
- on urban roads (54%)

Statistics show drivers not yielding the right-of-way contributed to about 10% of fatalities. These occurred mostly during daytime (75%), and in multiple-vehicle crashes (72%).

Fatalities that happened when drivers didn't yield the right-of-way were slightly more likely to happen on urban roads (53%) than on rural roads. For these collisions, 47% of people were occupants of light-duty vehicles and 17% rode motorcycles. In addition, distraction or inattention was also a factor for 43% of the drivers involved in these collisions.

Disobeying a traffic control device (e.g., traffic light) or a traffic officer is another aggressive driving behavior. Statistics show it was a factor in about 7% of fatalities:

- 90% happened in multiple-vehicle crashes
- 79% happened in clear weather conditions
- 77% happened on dry roads

For collisions that happened when a driver disobeyed a traffic control device or a traffic officer, roughly 78% happened at a location with traffic signals (30%), or stop signs (48%).

Measures to address aggressive driving

A variety of measures are in place to address aggressive driving. Speed cameras are a key tool used by several Canadian cities, such as Edmonton and Winnipeg, to control speed, with enabling legislation from provincial or territorial governments. Saskatchewan has given $500,000 in funding to help communities put photo speed enforcement programs in place.

Some jurisdictions allow for the use of speed cameras in high-risk areas such as roadway work sites and in school zones. Some municipalities, such as Ottawa, have reduced speed limits to 40 km/h or even 30 km/h in residential areas and school zones. A review of the effectiveness of these cameras found that the average rate of fatal and serious collisions decreased by 36% after cameras were installed (Owen et al., 2016).

With respect to the legal framework, most jurisdictions, including Nova Scotia, Ontario and British Columbia have passed stunt driving laws so that drivers traveling at high speeds can face large fines, have their licence suspended and their vehicle impounded. The stunt driving law in Ontario applies once drivers break the speed limit by more than 50 km/h. A study has shown that the Ontario law has led to less speeding and fewer collisions (Meirambayeva et al., 2014).

Municipalities also use a variety of infrastructure methods to reduce speeds such as road narrowing, sidewalk bulbouts, speed bumps and humps.

Another tool is red-light cameras which are used in several Canadian cities (e.g. Toronto, Ottawa, Calgary, Edmonton and Vancouver) to deter drivers from running through red lights. Cameras are often rotated to different intersections so that drivers are not sure whether there is a camera present. Some jurisditions, including British Columbia and Edmonton, use red-light cameras to detect drivers speeding through an intersection on a green light.

In a study, Hu et al. (2011) analyzed data on fatal crashes from 14 large US cities with red-light camera enforcement programs and 48 cities without camera programs. The data were from 1992 to 1996, and 2004 to 2008. The average annual citywide rate of fatal red-light-running crashes declined for both groups, but the rate for cities with red-light cameras declined more. The fatality rates for cities with the cameras went down by 35%, compared to 14% for the cities without cameras.

Finally, in the area of public awareness, Manitoba's "Traffic Culture" campaign invites people to consider their actions and attitudes toward other road users in relation to normal social etiquette. It also highlights how "road rage" causes high risk and unsafe driving situations.The campaign uses the brand "Friendly Manitoba" which reflects the longstanding slogan on Manitoba licence plates.

Young and new drivers

Because of their age and inexperience, young and new drivers are more likely to be involved in fatal and injury collisions.

Table 10 shows the rates of involvement in fatal collisions per 100,000 licensed drivers by age group from 2011 to 2020. Drivers aged 24 or less had higher fatal collision involvement rates than any other age groups. The fatal collision involvement rates declined for all age groups over the ten-year period. Specifically, for drivers aged 15 to 19 and 20 to 24, the rates decreased by 34% and 20% respectively. Overall, the involvement rate declined with age.

Table 10: Drivers involved in fatal collisions per 100,000 licensed drivers by age group from 2011 to 2020

Age group	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
15-19	18.4	15.6	14.4	12.3	11.7	12.2	12.8	11.1	10.3	12.1
20-24	15.1	16.3	14.3	12.1	11.5	12.6	13.3	12.4	10.5	12.1
25-34	11.2	12.1	10.3	10.8	9.7	10.7	10.9	10.3	8.5	8.9
35-44	9.5	8.8	9.6	8.5	8.7	8.9	8.9	9.5	8.6	7.4
45-54	9.1	8.7	8.5	8.3	8.0	8.2	8.4	8.6	8.4	8.1
55-64	8.4	8.0	8.0	7.6	7.4	8.4	8.3	7.7	7.7	7.2
65 +	10.2	8.9	8.7	8.5	9.4	8.2	7.5	8.3	8.1	6.2
Total	**10.5**	**10.1**	**9.7**	**9.2**	**9.0**	**9.3**	**9.3**	**9.2**	**8.5**	**8.0**

Figure 32 shows the percentage of fatalities in collisions involving young drivers (15 to 24 years old) in 2020. The data are grouped by type of road user:

- 40% of those fatally injured were the young drivers themselves
- 21% were passengers of young drivers
- 26% were occupants of other vehicles involved in the collision
- 9% were pedestrians
- 2% were bicyclists

Figure 32: Fatalities in collisions involving young drivers by road user type in 2020

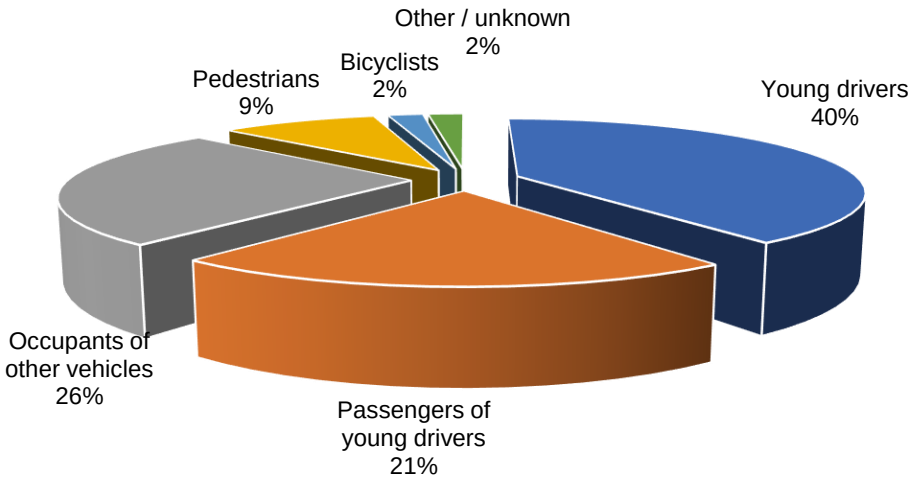


Table 11 shows that young drivers represented the highest percentage of fatalities for all years between 2011 and 2020, followed by passengers of young drivers from 2011 to 2013 and occupants of other vehicles from 2014 to 2020.

