IMPAIRED DRIVING COALITION OF CANADA

A best practices toolkit for **Empowering communities to tackle impaired driving**

Prevention. Education. Data. Technology.

TRAFFIC INJURY RESEARCH FOUNDATION

Acknowledgement

In 2022, TIRF partnered with Diageo North America to establish the Impaired Driving Coalition of Canada which is comprised of 23 organizations committed to preventing impaired driving.

Desjardins
Toronto Police Service
Ottawa Police Service
Ontario Provincial Police
North Bay Police Service
Victoria Police Department
Smart Start Canada
Manitoba Public Insurance
Canadian Automobile Association
Windsor Regional Hospital
Ford Canada
Private Motor Truck Council
Spirits Canada
Canada Safety Council
Canadian Telecommunications Association
Beer Canada
arrive alive DRIVE SOBER
MADD Canada
Alcohol Countermeasures Systems
Saskatchewan Government Insurance
Safer Roads Alliance
CARSP Young Professionals' Committee
Ontario Injury Prevention Practitioners Network
TIRF Youth Advisor Program (TIRF YAP)

About the IDCC Toolkit

The Impaired Driving Coalition of Canada (IDCC) created a National Action Plan to address identified gaps. It targeted four key areas for action:

- **Prevention:** Using local data to guide local initiatives.
- **Education:** Helping communities develop customized local educational messaging.
- **Data:** Identifying and compiling current, local sources of impaired driving data to inspire action.
- **Technology:** Exploring the role of technologies in preventing impaired driving.

The outputs from each of these focus areas were designed to empower communities and provide direction to tackle impaired driving.

What is the IDDC Impaired Driving Toolkit?

The Toolkit contains a series of user-friendly tools which provide guidance and can support local impaired driving prevention initiatives. It combines the latest knowledge with templates and examples of some new approaches used by communities to reduce impaired driving at the local level.

Tools include a fact sheet & infographic focused on young impaired drivers, guidance and templates to establish a Fatal Collision Review Committee, and effective strategies to deliver social media prevention messaging to raise awareness. It also includes the novel use of GIS mapping tools to identify where impaired driving incidents are occurring in a community and build community awareness and engagement along with an overview of alcohol ignition interlock programs. These resources are available in English and French:

- IDCC Alcohol, Other Drugs & Driving: Know the Facts
  - Conduite sous l'emprise de l'alcool et d'autres drogues : Connaître les faits
- Are you impaired? Alcohol & Cannabis | Zero is the safe choice
  - Vos facultés sont-elles affaiblies? Alcool et Cannabis | Le choix sûr : zéro
- Fatal Collision Review Committee Overview
  - Aperçu du Comité d'examen des collisions mortelles
- 10-step Guide to Form a Fatal Collision Review Committee
  - Guide en 10 étapes pour la création d'un comité d'examen des collisions mortelles
- Using Social Media to Strengthen Initiatives
  - Se servir des médias sociaux pour renforcer les initiatives
- Using Technology to Increase Community Awareness About Impaired Driving
  - Faire appel à la technologie pour sensibiliser les collectivités à la conduite avec facultés affaiblies
- Strategies to Strengthen Alcohol Interlock Programs in Canada
  - Stratégies de renforcement des programmes d'antidémarreurs avec éthylomètre au Canada

Who can use the Toolkit?

The Toolkit is freely available to community organizations and groups concerned about impaired driving issues in their communities, and that are interested in the latest research and what other communities are doing to address the issue. .

Who funded the development of the Toolkit?

The work of the Impaired Driving Coalition of Canada and Toolkit produced by them was funded by Diageo North America. Diageo is a global leader in beverage alcohol with an outstanding collection of brands including Johnnie Walker, Crown Royal, Bulleit and Buchanan's whiskies, Smirnoff, Cîroc and Ketel One vodkas, Casamigos, DeLeon and Don Julio tequilas, Captain Morgan, Baileys, Tanqueray and Guinness.

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For more information about Diageo, their people, brands, and performance, visit www.diageo.com. Visit Diageo's global responsible drinking resource, www.DRINKiQ.com, for information, initiatives, and ways to share best practice.

TIRF's Sober Smart Driving education program shares knowledge and science to answer common questions about alcohol, its effects on driving skills, and impaired driving. It contains facts to help Canadians learn about the risks associated with drinking and driving and encourages everyone to speak up and talk about why they choose not to drink and drive.

Find downloadable posters and PSAs to share:

sobersmartdriving.tirf.ca/posters-psas

Impaired Driving Coalition of Canada

Alcohol, Other Drugs & Driving
Know the Facts

Traffic Injury Research Foundation, September 2023

Alcohol, Other Drugs & Driving: Know the Facts

Obtaining a driver's licence is often a source of excitement and celebration because it brings independence. But a driver's licence does not make you invincible in a collision.

Road crashes are a leading source of death for young people. Young drivers are 5-10 times more likely to be fatally injured than any other age group (Reniers et al., 2016). Generally, they overestimate their driving skills and abilities, while underestimating the risks and hazards in different road environments.

From an early age, males take more risks than females because young males are less likely to believe they will be hurt. Males are also more likely to believe injuries are a result of bad luck instead of impulsive behaviours (Bukis, Lenne, & Fiztharris, 2015).

Most of all, young males underestimate the risks associated with certain behaviours, such as consuming alcohol and drugs other than alcohol[1], and using their phone while driving (Reniers et al., 2016).

Why do people drive impaired?

Many people cannot accurately gauge their level of impairment and ability to drive after drinking or consuming cannabis. This is because they tend to focus on impairment in physical movements, such as staggering or swaying instead of impairment in thinking such as unclear thinking, poor decision-making and inability to focus on a task or anticipate risks which are common factors in alcohol-related crashes (Sober Smart Driving, 2020). Many drivers do not recognize the impairing effects of alcohol on driving or the risk they pose to themselves and other drivers on the road.

In addition, people mistakenly believe they are okay to drive when they stop drinking and begin to feel better. But in truth they are still impaired, and their level of impairment continues to rise after their last drink even though they may not feel that different. Similarly, people also over-estimate their ability to perform tasks as impairment begins to decline and this is because they feel less impaired than they did

Many drivers do not recognize the impairing effects of alcohol on driving or the risk they pose to themselves and other drivers on the road.

previously, however, they still are not sober. A 2007 study found impairment was most evident as blood alcohol concentrations (BACs) were rising, but heavy drinkers perceived themselves to be less impaired than light drinkers (Brumback, Cao, & King, 2007). Further, many drinkers inaccurately estimate their intoxication, specifically persons who drink more and have higher BACs tend to underestimate their BAC on average (Brown et al., 2016; Cameron et al., 2018).

Research also shows women will drive impaired due to personal safety concerns. Their perceptions of safety can discourage them from relying on public transportation, using ride-sharing or ride-sourcing alternatives, or accepting rides from persons they do not know well (Robertson & Ireland, 2016).

How does alcohol affect driving skills?

Alcohol is absorbed into the bloodstream as it is consumed, circulating through the body to the brain. As the level of alcohol in the blood increases, so do the impairing effects. Initial effects of alcohol which can occur following one drink include sleepiness and relaxation which impairs judgement but is often unnoticed by the drinker. These effects result in unclear thinking or assessment of situations, poor decisions and being more likely to engage in behaviours or take risks which would typically be avoided. Small amounts of alcohol also affect muscle control, slow reaction times, and decrease motor coordination. Vision can also be affected due to the small muscles in the eye being very susceptible to the effects of alcohol.

As the amount of alcohol consumed increases, impairing effects become more obvious. After one standard drink (.02 BAC), drivers typically have difficulty performing divided attention tasks such as driving and anticipating hazards. Three standard drinks (.05 BAC) make it more challenging to steer and track other vehicles. After four drinks (.08 BAC), drivers have difficulty controlling speed and have trouble concentrating on a task. Problems staying within a lane and slower braking are common after four standard drinks (BAC .10).

BAC	Typical effects	Predictable effects on driving
.02	> Some loss of judgement > Relaxation > Altered mood	> Difficulty performing divided attention tasks such as driving and anticipating hazards > Decline in visual function
.05	> Exaggerated behaviour > Loss of small muscle control > Impaired judgement > Lowered alertness	> Reduced coordination > Difficulty steering and tracking other vehicles > Reduced response to emergency situations
.08	> Muscle coordination becomes poor > Harder to detect danger > Judgment, self-control, reasoning and memory are impaired	> Difficulty controlling speed > Reduced concentration > Impaired perception
.10	> Clear deterioration of reaction time and control > Poor coordination > Slowed thinking	> Difficulty staying in lane > Difficulty braking > Slow reaction time
.15	> Major loss of balance	> Blurred vision

Sources: Steer Clear of Impairment (TIRF, https://tirf.ca/download/dwi_steer_clear_impairment_infographic_dwiwg2018); Saskatchewan Driver's Handbook (SGI, https://sgi.sk.ca/handbook/-/knowledge_base/drivers/introduction)

How does cannabis affect driving skills?

Cannabis can reduce situational awareness and make it harder to focus on a complex task such as driving. This means the ability to anticipate or recognize hazards and react to them can be slower. It can also cause paranoia, drowsiness, and distorted perceptions of time and distance, resulting in disorientation and driving errors.

Research investigating the effects of cannabis on driving skills shows it can specifically impair certain skills necessary for safe driving (Hartman et al., 2012; Compton 2017; Battistella et al., 2013; Alvarez et al., 2021), such as:

- maintaining a consistent speed
- keeping the vehicle centred in the lane
- quick reaction times
- ability to divide attention between visual, manual and cognitive driving tasks
- staying focused on the driving task
- planning a route to drive
- making decisions behind the wheel to respond to a changing road environment
- avoiding risk-taking

Other research reviewing cannabis-related behavioural studies (Malhotra, Starkey, & Charlton, 2017) showed cannabis was associated with reckless driving and speeding, signalling errors, and decreased ability to visually track objects (i.e., the ability to visually follow a moving object) on the road.

Does cannabis affect people in the same way?

