



ROAD SAFETY ANNUAL REPORT 2018

CANADA

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Canada recorded 1 898 road fatalities in 2016, representing a 2% increase when compared to 2015. For the second year in a row, Canada saw an increase in the number of road fatalities. The mortality rate was 5.2 deaths per 100 000 population. Canada has adopted the Vision Zero approach as an inspirational goal. The fourth **national road safety plan**, the Road Safety Strategy (RSS) 2025, was launched in 2016. The plan has a greater emphasis on vehicle technologies and roadway infrastructure.

Trends

Canada registered an overall **increase in the number of road deaths in 2016**. According to latest available data, 1 898 persons lost their lives in traffic crashes in Canada in 2016. This represents a 2% increase on 2015.

The **longer-term trend for road deaths** in Canada has been downward. Between 1990 and 2016, the number of annual road fatalities fell by 52%. In the more recent past, the number of road fatalities fell by 35% during the 2000-16 period and by 15% in the 2010-16 period.

The number of **traffic deaths per 100 000 inhabitants** in Canada fell by 63% between 1990 and 2016. In 2016, 5.2 traffic deaths per 100 000 inhabitants were recorded, compared to 14.3 in 1990.

The fatality risk, measured as **traffic deaths per billion vehicle-kilometres** (vkm) driven, shows also a longer-term downward trend. In 2016 this metric stood at 5.1, 45.7% lower than in 2000. For the period 2010-2016, it dropped by 24%.

Canada recorded 0.8 **road fatalities per 10 000 registered vehicles** in 2016. This represents a decrease of 67% compared to the year 1990, when the rate of deaths per registered vehicles stood at 2.3. This positive performance was strengthened from 2000-2016, when it dropped by 52%. Between 2010 and 2006, the road death rate per motor vehicle decreased by 24%.

Country Profile

Population in 2016: 36.3 million

GDP per capita in 2016: USD 42 190

Cost of road crashes: 2.0% of GDP (2015)

Road network: 1 304 100 kilometres

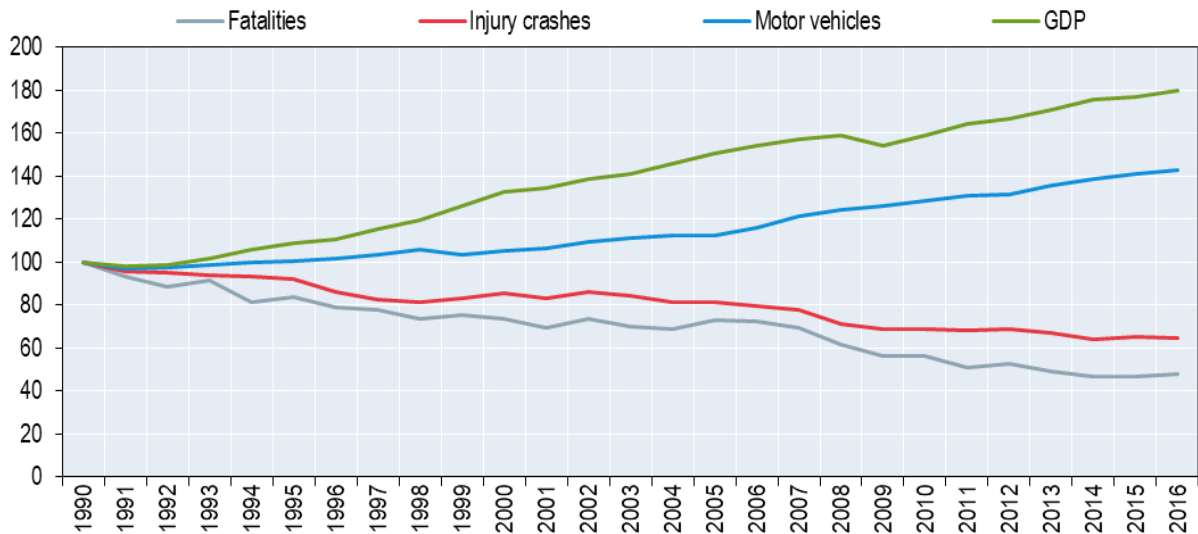
Registered motor vehicles in 2016: 24.3 million (cars 92%; goods vehicles 5%; motorcycles 3%)