Table 11: Percentage of fatalities in collisions involving young drivers by road user type from 2011 to 2020

Year	Young drivers	Passengers of young drivers	Occupants of other vehicles	Pedestrians	Bicyclists	Other / unknown
2011	45.3	22.7	22.5	7.6	1.1	0.8
2012	41.2	26.5	19.3	9.7	2.0	1.3
2013	44.9	22.0	19.8	8.4	1.6	3.3
2014	39.4	22.6	26.7	9.1	1.2	1.0
2015	42.3	19.7	25.8	9.2	2.0	1.0
2016	37.9	20.1	27.0	11.6	2.1	1.3
2017	38.7	15.6	33.9	9.0	1.3	1.5
2018	39.7	19.6	31.0	8.1	0.3	1.3
2019	37.0	23.4	29.6	6.2	1.9	1.9
2020	40.3	20.5	25.5	9.3	2.3	2.1

Measures to manage the risks associated with young and new drivers

Over the past decade, young and new drivers have become less involved in fatal and injury collisions. Several factors have likely helped to reduce these types of collisions.

One is the ongoing success of Graduated Driver Licensing Programs which now exist in all Canadian jurisdictions. Graduated Driver Licensing Programs slowly introduce young and new drivers to driving by keeping them out of higher risk situations. There is usually a twelve-month new driver phase. In some jurisdictions, this can be reduced to eight months if the driver takes certified driver training. Graduated Driver Licensing Programs also support parents in being aware of driver training programs and making sure that the new drivers have enough driving experience before they take a driver's test.

New drivers are subject to several rules, including:

- being at least 16 years old
- only driving with an experienced driver
- requiring all occupants of a vehicle to wear seat belts

Typically, the driver is banned or restricted from:

- using any alcohol or drugs
- driving late at night
- driving young passengers
- driving on highways

After this first phase, there's another twelve-month "intermediate" or "practice" phase. This phase has fewer restrictions (e.g., zero blood alcohol concentration and no drugs, all occupants belted).

Some jurisdictions like Ontario and Quebec have a zero-tolerance policy for alcohol and drugs for drivers under 21, even if they have graduated from a Graduated Driver Licencing Program.

More information about these programs in each province and territory can be found on the Traffic Injury Research Foundation's website.

Driver education programs are also in place in some jurisdictions. For example, Manitoba Public Insurance has officially launched its new high school driver education program, branded "Driver Z". The program features a progressive curriculum design, new technology elements, and new delivery model that offers extended, interactive engagement with students.

In September 2019, Prince Edward Island introduced a "Novice Driver Course for Newcomers" for drivers exchanging a driver's licence from a country that does not have a formal driver licence exchange agreement with the province.

Vulnerable road users

Vulnerable road users include pedestrians, bicyclists, and motorcyclists. The term "vulnerable" is used because these road users aren't protected by a vehicle's structure like a driver in a vehicle.

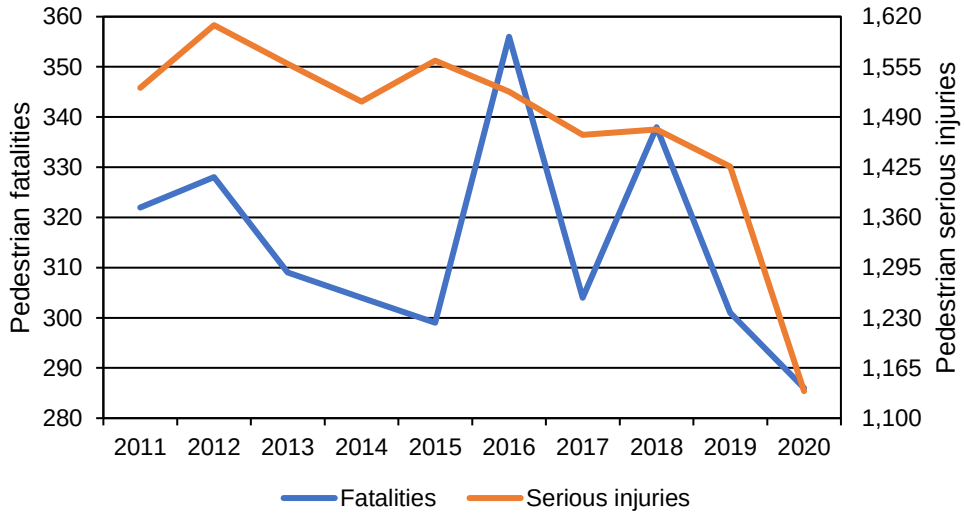
Pedestrians

From 2011 to 2020, the number of pedestrian fatalities and serious injuries varied from year to year. This is shown in **Figure 33**.

However, pedestrian fatalities decreased by 11% and serious injuries decreased by 26% between 2011 and 2020.

About 68% of the pedestrian fatalities occurred on urban roads and of these, approximately 54% took place at intersections. This means that one third of all pedestrian fatalities happened in urban intersections.