Since cannabis is absorbed in fat tissue, the time it takes for the body to absorb, circulate, and eliminate it varies. Several factors affect this process including how the drug is consumed, how frequently it is used, the amount of THC[2] in it, how quickly the body absorbs it when smoked or vaporized, and individual characteristics of users (such as age, sex, fatigue). Not only do these factors affect the amount of cannabis ingested and metabolized, but they also affect the level of behavioural impairment that users experience (Lyon & Robertson, 2020).

Is the level of impairment affected by how cannabis is consumed?

Unlike alcohol, the impairing effects of cannabis vary depending on how it is consumed. THC levels in the blood can vary widely based on whether cannabis is smoked versus consumed as oil or edibles. They can also vary depending on the potency of the product and individual biological characteristics (Compton, 2017). This means impairing effects can vary according to specific types of cannabis products consumed and individual biology.

- **Smoking or vaping.** Cannabis smoke or vapour delivers THC (the chemical that produces impairment) into your lungs where it passes directly into your bloodstream and then your brain. When inhaling cannabis, users feel the effects within a few seconds to a few minutes of inhaling and full effects can peak in about 30 minutes. The effects can last up to 6 hours after use and some residual effects can last up to 24 hours (CCSA, 2019).

- **Eating or drinking.** Cannabis edibles pass through the stomach, then the liver before reaching the bloodstream and brain. The liver changes THC into a stronger form and this form combined with the THC from the original product adds to the intensity of the high. This may be part of the reason edibles with greater amounts of THC can feel more intoxicating than other cannabis products, even if the dose consumed is the same. When ingesting cannabis, users feel the effects from 30 minutes to 2 hours after consuming it and full effects can peak within 4 hours. The effects can last up to 12 hours after use and some residual effects can last up to 24 hours (CCSA, 2019).

How does combining cannabis and alcohol affect driving skills?

When drivers combine cannabis and alcohol the impairing effect on brain function is far greater than the impairing effect of just one or the other. Consuming both alcohol and cannabis produces impairing effects that are additive. The way each drug impairs driving does not completely overlap, meaning the combined use results in a greater level of impairment even at low doses of alcohol. For example, while a breath test result would only indicate the level of alcohol consumed, mixing it with cannabis results in much greater impairment of the central nervous system which would be equivalent to a much higher alcohol level. Aside from cannabis, the combination of alcohol with other drugs, both illegal and prescribed medications, can increase impairment. Combining drugs and alcohol can produce a multiplying effect and it has an unpredictable effect on driving.

Number of drinks	Combined with	Equivalent to number of drinks
2	Cannabis (1 joint)	= 5 to 6
2	Antihistamine (cold remedy)	= 4 to 5
2	Tranquilizer (Valium, normal dose)	= approximately 6
2	Gravol	= approximately 6

Source: Saskatchewan Driver's Handbook (SGI, https://sgi.sk.ca/handbook/-/knowledge_base/drivers/introduction)

How many teens and young adult drivers die in road crashes involving alcohol & drugs?

Alcohol and drugs are common in fatal road crashes involving drivers under 35 years old. According to TIRF's National Fatality Database (Brown et al., 2023), between 2016 and 2020:

- More than 1 in 4 (or 26%) young drivers aged 16-19 years killed in road crashes tested positive for alcohol.
- More than 2 in 5 (or 42%) young drivers aged 20-24 years killed in road crashes tested positive for alcohol.
- Even larger percentages of young drivers killed in road crashes tested positive for drugs, with cannabis being the most common drug detected.
- Approximately half (48%) of young drivers aged 16-19 years killed in road crashes tested positive for drugs and 38% tested positive for cannabis post-legalization.
- More than half (55%) of drivers aged 20-24 years killed in road crashes tested positive for drugs and 41% tested positive for cannabis post-legalization.

Why is it important for passengers to speak up if the driver is impaired?

Passengers of a driver who has consumed alcohol and/or drugs are equally at risk for injury or death. Almost one in five persons (18.5%) killed in alcohol-related crashes in Canada in 2016 was a passenger (TIRF, 2020). The 2020 Canadian Cannabis Survey (Health Canada, 2021) asked Canadians if they had been a passenger in a vehicle driven by someone within two hours of using cannabis. Overall, 23% of people reported having ever been a passenger in a vehicle driven by someone who had recently used cannabis. Provincial and territorial estimates of ever being a passenger in a vehicle driven by someone who had used cannabis within two hours of driving ranged from 18% to 38% (Health Canada, 2021).

Just like drivers, passengers consuming alcohol or drugs can also be impaired. This can result in passengers making poor decisions and taking risks they would otherwise avoid. For example, they may fail to recognize how much the driver has consumed, or simply be unconcerned about the risk of riding with them. This speaks to the importance of planning ahead and making arrangements if you plan to consume alcohol or drugs. Several safe ride programs provide free or low-cost rides to alcohol-impaired passengers. These programs are intended to reduce alcohol-related driving, crashes and casualties and offer people a safe option to get home. Generally, these programs are community-based in response to an immediate need to overcome limited transportation options and reduce impaired driving (Barrett et al., 2017).

As a passenger, your life is in a driver's hands. While speaking up is not easy and can be scary, it can be necessary to protect yourself and others. If you believe a driver cannot drive safely or poses a risk to others on the road, it is okay to refuse a ride from them and speak up to discourage them from driving.

Is it possible for police to detect cannabis and other drugs?

Yes. If a police officer observes a driver weaving, drifting, failing to comply with traffic signals or displaying reckless or aggressive driving (e.g., speeding, failing to stop at stop signs or traffic lights, following too close to other cars, etc.) or similar behaviours, they can stop a driver and conduct an impaired driving investigation. During the investigation, officers may observe additional signs of impairment during their interaction with a driver (e.g., slurred speech, inability to follow directions, poor motor coordination and odour of alcohol and/or drugs). This evidence permits them to demand drivers to exit their vehicle and submit to further testing which may include Standardized Field Sobriety Tests (SFSTs) and/or a demand for a bodily fluid sample as well as an examination by a Drug Recognition Expert.

What is Mandatory Alcohol Screening (MAS) in Canada?

In December 2018 changes to the Criminal Code of Canada removed reasonable suspicion as a requirement to request a driver provide an alcohol breath test. This enables police to demand a breath test from any driver, even without suspicion or cause. Under common or provincial law, this would only be done after the person has been lawfully stopped. MAS is a proven traffic safety measure designed to deter and better detect alcohol-impaired drivers (Government of Canada, 2021).

What are the consequences of impaired driving for new drivers?

Administrative consequences. New drivers in a Graduated Driver Licensing (GDL) program must have no alcohol in their blood when driving until they are 21 years of age. Administrative consequences include a licence suspension, although the length of the suspension varies by province and territory, and vehicle seizure, again length of time varies by province and territory (CCSA, 2020).

The consequences of an impaired driving conviction are more significant for new drivers. In many jurisdictions across Canada, young impaired drivers are frequently subject to the same traditional penalties that are applied to adult offenders (e.g., fines, probation, community service, treatment, and incarceration).

- **Licence suspensions.** Youth convicted of impaired driving are subject to some licence suspension and any related remedial programming. For example, youth convicted in Ontario are required to successfully complete the Back on Track program as a condition of licence reinstatement.
- **Fines.** In Canada, when a youth is sentenced to pay a fine, they are required to pay a specific amount to the court that does not exceed $1,000. In general, fines for traffic offences among youth are typically $500. These fines do not include other costs associated with being charged, such as a licence reinstatement fee which can cost upwards of $200 depending upon the jurisdiction.
- **Probation.** Compulsory conditions of probation include keeping the peace and appearing in court when required to do so. A judge may impose additional conditions such as a curfew, requiring a youth to report to a probation officer and abstain from alcohol or drugs. The average length of a probation order is ten to 12 months.
- **Community service.** A judge has discretion to impose a community service order of up to 240 hours with a maximum completion term of 12 months. These orders are often overseen by community organizations, such as the John Howard Society, that have youth attendance/ intervention centres which provide structured and supervised programming.
- **Removal.** After three convictions or condition violations, novice licences are cancelled, any existing fees paid or credit earned for experience are forfeited and drivers must re-apply as a new driver.

What is serotonin syndrome and is it affected by cannabis and alcohol?

Serotonin is a neurotransmitter, meaning it helps relay messages between different regions of the brain. Serotonin syndrome can occur when starting to take a new drug (whether prescribed or otherwise) or the dose of a certain medication is increased. It is most often caused by combining medications that contain serotonin (i.e., migraine medication and an antidepressant) (Mayo Clinic, 2020). Cannabis (such as edible) with a high CBD concentration can increase the level of serotonin and when combined with an antidepressant, for example, can lead to serotonin syndrome. Alcohol can also increase serotonin levels temporarily, which raises the odds of serotonin syndrome.

Serotonin syndrome symptoms usually occur within several hours of taking a new drug or increasing the dose of a drug you're already taking. Symptoms of serotonin syndrome include (Mayo Clinic, 2020):

- confusion
- agitation or restlessness
- loss of muscle coordination
- headache
- muscle rigidity
- rapid heart rate
- dilated pupils

These symptoms are in addition to any impairment of alcohol and cannabis. Like when cannabis and alcohol are combined, serotonin syndrome will produce an additive effect, deepening the level of impairment.

How can you prevent alcohol and cannabis-impaired driving?

It is important to understand the risks and consequences of impaired driving and recognize that an impaired driver is not an option for a safe ride home. Planning for a safe ride home should happen prior to drinking alcohol or cannabis consumption because the impairing effects can result in poor decision-making. Speaking up can be difficult, but if you believe a driver cannot drive safely it is okay to refuse a ride from them and discourage them from driving.

[1]Alcohol is a drug and is the most commonly used substance. Specifically, alcohol is a Psychotropic Central Nervous System (CNS) Depressant. Being a "psychotropic" drug means alcohol has an impact on cognition, emotions, and perception. Alcohol shares this designation with many other well-known drugs, such as Marijuana, Cocaine, and LSD (CAMH, 2023).

[2]The primary psychoactive component of cannabis is delta-9-tetrahydrocannabinol, commonly known as THC. THC and its psychoactive metabolite, 11-hydroxy-THC or 11-OH-THC, and primary inactive metabolite, 11-nor-9-carboxyTHC or THC-COOH are frequently measured in biological fluids to document cannabis intake.