Volume of traffic : +20% between 2000 and 2016

Speed limits: 40-70 km/h on urban roads; 70-90 km/h on rural roads; 100-110 km/h on motorways

Limits on Blood Alcohol Content: 0.8 g/l for general drivers (0.5 g/l or 0.4 g/l in most provinces); 0.0 g/l for novice and young (under 21 years of age) drivers in most provinces

Figure 1. Road safety, vehicle stock and GDP trends
Index 1990 = 100

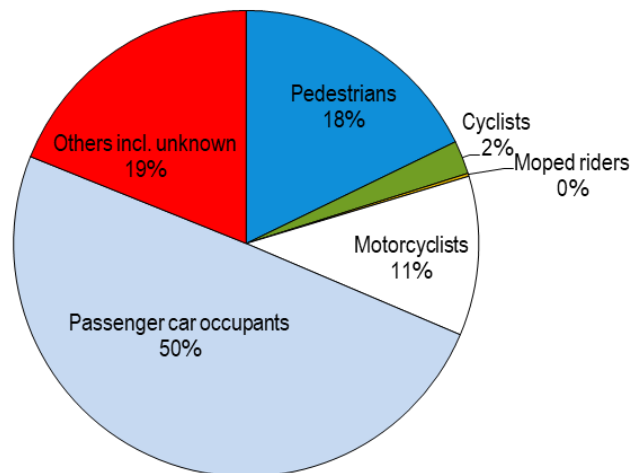


The picture for **fatalities by road user groups** shows an increase for non-occupant road users. In 2016, occupants of passenger cars accounted for the largest share of road deaths with 50% of the total. They were followed by pedestrians (18%), riders of motorised two-wheelers (11%) and cyclists (2%).

The largest increase in 2016 was registered among pedestrians with 21.1% more deaths compared to 2015, followed by cyclists with 7.3% more road deaths in 2016 compared to 2015 and motorcyclists with 2.4% more fatalities. Only occupants of passenger cars experienced a decrease of 4% in 2016 compared to 2015.

The long-term trend shows that traffic in Canada has become safer for all road user groups. All user groups have seen the number of fatalities decline over the past decades. The strongest decline was registered among cyclists, who accounted for 106 fatal crash victims in 1990, down to 44 in 2016. The overall reduction of 59% was somewhat dampened by a 10% increase in cyclists killed in the period 2000-16.

The user group that has experienced the slowest decline are motorcyclists, who saw the number of crash deaths fall by 17% since 1990. Progress in the reduction of fatalities of pedestrians was somewhat mixed, with a recorded 42% reduction in road deaths over the period 1990-2016, followed by a decrease of 9% since 2000 and an increase of 11% since 2010. Occupants of passenger cars experienced a decrease in road deaths by 58% since 1990, 47% since 2000 and 26% since 2010.

Figure 2. Road fatalities by road user group in percentage of total, 2016

Road deaths by age group in 2016 show an increase for children up to the age of 14. The strongest increase on the previous year was registered among this age group with 18.2% more fatalities in 2016 compared to 2015. The 21-24 age group saw the strongest reduction of fatalities in 2016, with 6.5% fewer road deaths reported than in 2015.

Looking at the longer-term trend, the strongest reduction fatalities over this period occurred in the under-24 age group, with more than 65% fewer deaths in 2016 registered than in 1990, while for the other age groups the decrease was less but still very significant.

Historically, young people represent a high-risk group in road safety. In 2016, the group most at risk in traffic was the 18-20 age group with a mortality rate of 9 deaths per 100 000 inhabitants, almost twice that of the general population. The second group the most at risk on the roads is among those 65 years of age and over.