Figure 33: Pedestrian fatalities and serious injuries from 2011 to 2020



As shown in **Table 12**:

- The rate of pedestrian fatalities per 100,000 population has decreased or remained the same for most age groups between 2011 and 2020 except for:
    - youth aged 10 to 14 years
    - adults aged 25 to 34 years
    - adults aged 35 to 44 years
- Pedestrians aged 65 or older had the highest rate of fatalities per 100,000 population in both years
- Older pedestrians made up 32% of pedestrian fatalities in 2020
    - This is almost double the share of the population that they represent overall (18%)
- The rates for both males and females aged 65 or older were also the highest among all age groups
- Despite the high rates for older pedestrians, those in the 65 and above age group experienced a 40% decrease in the rate of pedestrian fatalities from 2011 to 2020
    - This was the third largest drop for all age groups.
    - The decrease for males was 53% and for females it was 13%

Table 12: Pedestrian fatalities per 100,000 population by age group and gender in 2011 and 2020

Age group	Male, 2011	Male, 2020	Female, 2011	Female, 2020	Total, 2011	Total, 2020
0-4	0.31	0.10	0.22	0.21	0.26	0.21
5-9	0.65	0.29	0.23	0.10	0.44	0.20
10-14	0.30	0.28	0.11	0.20	0.21	0.24
15-19	1.40	0.56	0.55	0.29	0.98	0.43
20-24	1.17	1.00	1.04	0.34	1.11	0.68
25-34	0.98	0.99	0.47	0.62	0.72	0.81
35-44	0.86	0.95	0.30	0.35	0.58	0.65
45-54	1.21	0.96	0.48	0.53	0.85	0.74
55-64	1.14	0.99	0.68	0.60	0.91	0.79
65 +	3.09	1.46	1.34	1.16	2.16	1.31
Total	1.25	0.92	0.62	0.57	0.94	0.75

Motorcyclists

In 2020:

- Only 3% of registered vehicles were motorcycles
- Although motorcycles made up a small percentage of the total vehicles, motorcyclists represent:
  - 11% of Canada's road user fatalities
  - 14% of road user serious injuries

Figure 34 shows:

- Motorcyclist fatalities varied over the decade, but were 40% higher in 2020 than in 2011
- Serious injuries varied from 2011 to 2016, but were 19% higher in 2016 than in 2011
- Serious injuries then decreased by 23% from 2016 to 2020

Figure 34: Motorcyclist fatalities and serious injuries from 2011 to 2020

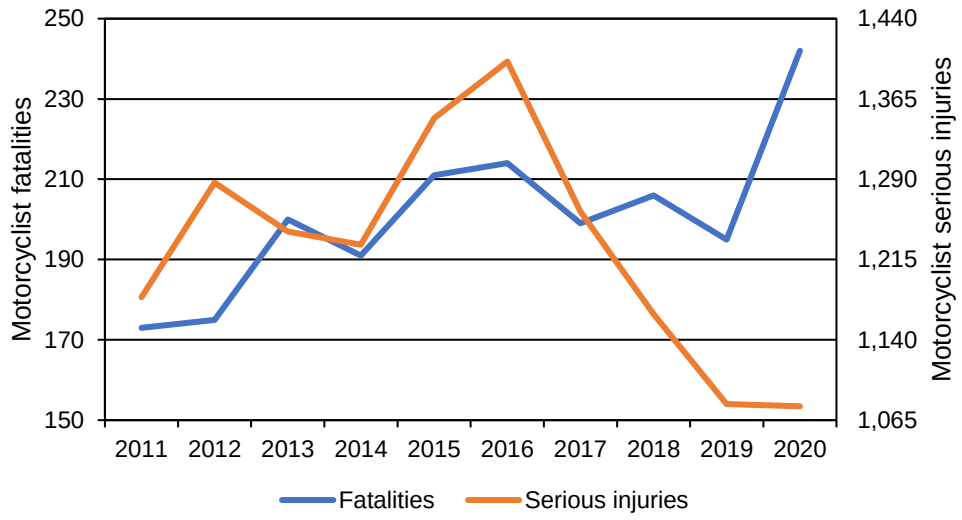
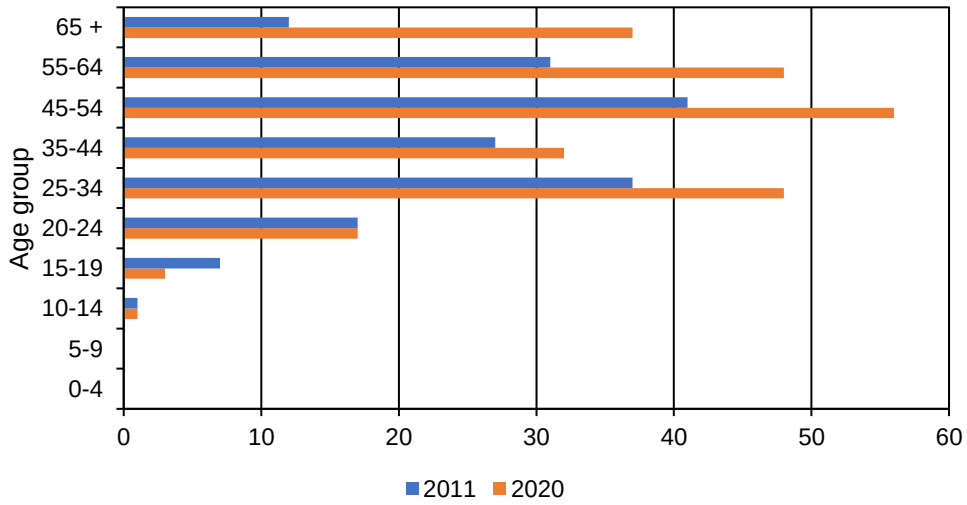


Figure 35 shows that between 2011 and 2020, there were more motorcyclist fatalities for all age groups 25 to 34 and older. During this time, fatalities for:

- motorcyclists aged 25 to 34 increased by 30%
- motorcyclists aged 35 to 44 increased by 19%
- motorcyclists aged 45 to 54 increased by 37%
- motorcyclists aged 55 to 64 increased by 55%
- motorcyclists 65 and older increased 208%.