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TRAFFIC INJURY RESEARCH FOUNDATION

The vision of the Traffic Injury Research Foundation (TIRF) is to ensure people using roads make it home safely every day by eliminating road deaths, serious injuries and their social costs. TIRF's mission is to be the knowledge source for safe road users and a world leader in research, program and policy development, evaluation, and knowledge transfer. TIRF is a registered charity and depends on grants, awards, and donations to provide services for the public. Visit **tirf.ca**.

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IMPAIRED DRIVING COALITION OF CANADA

TIRF & Diageo North America formed the IDCC to tackle impaired driving in Canada.

DIAGEO

Impaired Driving Coalition of Canada

Using Technology to Increase Community Awareness About Impaired Driving

Traffic Injury Research Foundation, December 2023

Impaired driving remains one of the top contributing factors to road deaths and injuries across the country. In fact, 391 people were killed in a road crash in Canada involving a drinking driver in 2021 (excluding British Columbia). New technologies have resulted in some unique tools which can help community-based organizations and partners increase awareness about the prevalence of impaired driving at a local level. In particular, visual tools are an effective approach to help communities understand the current magnitude of the problem. One such technology involves the use of dynamic Geographic Information System (GIS) mapping of locations where impaired drivers are caught or collisions have occurred.

Are there really that many impaired drivers on our roads?

According to TIRF's 2022 Road Safety Monitor, one in ten drivers admitted to driving after drinking when they thought they were over the legal limit in the past 12 months. In the same year, police services across Canada reported 57,221 alcohol-impaired driving incidents, which equals a rate of 147 incidents per 100,000 population.

In addition, 2021 data from the Ontario Student Drug Use and Health Survey (OSDUHS) showed slightly more than one in ten youth (11.8%) were a passenger in a vehicle with a drinking driver in the past year. Equally concerning, slightly less than one in ten youth (8.8%) youth were a passenger in a vehicle when the driver had used drugs in the past year.

In other words, the likelihood of people drinking and driving on the roads in your community is very real. Many people underestimate the frequency of impaired driving on our roads, and it can happen in any community and at any time.

How can I increase awareness about the frequency of impaired driving in my community?

Some of the ways you can educate the public on the prevalence of impaired driving are:

- Create news releases or social media posts to share monthly statistics if they are available.
- Utilize Report Impaired Driver signage, if 911 calling is available in your community, to remind drivers to report drivers they suspect may be impaired.
- Use interactive mapping to create a visual image of impaired driving incidents.

What is GIS mapping?

GIS mapping is a system that connects incident data to a specific location which can then be used to develop a map of incidents in a given geographic area. GIS mapping tools allow users to interpret the data more easily through a visual representation rather than reading the raw data in a spreadsheet format such as Excel. These maps which can be created with the tool are dynamic with different categories and layers of information. Depending on what communities would like a map to show, users can choose layers such as date, location and description.

What role does mapping have in increasing awareness about impaired driving?

There are different ways communities can create and utilize mapping. Some mapping may be more complex and can be integrated with collision data through geographical information systems. Other mapping can be created using tools like Google Maps. Some examples of different applications of mapping that can help increase awareness of impaired driving are below.

Type of Map	Intended use	Who can do this?	What type of map
Crime map	Highlights impaired driving charges at a municipal level.	A police agency can host this information on its public-facing website.	GIS mapping using records management data.
Impaired Driver Caught Here mapping	Creates awareness of impaired charges in a municipality or in multiple municipalities. Mapping is connected to physical signs placed at the locations.	Volunteer organizations such as MADD, SADD, law enforcement, community safety partners.	Google Maps
Collision data mapping	Maps the locations of collisions, injuries, and fatalities on a provincial level. This can help identify areas of focus for improvements.	Safety organizations having access to collision data as well as city councils.	GIS mapping using data and coordinates of collisions from crash report forms.

How can communities acquire and use mapping to address impaired driving?

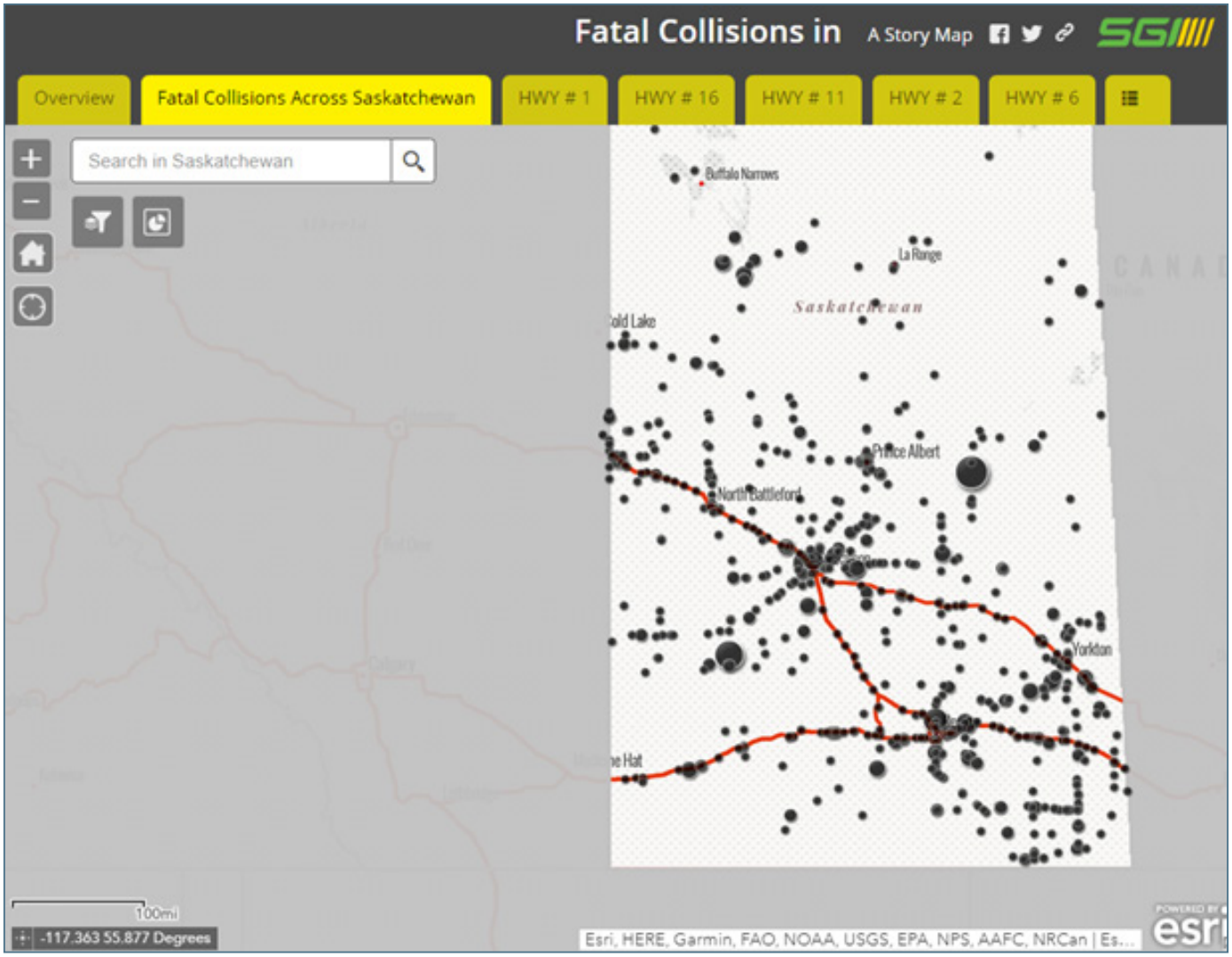
Communities can reach out to their local law enforcement or organizations that collect collision data to see if regional mapping is available through their records management systems. Collision data often includes geographic coordinates which can be used in GIS mapping systems to visualize the information being sought. Some municipal police agencies have crime maps they regularly update. When making this request, it's important to include as much information as possible such as:

- Number of months or years of data
- Collision or enforcement data
- Location (within the municipality or a geographical area)
- The road type (provincial highway or municipal roads)
- The contributing factors to the collisions (impaired driving)
- How data will be used

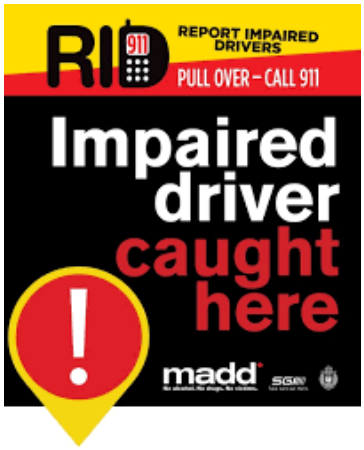
Can municipalities and law enforcement share these types of mapped analytics on a regular basis?

Collaborative data sharing can be very beneficial for communities and law enforcement to help identify needed areas of focus. Communities can consider forming a working group to meet on a regular basis, whether monthly, quarterly or yearly, to review and create action items based on the mapping.