Figure 3. Road fatality rates by age group, 1990-2016
Deaths per 100 000 population in a given age group

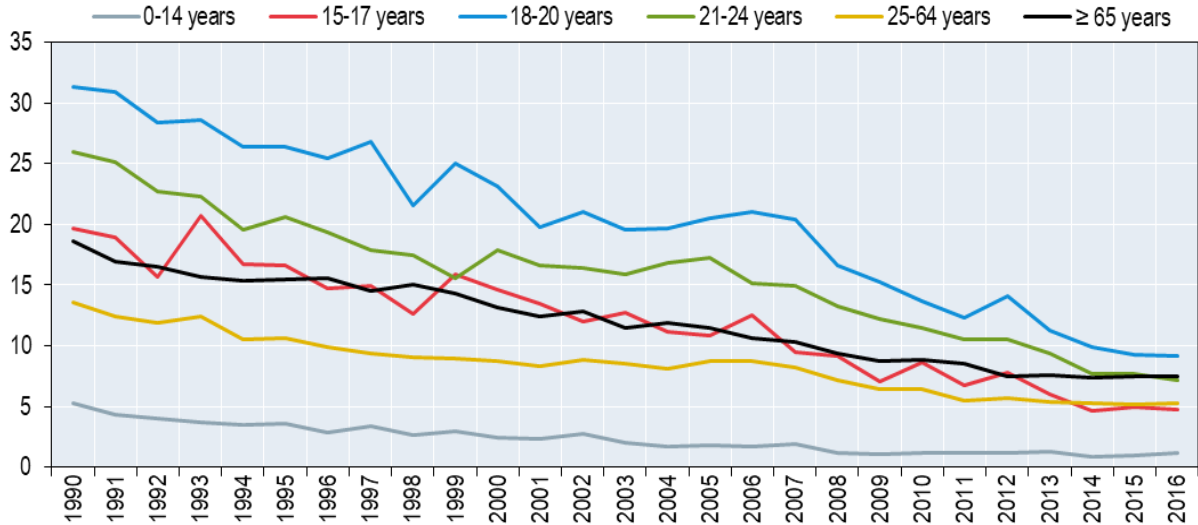
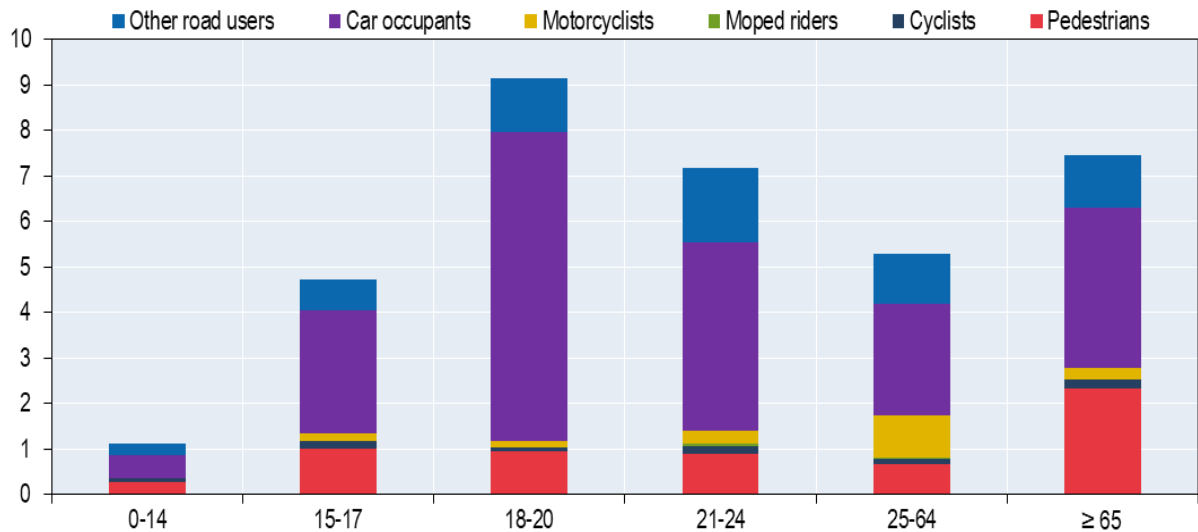