Figure 35: Motorcyclist fatalities by age group in 2011 and 2020



Bicyclists

In 2020, 2% of all traffic related fatalities were bicyclists.

Figure 36 shows:

- The number of bicyclist fatalities decreased 9% between 2011 and 2020
- Bicyclist serious injuries increased 16% between 2011 and 2015
- Serious injuries then decreased 28% between 2015 and 2020

Figure 36: Bicyclist fatalities and serious injuries from 2011 to 2020

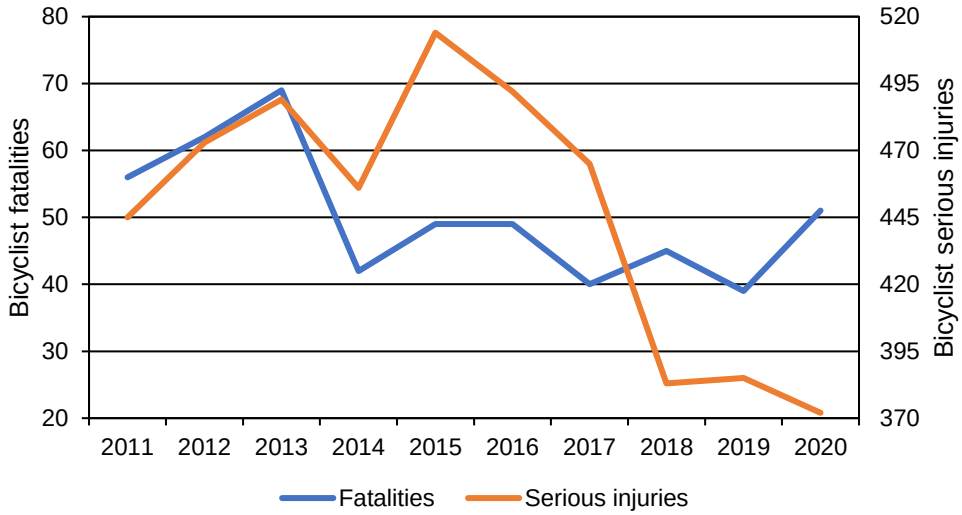


Figure 37 shows the number of bicyclist fatalities in 2011 and 2020 by age. In 2020:

- 41% were over 55 years
- 27% were 45 to 54 years

This means 68% of fatally injured bicyclists were over 45.

Table 13 indicates that in 2020:

- Bicyclists aged 45 to 54 had the highest fatality rate per 100,000 population followed by those aged 55 to 64
- Fatality rates went down for all age groups except bicyclists aged 0 to 4, 25 to 34, 45 to 54 and those aged 55 to 64 between 2011 and 2020.

Figure 37: Bicyclist fatalities by age group in 2011 and 2020

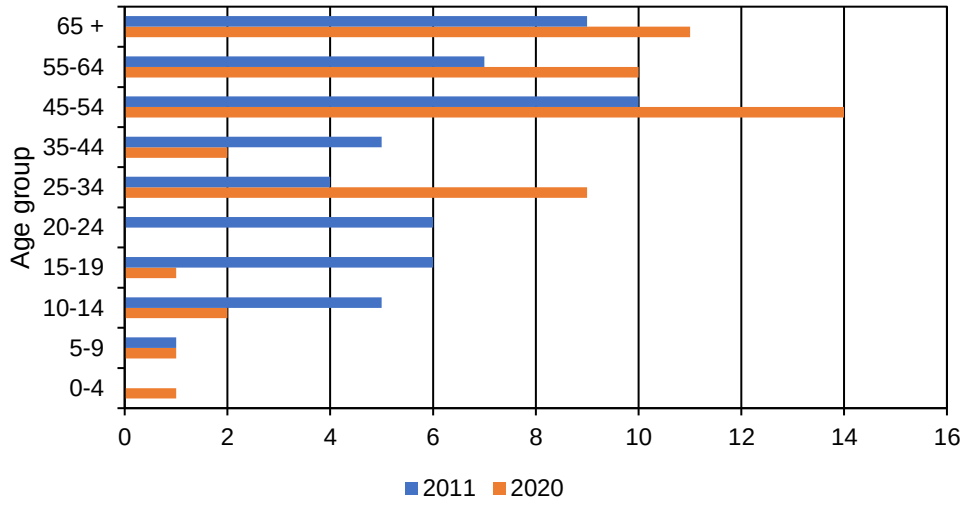


Table 13: Bicyclist fatalities and serious injuries per 100,000 population by age group in 2011 and 2020

Age group	Fatalities, 2011	Fatalities, 2020	Serious injuries, 2011	Serious injuries, 2020
0-4	0.00	0.05	0.00	0.05
5-9	0.06	0.05	0.61	0.54
10-14	0.26	0.10	1.67	1.40
15-19	0.27	0.05	1.70	1.28
20-24	0.26	0.00	1.40	1.05
25-34	0.09	0.17	1.30	0.94
35-44	0.11	0.04	1.31	1.02
45-54	0.18	0.29	1.18	1.28
55-64	0.16	0.19	0.82	1.26
65 +	0.18	0.16	0.46	0.58
Total	0.15	0.13	1.30	0.98

Measures to improve the safety of vulnerable road users

In 2018, the Council of Ministers Responsible for Transportation and Highway Safety issued a report entitled Safety Measures for Cyclists and Pedestrians Around Heavy Vehicles that identified methods that could improve safety for vulnerable road users around heavy commercial vehicles or in traffic in general.

These included:

- technology such as speed or red-light cameras
- road infrastructure improvements such as segregated bike lanes
- bicycle boxes for turning
- advanced green lights for pedestrians and bicyclists

- automatic pedestrian detection at crosswalks
- devices on heavy vehicles to detect nearby pedestrians or bicycles
- police enforcement of traffic rules
- awareness and education programs for all road users

Various jurisdictions have run public awareness campaigns addressing issues specific to vulnerable road users. For example, Quebec launched an awareness campaign on pedestrian safety in October 2019. The campaign focused on raising awareness among both drivers and pedestrians about the importance of making eye contact at pedestrian crosswalks, crossing at crosswalks, and respecting a pedestrian's right of way at crosswalks. Transport Canada has partnered with Parachute Canada to create a repository of new and emerging countermeasures to protect and support pedestrians and cyclists[18].

