

British Columbia Road Safety Strategy **2015 and Beyond**



British Columbia Ministry of Justice
Office of the Superintendent of Motor Vehicles
Research and Data Unit – **Road User Safety**
Policy and Strategic Initiatives Branch
Prepared by Cecile Lacombe and Neil Arason

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The British Columbia Road Safety Strategy is the result of the efforts of over 30 British Columbia stakeholder groups including: government, the insurance sector, crown entities, enforcement agencies, researchers, the health sector, local government representatives and others.

There is little doubt the future will bring into the fold even more partners than there are today. In the meantime, however, the Office of the Superintendent of Motor Vehicles would like to acknowledge all partners who contributed to the development of this strategy:

BC Forest Safety Council
 BC Health Authorities
 BC Injury Research & Prevention Unit
 BC Medical Association
 BC Trucking Association
 BCAA Road Safety Foundation
 City of Surrey
 City of Vancouver
 Capital Regional District Integrated Road Safety Unit
 Capital Regional District Traffic Safety Commission

First Nations Health Council
 Global Road Safety Committee
 Insurance Bureau of Canada
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 Mothers Against Drunk Driving
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 RCMP Traffic Services - E Division
 RCMP Lower Mainland District
 RCMP North District
 RCMP South East District
 RONA Kinetics
 Saanich Police
 TransLink
 Trucking Safety Council of BC
 Union of British Columbia Municipalities
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MESSAGE FROM THE ATTORNEY GENERAL AND MINISTER OF JUSTICE

Road safety is a fundamental public safety issue that affects us all. Every day, we all take chances when we use the sidewalks, bicycle lanes and roads.

Every week in British Columbia, almost seven people are killed and over 50 hospitalized with a serious injury from a motor vehicle crash on a public road.

These tragedies are not inevitable. Over the past few years, British Columbia has worked hard to reduce the number of fatalities and serious injuries on its roads.

We cannot take the downward trend for granted, however, and much more remains to be done.

This is why road safety partners in British Columbia have collaborated to produce this *British Columbia Road Safety Strategy 2015 and Beyond*. Together, government ministries, the insurance sector, crown entities, the health sector, law enforcement agencies, non-profit organizations, road safety advocacy groups and academic researchers examined the situation in our province and suggested priorities for the first made-in-British Columbia road safety strategy.

We will tackle the problem from all angles, focussing on safe behaviours, safe vehicles, safe roadways and safe speeds.

Road safety research and data specific to British Columbia will be enhanced to better support policy development, program evaluations, public education, interventions in the field and communication.

We will implement a new governance structure for road safety to strengthen and expand our partnerships, encourage input and leverage everyone's efforts to further reduce the human trauma from our roads. The Office of the Superintendent of Motor Vehicles will coordinate and facilitate collaboration among the partners. Finally, we will work closely with local communities, local governments and First Nations to facilitate progress with their road safety interventions.

Together, we aim to make British Columbia's roads the safest in North America.

The Honourable Suzanne Anton, QC
Attorney General, Minister of Justice

STRATEGY HIGHLIGHTS

British Columbia road safety partners have taken on the challenge of improving road safety outcomes by developing the first collaborative *British Columbia Road Safety Strategy 2015 and Beyond* (British Columbia Road Safety Strategy), in alignment with the Canada's Road Safety Strategy 2015.¹

We recognize that the success of the strategy will be achieved by the continued efforts and collaboration of all of us. We, the British Columbia road safety community, know this to be the future.

Our vision is that British Columbia will have the safest roads in North America and will work toward the ultimate goal of zero traffic fatalities and zero serious injuries.

Guiding principles

The road safety strategy will be based on four guiding principles:

1. **Adopt a comprehensive Safe System Approach coupled with a public health perspective**

The road safety community will adopt a comprehensive Safe System Approach to road safety. Our collective actions will focus on all factors that contribute to protecting road users. This includes promoting safe road users, safe vehicles, safe roadways and safe speeds.

Our aim is to reduce the number of crashes that cause serious injury and to also design systems so that, even when crashes occur, they will not cause fatal or serious injury.

2. **Envision road safety as a collaborative effort with a focus on results**

A foundational principle of the strategy is to rely on collaboration. This approach entails efforts from all those involved in the road traffic system and in the prevention of fatalities and serious injuries. This requires strong leadership and coordination. We will encourage contributions from all partners, leverage capacity and capitalize on the broad range of partners' resources and expertise. Collectively, we will focus on results to achieve continual declines in road user fatalities and serious injuries.

3. **Sustain successful measures and focus on new areas that require attention**

Progress has already been made in the province thanks to successful initiatives already implemented, and we intend to sustain these initiatives. To further improve road safety, we also will focus on other new areas or issues that require attention. These areas and issues will be identified on an ongoing basis by analyzing motor vehicle crash trends and consulting with stakeholders.

4. **Encourage innovation and flexibility among partners**

To increase road safety, we will encourage new ideas and best practices. We will also remain flexible to allow for these new ideas to flourish.

Measuring success and reporting on progress

In alignment with Canada's Road Safety Strategy 2015, the British Columbia Road Safety Strategy will focus on continually declining year-to-year numbers of fatalities and serious injuries from road crashes. Specific initiatives

may also have specific targets such as the new approach to drinking and driving which included a target of a 35 percent decline in alcohol and drug motor vehicle related deaths by the end of 2013. Regardless, overall road safety performance will include the following:

- ◆ **Decreasing number of motor vehicle fatalities and serious injuries per 100,000 population per year.**
- ◆ **Decreasing number of motor vehicle fatalities and serious injuries per year.**

Achieving the British Columbia vision

Target key areas of concern, using the Safe System Approach

Together with partners, we will work to embrace the Safe System Approach and use a variety of tools and road crash countermeasures.

Implement a new governance structure for road safety

A new governance structure will set the ground for new collaboration and provide a structure to respond to the road safety problem. This structure is based on a review of best practices from around the world. It will bring accountability to road safety at the provincial level.

Enhance road safety research capacity in the province

Improved research and data will provide a better understanding of why traffic crashes happen and how death and serious injuries can be avoided. It will support operational decision-making and the development of legislation and policy.

Improve communication with British Columbians and partner agencies

We will increase dialogue with partners and British Columbians, use consultation when relevant, engage with special groups and use a variety of communication methods to ensure that information is widely exchanged among road users, road safety practitioners and decision makers.

Sustain and increase engagement with local communities and First Nations to encourage and support innovative road safety solutions at the local level

Municipalities, regional districts and local communities have always played a major role in initiating and making road safety improvements. Together with partners, we will work collaboratively with local governments, local organizations and First Nations to encourage and support the development of innovative and proven road safety solutions at the local level. We will monitor local road safety initiatives and showcase successful local pilot projects.

British Columbia will have the safest roads in North America and will work toward the ultimate goal of zero traffic fatalities and serious injuries.

TAKING ON THE ROAD SAFETY CHALLENGE

The British Columbia Road Safety Strategy was developed to align with Canada's Road Safety Strategy 2015.² The national strategy underscores the need for collaboration and cooperation to reduce fatalities and serious injuries on Canada's roadways. It stresses the importance of improving collaboration among all stakeholders, raising public awareness and commitment to road safety, enhancing enforcement and improving road safety research and evaluation. The national strategy provides jurisdictions with a framework of over 130 best practices (with more being added) to tackle all aspects of the road safety problem.

British Columbia's strategy is based on these best practices used throughout the world and will focus on the most pressing road safety problems facing our province. Its success will be achieved by mobilizing all stakeholders' and road users' capabilities to make our roads the safest in North America.

The strategy is about how all road safety partners will work together. It will guide us until 2015 and beyond by providing a framework and structure for action.

The making of the British Columbia Road Safety Strategy

The strategy is designed to reduce, then eliminate, the 350 fatalities and approximately 2,750 serious injuries that occur every year on British Columbia's public roads.³

The Office of the Superintendent of Motor Vehicles conducted several intensive discussions with key players in the sector and considered the input of five expert working groups who investigated specific issues, examined best practices and considered the scientific evidence behind the solutions proposed. These valuable contributions have been incorporated into this strategy and will continue to inform future decisions.

Two in-person meetings helped to identify key priorities, engage all partners, and create a common vision.

The work of the partners will continue for all British Columbians, as we are committed to take into account the needs of all those who use our roads.

SUSTAINABLE ROAD SAFETY

Within the current fiscal environment, all partners must work to improve road safety in ways that are sustainable and that make use of existing resources. Governments at all three levels, the Insurance Corporation of British Columbia, WorkSafeBC and non-profit groups,

already spend and invest in road safety. Additionally, many road safety interventions are low-cost, while others can be designed to be self-funding. This strategy is about delivering change in smart ways while leveraging the capacity of our collective efforts.

GUIDING PRINCIPLES

The British Columbia Road Safety Strategy is based on four underlying principles that guide the development of road crash countermeasures.

1. **Adopt a comprehensive Safe System Approach coupled with a public health perspective**
2. **Envision road safety as a collaborative effort with a focus on results**
3. **Sustain successful measures and focus on new areas that require attention**
4. **Encourage innovation and flexibility among partners**

Adopt a comprehensive Safe System Approach coupled with a public health perspective

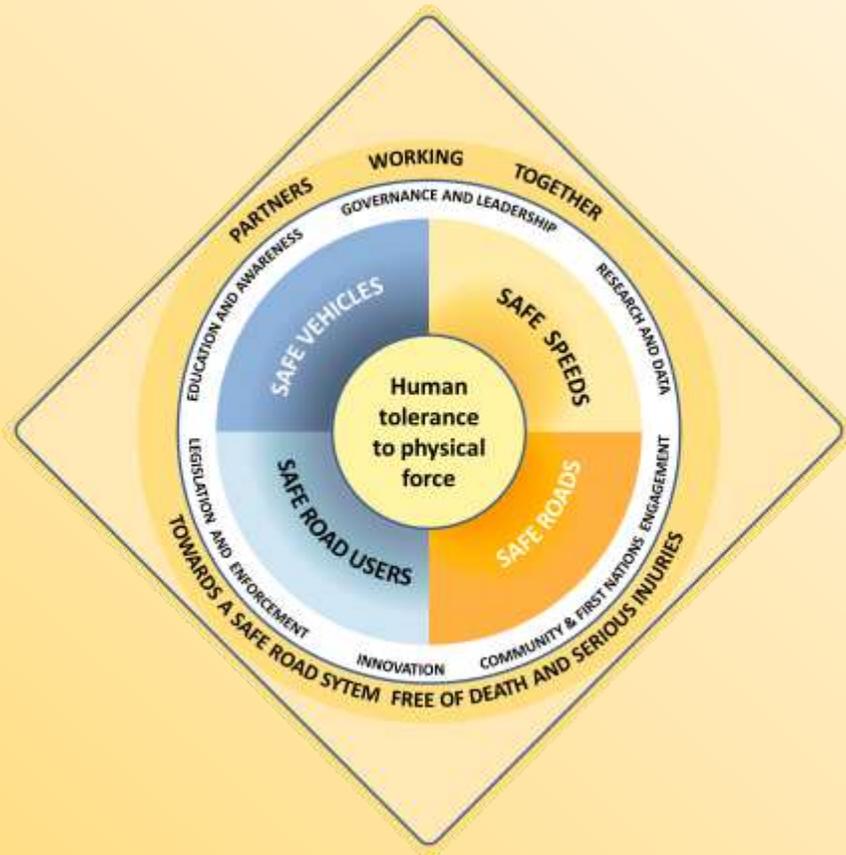
A key principle of this strategy is to move toward a comprehensive Safe System Approach to road safety, coupled with a public health perspective.