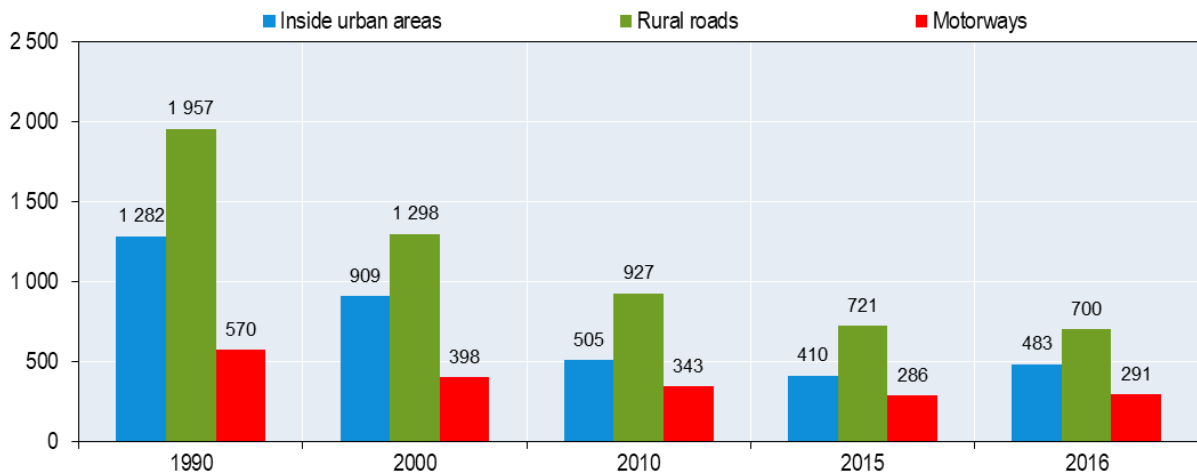
Figure 4. Road fatality rate by age and road user group, 2016
Fatalities per 100 000 population



Analysis of **fatalities by road type** shows an increase in road deaths on urban roads. In 2016 road fatalities on urban roads were 17.8% higher compared to 2015. In 2016 there was also a slight increase in road deaths on motorways (1.7%), while fatalities decreased on rural roads (-2.9%).

Over the past three decades, urban and rural roads have shown progress in terms of improved relative safety. Benchmarked against the average overall reduction of road fatalities in the 1990-2016 period of 52%, urban and rural roads outperformed the other road types with a reduction of more than 60%.

Figure 5. Road fatalities by road type



Fatality data are essential to understand road safety issues, but on their own do not provide a complete picture. Information on **serious injuries from crashes** is also critically important. In Canada the number of people hospitalised or injured after a road crash remained stable in 2016 compared to 2015. Since 1990 both categories have experienced large decreases (-59% for hospitalised and -38% for injured).

Economic costs of road crashes

For the purpose of this report, costs have been calculated using the willingness-to-pay approach. This means that the value of a statistical life (VSL) is used to value fatalities, and fractions of VSL are used to value injuries, based on quality-adjusted life years (QALYs) lost.

Traffic crashes represent a very significant cost for society at CAD 37.1 billion or 2.03% of GDP in 2015.

Table 1. Costs of road crashes, 2015

	Unit cost (2015 CAD) ¹	Total (2015 CAD)
Fatalities	8 141 033	15.1 million
Hospitalised	1 012 102	10.2 million
Slight injuries	26 253	3.7 million
Property damage costs	8 426	4.9 million
Total	58 659	37.1 billion²
Total as % of GDP		2.03%

1. Total unit cost is per crash.
2. The total includes other costs.

Behaviour

The behaviour of road users is an important determinant of a country's road safety performance. **Speed**, along with impaired and distracted driving, is a significant contributor to motor vehicle fatalities. In 2015, approximately 23% of fatal crashes involved speeding. Over the last decade, speed-related fatalities have declined significantly. Casualty data in 2015 indicated a 40% reduction in speed-related crashes compared to the 2006-2010 period.

The table below summarises the main speed limits in Canada.

Table 2. Passenger car speed limits by road type, 2018

	General speed limit
Urban roads	40-70 km/h
Rural roads	80-90 km/h
Motorways	100-110 km/h

Under the Criminal Code of Canada, the maximum permissible blood alcohol content (BAC) when driving is 0.8 g/l. However, in most provinces and territories, there is an administrative maximum level of 0.5 g/l (0.4 g/l in Saskatchewan, and in Quebec the 0.5 g/l limit only applies to commercial vehicles). In addition, most provincial/territorial jurisdictions have a zero BAC limit for young (under 21) and/or novice drivers.

Penalties under these administrative programmes are significant but do not match the seriousness of a full Criminal Code of Canada charge. Penalties in both situations increase for repeat offenders.