With respect to motorcycles, a 2019 spring/summer Quebec campaign encouraged motorcyclists and drivers to adopt good behaviours. It also encouraged drivers to anticipate motorcyclists. Nova Scotia ran a motorcycle safety campaign over the summer of 2019.

Heavy Commercial Vehicles

In the *National Safety Code for Motor Carriers*, a commercial vehicle is defined as:

"…a truck, tractor, tractor-trailer, or combination thereof which exceeds a registered gross weight of 4,500 kilograms or a bus designed, constructed, and used for the transportation of passengers with a designated seating capacity of more than ten, including the driver, but excluding operation for personal use."

Figure 38 shows that from 2011 to 2020:

- the number of annual fatalities in collisions involving heavy commercial vehicles decreased by 26%
- commercial vehicles represented approximately 9% of all vehicles involved in collisions, but they were involved in roughly 18% of all road user fatalities

[18] Vulnerable Road User (VRU) Safety Resources Repository – Parachute (parachutecanada.org)

Figure 38: Fatalities and serious injuries in collisions involving commercial vehicles from 2011 to 2020

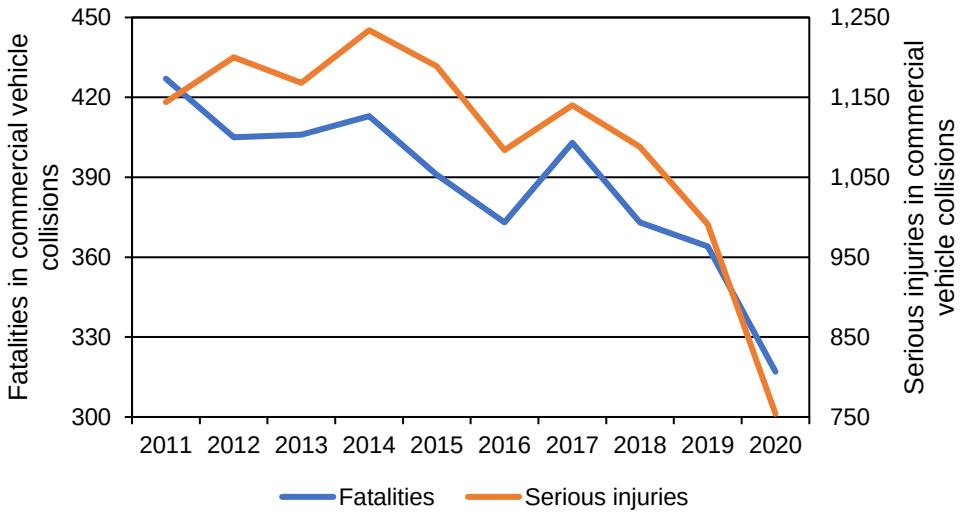


Figure 39 shows the percentage of fatally injured victims from collisions that involved heavy commercial vehicles in 2020. The data are grouped by road user type and show:

- 67% of the people who died in collisions were occupants of other vehicles in the collision
- 15% were occupants of heavy commercial vehicles
- 15% were pedestrians
- 3% were bicyclists.

Table 14 shows that these percentages were relatively stable between 2011 and 2020.

Figure 39: Fatally injured victims of collisions involving commercial vehicles

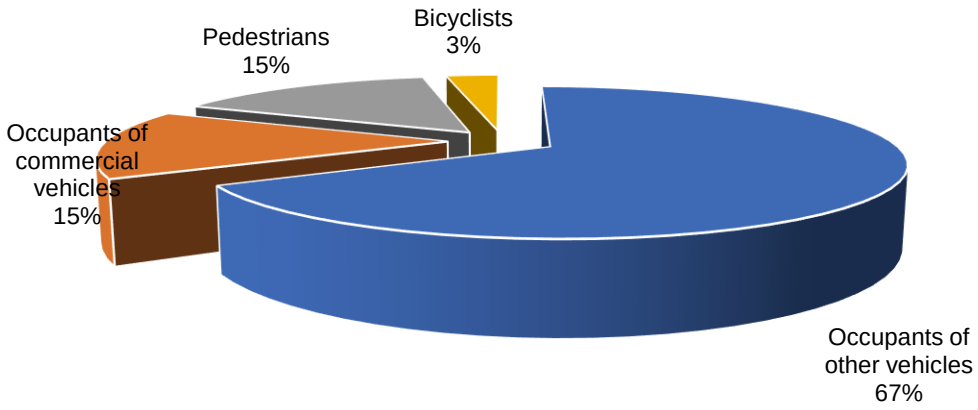


Table 14: Percentage of fatally injured victims of collisions involving commercial vehicles by road user type from 2011 to 2020

Year	Commercial vehicle occupants	Occupants of other vehicles	Pedestrians	Bicyclists
2011	15.7	69.6	12.6	2.1
2012	17.5	67.2	11.6	3.7
2013	16.3	66.7	12.6	4.4
2014	13.8	72.4	11.4	2.4
2015	11.5	76.5	10.2	1.8
2016	15.3	67.8	13.4	3.5
2017	16.9	68.5	11.9	2.7
2018	19.8	63.3	14.2	2.7
2019	12.9	70.6	13.7	2.8
2020	14.8	66.9	14.8	3.5

Table 15 shows:

- 64% of commercial vehicle occupants who died in collisions in 2020 were in tractor trailers, the second highest percentage in the period since 2011
- 36% were in straight trucks (heavy unit trucks without a trailer) in 2020
- In 2018, 27% of commercial vehicles occupants who died in collisions were in buses

Table 15: Percentage of fatally injured commercial vehicles occupants by vehicle type from 2011 to 2020

Year	Buses	Straight trucks	Tractor-trailers
2011	3.0	53.7	43.3
2012	22.5	39.4	38.0
2013	18.2	31.8	50.0
2014	7.0	35.1	57.9
2015	6.7	37.8	55.6
2016	8.8	28.1	63.2
2017	7.4	29.4	63.2
2018	27.0	32.4	40.6
2019	0.0	34.0	66.0
2020	0.0	36.2	63.8

Table 16 shows that from 2011 to 2020, seven school bus occupants died in collisions. Five of these people were drivers and two were passengers. One of the school bus passengers who died was a school-aged occupant and the collision occurred during normal school hours.