Collision data mapping example - SGI Fatal Collisions in A Story Map

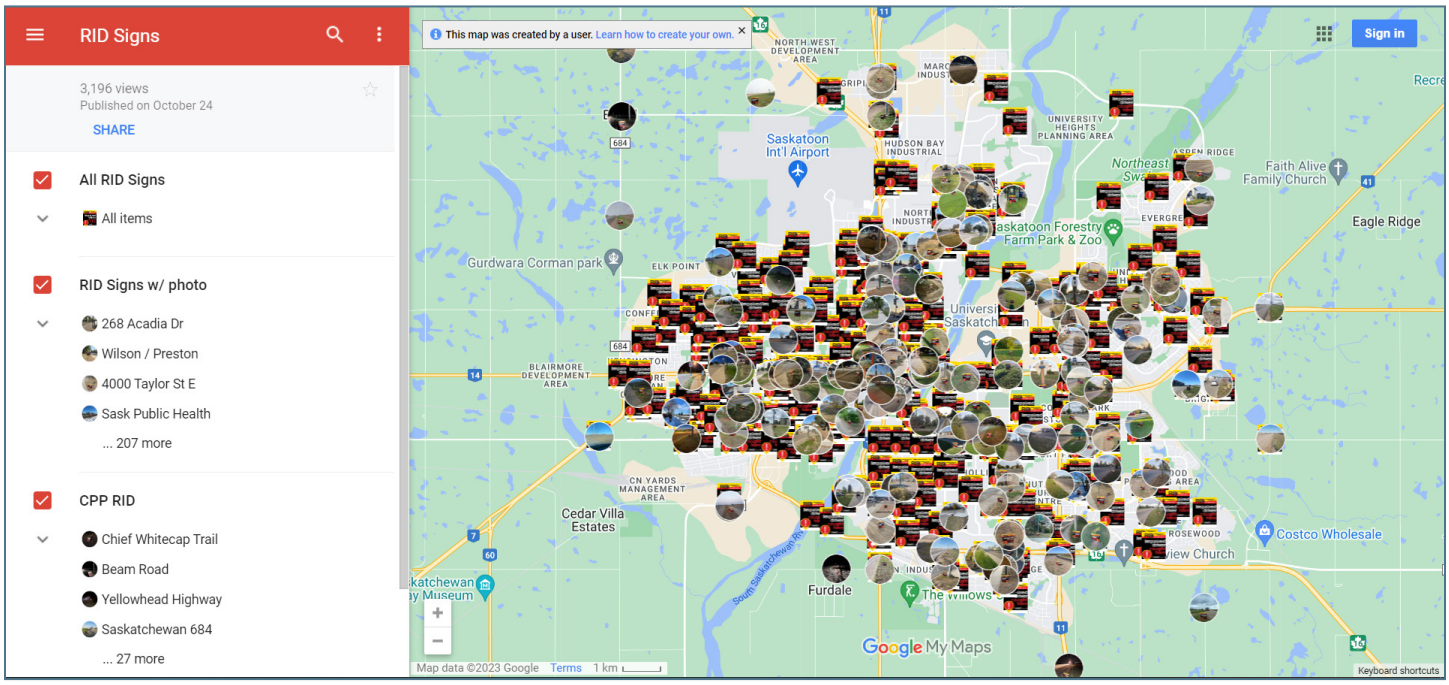


Are there examples of community programs which use mapping as an awareness tool?



In Saskatchewan, Report Impaired Driver (RID) signs are placed on provincial highways and in municipalities. The signs are intended to remind drivers of the important role they play in calling and reporting suspected impaired drivers when they see them on the roads. In partnership with the RID program, volunteers from MADD place Impaired Driver Caught Here signs within their communities where impaired drivers were caught and criminally charged. In some cases, impaired drivers were caught after someone from the public reported them to 911.

Every two weeks, signs are placed in locations where an individual was criminally charged. This provides visibility to the public. For more targeted education, the sign locations are placed on a Google Map along with the geolocations including the date/time of the offence. MADD Saskatoon piloted the mapping project; an example of impaired driving locations is below. Each of the circles on the map can be clicked on to see the specific location (https://www.google.com/maps/d/viewer?mid=1uQ5gumy_qBTK3Uygf999KCRJK67FjCSn&ll=52.136795032774074%2C-106.65305034999999&z=12).



Since the summer of 2020, nearly 600 locations have been added to the MADD Saskatoon's map.

How can this visual tool outreach efforts?

Visuals are an effective way to help communities recognize the prevalence of the problem as well as which locations within the community may be most affected. This approach has helped communities understand how frequently this problem is occurring in their neighbourhood and motivate action to work towards solutions. Visuals help bridge the gap between knowing there is an impaired driving problem and making it relevant to community members.

What types of driving behaviours are useful indicators of impaired driving?

Police officers are generally looking for a combination of factors over a period of time which are indicative of a driver potentially being impaired and which have been validated through research. The below individual indicators in and of themselves can be indicative of a range of risky behaviours and alone, may not constitute impairment.

According to research, the 10 signs most common signs of driver impairment are below:

- Drifting in and out of lanes
- Driving unreasonably fast, slow or at an inconsistent speed
- Tailgating and changing lanes frequently
- Making exceptionally wide turns
- Changing lanes or passing without sufficient clearance
- Overshooting or stopping well before stop signs or stop lights
- Disregarding signals and lights
- Approaching signals or leaving intersections too quickly or slowly
- Driving with windows open in cold or inclement weather
- Driving without headlights, failing to lower high beams or leaving turn signals on

What kind of feedback has been received from the public on the use of these mapping tools?

When this map has been shared in outreach efforts in Saskatchewan, the reactions have been quite consistent. People are surprised at the prevalence of the behaviour in their community and the visualization is often a reality check to challenge misperceptions about the problem. The mapping approach helps underscore the reality which is, impaired driving happens in every community and is more common than people believe. The mapping website can have a QR code so people can easily access and share it with others using their phones.

Are GIS mapping tool awareness campaigns more effective than other educational tools?

GIS mapping tools can certainly help increase awareness and help communities understand the prevalence of the problem. It can also help identify areas of focus to tackle specific features of the problem. It can also empower communities to take action with a more tailored approach to the problem.

Messaging for communities based on the results of the tools should be crafted with an understanding of what makes education campaigns effective. A good overview of this topic is TIRF's Road Safety Campaign report and the Community Tool Kit.

While different methods have different purposes, using a GIS mapping style of awareness is an ideal option to spark conversation and make the discussion personal and relevant for communities that are most adversely affected at all levels by the consequences of impaired driving. The information flowing from the tool can provide concrete data to engage communities in conversation and advocate for change.

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TRAFFIC INJURY RESEARCH FOUNDATION

The vision of the Traffic Injury Research Foundation (TIRF) is to ensure people using roads make it home safely every day by eliminating road deaths, serious injuries and their social costs. TIRF's mission is to be the knowledge source for safe road users and a world leader in research, program and policy development, evaluation, and knowledge transfer. TIRF is a registered charity and depends on grants, awards, and donations to provide services for the public. Visit **tirf.ca**.

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IMPAIRED DRIVING COALITION OF CANADA

TIRF & Diageo North America formed the IDCC to tackle impaired driving in Canada.

DIAGEO

Impaired Driving Coalition of Canada

Using Social Media to Strengthen Initiatives

Traffic Injury Research Foundation, December 2023

Introduction

Social media tools create unique opportunities to reach target audiences with tailored messages to increase awareness about impaired driving and strengthen educational initiatives. These platforms are ideal for delivering brief, informative, and personally relevant information at critical moments which can help change behaviour. This fact sheet answers common questions about social media tools that are available, who uses them, optimal strategies to post and promote content as well as strategies to engage with social media influencers, track impact on audiences, and develop messaging. For any of the tools mentioned, YouTube is a great resource to source short how-to training videos.

What is social media?

Social media comprises various online platforms allowing users to connect and share news, ideas, images, and videos. Nearly 33 million Canadians actively use social media, equating to 85.7% of the total population.[1] The list of social media sites is growing, and well-known platforms are constantly adding new features. As traffic safety stakeholders, integrating social media into our impaired driving campaigns is crucial.

How do I choose which platforms to use?

Different sites specialize in different kinds of engagement and targeted audiences. For example, social networking sites, such as Facebook, Twitter, and LinkedIn, allow individuals and businesses to interact in various ways. Everyday actions include tagging, sharing, using #hashtags, commenting, direct messaging, and reacting to posts. Media Sharing Sites, including Instagram, Snapchat, and TikTok, share moments through pictures and videos and link them to other social networking platforms. Video hosting sites (e.g., YouTube, Vimeo) allow users to upload, share, and track longer videos. Other sites include blogging/

The power of social media is it forces necessary changes.
Erik Qualman

community sites (e.g., Reddit, Tumblr) and audio/podcast platforms (e.g., Spotify, Apple Music, Apple Podcasts). It's worth noting that some content formats designed to increase reach and engagement are intended to only last for 24 hours (e.g., Snapchat and stories on Instagram & Facebook). This is a more advanced use of social media and may require more specific skills to implement and manage. Organizations can also consider using Linktree (e.g., Linktr.ee/TIRFCanada) to link their social media sites in one place and track clicks to each site.

A brief overview of some of the most common platforms is below along with guidelines to use them as a tool to share knowledge, research, educational tips and resources.

- **Facebook |** Facebook is a popular site among middle-aged and older adults. Users can develop a profile, connect with others, share content, join groups, and follow pages of interest. It also offers features like Stories, where users can share content that lasts for 24 hours.
  - **Potential use |** Create a dedicated page or group to share educational content, resources, and stories about impaired driving prevention. Engage with followers through posts, comments, and promotion of events.
  - **Recommended format & length |** Posts can include text, images, videos, links, or a combination of these elements. Aim for concise and engaging posts. Keep it under 80 characters for better visibility, but longer posts (around 40-80 words) can still perform well.
- **Instagram |** This photo and video-sharing platform permits users to post content, follow other users, and engage with posts (e.g., likes, comments, direct messages). It is the most-used platform by American social media users aged 12-34.[2] Users can also post Stories, which usually disappear in 24 hours (unless saved by the user).
  - **Potential use |** Share visually appealing graphics, infographics, and photos. Use captions and hashtags to increase reach and encourage discussions.
  - **Recommended format & length |** It's best to keep captions concise and captivating. Aim for 125-150 characters to maintain engagement.
- **LinkedIn |** This professional networking site is designed for career-related connections. It allows users to create professional profiles, connect with colleagues, share updates, join industry groups, and search for job opportunities.
  - **Potential use |** Use LinkedIn to target professionals, organizations, and influencers in law enforcement, public health, and transportation. Share articles, research findings, and professional insights about impaired driving education.
  - **Recommended format & length |** Posts should be informative and professional. Aim for 50-100 words or around 3-5 lines to maximize engagement.
- **Snapchat |** This multimedia messaging app allows users to send photos, videos, and messages that disappear after a short period. Snapchat also offers Stories, which disappear in 24 hours.
  - **Potential use |** Utilize Snapchat's Stories feature to share time-limited content related to impaired driving prevention. Use creative filters, stickers, and geolocation tags to engage and educate the Snapchat community.
  - **Recommended format & length |** Snapchat Stories can be up to 60 seconds in length. Consider using text overlays, filters, stickers, and augmented reality effects to enhance your content and make it more interactive.
- **TikTok |** This is a short-form video platform that has recently gained immense popularity. Users can create and share 15-60-second videos set to music, explore trending content and engage with other users' videos. The TikTok algorithm is a recommendation system that determines which videos will appear on user *For You* pages. As TikTok continually monitors trends, it generates suggestions for users, such as using 60-second videos because they are increasingly popular and are more likely to

be viewed. These prompts from the platform are automatically generated and adapted as needed to match the user's engagement habits.