In 2015, National Collision Database statistics showed that approximately one-in-five fatal collisions were noted to have **alcohol** involvement as a contributing factor. Looking at coroner-based fatality data, in 2014 it was observed that 28% of fatally injured drivers in Canada had some level of alcohol in their blood.

Information on the presence of alcohol is collected on police crash report forms, but as the data are not always reliable, a surrogate is used for instances of deaths of drivers and pedestrians involving alcohol and drugs. The percentage of fatally injured drivers who were tested for alcohol and drugs is applied to all motor vehicle deaths to estimate the percentage of all deaths which were alcohol or drug related. With respect to injury crashes, any police report which indicates alcohol or any crashes that fit a surrogate model are identified as alcohol related (Mayhew et al., 1997). Bill C-46 is before Parliament and will change the *Criminal Code of Canada* regarding impaired driving. It will lower the legal limit to 0.8 g/l or over, authorise mandatory alcohol testing of motor vehicle drivers by a police officer and include a formula for calculating BAC at time of driving dependent on when the test was administered.

The Criminal Code of Canada sections that govern impaired driving also include **impairment by drugs**. The Criminal Code was updated in 2009 to detail a police investigation of suspected drug-impaired driving situations, based on behavioural indices of unsafe driving and following the procedures set out by the Drug Recognition Evaluator (DRE) programme at the International Association of Chiefs of Police. This programme is initiated if there appears to be behavioural indications of impairment and no or little alcohol is found. The penalties are the same as for impairment by alcohol.

Canada began testing fatally injured drivers for drugs in 2000, similar to the method used for alcohol. Not all drivers are tested and the testing rate is typically lower than that of alcohol. It should be noted that the rate of psychotropic drugs found in fatally injured drivers appears to be increasing while alcohol has been decreasing. Canada is changing the way cannabis is regulated for use through Bill C-45. Cannabis would be legalised in limited quantities for people over the age of at least 18. Bill C-46 will create three new offences regarding cannabis use and driving and combining cannabis and alcohol and driving.

Broadly speaking, **distracted driving** is commonly associated with activities such as eating, talking to other passengers, adjusting entertainment or climate controls and general inattention. While these types of driver distraction continue to this day, there is increasing focus on distracted driving due to electronic communication devices and electronic vehicle equipment.

The use of mobile phones or other electronic devices while driving is regulated by the individual provinces and territories.

Nationally, an estimated 4.4% (± 0.4) of the drivers used an Electronic Communication Device (ECD), varying by jurisdiction from 1.4 to 8.7%. ECDs were used for talking by 2.3% of drivers and for typing by 1.6% of drivers. Nationally, the use of hand-held ECDs for talking was 58% lower in the 2012-13 surveys than that observed in 2006-07 surveys.

The North American **Fatigue Management Program** is a comprehensive educational website that provides Motor Carriers, their drivers, dispatchers and managers with all the

necessary information to mitigate driver fatigue over and above Hours of Service Regulations.

Seat-belt use was made compulsory in Canadian jurisdictions between 1976 and 1988. The laws around the use of seat belts and child restraints are provincial or territorial. All provinces and territories have laws in place mandating the use of child restraints since the 1980s, and they are occasionally updated. In most cases, the driver is responsible for ensuring that a child is correctly restrained.

In Canada, child restraint use is promoted in four stages: rear facing; forward facing; booster seats; three-point seat belt in the rear seat. Graduation from one stage to another is based on the seat involved and the weight and height of the child. Use of Stage 1 and Stage 2 seats is very high but only some provinces/territories have legislation requiring booster seats.

Seat belt use in Canada over the last several years was at approximately 95%. A recent 2016 urban survey of front seat occupants in Canada indicates seat belt wearing rates were 97.5%. However, almost 29% of occupants killed in 2015 were unbelted at the time of the crash. This represents a slight improvement since 2011, when 31% of occupants killed were unbelted.

A 2010 observational study of child restraint use in Canada indicates that incorrect use of child restraints increases with the age of the child. The most significant incorrect usage issue is premature graduation from one stage to another, which reduces safety for the child (Snowdon et al., 2011).