Figure 40 shows the percentage of fatally injured victims from collisions that involved school buses. The data are grouped by type of road user.

- Around 61% were occupants in vehicles other than school buses
- From 2011 to 2020, 63% of fatal collisions involving school buses were two-vehicle collisions, compared to 41% for fatal collisions overall
- Around 48% of fatal collisions involving school buses happened at intersections, compared to 29% for fatal collisions overall

Table 16: Fatally injured victims of collisions involving school buses by road user type from 2011 to 2020

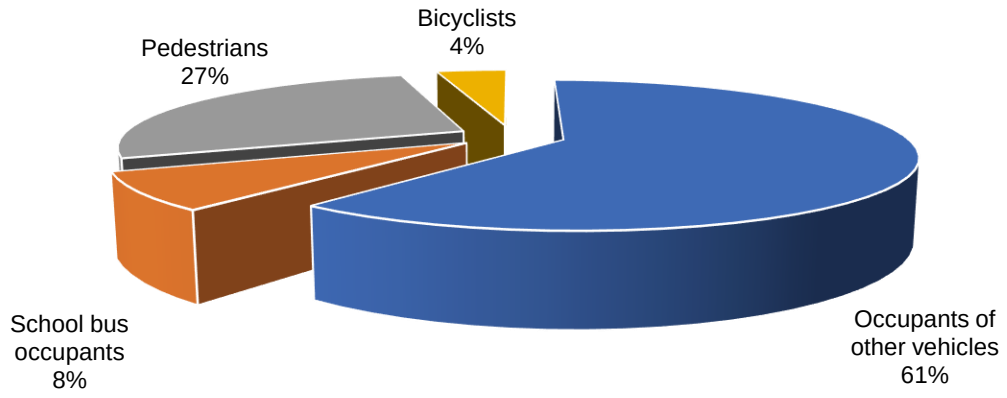
Year	School bus occupants	Occupants of other vehicles	Pedestrians	Bicyclists	All victims
2011	0	11	4	0	15
2012	0	4	1	0	5
2013	1	6	1	0	8
2014	0	1	3	1	5
2015	1	7	2	0	10
2016	2	9	1	0	12
2017	1	3	4	1	9
2018	2	4	3	1	10
2019	0	2	3	0	5
2020	0	7	2	0	9

When adjusting for vehicle fleet composition, school bus occupant fatalities are less likely to happen compared to other modes of road transportation.

Between 2011 and 2020:

- the average annual occupant fatality rate for school buses was 0.1 fatalities per 10,000 school buses
- there were 0.5 occupant fatalities per 10,000 vehicles registered for all vehicle types

Figure 40: Fatally injured victims of collisions involving school buses by road user type from 2011 to 2020



Measures to improve commercial vehicle safety

A variety of measures are in place and in development to improve commercial vehicle safety. The Canadian Council of Motor Transport Administrators, TC and the provinces and territories developed the *National Safety Code for Motor Carriers*. It consists of 16 standards intended to maintain the safety of motor carriers, addressing issues such as licensing requirements, load securement and periodic motor vehicle inspections.

A further important measure is the *Commercial Vehicle Drivers Hours of Service Regulations* (the Regulations) which sets work and drive limits and rest requirements in order to reduce fatigue-related crashes, injuries and fatalities. On June 12, 2019, Transport Canada (TC) published amendments to the Regulations in the *Canada Gazette Part II* to mandate the use of electronic logging devices (ELD) by federally-regulated bus and truck motor carriers and their drivers. The amendments to the Regulations came into force on June 12, 2021. These devices automatically track driving time by connecting to the engine's control module.

The amendments will yield safety benefits by reducing crashes, reducing out-of-service detention time of drivers for violations of the Regulations, and reducing administration costs for industry and provincial/territorial enforcement. Other benefits include fairer and more level competition for federally regulated motor carriers; greater harmonization with U.S.

regulatory requirements; improved compliance with the Regulations and improved quality of life for drivers.

With respect to truck driver training, the Council of Ministers for Transportation and Highway Safety tasked the Canadian Council of Motor Transport Administrators (federal, provincial, and territorial governments) with developing a minimum standard for entry-level training for Class 1 (tractor-trailer) commercial drivers, ensuring they have the knowledge and skills to safety operate these vehicles in Canada and the United States. Entry Level Training (ELT) has been added to the National Safety Code Standards (NSC 16)[19].

In 2019, Ontario was joined by Alberta, Saskatchewan, and Manitoba in requiring drivers to take a training course prior to taking a Class 1 or A (tractor-trailer) commercial vehicle drivers' test and having a licence issued. British Columbia introduced entry-level-training for new Class 1 drivers in October 2021.

Alberta also requires mandatory entry level training (MELT) for drivers seeking a Class 2 (bus) driver's licence. The remaining jurisdictions have committed to being well on their way to adopting MELT in their respective jurisdictions by 2021. Newfoundland and Labrador and Saskatchewan are offering some of the classroom training as an online training program. Some jurisdictions are strengthening their road tests for those who want to obtain a Class 1 licence (e.g., Manitoba).

Finally, in the area of school bus safety, in 2021, New Brunswick increased fines and demerit points for drivers who pass a stopped school bus with red lights flashing. It is also allowing the use of cameras on school bus stop arms to help enforce the red flashing light law.

In addition, Transport Canada published amendments to the *Motor Vehicle Safety Regulations* with a view to improving bus occupant safety. Technical requirements were introduced mandating school bus companies, that choose to install seat belts on school buses, to follow these standards to ensure correct installation.[20].