The Safe System Approach has been successfully adopted by the best performing road safety jurisdictions in the world. It is based on a comprehensive view of the combined factors involved in road safety and recognizes that, even with a focus on prevention, road crashes will still occur. Indeed, all crashes cannot be avoided: even the most responsible road users make mistakes. One error, one moment of inattention or one slightly delayed reaction, can result in a serious injury or fatality.

The Safe System Approach focusses both on preventing crashes from happening and on reducing the severity of human injuries when crashes occur.

Adopting a Safe System Approach acknowledges that all elements of the road system interact to create safe – or unsafe – situations. Road users, vehicles, roadways and travel speeds are all part of the solutions. To increase the safety of travel, it is essential to intervene on all fronts and to understand how their multiple components can crossover to create new and better levels of safety.

A public health perspective brings the combination of scientific and systematic approaches traditionally applied to problems of diseases and injury control. It allows for expanding the way in which road safety is approached, so that it does not remain the domain of any single group. This perspective encourages collaboration with the public health sector because this sector has an important role to play. For example, the health sector brings expertise in injury surveillance by collecting data on injury severity and characteristics, and it brings expertise in ways to prevent and reduce the severity of injuries. The public health perspective also encourages adopting a broad view of progress made across different areas of intervention.



A comprehensive Safe System Approach manages the road system to prevent crashes and minimize human trauma when crashes occur.

A safe road system includes

- **Safe road users (e.g., behaviours of drivers, pedestrians, cyclists, motorcyclists)**
- **Safe vehicles (e.g., cars, heavy vehicles, bicycles, motorcycles)**
- **Safe roadways (e.g., roads, signals, sidewalks)**
- **Safe speeds**

All stakeholders of the road system contribute through legislation, enforcement, collaboration, licencing programs, research, innovation and communication.

Based on these approaches, while striving to reduce the number of crashes, our collective efforts will also concentrate on understanding and designing a system that is more forgiving of human error and that reduces the impacts of crash forces on the human body.

Our aim is that, even if crashes occur, they will not cause fatal or serious injury.

Our collective actions will focus on all factors that contribute to protecting road users. This includes promoting safe behaviours, safe vehicles, safe roads and safe speeds.

Together we, all of the partners, will align our safety management decisions with broader transport and planning decisions to meet wider economic, human and environmental goals.

This combined approach will stimulate the development of innovative interventions and technologies, as well as the emergence of new partnerships aimed at increasing road safety in the province.

Envision road safety as a collaborative effort with a focus on results

A foundational principle of the strategy is to rely on collaboration.

The new approach entails efforts from all those involved in the road traffic system and in the prevention of injuries. This includes road and urban planners, government regulators, researchers, enforcement units, the health system, local communities and non-profit groups.

We will encourage contributions from all partners, leverage capacity and capitalize on the broad range of partners' resources and expertise. We are joining forces with key

groups and organizations that have an interest in road safety.

Collaboration may take many forms, and several successful experiences already exist to build upon. For example, one valuable partnership is the Capital Regional District's Traffic Safety Commission. This independent evidence-based multidisciplinary group brings regional partners together to co-ordinate road safety enforcement, education and prevention to reduce traffic fatalities, injuries and crashes in Greater Victoria.

Another example of successful collaboration is that of the 2012 roadside survey developed to help understand the prevalence of alcohol and drugs in British Columbia drivers. This survey, the seventh of its kind in British Columbia, was conducted thanks to the in-kind and financial contribution of provincial partners including the Office of the Superintendent of Motor Vehicles, the Insurance Corporation of British Columbia (ICBC), the Police Services Division, BCAA Road Safety Foundation⁴, Mothers Against Drunk Driving (MADD) Canada⁵ and Transport Canada. Finally, in the research area, another kind of successful collaboration was created: the early reporting of fatality data on an annual basis. This was made possible through a multi-party agreement between the Office of the Superintendent of Motor Vehicles, Police, ICBC and the BC Coroners Service. The agreement is aimed at speeding the process of collection, entry, reconciliation and reporting of fatality data.

Without collaboration, it will not be possible to truly implement a broad approach to road safety. Such a collaborative effort will require skilled leadership and coordination, as well as constant scanning of opportunities to be developed.

Each partner must accept and share responsibility for the safe conditions of road travel. In addition, road users have also to accept responsibility for complying with the rules and constraints attached to road travel in our province. Collectively, we will focus on results to achieve a continuous decreasing trend of fatalities and serious injuries, until we reach the ultimate goal of zero.

Sustain successful measures and focus on new areas that require attention

We must continue to do what works. This is fundamental for the British Columbia Road Safety Strategy. Thus, it is important to retain successful measures already in place and to continue building on their success.

For example, much progress has already been made from the introduction of Immediate Roadside Prohibitions to tackle drinking and driving, seatbelt legislation to reduce crash impacts on the human head and body, and changes to legislative penalties for excessive speeding and stunt-like driving. These measures and others will be sustained because they help save lives and reduce serious injuries. As well, we will continue to rely on multiple methods such as new legislation, traffic enforcement, road infrastructure adaptations, public information and efforts to improve the vehicle fleet.

However, to further improve road safety, we also must focus on other new areas or issues that require attention.

These areas and issues will be identified on an ongoing basis by analyzing motor vehicle crash trends and consulting with stakeholders. For example, today in British Columbia, we know

that vulnerable road users (pedestrians and cyclists) will need better protection while re-offending high-risk drivers with a pattern of dangerous driving behaviour will demand new responses. Partners also identified that collaboration should be organized in a formal way to be more effective, that road safety research should better support practitioners and decision makers, and that engagement with local communities and First Nations should be strengthened to find appropriate solutions in every area of the province.

Because the road safety problem can change, we will continuously monitor trends, evaluate interventions, identify needs and consult among partners to readjust the problem areas that require attention.

Encourage innovation and flexibility

To further improve road safety, it is important to encourage new ideas and new practices in our province. As well, it is essential to remain flexible to allow for these new ideas to flourish.

Technology has played an important part in traffic safety worldwide by contributing to enhanced vehicle and roadway safety, assisting with enforcement practices and augmenting research and communication capacity.

Innovation comes in many forms. We will remain cognizant of all the opportunities and, when necessary, we will continue to take innovative approaches to save lives and prevent serious injuries in the future.

MEASURING SUCCESS AND REPORTING ON PROGRESS

It is expected that all partners' collective efforts will lead to a continuing downward trend in both fatalities and serious injuries.

In alignment with Canada's Road Safety Strategy 2015,⁶ the British Columbia Road Safety Strategy does not include hard specific targets, but downward trending at the provincial level.

All partners will contribute to this downward trending in various ways and may wish to establish their own targets.

This downward trending will be determined both using rate-based measures and absolute numbers, as follows:

- ◆ **Decreasing number of fatalities and serious injuries per 100,000 inhabitants per year. This rate-based measure is typically used to compare jurisdictions among themselves.**
- ◆ **Decreasing number of fatalities and serious injuries per year. Absolute figures directly speak to the number of lives saved in British Columbia.**
- ◆ **Every year, the Office of the Superintendent of Motor Vehicles will report out on road safety in British Columbia.**

Serious injuries will be measured as those injuries requiring admission to hospital. If we are able to extend the past-decade downward trend, we are confident that we will become the leading jurisdiction in North America by the end of 2020.

Numerical measures such as fatality rates are one type of accountability tool that helps us understand progress made. However, other key information will be necessary to report on the implementation of the strategy.



Improving fatality and serious injury rates will require making progress on multiple fronts in complex environments where multiple factors interact.
Photo credit: Anna Vunder.

WHAT IS HAPPENING IN BRITISH COLUMBIA?



Vanderhoof, British Columbia. Photo credit: BC Ministry of Transportation and Infrastructure.

Population and driver demographics

- **Increasing population**
- **Increasingly diverse society**
- **Aging population**
- **Growth in passenger and freight traffic**
- **Smart growth in walking, bicycling and public transit**

British Columbia's population is projected to continue to increase, with the majority of the growth coming from international migration (three quarters), interprovincial migration (one-fifth) and natural births over deaths increases.⁷ Our population has increased by about 6% over the past five years, and the number of drivers has increased by a similar proportion within the same timeframe.

Our senior driving population also is expected to grow. In the next decade, the “young seniors” (65-74 year-old) are projected to increase by just over 200,000 (up 58%).⁸ By comparison, the overall British Columbia population is projected to increase by about 12% in the same time period.⁹ The increasing age of the British Columbia population is relevant to road safety policy in the coming years. Older drivers (over age 60) represent the fastest growing segment of the licenced drivers in British Columbia.¹⁰ Older drivers can be more physically fragile, and there are many age-

associated medical conditions which can affect driver fitness.

Smarter planning is on the rise in British Columbia's urban areas, with compact communities and more clean transportation such as walking, bicycling and public transport. Because these forms of getting around help reduce the total number of motor vehicles on the road, these changes are also likely to reduce the risk of being involved in a motor vehicle crash. It will be necessary to address the safety needs of these transportation modes which will help save lives in many areas of the province.

Registered vehicles

With an increasing population, growing urbanization and increasing demand for the transport of goods, it is not surprising to find escalating numbers of motor vehicles on British Columbia's roads. Since 2000, the fleet of all insured vehicles increased by 26%.¹¹

Passenger cars remain by far the main type of licensed vehicle in the province, followed by commercial vehicles.¹²

Both regular passenger vehicles and commercial vehicles are constantly increasing in numbers.

However, the number of commercial trailers, utility trailers and motorcycles are increasing at an even faster pace.

This changing nature of the vehicle fleet will require specific attention in many areas.

Motor vehicle fatality and hospitalization figures in British Columbia

The success of British Columbia’s efforts is reflected in the ongoing drop in the number of road casualties in recent years. The number of motor vehicle fatalities dropped substantially from 364 in 2010 to 291 in 2011. As well, the number of injuries requiring overnight hospitalization dropped from over 2,600 in 2010¹³ to below 2,400 in 2011.

These numbers are not merely statistics: they represent the potential suffering of real people in our province, as well as their families and friends.