Table 3. Seat belt wearing by car occupancy and road type
Percentages

	2000	2010	2016
Front seats			
Driver	91	96	98
Urban roads (driver)	92	96	

Road safety management and strategies

There are several **influencing factors on Canada's road safety performance** as captured by the above indicators. It is believed that increased efforts by key stakeholders in developing and implementing road safety strategies, plans and countermeasures that focused on key areas of concern, such as speeding, impaired driving and unbelted occupants, contributed to the overall progress. Other contributors include improvements in vehicle safety features and equipment.

The overall long-term progress was achieved despite ongoing growth over this period in the Canadian population, the number of licensed drivers, the number of registered vehicles and in vehicle kilometres travelled.

In terms of progress made on national road safety plans, the progress that was achieved in the closing years of the Road Safety Vision 2020 has so far kept its momentum going over the course of Road Safety Strategy 2015.

In Canada, the **responsibility for road safety** is divided among different levels of government and other road safety and private sector partners.

Federal, provincial and territorial departments responsible for transport and highway safety work together through various committees and associations that report to the Council of Ministers responsible for Transportation and Highway Safety. This council is assisted by the Council of Deputy Ministers responsible for Transportation and Highway Safety. Within this structure, three committees co-ordinate multi-jurisdictional views and efforts (Canadian Council of Motor Transport Administrators, Engineering and Research Support Committee and the Policy and Planning Support Committee). In addition, the Transportation Association of Canada, which also includes a number of municipal partners, addresses infrastructure issues.

This structure is designed to promote national consistency, provide a platform to share information and assist jurisdictions in addressing issues within their specific mandate. Ultimately the responsibility for implementation remains with the appropriate jurisdictions.

The Federal Government is responsible for regulations and standards related to the manufacture and importation of motor vehicles, tyres and child restraints. Provincial and territorial governments are responsible for licensing drivers, registering vehicles and administering justice and jurisdictional road safety programmes. They are also responsible for policy and regulations regarding the roadways. In many cases, the road authority responsible for the operations of the road may be regional or municipal governments, which must operate within the provincial guidelines.

Canada's fourth **national road safety plan**, the Road Safety Strategy (RSS) 2025 was launched by the Council of Ministers responsible for Transportation and Highway Safety in early 2016. The goal remains to achieve downward trends in fatalities and serious injuries throughout a five-year duration, comparing a rolling three-year average with the established baseline period.

The new plan has a greater emphasis on vehicle technologies and roadway infrastructure. Canada has adopted the Vision Zero approach as an inspirational goal. A database of proven and promising road safety initiatives is maintained as a part of the strategy and each jurisdiction is encouraged to develop their own road safety plan based on regional needs and conditions.

The aspirational goal of RSS 2025 is zero fatalities and serious injuries. The Canadian Council of Motor Transport Administrators with assistance from Transport Canada reports annually on progress toward the goals of fatality and injury reduction. A number of rate-based measures are used to focus on progress in specific areas such as impaired driving, speeding and unbelted occupants.

When comparing the 2015 figure (last year of the Road Safety Strategy 2015) with the baseline period of 2006-10, fatalities were down 24%, while serious injuries were down

by 23%. Starting with collision year 2016, there will be a new assessment and reporting period to reflect the introduction of the RSS 2025.

Measures

Road safety management

Vision Zero is being adopted by a number of safety partners such as municipalities and transportation departments.

Road users

Canada legalised cannabis in the second half of 2018. Bill C-45, the Cannabis Act, lays out the rules regarding legalisation, possession amounts and age restrictions around cannabis use.

Bill C-46, change to the *Criminal Code of Canada* regarding impaired driving, is in two parts. The first one deals with cannabis impaired driving, while the second one is a complete modernisation of the impaired driving section of the criminal code.

Transport Canada and the Canadian Council for Motor Transport Administrators are completing an urban/rural observational study on the use of electronic communication devices while driving which will also estimate seat belt use by front seat occupants.

Transport Canada assists provinces and territories in conducting roadside surveys on drug and alcohol use while driving.

Alberta and Transport Canada co-chair a project examining possible countermeasures to address pedestrian and cyclist safety around heavy vehicles. The report, to be published in 2018, will act as a reference guide describing countermeasures, and outlining evidence, considerations and barriers.

Transport Canada is undertaking a pilot project with five municipalities examining safety sensors and systems on heavy vehicles to help protect pedestrians and cyclists.