Vehicle safety

Between 2011 and 2020, around 5% of the fatalities and 4% of serious injuries involved a vehicle issue, such as faulty brakes or tires, as a contributing factor.

In the last decade, Transport Canda has put into law a number of improvements to vehicle safety regulations. These include requirements for:

- electronic stability control
- door lock and door retention
- reduced braking distances for heavy vehicles
- steering control systems
- head restraints

[19] https://www.ccmta.ca/web/default/files/PDF/ELT_Standard_16_Update_2021_FINAL_English.pdf
[20] http://www.gazette.gc.ca/rp-pr/p2/2018/2018-07-11/html/sor-dors143-2-eng.html

- child restraints
- seat anchor strength
- occupant protection in frontal collisions
- tires
- rear visibility systems

Future road safety challenges

Connected and automated vehicles

Connected and automated vehicles (CAV) hold great potential to make Canada's roads safer. According to 2020 data from the National Collision Database, driver behaviour was a contributing factor in around 87% of fatal collisions, including speeding (25%), distracted driving (22%) and impaired driving (18%).

Road safety experts expect that in the future, connected and automated vehicles will help to greatly reduce collisions and improve safety for all road users.

As such, it's important for all levels of government to work together to respond to emerging road safety issues related to the introduction of connected and automated vehicles, including safety validation, cybersecurity, and privacy, among others.

While Transport Canada is responsible for setting and enforcing safety regulations, provinces and territories are responsible for issues related to the safe operations of vehicles on public roads. This includes driver licensing and vehicle registration. Provinces and territories are also responsible for setting and enforcing the rules of the road, and approving testing of experimental vehicle technologies on public roads.

To support a shared approach to connected and automated vehicle safety, Transport Canada has worked with stakeholders to develop guidance documents that clarify and provide direction respecting connected and automated vehicles. They also lay the groundwork for developing safety-focused connected and automated vehicles regulations, while promoting policy alignment within Canada and promoting policy and standards harmonization with the US and internationally, as appropriate.

Key documents[21] developed to date are:

- Canada's Safety Framework for Automated and Connected Vehicles (2019) articulates the Department's vision for safety and provides access to a broad range of guidance and tools that support the safe testing and deployment of CAVs in Canada
- Safety Assessment for Automated Driving Systems in Canada (2018) assists vehicle manufacturing industry in reviewing the safety of highly automated vehicles that they intend to manufacture, import, operate and/or sell in Canada

[21] Documents can be found at Connected and automated vehicle safety: what you need to know (canada.ca)

- Testing Highly Automated Vehicles in Canada: Guidelines for Trial Organizations (2018) promotes a minimum set of safety practices and support a consistent national approach to the testing of CAVs
- the Canadian Jurisdictional Guidelines for the Safe Testing and Deployment of Highly Automated Vehicles (2018)[22], which were published by the Canadian Council of Motor Transportation Administrators

CAVs and the infrastructure that supports them can be vulnerable to cyber security threats, meaning that road safety is increasingly dependent on the cyber resiliency of Canada's transportation system. Transport Canada works with a broad range of stakeholders, including manufacturers, industry, and academia, to support cyber security research, testing, and the development of vehicle cyber security guidance and tools. In addition, Transport Canada is actively working with the international community to develop global guidance and standards for the safety and security of vehicle technologies. As part of this work, Transport Canada participates in meetings, and monitors the work of the international Task Force on Cyber Security and Over-the-Air updates, which was established under the United Nations Economic Commission for Europe's World Forum for the Harmonization of Vehicle Regulations (WP.29) Working Party on Automated/autonomous and Connected Vehicles. Transport Canada also follows the efforts of other standard-setting organizations developing requirements for vehicle cyber security, such as the ISO/SAE *International Standard 21434: Road vehicles cybersecurity engineering*.

Building on Canada's overarching National Cyber Security Strategy (NCSS) and in close collaboration with stakeholders, Transport Canada has published resources providing useful information on vehicle cyber security threats, best practices for maintaining a strong cyber security posture, and opportunities for alignment within Canada and with our international partners including:

- *Canada's Vehicle Cyber Security Guidance (March 2020)*,which sets out technology-neutral guiding principles to strengthen cyber security throughout the vehicle lifecycle
- *Transport Canada's Vehicle Cyber Security Strategy (August 2021),* which outlines overarching goals and priorities that will collectively guide TC's efforts in support of a secure and resilient automotive cyber security ecosystem
- *Canada's Vehicle Cyber Security Assessment Tool (August 2021),* a non-regulatory, voluntary tool designed to support manufacturers and suppliers in assessing the cyber security performance and resilience of their vehicles and vehicle components

These documents build on the department's flexible and modernized motor vehicle safety regime and complement Transport Canada's broader suite of guidance and tools to support the safe and secure introduction of new vehicle technologies. Transport Canada is committed to continue working with stakeholders to monitor trends and advancements in vehicle security to further strengthen Canada's vehicle cyber security posture.

[22] ccmta_avguidelines_sm.pdf (canada.ca)

Transport Canada's work in the area of connected and automated vehicle safety focused in several areas. These include research and testing at Transport Canada's Motor Vehicle Test Centre to assess the performance of new vehicle technologies. Transport Canada's approach is also informed by participation in various international fora to develop guidance and standards and to share best practices for the safe testing and deployment of automated vehicles. These fora include:

- The Global Forum for Road Traffic Safety (WP.1)
- The World Forum for Harmonization of Vehicle Regulations (WP.29)
- The International Standards Organization (ISO)
- SAE International

Further, the department's automated vehicles webpage (www.canada.ca/automatedvehicles) helps inform the public about the capabilities, limitations, and safe use of these new vehicle technologies.

Moving forward, Transport Canada will continue collaborating with partners to advance guidance, standards and research that is necessary to support the safe and effective deployment of connected and automated vehicles.