- » **Potential use |** Utilize short, engaging videos to raise awareness about impaired driving prevention in a creative and relatable way. Use popular audio tracks, challenges, and trends to reach a younger audience. Example: Toronto Police Traffic Unit.

  **Note that due to recent privacy and cybersecurity concerns, several Government agencies have banned TikTok on federal/ provincial/ municipal devices, and some industries have adopted similar restrictions for use.*

- » **Recommended format & length |** Videos are limited to 15 or 60 seconds. Aim for quick and captivating content that grabs attention within the first few seconds.

> **X (formerly Twitter) |** This microblogging platform enables users to share short messages, photos, and videos.

- » **Potential use |** Share news, statistics, links, and tips. Engage with other community groups and authorities (e.g., police, politicians, partner organizations) through likes, retweets, and replies.
- » **Recommended format & length |** The character limit is 280, but shorter tweets (around 70-100 characters) tend to attract more attention. Use photos to gain viewers' attention.

> **YouTube |** This video-sharing platform is most popular among males over the age of 18.[3] It enables users to upload, view, like, comment on, and share videos. It offers a wide range of content, including music, tutorials, vlogs, documentaries, and more.

- » **Potential use |** Create and share educational videos and PSAs about impaired driving prevention, personal stories, interviews with experts, and informative animations. Encourage viewers to subscribe, like, and share the content.
- » **Recommended format & length |** Video length can vary depending on the content. Try to be concise and engaging, keeping in mind the average viewer's attention span is less than 10 minutes. Aim for 7-15 minutes, but it can be longer for in-depth content (e.g., podcasts).

How can I utilize these platforms to build engagement with audiences and stakeholders?

Engaging with key stakeholders on social media can help build relationships, gather feedback, and establish a recognized presence. Stakeholders can include partner organizations, the public, and members of the target population, including those who drive after alcohol and/or drug use. Each stakeholder is unique, so adapt engagement strategies based on their preferences and communication style. Look at data to determine the best frequency to post, check peak times and schedule resources accordingly. Below are some strategies for engagement.

- **Listen and monitor |** Monitor hashtags, keywords, and mentions to gain insights into what stakeholders say and identify engagement opportunities. Consider aligning posts with key dates, such as National Impaired Driving Prevention Week, which occurs the third week of March each year and National Road Safety Week during the third week of May. Also, consider using GoogleTrends and AnswerThePublic to explore the popularity of search queries.
- **Respond promptly |** When stakeholders engage with social media content (e.g., through comments, messages, or mentions), it should be a priority to respond promptly. Acknowledge their feedback, answer their questions, and demonstrate active listening.
- **Personalize interactions |** Tailor responses to individual stakeholders. Use their names, reference their concerns or comments, and provide personalized solutions or recommendations.
- **Create compelling content |** Develop engaging content that educates about the dangers of impaired driving and promotes safe alternatives. Examples include creating impactful videos, sharing informative graphics, providing recent statistics, and encouraging tips to avoid impaired driving (e.g., planning a safe ride home). Remember to hook people at the beginning of the post (see The 8-Second Filter), and always use visuals with text. Text-only posts typically underperform. There are several online resources to help develop compelling content | Canva, VistaCreate, VisMe, Adobe Express, Stencil, Snappa, Animoto, Unsplash.
- **Encourage user-generated content |** Encourage stakeholders to share their stories, experiences, or creative content about impaired driving prevention. For example, the YMCA's Youth Cannabis Awareness Program utilizes a Youth 4 Youth Digital Media Contest to raise awareness about the impacts of youth cannabis use.
- **Collaborate |** Partner with influential individuals or organizations in the community who have a strong following or credibility in impaired driving prevention. They can amplify your message and reach a wider audience. For example, the Impaired Driving Coalition of Canada utilizes strategic partnerships to combine the knowledge and expertise of several organizations. Likewise, Parachute Canada engages with key social media influencers to promote National Teen Driver Safety Week.
- **Show appreciation |** Recognize your stakeholders by engaging with their content (e.g., like, retweet, comment) to show gratitude and encourage future engagement.

Is it important to engage with social media influencers?

The short answer is it depends. Engaging with popular social media influencers and celebrities can amplify your content and increase reach. One important consideration is whether your objectives are simply to reach a large audience with a message versus prioritizing some level of engagement from, or action by, those reached. There are a variety of pros and cons to this paid promotional option.

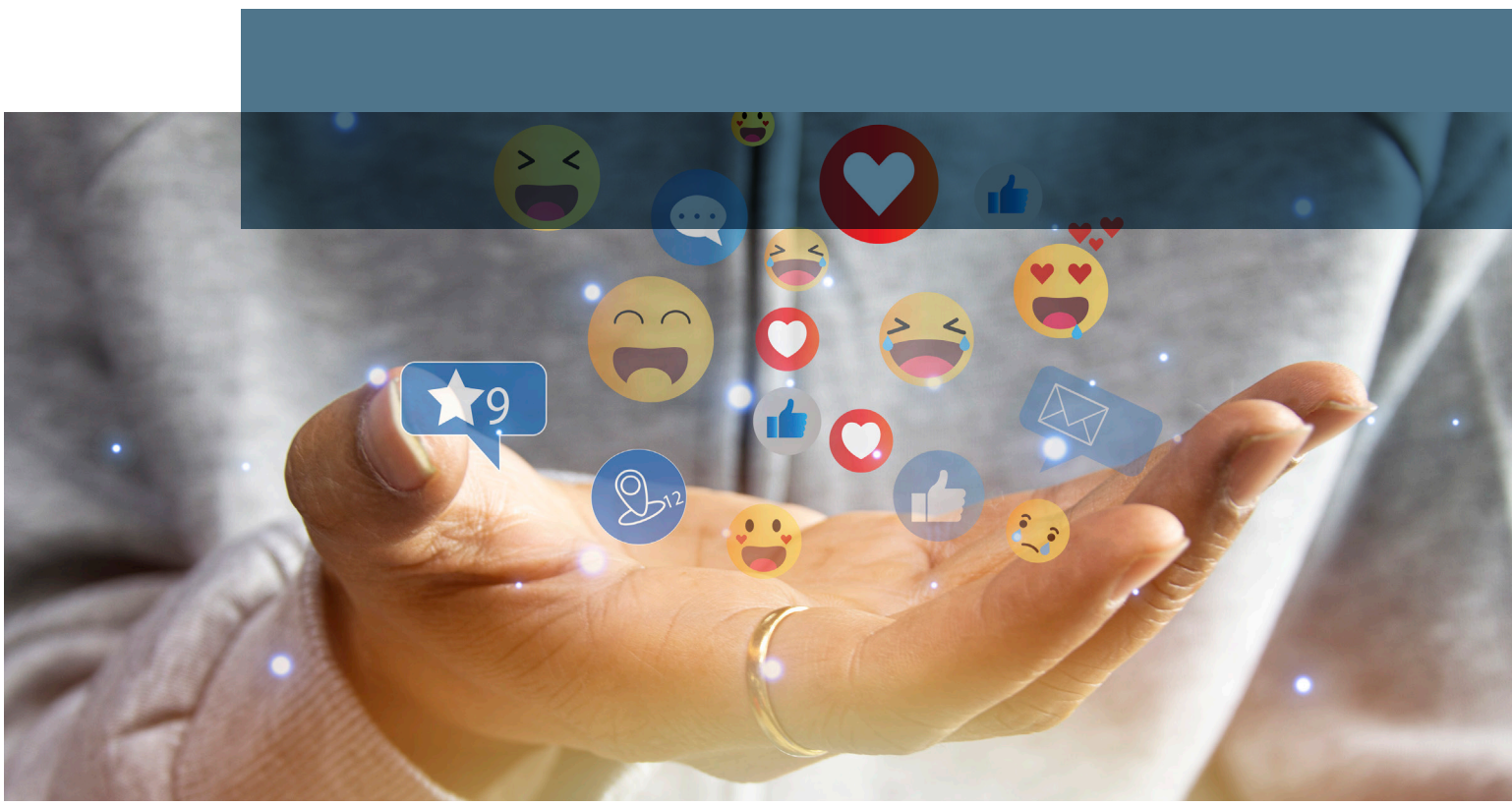
Pros

- **Reach |** Influencers often have large followings which can help share the message by increasing impressions and reach.
- **Credibility |** Depending on the influencer, collaboration may enhance message credibility and trustworthiness among the target audience.

- **Targeted audience |** Influencers often have a specific niche or demographic they cater to, meaning they can target content to a relevant and engaged audience.
- **Authenticity |** Influencers have built relationships with their followers which creates a sense of authenticity and relatability. When they share content, it can resonate more deeply with their audience. Influencers demonstrating a historical interest in the topic or cause can have a greater impact as their audience is already familiar with their stance.

Cons

- **Cost |** Engaging with influencers can be expensive. They may require payment, free products, or other incentives in exchange for sharing your content, which may not always fit within organizational budgets.
- **Lack of control |** When collaborating with influencers, some control is lost with respect to how content is presented or shared. They may have their own style and voice which could affect the messaging and delivery of paid content.
- **Authenticity concerns |** While influencers can bring authenticity, there is also a risk of false endorsements. Some influencers may accept collaborations purely for financial gain, leading to less genuine content that may not resonate with their audience.
- **Limited long-term impact |** Influencers often provide a short-term boost in visibility and engagement. However, the long-term impact may be limited, as content can have a short-lasting impact if it is not constantly refreshed. This also applies without the use of influencers, but doesn't carry the same financial burden.
- **Dependency |** Content success may depend on the influencer (i.e., if they decide to discontinue their collaboration or change their content strategy). Therefore, it's best to house content on your original channels and have the influencers share/repost.
- **Public relations liability |** The choices influencers make in their personal lives may have a negative impact on your campaign. For example, the decision by an influencer to drive impaired not only harms their brand but also the brand of who they have partnered with, even if it was a previous campaign.