Despite improvements made, too many people are still killed and seriously injured on British Columbia roads. If British Columbia’s figures were to remain at their 2011 level, another 2,910 persons would be killed, and almost 24,000 seriously injured¹⁴ in the next decade.

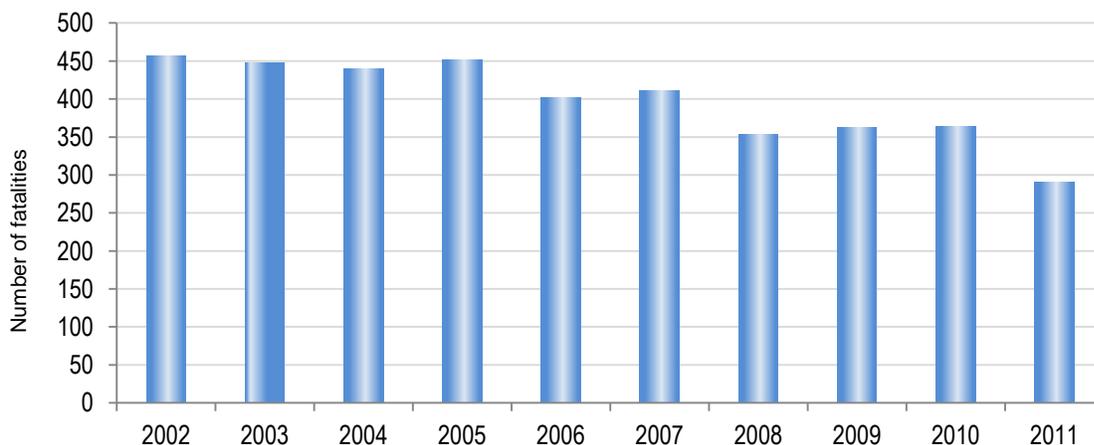
The regions of the province vary with respect to the numbers of traffic fatalities. Despite a relatively low population, the Southern Interior has the highest number of fatalities in the province. With partners, we will further

investigate how best to reduce the fatalities in this vast mountainous area.

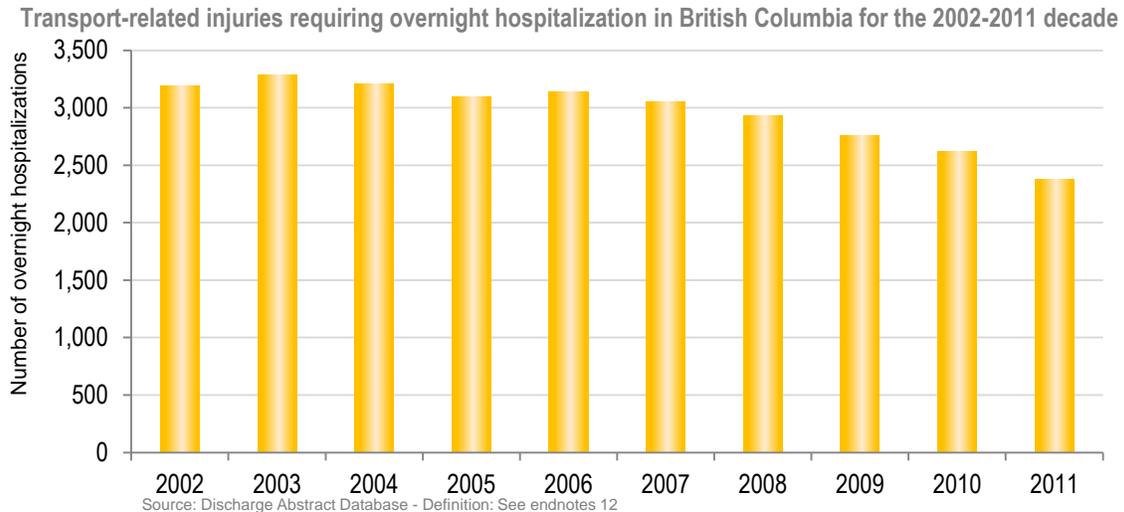
The average age of road crash victims is increasing. The proportion of fatal victims aged 46-to-75 increased from 31% in 2002 to 38% in 2011. Conversely, the proportion of younger fatal victims (16-45 year-old) decreased from 54% in 2002 to 44% in 2011. Additionally, the proportion of senior fatal victims (over 75) increased from 9% in 2002 to 13% in 2011. The trend is similar for injuries requiring overnight hospitalizations. Obviously, the increasing trend in fatalities and injuries requiring hospitalization for middle-aged and senior groups may reflect the bulge of the aging baby boomers. The decreasing proportion of casualties with young road users may reflect the shrinking size of the young generation, and may also come from education efforts and the Graduated Licensing Program.

Like much of the rest of North America, little progress has been made in reducing the number of pedestrians and cyclists killed or seriously injured on our roads. Most of the progress on road safety during the past decade has benefited vehicle occupants and not people outside of motor vehicles.

Motor vehicle fatalities in British Columbia for the 2002-2011 decade



Source: B.C. Traffic Accident System - Definitions: See endnote 14

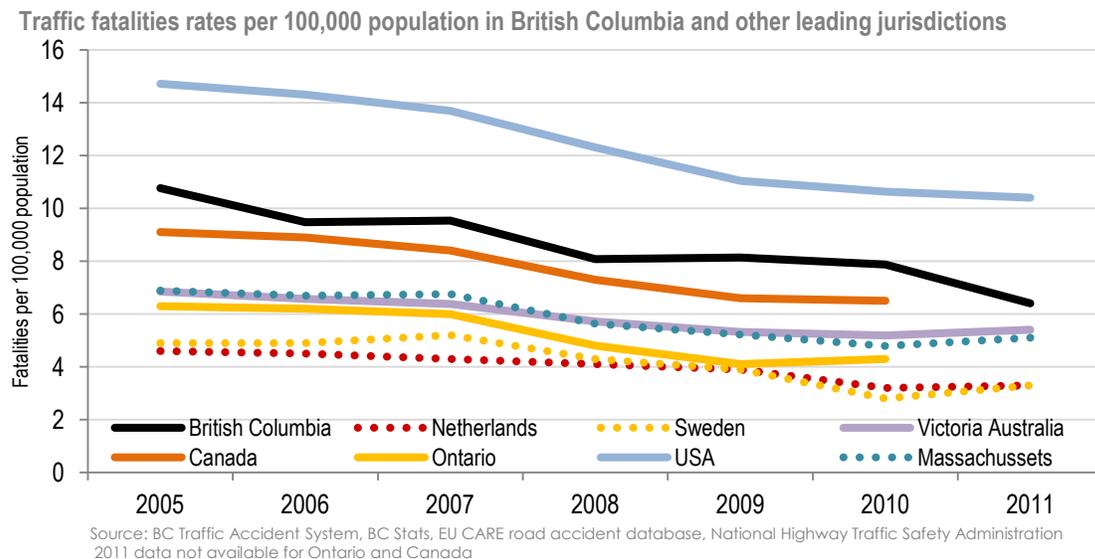


How does British Columbia compare internationally?

Despite recent success and an encouraging downward fatality¹⁵ trend, other leading North American and European jurisdictions have still fewer numbers of people killed when measured on the basis of fatalities per 100,000 persons in the population.

British Columbia's traffic fatality rate reached its lowest point at 6.4 per 100,000 population in 2011 and 2012 preliminary estimates are even lower, but more progress can be made. In 2011, our fatality rate was still double that of the

safest nations in the world (Netherlands, 3.3 and Sweden, 3.3). The most recent available numbers for all North American jurisdictions are from 2010. They show that, at this time, Ontario and Massachusetts were the safest jurisdictions with fatality rates in the 4-5 range. British Columbia's numbers for 2011 show a significant and encouraging decrease. But we must continue this trend to save more lives and reach our goal of becoming the best performer in North America.



Positive developments during the past decade

A detailed analysis of the fatality and hospitalization data highlights positive changes that have occurred despite the increasing traffic on our roads.

- ◆ Despite the overall increase in traffic, the annual fatality figure has decreased by 36% over the past decade.
- ◆ The prevalence of drinking and driving has declined in British Columbia since the implementation of the Immediate Roadside Prohibitions in September 2010.¹⁶ A roadside survey conducted in five locations in British Columbia shows that the percentage of drivers with blood alcohol content over 80 mg/dL decreased by 59% in 2012 compared to 2010; drivers with blood alcohol content of at least 50 mg/dL decreased by 44%. Compared to similar roadside surveys dating back to 1995, the levels of drinking and driving were the lowest ever recorded in British Columbia.
- ◆ The number of motor vehicle fatalities related to drinking and driving has dropped drastically. All analyses conducted on this topic converge to attribute this decline to the Immediate Roadside Prohibitions.^{17,18} An estimated 143 lives have been saved in the first 30 months of the program, a 51% decrease.
- ◆ Occupants of passenger cars and heavy vehicles (e.g., trucks, buses, combination units) benefitted from most of the road safety improvements over the past decade. They accounted for 65% of all fatalities in 2011, down from 83% a decade ago.

- ◆ 16-year-old drivers, in their learning year, are safer than they have ever been, thanks to the Graduated Licencing Program for new and young drivers.
- ◆ Intersections with safety cameras have become safer, with approximately a 6% reduction in crashes annually.¹⁹
- ◆ Investments in road improvement have resulted in reductions in severe incidents (serious injuries and fatalities).²⁰

Areas for further work and program evolution

Despite the progress made, much more remains to be done.

- ◆ Since 2002, there has been virtually no progress in achieving better injury and fatality outcomes for pedestrians and cyclists, who are among the most vulnerable and least protected types of road users. Today, pedestrians account for about 20% of all fatalities and 16% of injuries requiring overnight hospitalizations, with 57 deaths and over 430 overnight hospitalizations in 2011. These numbers have remained relatively stable during the past decade. In addition, pedestrians become more at risk the older they become.²¹ This is not surprising, given that seniors involved in motor vehicle crashes are more likely to be killed or have more severe injuries than younger people.
- ◆ Motorcyclists experienced just over 500 overnight hospitalizations in 2011, representing little change since 2002. Motorcycle fatalities have remained flat. The 2012 legislation on motorcycle helmets will help but more can be done. The

motorcyclist population, and its crash victims, are older than in the past. This means that road safety initiatives may have to adapt to target the changing demographics of riders.

- ◆ The Southern Interior remains by far the most deadly region of the province with about one-third of all motor vehicle related fatalities.
- ◆ The number of fatalities involving heavy vehicles has remained relatively constant during the past decade despite progress in reducing other passenger vehicle deaths. In the Southern Interior and Northern British Columbia, almost one-third of fatalities involved a heavy vehicle, compared to about one-fifth for the rest of the province.
- ◆ Motor vehicle incidents remain a leading cause of workplace fatalities and serious injuries. To reduce the frequency and severity of incidents involving workers, measures *need to be developed*.
- ◆ Dangerous behaviours still occur in the province despite recent progress. Many crashes are still caused by speeding drivers, drivers with an extensive history of repeat offending, distracted drivers, fatigued drivers and drivers under the influence of alcohol or drugs.