Advanced Driver Assistance Systems

Advanced Driver Assistance Systems, such as automatic emergency braking and intelligent speed adaptation, are currently available on some vehicles, and can help reduce fatalities and injuries on Canadian roads.

By using a similar approach to the European Union's revised General Safety Regulation, which mandates safety technologies on new vehicles as of 2022, Canada would help to protect passengers, pedestrians, and cyclists.

Advanced Driver Assistance Systems features covered by the European Union's General Safety Regulations include:

- driver monitoring (warning for drowsiness or distraction)
- intelligent speed assistance
- reversing safety with camera or sensors
- event data recorder
- lane-keeping assistance
- advanced emergency braking
- vulnerable road user detection

Canada works with the European Union and other international partners at the United Nations Economic Commission for Europe to develop vehicle safety regulations and road safety policies, performance requirements and test procedures that are required to make sure that each Advanced Driver Assistance System feature reaches the desired level of safety.

New vehicle types

Jurisdictions such as Quebec and Ontario are developing regulations for low-speed electric scooters, which are a new innovation. Several industry organizations and jurisdictions are also working to develop, test, and deploy low-speed automated shuttles.

With the possibility of new vehicle designs being introduced to the market, existing regulations and vehicle types will have to be reviewed. New vehicles may have operational risks that are different from what was intended by the initial definition of the vehicle type and applicable regulations.

The introduction of new vehicle types may result in changes to existing rules and regulations. This is because requirements might have to be removed or created based on how the new vehicles work.

Older drivers

Older drivers (65 and over) make up an increasing share of licensed drivers on Canadian roads. This age group now accounts for roughly 20% of all drivers compared to around 12%, 20 years ago.

As the population ages and vehicle technology becomes more complex, there are several questions to consider. These include:

- Will older drivers have difficulty using high-tech vehicles?
- Which of these technologies may help senior drivers in the driving task?
- Will distracted driving differentially impact different age groups in the future due to this technology?

Also, as seniors age they are more likely to develop physical and cognitive issues which could affect the safety of their driving (i.e., medically-at-risk driver challenges).

Event data recorders

Event data recorders will play an important role as more Advanced Driver Assistance Systems and connected and automated vehicles arrive on Canadian roads.

These devices record and store sensor data when a crash happens. They will be an important tool for collision investigators and vehicle designers. Data type, format, and extraction will need to be standardized to make it accessible by the relevant stakeholders to analyze failures and to develop safety countermeasures.

Drug impaired driving

Measuring drugs is far more complicated than measuring alcohol. At this point, there are no roadside or laboratory interlock devices that can be used to measure the amount of drugs a

driver has used. Further, no dose/response relationship for cannabis or other drugs exists. This makes it hard to define an unsafe level for drivers. Finally, the amount of time it takes for cannabis to affect the user is affected by how the cannabis is used.

Without comment as to policies regarding decriminalization of other psychotropic drugs, consideration to these challenges must be addressed in advanced in order better monitor and assess any impacts on road safety.

References

Beirness, D. J. (2020). A Compilation of Jurisdictional Roadside Surveys Conducted Prior to Cannabis Legalization. Report prepared for Canadian Council of Motor Transport Administrators.

Brown, S., Vanlaar, W., and Robertson, R., (2018). The Alcohol and Drug-Crash Problem in Canada: 2016. Report prepared for the Canadian Council of Motor Transport Administrators.

Canadian Council of Motor Transport Administrators (2016). Canada's Road Safety Strategy 2025 – Towards Zero: The Safest Roads in the World.

Canadian Council of Motor Transport Administrators (2014). Use of Electronic Communication Devices by Canadian Drivers: [Rural Areas (2013); Combined Urban/Rural Sites (2012-2013)] – Summary Report.

Canadian Council of Motor Transport Administrators (2018). Use of Electronic Communication Devices by Canadian Drivers [Urban Areas (2016); Rural Areas (2017); Combined Urban/Rural Sites (2016-2017)] – Summary Report.

Canadian Council of Ministers Responsible for Transportation and Highway Safety (2018). Safety measures for cyclists and pedestrians around heavy vehicles: Summary report.

Hu, W., McCartt, A. T., Teoh, E. R. (2011). Effects of red-light camera enforcement on fatal crashes in large U.S. cities. *Journal of Safety Research.*

International Traffic Safety Data and Analysis Group (IRTAD) of the International Transport Forum (ITF) (2020). 2020 Road Safety Annual Report.

Jonah, B.A. (2018). Canadian Road Safety Strategies. Paper presented at Canadian Association of Road Safety Professionals Conference, Victoria, 2018.

Meirambayeva, A., Vingilis, E., McLeod, A. I., Elzohairy, Y., Xiao, J. Zou, G., and Lai, Y. (2014). Road safety impact of Ontario's street racing and stunt driving law. Accident Analysis and Prevention 71, 72-81.

Nilsson, G. (2004). Traffic Safety Dimension and the Power Model to describe the effect of speed on safety. Lund Institute of Technology, Sweden.

Owen, G. Ursachi, R. Allsop, R. (2016). The Effectiveness of Average Speed Cameras in Great Britain, RAC Foundation & Road Safety Analysis.

Snowdon, A. W., Hussein, A., and Ahmed, E. (2010). Technical Report: Canadian National Survey on Child Restraint use 2010. Report completed for Transport Canada, in partnership with AUTO21.

Statistics Canada, Catalogue no. 53-223-X: Canadian Vehicle Survey, Annual.

Statistics Canada, Table 17-10-0009-01: Population estimates, Quarterly.

Statistics Canada, Table 23-10-0067-01: Road motor vehicle registrations, by type of vehicle.

Statistics Canada, Table 17-10-0005-01: Population estimates on July 1st, by age and sex.

Transport Canada (2011). Road Safety in Canada. TP 15145 E.

Transport Canada, National Collision Database (NCDB).

Transport Canada (2021). 2020 Transportation in Canada Report.

Transport Canada, Results of Transport Canada's Survey of Seat Belt Use in Canada [2002-2003, 2004-2005, 2006-2007, 2009-2010], TP2436E.