Is it important to track my social media presence?

Yes. Monitoring social media influence is vital to determine the effectiveness of road safety messaging and campaigns. There are several social media monitoring tools (e.g., Hootsuite, Sprout, Buffer) to allow posts to multiple sites and track metrics. Here are some of the simple, yet powerful, social media metrics.

- **Awareness |** Reach refers to the potential number of users who see your content. It often includes both followers and non-followers. Impressions are the total number of times your content was shown to users, including users seeing it multiple times. These are essential metrics if your goals are focused on increasing awareness. For videos, view count may be more suitable.
- **Engagement |** Engagements measure the number of clicks, likes, comments, shares, and retweets your content gets. Engagement rates help determine how active your audience is with your content. This also includes click-through rates, retention rates (for videos), and profile visits. Click-through rate is the ratio of clicks on a specific link to the number of times a post is shown and is used to measure the effectiveness of email campaigns. So, if a post is seen 100 times and is clicked on 5 times, that's a rate of 5%. Whereas retention assesses the ability to keep users engaged and active over an extended period, such as commenting or sharing. Both metrics are crucial to understand the effectiveness and longevity of social media content.
- **Audience |** Your audience refers to your total number of followers and/or subscribers. Building an audience is key to sharing content. Audience growth rate can be a great metric to monitor during campaigns.

How do I develop an appropriate social media message?

When developing campaign messaging, content must be engaging, informative, and impactful. The Community-Based Toolkit for Road Safety provides an overview of creating a message strategy and using hashtags. There are several aspects to consider for messaging.

- Understand your audience's demographics, interests, and concerns to tailor your messaging to generate interest and engagement.
- Determine the primary message or call to action you want to convey. It may be raising awareness, promoting responsible behaviour, or encouraging alternatives.
- Craft a compelling headline using strong language or thought-provoking questions.
- Use powerful visuals like images, infographics, or videos that resonate with your audience.
- Share relevant statistics and credible facts to emphasize the seriousness of impaired driving.
- Tell relatable stories of those affected to evoke empathy.
- Provide practical tips on preventing impaired driving and highlight the benefits of responsible choices.
- Include personal testimonials or quotes to create an emotional connection.
- Incorporate clear calls to action, such as sharing, pledging, or attending events.
- Use relevant hashtags to increase visibility and join larger conversations. Examples include #DriveSober, #SoberDriver, or #SafeRides.
- Encourage dialogue through questions, polls, and active engagement with your audience.
- Schedule posts strategically for maximum reach and maintain a consistent presence.

How do I frame my message?

Framing messages using appropriate terminology is essential when discussing impaired driving. Here are some common terms that avoid stereotypes, encourage responsible behaviour, and shift public perception.

Crash vs Accident

Using crash instead of accident is important to shift how people think about impaired driving crashes and to recognize these collisions are preventable. The term accident implies the event was unavoidable or

unintentional. However, impaired driving crashes are entirely preventable. Using the term crash creates accountability for drivers responsible for the collision, shapes public perceptions of the issue (i.e., that impaired driving is preventable and unacceptable) and influences policy discussions. To learn more, download TIRF's Let's Talk About Crashes fact sheet.

Sober Driver vs Designated Driver

The term sober driver communicates it's essential to be alcohol and drug-free when operating a vehicle. This leaves no room for confusion or misinterpretation about an individual's state of sobriety, which is often misjudged. The term designated driver may lead to misconceptions about the amount an individual can consume, whether from alcohol, drugs, or other substances, and still be fit to drive. In fact, discussions with young cannabis users reveal that *designated driver* can refer to an individual using cannabis when others are consuming alcohol. Therefore, the term *sober driver* reinforces a culture of responsible behaviour and discourages any form of impaired driving.

Impaired Driver vs Drunk Driver

Impaired driver encompasses a broader range of impairments beyond alcohol, such as drugs, medications, or a combination of substances. The term impaired describes the condition of the driver and focuses on their diminished abilities, rather than solely emphasizing alcohol consumption. The term drunk driver can carry negative connotations, including perceptions that only those visibly intoxicated or highly intoxicated are dangerous on the road. This disregards the risks posed by individuals with lower levels of impairment. It's important to understand that several factors such as food consumed, level of fatigue and other factors can produce impairment even with small amounts of alcohol.

Increasing engagement

Using hashtags as well as tagging contacts and organizations in social media posts can increase engagement and contribute to a positive return on investment (ROI) for your social media efforts. In addition, posting content daily (five days/week), even one post per day, can help increase engagement as your content is more likely to appear in your audience's stream and creates consistency.

Creating engaging content for social media is just the first step. The key is to ensure that content is discovered and then shared to increase your reach, and ideally generate authentic engagement and online conversation. Hashtags assign a category to your posts which makes it easier for your audience to understand what your post is about and also drives people to your post who are searching for content with specific hashtags to your post.

Tagging contacts or organizations in your posts can foster a sense of community and collaboration with your connections and can prompt likes, comments, and shares. It also encourages others in their network to engage with your content. Tagging is also a way to build relationships and get your content noticed by industry experts and potential collaborators.

Many social media platforms provide analytics to track the performance of your posts, including the reach and engagement generated by specific hashtags and mentions. This data helps you assess the ROI of your social media efforts.

Where can I find more information?

Additional resources designed to help prevent impaired driving are available through several organizations.

109 Social Media Demographics Marketers Need to Know in 2023
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IMPAIRED DRIVING COALITION OF CANADA

Fatal Collision Review Committee Overview

TRAFFIC INJURY RESEARCH FOUNDATION, DECEMBER 2023

This fact sheet is designed to help communities understand the role and benefits of a Fatal Collision Review Committee (FCRC). It provides some background on the City of Ottawa's establishment of an FCRC including the rationale prompting its creation. A overview of an FCRC and the general steps to establish and manage one can help communities to better understand fatal collisions and steps to prevent them in the future.

What is a Fatal Collision Review Committee?

The City of Ottawa established a multi-disciplinary Fatal Collision Review Committee (FCRC) in 2017 as a pilot program. It was formed with the intention of undertaking a timely review of fatal road crashes as they occurred in the municipality.

The committee is comprised of representatives from the Regional Supervising Coroner's Office of Eastern Ontario, the Ottawa Police Service (Collisions and Traffic Enforcement), Traffic Services (City of Ottawa), city planners and engineers, Safer Roads Ottawa and Ottawa Public Health.

The committee reviews all aspects of fatal crashes to identify contributing factors that played a role and how they might be addressed. They are responsible for making recommendations specific to the precise location of the crash which may potentially have implications for the larger transportation network.

FCRCs are more common at a municipal level, but for rural communities, a regional approach may be more efficient or manageable for smaller communities within the same geographic area. However, this approach will require more complex confidentiality protocols with respect to small numbers of incidents to protect the privacy of individuals.

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Why was the FCRC formed?

The FCRC was formed to provide key decision-makers at the municipal level with a more complete understanding of fatal crashes as well as their contributing factors. Prior to the formation of the FCRC, the Ottawa Police Service collected information about fatal crashes and made recommendations for improvements based on their investigations which were then provided to the municipality. However, this process didn't include a systemic review with consideration of context to inform the development of education campaigns, guide engineering improvements, determine appropriate enforcement initiatives, or propose changes to the built environment and transportation network, as well as more wide-ranging road safety improvements (e.g., provincial or federal).

What is the objective of an FCRC?

The purpose of an FCRC is to provide communities of all sizes with a tool that gives them better understanding of, and insight into, fatal crashes in their jurisdictions and helps identify what factors play a role in them. The work of an FCRC shares a high-level overview of fatal crashes with key community stakeholders so that each agency represented by participating members can get a more complete picture of the factors contributing to crashes. This approach also facilitates discussion about priorities and concrete steps to address these factors as well as prevent future crashes by tapping into the expertise of various agencies represented on an FCRC. The foundation of this initiative is the four E's. In addition to education, enforcement, and engineering, there was an emphasis on helping communities focus more on the built environment.

It is essential communities have a more thorough and timely understanding of the contributing factors to fatal crashes in order for decision-makers to make data-driven decisions relating to education, enforcement, engineering and most importantly the built environment. It also creates a more current analysis of crashes for decision-makers to take action as problems occur and to identify opportunities for action to prevent future incidents.

What agencies are represented on an FCRC?

First piloted in the City of Ottawa in 2017, the FCRC concept brought together representatives from the Regional Supervising Coroner's Office of Eastern Ontario, the Ottawa Police Service (Collisions and Traffic Enforcement), Traffic Services (City of Ottawa) and city planners/engineers, Safer Roads Ottawa and over time Ottawa Public Health.

The key to a successful FCRC is to ensure the group stays small and agile and involves key decision-makers at the local level. At the same time, other agencies can potentially be engaged in an advisory or consulting role or to gather/share specific or technical expertise pertaining to trends or key factors as needed. However, the success of an FCRC remains contingent on it being a small, flexible and efficient committee.

Is there a role for community partners in an FCRC?

In order to maintain confidentiality of personal information, community partners are generally not formal members of an FCRC, however, they have an essential role around advocacy for the implementation of change in their respective municipalities. The information contained in each FCRC annual report should provide timely data to individuals and organizations who wish to advocate for change and improvement in the road safety culture in their municipality.

In addition, community partners may often be able to speak about issues relating to fatal crashes using more personalized and relevant messages. Conversely, staff from the coroner's office, police services, and municipal governments can communicate neutral messages supported by data.

How does an FCRC function?

The process itself involves a presentation of the characteristics and factors in each fatality within a specified number of days after it occurs. The presentation is followed by an open floor question and answer period in order to ensure all partners have an opportunity to ask questions. This is followed by a round table

discussion which allows members to engage with the goal of identifying contributing factors relating to the crash. This discussion also explores concrete solutions and interventions to prevent a future fatal crash at the specific location, as well as other, similar locations across the municipality.

On what basis are the member agencies of an FCRC able to share data about fatal collisions?

An FCRC functions under the direction of the Regional Supervising Coroner's Office and as such, they have the ability defined under legislation (the Coroners Act) to share information related to each of the fatal crashes. This includes information pertaining to a deceased person's medical history, toxicology and other relevant details.