ACHIEVING THE BRITISH COLUMBIA VISION



Tumbler Ridge, British Columbia. Photo credit: BC Ministry of Transportation and Infrastructure.

1. THE SAFE SYSTEM: TARGETING KEY AREAS OF CONCERN

Considerable resources and efforts have already been put in place to improve road safety in British Columbia, but we have to constantly re-align our efforts to where they are most needed.

With the Safe System Approach as a guiding principle, we must target, in a collaborative manner, all aspects of travel, such as road user behaviours, vehicle safety, roadways safety and speeds.

As a road safety community, we will continually monitor where interventions are needed, and facilitate collaborative efforts required to achieve sustained improvements in road safety.

The following sections discuss specific potential targets identified from examining traffic statistics.

Safe road users



Traffic is complex and requires monitoring and intervening on multiple fronts. *Photo credit: Cecile Lacombe.*

All British Columbians share a responsibility to use the roads safely and with consideration for all other road users. Responsible road users comply with the rules of the road, pay attention to their environment and try to improve their own safety and that of others. They also act as role models by engaging in only safe behaviours when using the roads.

Reduce unsafe behaviours

Although most British Columbians are responsible road users most of the time, some still behave in ways that cause unsafe situations for others and themselves.

For example, speeding, drinking and driving, drug use and using a handheld electronic device while driving are just a few of the dangerous behaviours that can have tragic consequences.

To help road users with safe travel, British Columbia has developed a long history of public education coupled with traffic enforcement to target irresponsible behaviours known to cause fatal and serious injury crashes.

Public education raises awareness and will remain one strategy to help curb unsafe behaviours. Enforcement and effective sanctions are often necessary too.

Together, the road safety partners will adopt effective approaches for road users who create unsafe situations through irresponsible behaviours such as:

- **Drinking and driving;**
- **Drug use and driving;**
- **Using a hand-held electronic device while driving;**
- **Speeding;**
- **Driving in any manner that does not show care and consideration for others, such as running red lights and failing to yield to others.**

Target high-risk drivers and chronic offenders

Evidence shows that drivers with a history of violations on their driving record have a higher risk of being involved in a crash.^{22 23} Typically, high-risk drivers with a pattern of dangerous driving behaviour are identified by the police, through penalty points or Criminal Code convictions. The Driver Improvement Program is one program currently in place to identify and encourage such drivers to improve their driving behaviours. Under the program, these high-risk drivers receive driving prohibitions of various lengths ranging from 1 month to 24 months.

We will continue to monitor and address the risks posed by high-risk drivers with patterns of dangerous driving behaviour.

Protect vulnerable road users

Data show that some road user groups, such as pedestrians and cyclists, have benefited less from the previous road safety improvements.

Pedestrians and cyclists are not part of the motorized traffic flow and, unlike vehicle occupants, do not benefit from the traditional passive safety features of most cars (vehicle crumple zones, air bags and seat belts). Seniors

are more at risk of becoming pedestrian victims for a number of complex reasons including that they are more fragile than their younger counterparts, when subjected to equivalent amounts of moving crash energy.^{24 25}

Many measures exist to better protect pedestrians and cyclists including reduced vehicle speeds and separating pedestrians and cyclists from traffic flows through space and time.

Most serious pedestrian and cyclist crashes occur in urban areas. Municipalities are therefore best positioned to implement an array of solutions, such as limited right-hand turns on red lights, greater use of measures like pedestrian scrambles, leading pedestrian intervals and more advanced crosswalk designs. The Canadian Council of Motor Transport Administrators has recently produced a comprehensive report on the many countermeasures available to improve pedestrian safety.²⁶

Together with partners, we will support increased safety for vulnerable road users such as pedestrians and cyclists.



Many countermeasures help protect pedestrians. For example, Danish Offsets at the middle of a multilane crossing provide refuge for pedestrians and ensure they are facing the traffic before crossing the second half of the roadway. Danish Offset Crossing. Photo credit: David Coburn, Neil Arason.

Safe vehicles

Increasing the proportion of vehicles equipped with crash-avoidance and passive crash-protection features will significantly reduce crashes and the human trauma caused by crashes.

In 2003, the European Commission stated that if all cars were designed to be equal in standard to the best car currently available in each class, then an estimated 50 percent of all fatal and disabling injuries could be avoided.²⁷

The past several decades have seen significant progress towards protecting road users through better vehicle safety design. The development of innovative and lower cost technologies have reduced crashes (active safety) and also reduced the amount of moving force experienced by humans when things do go wrong (passive safety).

Today, all new vehicles available in Canada must be equipped with seatbelts, and many new vehicles have a growing number of both active and passive safety devices. Much of the impetus for the use of these safety devices and features come from the automobile sector's desire to achieve good safety ratings (e.g., five-star ratings) from crash testing programs such as the U.S. New Car Assessment Program (NCAP) and the Insurance Institute for Highway Safety (IIHS) crash testing program.

However, many more safety technologies exist, such as collision avoidance systems (including detection and auto-braking), improved vehicle designs and shapes, larger numbers of thorax air bags, side head curtains and countless numbers of other improved active and passive safety features. Today, safe vehicles not only protect vehicle occupants, but protect all road users – even those outside of motor vehicles.

To further improve the safety of the vehicle fleet across the province, government agencies, manufacturers, and consumers – both individual and corporate - must work together.

Together with the road safety partners, we will work to support an increased fleet of safe vehicles at the provincial and national levels.

This will include:

- **Working in partnership with corporate consumers, the automotive industry and researchers to assess and showcase the next generation of safety technologies with a view to creating future markets for the most effective of these technologies;**
- **Continuing to raise awareness of vehicle safety features, and in turn increasing consumer and organizational demand for such features across the province;**
- **Monitoring vehicle safety issues across the province and ensuring that our views on vehicle safety regulation are communicated to federal authorities responsible for motor vehicle regulation in Canada.**



Side head curtains and air bags to protect the thorax are examples of how vehicle technology helps protect the human head and body from blunt crash force.

Photo credit: caricos-daimler_2010_mercedes-benz_e-class_coupe_174 (2)

Safe roadways

Many of British Columbia's roads and highways were designed and built in the 1950s and 1960s, in accordance with the standards and road-building techniques of the day. Since then, much has changed. New research has emerged, and we know more today than we did in the past about both what causes crashes and what improves safety. Additionally, road design standards, construction methods and materials, automobile capabilities and driving attitudes have also contributed to a much different road environment.

Road crash countermeasures have been recognized as effective means to reduce the impact of crashes. Extensive evidence demonstrates their effectiveness, which is sometimes contingent on a combination with public education and enforcement.

For example, these road engineering measures include roundabouts, rumble strips, cable-barrier systems, red-light cameras, dedicated left-turn lanes and phases, reduced roadway cross-sections, traffic calming, bicycle lanes, bicycle boxes for cyclists, sidewalks, roadway lighting improvement, median refuge islands and pedestrian countdown timers.

Targeted improvements to road infrastructure will help to save the lives of British Columbians as well as reduce injuries to them.

Together with the road safety partners, we will work to improve roadways for all road users.

The possibilities are numerous and may include:

- Encouraging more emphasis on safety in project planning and continuous improvement, including municipal and regional planning, land use and neighborhood planning;
- Encouraging innovation in road design that increases safety like roundabouts or channelized traffic patterns;
- Encouraging better identification and improvement of crash-prone locations;
- Supporting the design of facilities for vulnerable road users including simple and low cost measures like pedestrian scrambles, leading pedestrian intervals and better crosswalks.

Safe speeds

Speed both increases the likelihood of a crash and increases the raw amount of kinetic energy released in a crash. Even small reductions in speed greatly reduce the likelihood of a crash and greatly reduce the likelihood of severe injury or death even when crashes occur. Research is conclusive that at higher speeds, more people are killed and injured in the traffic system. At lower speeds, fewer are killed and injured as a direct result of the safety buffer that lowered speeds create. Therefore, speed management is a critical part of a Safe System Approach.

Results from crash investigations involving pedestrians and cars show massive differences in survival rates based on speed differences. When the impact speed rises from 30 km/h to 50 km/h this increases the fatality risk to a pedestrian by five to eight times.^{28 29}

The design of our roads and the use of simple and low-cost measures can ensure that drivers follow the correct speed.³⁰

Many roadway measures and design considerations exist such as traffic calming, the use of gateways and visual cues and, of course, more effective ways of enforcing the speed limit.

Irresponsible speeding requires an effective enforcement and penalty scheme.

Education is also key to inform road users about the consequences of driving too fast.

Finally, innovative vehicle technologies are becoming available to help drivers maintain a safe speed. The innovations include adaptive cruise controls that adjust vehicle speed to maintain safe following distance from vehicles ahead and speed-alert systems that use cameras to read speed limit information and remind drivers of the current speed limit. New heads-up displays can also show the current speed to the

driver much more vividly than a small and standard odometer.

Together with road safety partners, we will encourage greater adherence to speed limits across the province. This will include:

- Promoting greater compliance with speed limits;
- Encouraging vehicle-speed management technologies;
- Educating drivers.



Reducing traffic on local roads and appropriate speeds reduce injuries and deaths. Photo credit: [www.pedbikeimages.org/Dan Burden](http://www.pedbikeimages.org/)

2. ROAD SAFETY GOVERNANCE

Partnership

At the outset, the implementation of a strategy that adopts a Safe System Approach must begin with a governance structure that reflects a shared responsibility within the road safety community.

The British Columbia Road Safety Strategy will be managed in partnership with organizations, partners and stakeholders, communities, experts and policy makers.

Leadership: The steering committee

Effective leadership is vital to move the provincial plan forward and coordinate efforts in a multi-sectoral environment.

A key feature of British Columbia's road safety framework is the creation of a Provincial Road Safety Steering Committee.

This committee will be made up of the Superintendent of Motor Vehicles, Assistant Deputy Ministers from ministries with responsibilities in road safety and representatives from crown entities with road safety roles like the Insurance Corporation of British Columbia.

This steering committee will meet regularly to review priorities and progress. The committee will be supported and advised by people who have expertise in road safety.

Coordination

Our desired improvements will only be achieved through coordination and collaboration with the

many partners and stakeholders operating in the road safety sector.

Effective coordination is fundamental to good governance. It will be supported by a high level of commitment from the road safety community.

The Office of the Superintendent of Motor Vehicles will coordinate five road safety standing committees and an annual meeting of provincial road safety partners and stakeholders.

The coordination role will include facilitating and promoting collaboration within the road safety community. The coordination role will also include continuously encouraging engagement with citizens to ensure that they remain informed about the road safety activities in the province.