Transport Canada is developing, with the Canadian Council of Motor Transport Administrators, an action plan to address the issue of use of electronic communication devices while driving.

Vehicle safety

Transport Canada has proposed a new standard to mandate Electronic Stability Control systems on most truck tractors and heavy buses with a targeted full implementation date of August 2019.

A proposal was made in last quarter of 2016 requiring Canadian vehicles to be equipped with improved rear visibility to aid the driver during reversing and more specifically requires backup cameras on applicable vehicles built after May 2018.

A proposal was made in spring 2017 to include several new requirements for the voluntary and mandatory installation of seat belts on different types of buses and specifies restraint type to be used.

Transport Canada is evaluating the feasibility of adopting a requirement similar to that of the US National Highway Traffic Safety Administrations Notice of Proposal of a new standard to mandate vehicle-to-vehicle (V2V) communications for new light vehicles and to standardise the message and format of V2V transmissions.

Infrastructure

The Transportation Association of Canada (TAC) has released the 2017 edition of the Geometric Design Guide for Canadian Roads (GDG). The Guide is a fundamental reference document for roadway design practitioners in the consistent and safe development and expansion of regional, provincial and national roadway and highway systems in Canada.

Complementary to the GDG is the *Canadian Roundabout Design Guide* (CRDG) which provides information and guidance related to the planning, design, construction, operation, maintenance and safety of roundabouts in Canada. The CRDG has been written and compiled based on review of national and international best practice documents and research, while considering the experience of Canadian jurisdictions with roundabouts already in service.

The Transport Association of Canada (TAC) is commencing a project that will produce a report on study findings to help practitioners evaluate the safety performance of bicycle facilities within their jurisdiction.

Definitions, methodology, data collection

Road fatality: a person who died immediately or within 30 days of a crash.

Seriously injured: a person admitted to hospital for treatment or observation.

Slight injury: if “minimal” then no immediate medical attention was required, but would include minor abrasions, bruises and complaint of pain. If “minor” the person went to the hospital, was treated but not admitted.

There has been no significant progress made in relation to collecting and/or reporting injuring using the MAIS or MAIS3+ standard.

Transport Canada has a well-established road safety data programme and has been reporting on motor vehicle crash statistics since the 1970s. Police-reported road traffic

crash information is collected and processed by provinces and territories and is then sent to Transport Canada for final processing and for compilation of national crash statistics.

Transport Canada considers the motor vehicle crash data to be relevant, of good quality overall and reliable for most analytical purposes. However, there are areas for improvement, as some specific data variables are not provided by certain jurisdictions or consistently reported by all of them. In some cases, where data has not been received from all jurisdictions within Canada, methodologies are used to ensure that national estimates take into account any non-reporting.

Transport Canada is currently working with provincial and territorial road safety partners in the area of electronic data collection and other initiatives aimed at improving the timeliness and accuracy of motor vehicle crash data. A pilot project by a national police agency in Canada is being implemented and as a result, it is anticipated that approximately one-third of the national collision data will be collected.

Currently, serious injury data are collected through the same reporting mechanism as for all crash data. Transport Canada is in the initial stages of trying to improve the quality of the injury data, and is currently undertaking an environmental scan and consultation process as part of its efforts.

The *National Collision Database* online web application is a query tool that contains national level statistics on vehicle crashes occurring on public roads in Canada. Approximately 23 of the data elements in the *National Collision Database* are available to users, so that they can select and extract data of interest to them. A second version created for provinces and territories allows access to more detailed information.

Resources

Recent research

There are a number of research projects managed by various levels of government and/or safety associations. There are also some specific Transport Canada research activities in the areas of autonomous vehicles, distracted driving and vulnerable road users that are in progress.