Depending on authorizing legislation in each jurisdiction, it may be necessary to enter into a Memorandum of Understanding or data-sharing agreement. In this event, key elements of a data-sharing agreement should address, at a minimum, the following issues:

- confidentiality
- restricted use of the data
- ownership of the data
- destruction of the data
- intellectual property rights/ownership

What kinds of data are presented to an FCRC and why is it important?

Several sources of data are presented during FCRC meetings. The most common sources are described below and include:

- **Law enforcement data.** Police Collision Investigators who attend the scene of fatal crashes are permitted to share information related to the crash investigation, the driving history of the individuals involved and other related information (police assistance in Ontario coroner investigations is mandated in Section 9 of the Coroners Act). It is also important to have a good understanding of enforcement-related data and formal complaints from the public to provide context. This can include a history of dangerous behaviours at the location, previous formal complaints from residents and/or localized enforcement campaigns.
- **Engineering data.** An FCRC also needs to consider the history of crashes at each location which can be provided by the local municipality and background information on what physical improvements/changes have been undertaken at each site. This can include engineering changes, the implementation of road safety technology such as red-light cameras and automated speed enforcement. Most jurisdictions can also provide a history of complaints from residents about the location (e.g., speeding, dangerous behaviours, faded paint markings).
- **Education campaigns.** It is also important for an FCRC to understand if any public education campaigns have been undertaken in each of the jurisdictions. This is an important component when it comes to new infrastructure being implemented in municipalities, new laws and spikes in specific types of crashes.
- **Environmental data.** Many jurisdictions are now taking a more upstream approach with the goal of building communities that are physically safer than what has been constructed in the past 50 years. It is important that information generated by FCRCs be shared openly so that planning staff and decision-makers can begin to influence subdivision design decisions at the concept stage as well as land use planning.

Are the findings of an FCRC published or shared with the community?

Yes. It is critical the work of each community's Fatal Collision Review Committee be published on an annual basis. This achieves a necessary level of accountability for the committee and the municipality to keep road safety a focus on the political agenda. It also provides various community stakeholders an opportunity to evaluate the progress of their cities becoming safe, and to provide to provide input into proposed initiatives. An example of an annual report is available at: https://www.ontario.ca/document/ottawa-fatal-collision-review-committee-2020-annual-report

Who in the community benefits from an FCRC?

The data and insight generated by an FCRC are crucial for community partners. These can include elected officials, public health professionals, a local MADD or Safety Council chapter, cycling and pedestrian organizations, private sector partners and media organizations amongst others. It is important to share the annual report broadly to help residents understand what is occurring on their roads in order to evaluate local efforts to make their communities safe.

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10-step Guide to Form a Fatal Collision Review Committee

Traffic Injury Research Foundation, December 2023

A Fatal Collision Review Committee (FCRC) is a multi-disciplinary committee formed to undertake timely reviews of fatal road crashes as they occur within a municipality. This fact sheet provides a comprehensive 10-step guide to forming an FCRC.

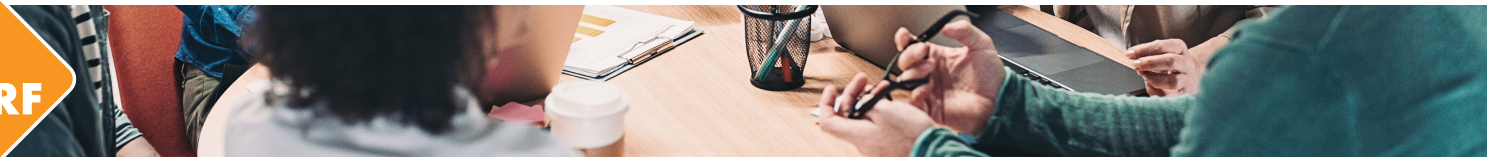
An overview of the structure and main features of an FCRC is available as a fact sheet on the TIRF website at: tirf.ca/download/idcc-fcrc-overview

STEP 1

Engage key stakeholders to gauge interest and gather ideas

Identify and connect with key stakeholders in your community to gauge the level of interest in forming an FCRC. Establish a strategy for approaching agencies to gauge interest, discuss ideas, build support and identify potential issues requiring consideration. This can be accomplished by reaching out individually or by hosting a meeting with your local knowledge as a guide on the best course of action. Key stakeholders to include in this process are:

- Regional coroner's office
- Police (collision investigations and traffic enforcement)
- Municipal road safety engineers
- Ministry of Highways & Transportation
- Representatives from the local Public Health Unit (PHU)
- Other road safety stakeholders as appropriate



The value for these stakeholders in forming an FCRC is in how sharing information related to fatal collisions can help coordinate resources to increase efficiency, prioritize issues by building consensus, and guide the development of more targeted and comprehensive initiatives. FCRCs are more common at a municipal level, whereas smaller rural communities within the same geographic area may benefit from a regional approach. However, this latter approach will require increased more in-depth discussions about sharing confidential information among communities.

Developing key talking points to help structure the conversations with individual agencies and groups is useful to focus discussion. Some important topics to include are:

- a brief overview of an FCRC and its objectives (see fact sheet)
- a clear ask for each agency and benefits of participation (e.g., enabling agencies to more efficiently identify issues, allocate resources and coordinate action)
- mechanisms to structure the relationship among partners (e.g., terms of reference)
- potential mechanisms to facilitate sharing relevant data (e.g., existing legislation/regulation, memoranda of understanding, terms of reference)
- types of outputs that can be produced and audiences that can be reached (e.g., annual reports as a foundation to develop timely road safety messaging to community)

Prepare a letter of invitation to invite stakeholders

If there appears to be general interest in exploring the formation of an FCRC based on initial discussions, it is recommended to send a formal email or letter to the local coroner's office requesting the establishment of an FCRC in their community or region. In principle, the regional coroner's office has the ability to engage various partners and often the legal authority to facilitate the sharing of confidential fatal crash information within an FCRC. Other provinces and territories may have different legal authority, but the goal of public safety is present in every death investigation system. Engagement with the local or regional coroner's office or the medical examiner's office is a critical step because, in most jurisdictions, fatal crash investigations fall under their authority.

Host a meeting of participating agencies

This first formal meeting of agencies agreeing to participate in the FCRC is essential to create a framework for the activities to be undertaken. Mechanisms needed to formalize the relationship between agencies can be explored. A Terms of Reference or similar document may be the most useful way to structure the partnership and describe its functionality. The contribution of member agencies can be identified so their role in the partnership is clearly delineated.

Another important issue is to identify any perceived challenges and ways they can be addressed. The sharing of data and information related to fatal crashes is likely to be identified as a priority issue. As such, including legal representation from agencies can help them determine appropriate tools and strategies may be needed to facilitate data-sharing. Finally, a structure for meetings and timelines to review fatal collisions as they occur should also be established.

STEP 4

Identify data sources & sharing mechanisms

With guidance and input from legal counsel, agencies should discuss what data sources and data elements (i.e., variables) are necessary to facilitate the work of the FCRC. A good starting point for discussion is the types of data needed to create a complete picture of a fatal crash. Identifying the types of questions the FCRC wants to answer to inform road safety strategy can help provide direction. For example:

- What are the top contributing factors in fatal crashes in your community?
- What is the profile and characteristics of persons involved in fatal crashes?
- Where in the community do fatal crashes most often occur?
- What are the most common crash configurations?

Another important topic to consider once a list of potential variables has been developed is the ways these variables may be defined across agencies to ensure consistency in definitions or a clear understanding of differences to facilitate data interpretation. The ways in which data may be collected and programs/platforms used to analyze data is another key area to explore.

Some of the potential data sources to consider and their relevance to the work of an FCRC are presented below.

1. **Enforcement data**
   - Historical enforcement data for the particular location or corridor
     - enforcement strategies (e.g., automated enforcement, high-visibility enforcement, targeted enforcement)
     - is the location or corridor known for specific high-risk behaviours (e.g., speeding)
   - driver history of drivers in fatal crashes (e.g., 15+ years)
     - all charges and convictions
     - previous suspensions (medical or otherwise)
   - class of driver's licence and year of licensure
   - statements of any witnesses to fatal crashes
2. **Engineering data:**
   - 10 years of historical crash data per location (e.g., date, time, weather conditions)
   - any roadway improvements at the location in the past five years
   - outcomes of any safety audits underway or completed
   - complaints from residents
3. **Municipal data**
   - local crash data
   - as needed, recent road work, engineering treatments or repairs in fatal crash locations (e.g., whether roadway was plowed or salted for winter fatal crashes)
   - other data sources related to forestry data, line painting standards, and so forth
   - other safety reviews undertaken such as school audits or local neighbourhood initiatives
4. **Medical data**
   - medical history of deceased drivers/vulnerable road users in fatal crashes, from medical records or friends/family members (e.g., sleep apnea, medical cannabis, use of glasses, history of mental illness, mobility issues)
   - forensic toxicological results of the deceased
   - some medical history for living drivers, such as substance/alcohol use while driving, may be available, if criminal charges are laid

Develop a Terms of Reference document

A Terms of Reference document (TOR) should contain parameters for the purpose, structure and functionality of the FCRC that are agreed to by all the partners. The TOR should provide a foundation or framework for the FCRC. Key components that should be part of the TOR may include:

- a description of how the work of the committee is to be completed;
- which agency is responsible for leading the FCRC and its meetings;
- the roles and responsibilities of members;
- how soon after fatal crashes a meeting will occur;
- how the information collected will be protected and shared among the members; and
- whether and what information can be shared publicly whether through annual reports or in the event of a particular access to information request.

Review TOR by legal professionals

Protecting the confidentiality of personal information and the privacy of persons involved or killed in road crashes is a paramount concern for government agencies, health professionals and police services. Often the practices related to the management of personal information collected in the performance of duties are governed by local or provincial legislation or regulation such as the Coroners Act or other acts related to death investigation or public health. Similarly, licensing authorities also have clear policies with respect to how, when and with whom licensing data may be shared. As such, inviting legal counsel from each agency involved in an FCRC can guide the development of any TOR and ensure the work of an FCRC is compliant with applicable laws and regulations. This is a critical due diligence step that each agency must undertake to protect its integrity. This work is also necessary to inform the roles and responsibilities of each agency and lay a solid foundation for work processes utilized as part of an FCRC.