Collaboration: The standing committees

According to leading experts on road safety management, a good road safety governance structure encompasses an interdisciplinary organizational structure formed through a coalition of road safety partners and stakeholders that allocates responsibilities to specific groups or individuals who must work together to maximize safety.³¹

Collaboration among the various disciplines and structures is necessary to optimize the interdisciplinary implementation of the Road Safety Strategy.

Five standing committees, comprised of government and non-government stakeholders and experts, will be established in the following areas:

- Safe road users;
- Safe vehicles;
- Safe roads and communities;
- Research and data;
- Education and awareness.

These committees will promote collaboration within the sector and continuously identify priorities, suggest solutions, provide expertise and support the implementation of crash countermeasures.

The chairs of the five committees will be part of an expert group that will support the Road Safety Steering Committee.

Depending on their focus, the committees will have representation from government, advocacy groups, local communities, scientific community, enforcement, health, non-profit, education and industry sectors.

Engagement: An annual assembly of road safety partners and stakeholders

Partners and stakeholders play an essential role in reducing the amount of human trauma produced by the road system. It will be essential to support exchange among all the members of the road safety community, to gather their input and inform them on a regular basis.

An annual assembly will meet to maximize collaboration and knowledge transfer.

The assembly will be a vehicle for all partners to learn from each other, connect with one another, share knowledge, work collaboratively and report on progress.

Systemic Approach to Road Safety: Connecting and Leveraging the Broader Road Safety Community



3. RESEARCH AND BUSINESS INTELLIGENCE TO SUPPORT DECISIONS AND ACTION

Research capacity

Data and research are essential to build evidence about road traffic fatalities and injuries. Data and research are also crucial for assessing risk factors, for developing and evaluating interventions and for providing information to policy and decision makers. Furthermore, researchers with an interest in road safety contribute to raising awareness across their communities, students and the larger population. The World Health Organization recommends that policy decisions for effective road injury prevention should be based on data and objective information.³²

Not surprisingly, the safest jurisdictions in the world extensively use research and data, and collaborate to share their results internationally.

British Columbia has solid research capacity in academia, government and partner agencies, and we can strengthen and increase this capacity through greater collaboration.

Research collaborations

In British Columbia today, government and academic road safety researchers have started to intensify research collaborations. However, collaboration is generally limited to specific projects.

There is currently no formal structure to identify and coordinate road safety research priorities province-wide. As well, no structured

mechanism exists to assist with leveraging capacity and resources for road safety research and to facilitate knowledge transfer to practitioners and decision makers in British Columbia.

Because the major Canadian research funding agencies increasingly favour projects involving partnerships, a lack of coordinated and collaborative road safety research in the province can limit access to these research funds.

These problems call for better coordination of and support to road safety research in British Columbia.

British Columbia road safety research partners, which include government research units, universities and other research specialists, will pursue cooperation and collaboration.

The partners will:

- Facilitate road safety research that encompasses all aspects of the Safe System Approach, with a focus on provincial issues and using data collected in British Columbia;
- Foster collaboration with knowledge users such as road safety practitioners and provide them with ongoing support;
- Facilitate active knowledge transfer using methods such as project collaborations, meetings and scientific publications;
- Facilitate collaboration with and learning from national and international road safety

- researchers to bring best practices from other jurisdictions to British Columbia;
- Identify research priorities and opportunities at the province-wide level and advise on knowledge transfer events.

Business Intelligence and analytical processes

The collection and analysis of data related to traffic crashes should be continually improved to ensure the ongoing development of innovative and effective road crash countermeasures.

Among the things to take into consideration are data quality and timeliness because they are essential to deliver valid results. Too often data definitions or analytical processes remain unclear, and this affects the quality of the analyses and leads to inconsistency in the communication of key statistics and results.

In the coming years, data collection tools and analytical processes will be enhanced to report research outcomes in a timely and open manner:

- **A new Road Safety Systems Initiative is currently being developed. This is a long-term project that will allow electronic collection of violation tickets and traffic collision data. The initiative supports research needs and timely reporting to the public and local communities.**
- **Data quality and analytical procedures will be improved for serious injuries and geo-location of traffic accidents because these areas have been identified as deficient.**
- **Data definitions and reporting procedures will constantly be enhanced and rendered consistent among stakeholders and researchers.**

- **Research projects that evaluate the outcome of road safety programs and initiatives will be fostered.**

Data sharing

Because road safety spans many disciplines, multiple organizations collect useful data. For example, when a crash occurs, the police collect traffic accident data, BC Ambulance collects data on treatment and transportation to hospital of those injured individuals, and the Ministry of Health collects data about patient hospitalizations.

The various datasets available in the province are rich in information but, taken in isolation, they provide only a partial understanding of the many complex and inter-related dimensions of the safe system.

To achieve a comprehensive understanding at the province-wide level or to examine specific issues in-depth, linking data from various sources is often essential. This process is recommended by the World Health Organization to achieve more accurate reporting on road safety.³³

However, accomplishing this is often a technically complex and time consuming process that also requires strict security measures to protect privacy.

Consequently, public bodies that collect data often are limited to analyzing their own datasets, in isolation. As well, academic researchers whose research funds are tied to research feasibility and reasonable timelines often choose to use readily accessible data. This is understandable, but we can continue to evolve and improve as we work to augment knowledge of important road safety issues.

In the coming years, capacity for data sharing and linkages will be enhanced between different agencies to increase understanding of road user behaviours, traffic crashes and injury outcomes.

- Research partners will work with data administrators to create a dictionary of datasets relevant to road safety.
- Data sharing projects will be facilitated when relevant.
- Research partners will explore solutions to facilitate usage of linked data for the benefit of road safety research.



Data collection for the 2012 Roadside Alcohol and Drug survey. Surveyors interview participating drivers who choose to participate and provide a breath test for alcohol and a saliva sample for certain drugs. *Photo credit: Doug Beirness, Erin Beasley.*

4. RAISING PUBLIC AWARENESS AND COMMITMENT TO ROAD SAFETY

Improving communication with British Columbians and partner agencies

Raising public awareness and commitment to road safety requires sustained efforts to produce good results. To do so, effective communication with road users, local communities and road practitioners is essential.

Communication is a two-way process. Indeed, it is only by focussing attention on dialogue, by listening to and working with British Columbians and partner agencies, that we can achieve commitment from everyone.

Road users must be offered accurate and timely information so that they can play their part in a system, in which each person behaves responsibly and in accordance with the road rules. In return, road safety practitioners and decision makers need information about the road users' and community's expectation so they can design and implement appropriate solutions.

This dialogue is an ongoing common effort aimed at saving lives and reducing serious injuries in our province.

Communication and dialogue will be enhanced to raise public awareness and commitment to road safety.

Public consultation and engagement

Many British Columbians will have ideas on how they could contribute to implementing the new British Columbia Road Safety Strategy, and on what the primary road safety issues are for them.

As the implementation of the British Columbia Road Safety Strategy moves forward, different levels of engagement with the public may be appropriate, from delivering information about the content of the strategy to reaching out for constructive ideas. With strong support from stakeholders and a well-informed public, the successful implementation of a provincial strategy will gain support.

Regular communication and updates will keep the public engaged and provide opportunities for community leaders to represent their constituents.

In some cases, engagement with road users will be critical to identify priority concerns and hear their input. Engagement will also be considered, when necessary, because it contributes to education, helps raise awareness of road safety issues, allows input into appropriate solutions or crash countermeasures and helps identify barriers that may get in the way of a safe road system.

Speaking with one consistent voice

Together, we aim at coordinating communication to become more efficient at sharing the language of the Safe System Approach.

Improved coordination of road safety campaigns among partners could reduce overlap and duplication of effort, maximize efficiencies and ensure that the voices of all partners are heard. Consistent language would contribute in the public receiving a strong and clear message.

Together with partners, we will work to harmonize road safety communication across the province and improve the effectiveness of messages and campaigns.

This will include:

- **Identifying and sharing communication plans, needs and suggestions;**
- **Facilitating message consistency among the partners while respecting their different mandates;**
- **Encouraging all willing partners to leverage and share their communication networks and tools to further raise communication effectiveness.**

Engaging specific groups

Mobilizing together to achieve better road safety outcomes requires constant and renewed efforts.

Communication with the general public will remain a priority. However, communication will also be crafted to meet the needs of specific groups.

For example, youth tend to take more risks on the road. Evidence and theory-based education

and communications can empower them to adopt safe behaviours. Mature drivers, road users in rural areas and professional drivers are also groups that would benefit from targeted communication tailored to engage them and meet their specific needs.

Communication Methods

The crash countermeasures introduced by government will be much more effective if they are largely supported and accepted by British Columbians. Because multiple approaches and methods of communication are available, these should be adapted to targeted groups and regional characteristics.

Road safety public education and communication has evolved. For example, the province increased the road safety information available on the web and developed its presence in social media through Twitter using the @RoadSafetyBC, @TranBC, and @ICBC twitter accounts, as well as through YouTube and other social media channels. Dialogues with local communities, researchers and seniors groups have been initiated.