Updates on road safety research and their findings/results can be found at:

- Transport Canada: <https://www.tc.gc.ca/eng/motorvehiclesafety/menu.htm>
- Canadian Association of Road Safety Professionals Conference: <http://www.carsp.ca/>
- Road Safety driver and vehicle policy, regulations and research: <http://www.ccmta.ca/en/>

- Infrastructure projects: <https://www.tac-atc.ca/>
- Traffic Injury Research Foundation: <http://tirf.ca/>

Websites

- Transport Canada: <http://www.tc.gc.ca/>
- Road safety Vision 2010: <http://www.ccmta.ca/en/road-safety-vision-2010-final-report>
- Road Safety Strategy 2025: <http://roadsafetystrategy.ca/en/>
- Transport Association of Canada: <https://www.tac-atc.ca/>
- National Collision Database on-line Web application: <http://wwwapps2.tc.gc.ca/Saf-Sec-Sur/7/NCDB-BNDC/p.aspx?l=en>
- North American Fatigue Management Program: <https://www.fmcsa.dot.gov/safety/research-and-analysis/north-american-fatigue-management-program-nafmp>

References

Mayhew, D.R., D.J. Beirness and H.M. Simpson (1997), *Indicators of the Alcohol-Crash Problem, Road Safety and Motor Vehicle Regulation*, Transport Canada, Ottawa, Ontario.

Snowdon, A., A. Hussein and E. Ahmed (2011), *Canadian National Survey on Child Restraint Use 2010*, completed for Transport Canada, in partnership with AUTO21, <https://www.tc.gc.ca/eng/motorvehiclesafety/resources-researchstats-child-restraint-survey-2010-1207.htm>

Road safety and traffic data

	1990	2000	2010	2015	2016	2016% change over			
						2015	2010	2000	1990
Reported safety data									
Fatalities	3 963	2 904	2 238	1 860	1 898	2.0%	-15.2%	-34.6%	-52.1%
Injury crashes	181 960	155 838	125 636	118 060	117 673	-0.3%	-6.3%	-24.5%	-35.3%
Injured persons hospitalised	25 020	13 439	11 290	10 246	10 164	-0.8%	-10.0%	-24.4%	-59.4%
Deaths per 100 000 population	14.3	9.5	6.6	5.2	5.2	0.3%	-20.5%	-44.7%	-63.4%
Deaths per 10 000 registered vehicles	2.3	1.6	1.0	0.8	0.8	0.1%	-23.7%	-51.8%	-66.5%
Deaths per billion vehicle kilometres	..	9.3	6.7	5.1	5.1	-0.9%	-24.0%	-45.7%	..
Fatalities by road user									
Pedestrians	584	373	306	279	338	21.1%	10.5%	-9.4%	-42.1%
Cyclists	106	40	61	41	44	7.3%	-27.9%	10.0%	-58.5%
Moped riders	8	5	5	3	4	33.3%	-20.0%	-20.0%	-50.0%
Motorcyclists	252	166	188	205	210	2.4%	11.7%	26.5%	-16.7%
Passenger car occupants	2 244	1 761	1 270	982	943	-4.0%	-25.7%	-46.5%	-58.0%
Other road users	769	559	408	350	359	2.6%	-12.0%	-35.8%	-53.3%
Fatalities by age group									
0-14 years	305	144	63	55	65	18.2%	3.2%	-54.9%	-78.7%
15-17 years	223	183	114	59	56	-5.1%	-50.9%	-69.4%	-74.9%
18-20 years	382	293	193	128	124	-3.1%	-35.8%	-57.7%	-67.5%
21-24 years	444	294	211	153	143	-6.5%	-32.2%	-51.4%	-67.8%
25-64 years	2 004	1 461	1 220	1 027	1 052	2.4%	-13.8%	-28.0%	-47.5%
65-74 years	..	225	191	195	200	2.6%	4.7%	-11.1%	..
≥ 75 years	..	280	235	240	246	2.5%	4.7%	-12.1%	..
Fatalities by road type									
Urban roads	1 282	909	505	410	483	17.8%	-4.4%	-46.9%	-62.3%
Rural roads	1 957	1 298	927	721	700	-2.9%	-24.5%	-46.1%	-64.2%
Motorways	570	398	343	286	291	1.7%	-15.2%	-26.9%	-48.9%
Traffic data									
Registered vehicles (thousands)	16 981	17 882	21 848	23 924	24 270	1.4%	11.1%	35.7%	42.9%
Vehicle kilometres (millions)	..	311 334	335 900	365 854	374 740	2.4%	11.6%	20.4%	..
Registered vehicles per 1 000 population	613.2	582.7	642.5	667.8	669.4	0.2%	4.2%	14.9%	9.2%