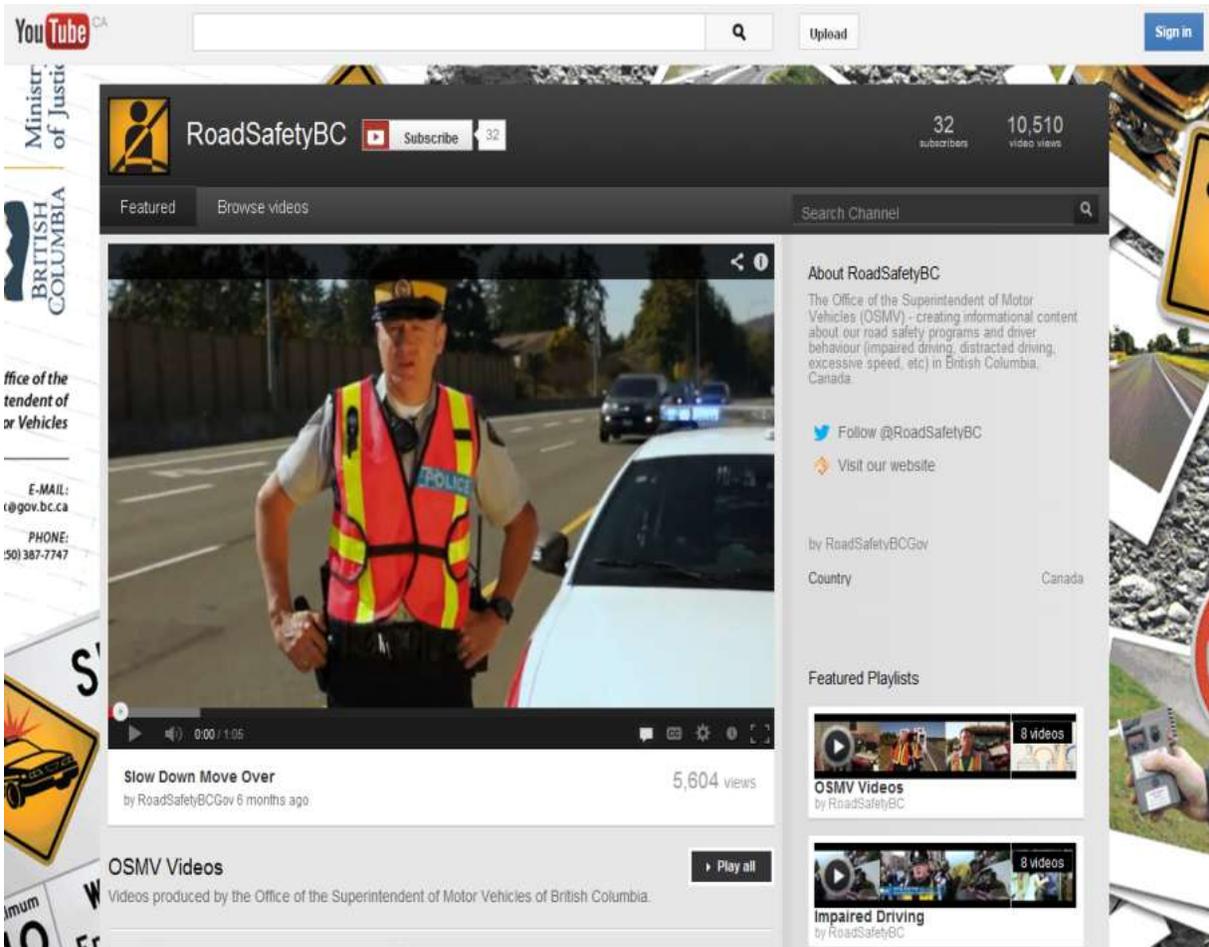
We must ensure that all channels of communication are opened to allow for the highest quality dialogue.

Together with partners, we will use a variety of communication channels to ensure that information is widely exchanged among road users, road safety practitioners and decision makers.

This will include:

- **Facilitating and encouraging communication from third parties such as the non-profit sector that has traditionally played an important role in promoting the**

- importance of road safety across the province;
- Using and facilitating face-to-face discussions among road safety practitioners and specific road user groups such as senior drivers;
- Continuing to use traditional mass media that are well-suited for the general public information province-wide;
- Enhancing the use of social media because they are well suited for quick updates and two-way dialogue.



Example of one of the multiple communication methods: Road safety information available on social media. Photo credit: @RoadSafetyBC <http://www.youtube.com/user/RoadSafetyBCGov>

5. ENGAGING AND SUPPORTING LOCAL COMMUNITIES AND FIRST NATIONS

The need to engage communities

Road safety affects all of us, in each region of the province. Municipalities and regional districts have always played a major role in initiating road safety improvements at the local level.

In this effort, local governments regularly collaborate with local non-profit organizations. For example, these organizations may coordinate local awareness campaigns, help to educate children about road safety and support victims of traffic crashes and their families.

Recent discussions with local governments show that road safety is a high priority issue for them.

However, the lack of strategic planning across regional and municipal borders may cause inconsistent road safety solutions. Numerous engineering and traffic control measures exist that could be implemented across municipalities. Some of these measures are extremely low-cost and effective, yet they remain currently under-utilized. Programs such as the ICBC *Safer Roads Program* have traditionally provided funding and expertise to help invest in local road safety improvements.³⁴

Numerous opportunities exist to support local governments in their efforts to provide a safe system. For example, smart modes of transportation are increasingly considered at the international level. These smart modes of

transportation include walking, cycling and public transport. By reducing private car use, these other travel modes reduce the motor vehicle crash rate, encourage healthy physical activity, and reduce greenhouse gas emissions and our carbon footprint.

To find the most appropriate solutions for each area of the province, we have already begun to strengthen collaboration with local governments, local organizations and First Nations.

As a road safety community, we will sustain and increase our engagement with local governments, local organizations and First Nations to encourage and support innovative road safety solutions at the local level.

This will include:

- **Offering a forum for sharing information about successful and innovative road safety practices and interventions by local communities;**
- **Providing continued support to local government road safety officials through sharing business intelligence, tools, data and providing advice;**
- **Identifying local communities that are willing to try new and innovative road safety practices;**
- **Working towards increasing the ability of local governments, local communities and First Nations to implement initiatives and improve road safety at the local level;**
- **Identifying local road safety champions to help increase commitment in communities;**

- Ensuring that all areas of the province have a chance to express their concerns and ideas, including urban and rural areas, Northern British Columbia and the Southern Interior.

Encouragement, motivation and innovation

To find solutions that fit with local needs and resources, it is essential to understand how each municipality and regional district operates, and what local solutions are successful. These solutions could then be expanded to other areas of the province.

As well, a deep understanding of the road safety challenges and resources of local communities is essential.

For example, in the fall of 2012, the City of Vancouver adopted its new transportation plan³⁵ with a goal of “moving towards zero traffic-related fatalities”. The city will work with its partners “to examine the location and

contributing factors of any collision resulting in death and identify appropriate steps to take in response”. Vancouver is well placed for innovation.

Another example is the City of Surrey where a local road safety plan is under development and where there is an intention to share its experience with other communities.

By facilitating the sharing of local experience across the province, we will encourage local communities to innovate and make the kind of changes that will bring better results.

Local road safety initiatives will be monitored and local pilot projects will be showcased when they demonstrate measurable positive outcomes.

This will include:

- Facilitating open data so that communities can assess their road safety performance and needs;
- Supporting the transfer of road safety knowledge across local communities.



Photo credit: Anna Vunder

CONCLUDING REMARKS

Road safety is a fundamental public safety issue that affects all of us. Traffic injuries and deaths are a human-made problem with human-made solutions and, as such, the British Columbia Road Safety Strategy sets in motion changes that will make our province a better place and position our province as a North American leader in road safety.

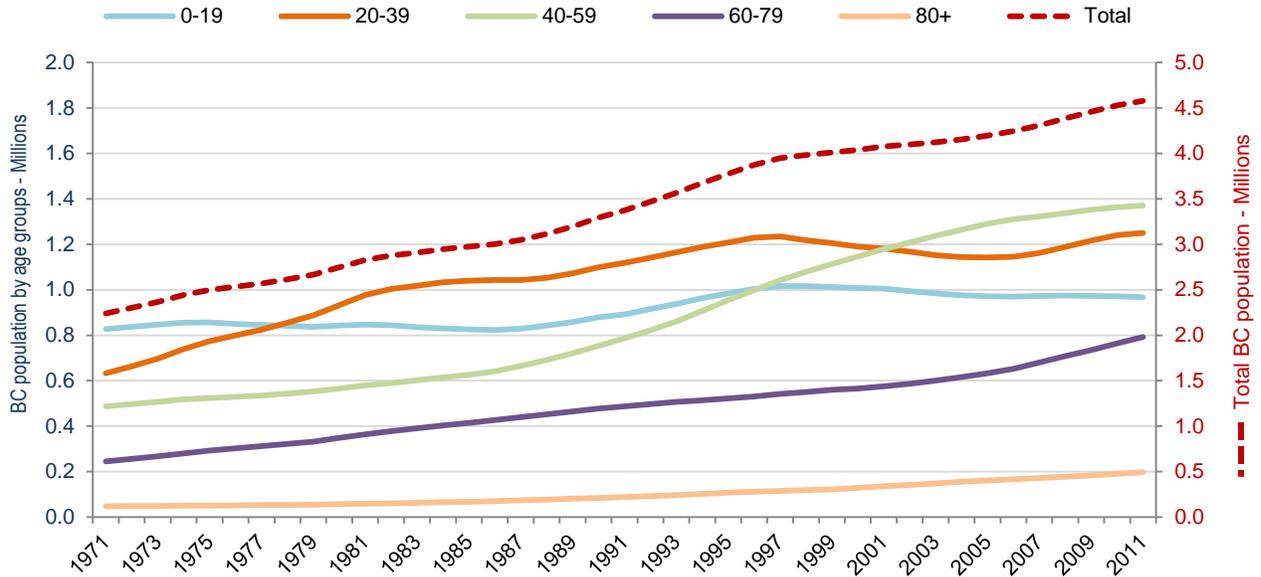
Together, government ministries, the insurance sector, crown entities, the health

sector, law enforcement agencies, non-profit organizations, road safety groups and academic researchers will combine their capabilities to implement the British Columbia Road Safety Strategy.

Our vision is that British Columbia will have the safest roads in North America and will work toward the ultimate goal of zero traffic fatalities and zero traffic serious injuries.

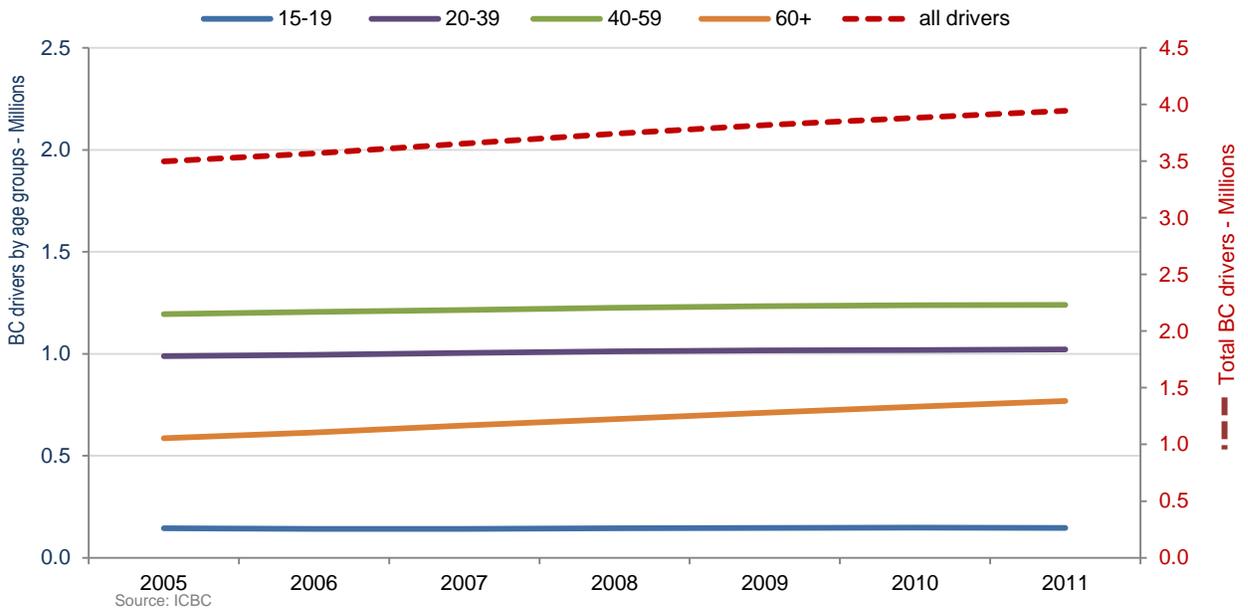
STATISTICAL TRENDS

British Columbia population trends by age groups. 1971 to 2011



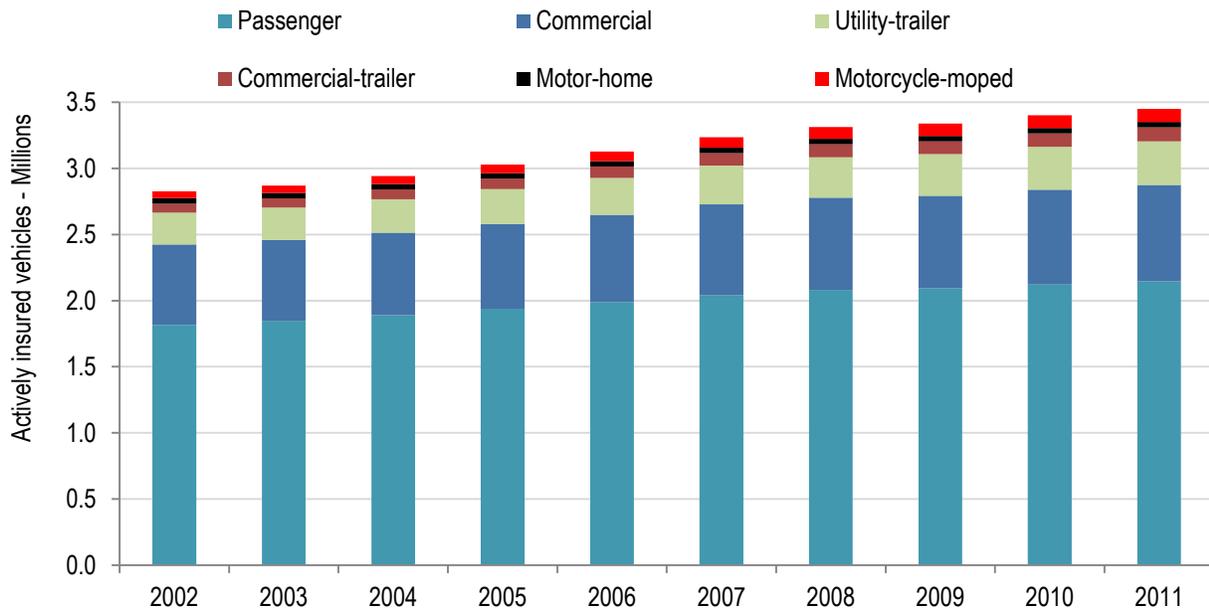
Source: BC Stats

British Columbia driver trends by age groups. 2005 to 2011



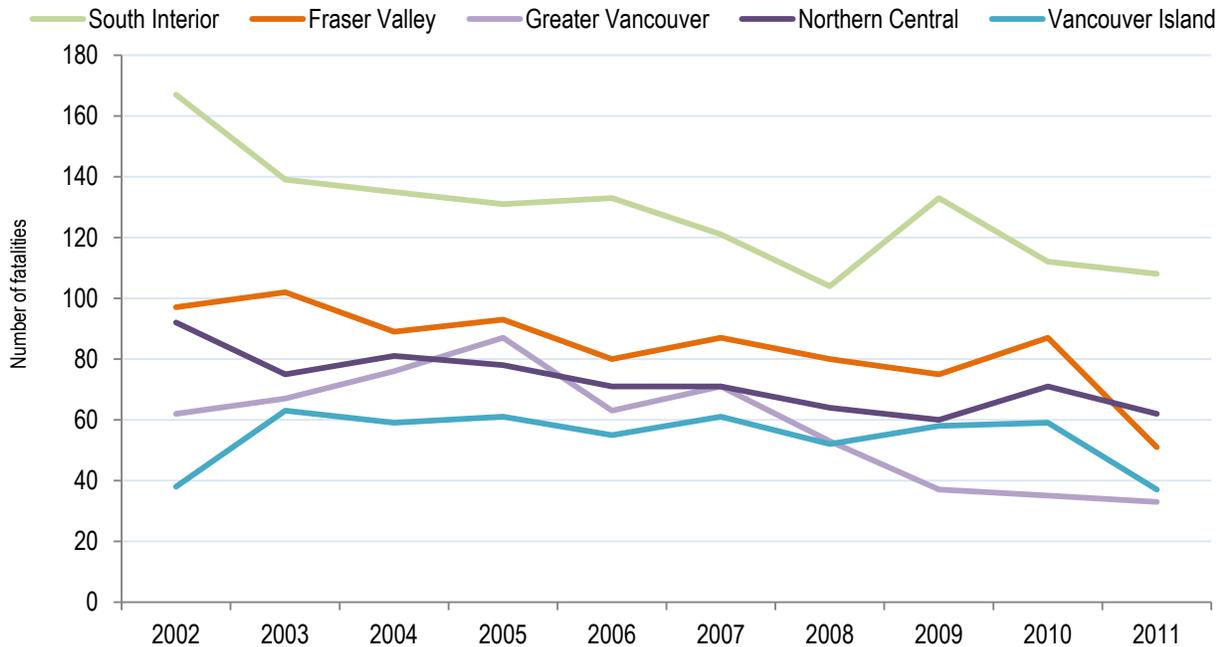
Source: ICBC

Actively insured vehicles in British Columbia by vehicle type for the 2002-2011 decade



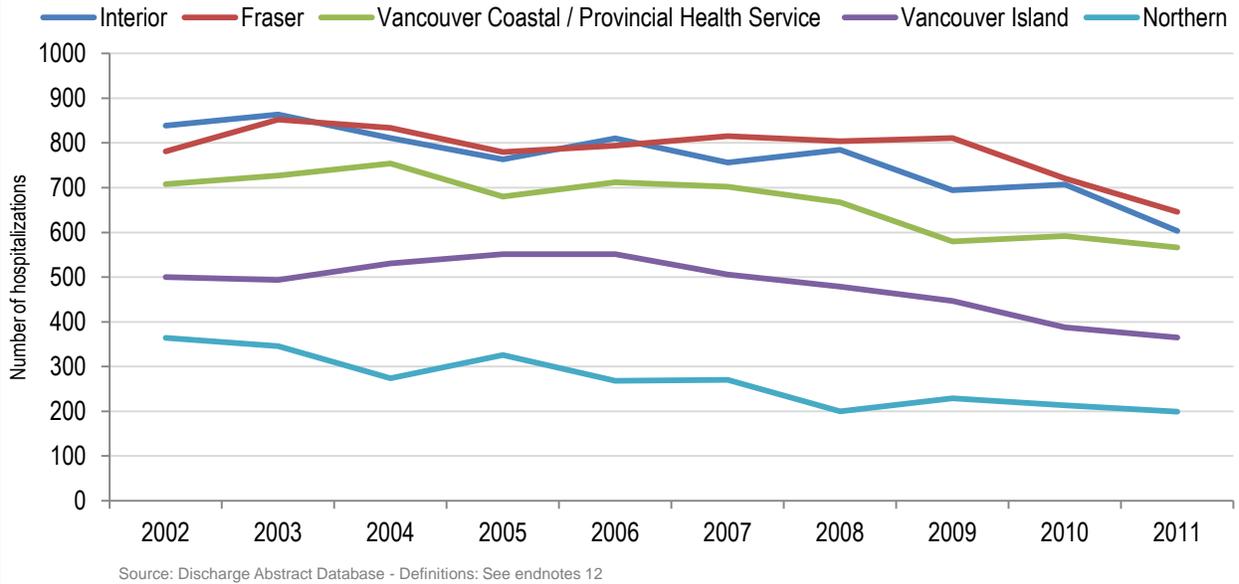
Source: ICBC
As of Aug. 31st of each year

Motor vehicle fatalities in British Columbia by region for the 2002-2011 decade

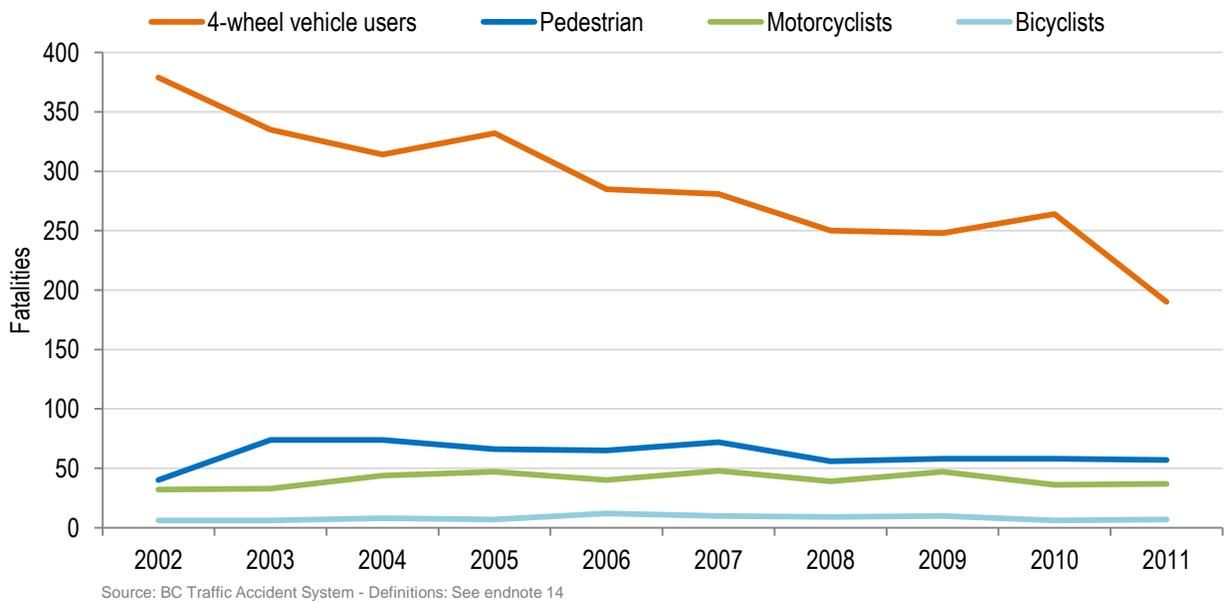


Source: BC Traffic Accident System - Definitions: See endnote 14

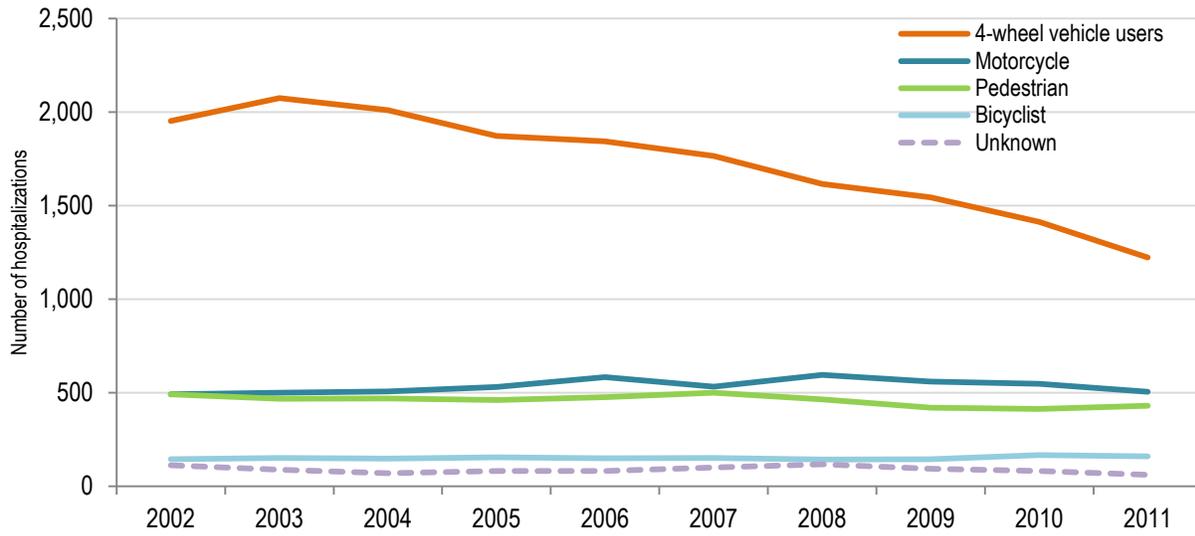
Transport-related injuries requiring overnight hospitalization in British Columbia by Health Authority for the 2002-2011 decade



Fatalities by road user type for the 2002-2011 decade

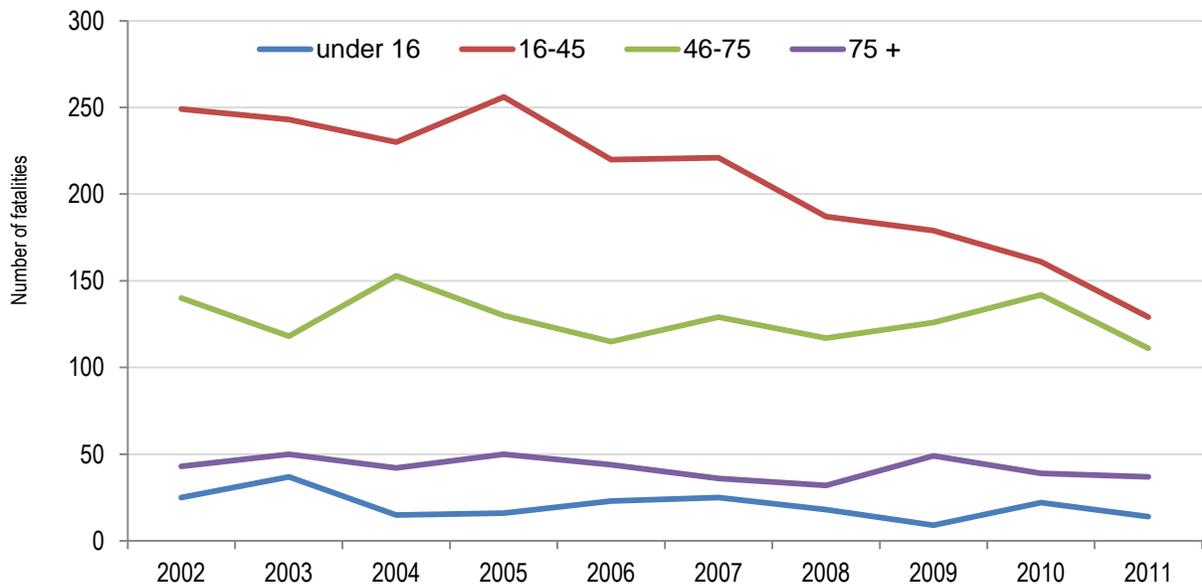


Transport-related injuries requiring overnight hospitalization in British Columbia by user type for the 2002-2011 decade



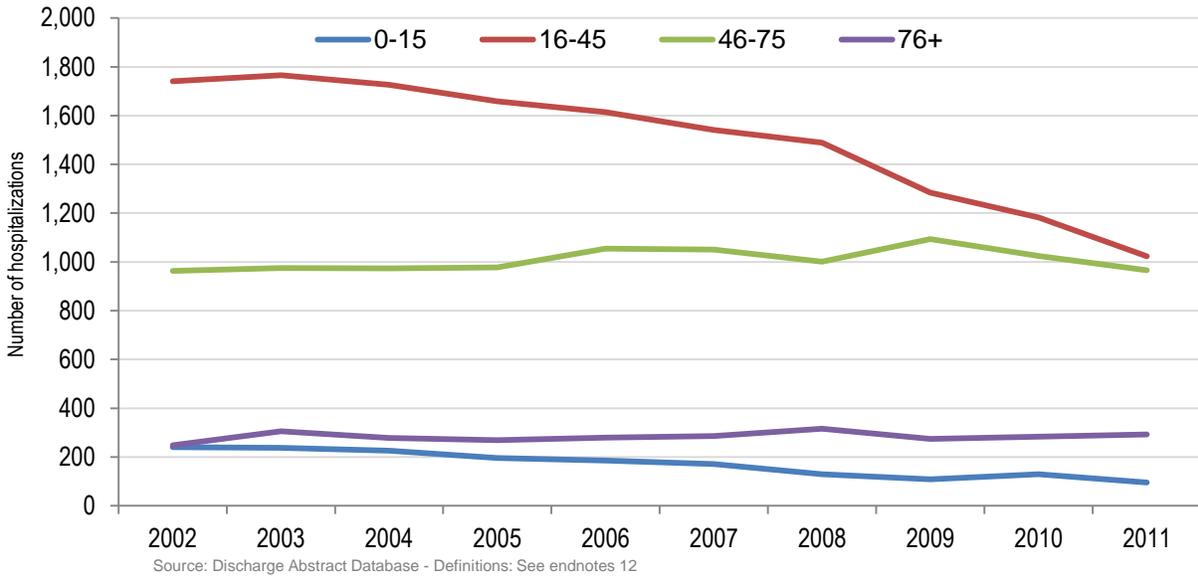
Source: Discharge Abstract Database - Definition: See endnotes 12

Motor vehicle fatalities in British Columbia by age groups for the 2002-2011 decade



Source: BC Traffic Accident System - Definitions: See endnote 14

Transport-related injuries requiring overnight hospitalization in British Columbia by age groups for the 2002-2011 decade



ENDNOTES

¹ Canadian Council of Motor Transport Administrators (2011). *Canada's Road Safety Strategy 2015*. Retrieved from <http://www.ccmta.ca/crss-2015/>

² Ibid

³ These averages are based on the five-year period 2007-2011 using Traffic Accident System (TAS) data for fatalities and hospitalization data from the Discharge Abstract Database (DAD) for serious injuries.

⁴ British Columbia Automobile Association. Road Safety Foundation.

<http://www.bcaaroadsafety.com/>

⁵ Mothers Against Drunk Drivers.

<http://www.madd.ca/madd2/>

⁶ Canadian Council of Motor Transport Administrators (2011). *Canada's Road Safety Strategy 2015*. Retrieved from <http://www.ccmta.ca/crss-2015/>

⁷ BC Statistics (2011). *Overview of the BC and regional population projections 2011 to 2036*. Retrieved from <http://www.bcstats.gov.bc.ca/Publications/AnalyticalReports.aspx>

⁸ Ibid

⁹ BC statistics (2012). *British Columbia population projections 2012-2036*. Retrieved from <http://www.bcstats.gov.bc.ca/StatisticsBySubject/Demography/PopulationProjections.aspx>

¹⁰ Source ICBC. Active Drivers by Age from 2005 to 2011, as of December 31st of each year. Data retrieved April 2012.

¹¹ Data retrieved February 2012 from ICBC Business Information Warehouse. Based on the number of all actively insured vehicles, as of August 31st of each year.

¹² Data retrieved February 2012 from ICBC Business Information Warehouse. Based on the number of all

actively insured vehicles, by vehicle type, as of August 31st of each year.

¹³ Transport-related injuries requiring overnight hospitalization: Data extracted November 2012 from the Discharge Abstract Database. Hospital stays involving at least one night (day hospitalization excluded). Hospitalizations with fatality outcomes not included (reported in the fatality tables). Based on the admission year. To account for the number of injuries, when a patient was hospitalized more than once during a fiscal year (e.g., transfer to another hospital), only the first admission was counted. Includes all transport injuries with a "road motor vehicle" (excludes non-road motor vehicles such as trains, planes and boats). Does not distinguish between injuries occurring on public and non-public roads (e.g., forest roads). "3-wheel vehicle occupants" were excluded (mainly recreational vehicles used on private roads).

¹⁴ See above definition

¹⁵ Fatalities: Data extracted June 2012 from the Traffic Accident System. A fatality refers to a road user who died within 30 days after an injury sustained in a collision involving at least one motor vehicle on a 'highway' as defined in the Motor Vehicle Act (largely any public roadway). The Motor Vehicle Act does not apply to forest-service roads, industrial roads and private driveways. Fatal victims of off-road snowmobile accidents, homicides or suicides are excluded from the counts.

¹⁶ Beirness, D. and Beasley, E. (2012). *Alcohol and drug use among drivers following the introduction of Immediate Roadside Prohibitions in British Columbia: Findings from the 2012 roadside survey*. Retrieved from Ministry of Justice website:

<http://www.pssg.gov.bc.ca/osmv/data/index.htm>

¹⁷ Macdonald, S., Zhao, J., Martin, G., Brubacher, J., Stockwell, T., Arason, N., Steinmetz, S., & Chan, H. (2013). The impact on alcohol-related collisions of the partial decriminalization of impaired driving in

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¹⁸ Beirness, D., & Beasley, E. (2012) *Alcohol and drug use among drivers following the introduction of Immediate Roadside Prohibitions in British Columbia: Findings from the 2012 roadside survey*. Retrieved from Ministry of Justice website:

<http://www.pssg.gov.bc.ca/osmv/data/index.htm>

¹⁹ Ministry of Justice, Policing and Security Programs Branch (2012). *British Columbia road safety traffic enforcement. 2011 annual report*. Retrieved from:

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²⁰ Sayed, T., & De Leur, P. (2009). *Program evaluation report. Road improvement program*. Report for the Insurance Corporation of British Columbia. Retrieved from:

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²² Lui, K.J., & Marchbanks, P.A. (1990). A study of the time between previous traffic infractions and fatal automobile crashes, 1984–1986. *Journal of Safety Research*, 21, 45-51.

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