Develop a tracking tool for collisions

To track collisions, a tool should be created within the committee. The purpose of this document is to track data collected as part of Step 4. This document will provide an overview of collision data elements to help identify patterns and problem areas that may need to be addressed.

Generally speaking, it is recommended that written information for specific investigations remain in the possession of a member of an FCRC (e.g., coroners/death investigator's office/police) who is responsible for confidentiality. It should not be circulated, nor shared throughout the committee. This ensures that privacy and confidentiality remain intact at all times.

Key data elements to include in a tracking spreadsheet or database include:

- time of day
- day of the week
- contributing factors (e.g., speed, fatigue, distraction)
- level of impairment
- make, model and year of vehicle
- collision location
- speed limit where the collision occurred
- previous driver history
- road conditions
- any additional contributing factors (e.g., road construction, inclement weather).

Create a structure for an annual report

This discussion should consider the structure of an annual report and types of information it will contain as well as how it will be circulated or shared with politicians and community stakeholders. Other important topics are what contextual data will be included in relation to fatal crashes and whether specific and/or systemic recommendations will be put forward to guide road safety planning and initiatives. With respect to publication, key topics to consider are authorship, internal and external review protocols, annual release dates and any media briefings or talking points by media spokespeople.

Host the first meeting

The first official meeting of an FCRC should occur after an agreed-upon period of time following a fatal crash established during Step 4. Some jurisdictions have a set meeting five business days following the crash as this allows the crash investigation to begin, basic information on the drivers to be collected, as well as time to gather information on the specific crash location.

This facilitates the meeting to start with the collection of data, followed by an initial discussion regarding factors involved in the crash (i.e., alcohol, drugs, speed, pedestrians, location history) and steps needed to prevent future crashes. Follow-up may be required after the initial meeting, based on results obtained over time.

Produce an annual report

It is critical the committee provides the general public with a report on its high-level activities. The report should include:

- the total number of fatal crashes;
- the total number of people who were killed;
- what type of road user (cyclist, driver, motorcyclist, pedestrian, etc);
- the time of day;
- day of the week; and,
- other non-confidential collected information.

Sharing this information helps inform the general community, local decision-makers and community organizations. The information should also be used to chart the progress of a community's road safety initiatives and whether or not progress is being made.

An FCRC Annual Report can provide the general community with timely and insightful information on road fatality trends, such as an increase in specific road user fatalities, spikes in alcohol- or drug-impaired driving and whether specific age groups are impacted. This information can be used by participating organizations to modify their plans and interventions, but it can also be used by others in the community and other levels of government to gain a much more timely understanding of trends.

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Strategies to Strengthen Alcohol Interlock Programs in Canada

TRAFFIC INJURY RESEARCH FOUNDATION, JULY 2024

Increases in self-reported impaired driving and fatalities among Canada's 26 million licenced drivers in the past few years, particularly during and post-pandemic, are a cause for concern. According to the Traffic Injury Research Foundation's (TIRF's) 2023 Road Safety Monitor (RSM), 5.8% of Canadian drivers admitted driving when they thought they were over the legal limit in the past 12 months. While this percentage may appear small, it should be underscored that this is a percentage of 26 million drivers across Canada (Barrett et al., 2023).

Equally concerning, there were 391 Canadians killed in a road crash involving a drinking driver in 2021; the most recent year that data are available. These fatalities occurred within 12 months of crashes on public roadways across the country (Vanlaar et al., 2022). The percentage of persons killed in a crash on a public roadway in Canada involving a drinking driver was 26.5% (or roughly 1 in 4 road deaths) in 2021. Although this percentage has remained under 30% since 2012, it has increased during the past two years (Barrett et al., 2023).

It is noteworthy that the prevalence of risk-taking on the road among persons not previously taking such risks in 2019 increased in 2020 and 2021 in tandem with the pandemic. These risks included impaired driving, speeding, distraction and fatigue. However, while the latter three behaviours subsequently declined among this population in 2022, impaired driving remained higher until 2023, decreasing from 10.5% in 2022 to 5.8% in 2023 (Barrett et al., 2023). Compared to other risky behaviours, impaired driving declined more slowly and as such, it is imperative that more targeted action is undertaken to address impaired driving.

One very effective and proven strategy to keep communities safe from impaired driving is to ensure all convicted impaired drivers have an alcohol interlock installed on their vehicles. An interlock is a breath-testing device attached to the starter of a vehicle and it is shown to be one of the most effective tools available.

This fact sheet describes the current impaired driving situation in Canada and discusses the effectiveness of the interlock technology. It also summarizes the latest best practices for alcohol interlock programs that should be considered by licensing authorities.

Ignition interlocks are one of the most effective strategies to prevent impaired driving.

Alcohol interlocks are an effective countermeasure that make roads safer for everyone

Research shows the installation of interlocks as part of a robust program prevents these drivers from starting their vehicle when they have been drinking not only while it is installed, but it also reduces recidivism post-removal. Even more compelling is evidence that interlocks reduce alcohol-related crashes. The use of these devices also has other positive benefits including enabling drivers to drive legally, attend treatment, retain employment, and fulfill family responsibilities while still being held accountable for their actions.

A five-year comprehensive evaluation of the alcohol interlock program in Nova Scotia, Canada conducted by TIRF revealed a small but significant permanent decrease in the number of fatal and serious injury alcohol-related crashes following the implementation of the program (Vanlaar et al., 2017).

There are also findings from several US studies showing all-offender interlock legislation is effective in decreasing fatal crashes when compared to states without all-offender legislation. A 2021 study (Teoh et al.) examined the association between interlock laws and fatal impaired-driving crashes between 2001 and 2019 in the U.S. Results revealed all-offender laws were associated with 26% fewer drivers with a .08 blood alcohol concentration (BAC) or higher involved in fatal crashes, compared with no law. Repeat-offender laws were associated with a 9% reduction in impaired drivers and repeat and high-BAC laws were associated with a 20% reduction in impaired drivers in fatal crashes when compared with no law.

Similarly, McGinty et al. (2017) utilized a multilevel modelling approach to examine the effects of state interlock laws on alcohol-involved fatal crashes in the U.S. from 1982 to 2013. All-offender laws were associated with a 7% decrease in fatal crashes (BAC > .08) and an 8% decrease in fatal crashes (BAC > .15). This means an estimated 1,250 fatal crashes would have been prevented in the US if all states adopted an all-offender law. This study also revealed reductions in fatal crashes were evident approximately two years after implementation.

In addition to crash reductions, while interlocks are installed in the vehicle, they reduce recidivism among both first impaired drivers and repeat impaired drivers. This includes the most persistent offenders who repeatedly drive after drinking with an extremely high-BAC and are resistant to changing their behaviour. In fact, more than ten evaluations of interlock programs have reported reductions in recidivism ranging from 50-90% with an average reduction of 64% (Willis et al. 2005; Kanable 2010; Elder et al. 2011; Fielder et al. 2013; McCartt et al. 2013; Voas et al 2013; Beck et al. 2015; Vanlaar et al. 2016; Kaufman and Wiebe 2016).

Limited hard driver licence suspension requirements reduce unlicenced driving

A hard suspension period is the set time during which an offender's driver's licence is suspended until they are eligible to obtain a restricted (interlock) driver's licence. The restricted licence permits them to only drive a motor vehicle equipped with an interlock device. Evidence suggests that the sooner offenders enter the interlock program, the less likely they are to drive while suspended or revoked. Hence, eliminating the hard suspension requirement ensures drivers can legally and safely drive with the device installed on their vehicle, without posing a risk to other road users. The highest-risk offenders are more likely to drive after drinking during the hard suspension period, and the longer they are able to drive without detection or consequences, the more likely they will continue this behaviour and not return to licenced driving. Of concern, drivers who are suspended or revoked are more likely to be crash-involved, and being caught for driving unlicenced may render them ineligible for interlock program participation. This means that having an interlock installed as soon as possible after the offence would help prevent subsequent offences that might otherwise occur during the period of hard suspension (Barrett et al., 2023; Beirness et al. 2003; Chamberlain & Soloman, 2012; Voas et al., 2013; Roberts & Meuleners, 2023). Many (27) states in the U.S. require only persistent offenders to comply with a hard suspension, which can be as limited as 30 days (Barrett et al., 2023). In other words, many states have moved away from a hard suspension period to instead ensure offenders can drive legally and safely with an interlock installed on their vehicle, as opposed to driving while unlicensed during their suspension period and without the interlock.

Mandatory all-offender interlock programs are optimal

Research has shown that monitoring offenders for failing to provide a breath test when required to do so, failing breath tests, tampering and circumvention and imposing graduated responses to these events increases compliance. For example, monitoring offenders has resulted in reducing average BACs and

the number of violations (Vanlaar et al., 2013; Ahlin et al., 2014; Assailly & Cestac, 2014; Voas et al., 2016; Vanlaar et al., 2017). Once interlock users have been compliant for a specific amount of time (e.g., 90 days), or for a specified time at the end of their interlock period, they are eligible to have the device removed. In contrast, a failed breath test or circumvention attempt within the designated time can result in an appropriate program extension of 30-90 days. In this way, program compliance is reinforced among participants and non-compliance is sanctioned.

In Canada, interlock programs that are most inclusive and applicable to the largest number of impaired drivers are typically found in provinces with the highest rates of interlock participation. Enrollment in the interlock program is a condition of relicensing such that impaired drivers are unable to simply wait out the hard licence suspension period. Most of these provinces also reduce the minimum licence suspension period to encourage impaired drivers to install an interlock.

Some jurisdictions have reduced the hard suspension period for interlock participants. Evidence suggests impaired drivers are less likely to participate in an interlock program if it is preceded by a lengthy hard licence suspension period. Most of the provinces with higher participation rates reduced the provincial licence suspensions for some categories of criminally convicted impaired driving offenders who enrolled in their interlock programs (i.e., Nova Scotia and Prince Edward Island).

Early licence reinstatement alone may not be sufficient to motivate impaired drivers to participate in an interlock program. Many impaired drivers choose to avoid the expense and inconvenience of using an interlock device and drive while suspended. All of the provinces with higher interlock participation rates, and most others, have some form of vehicle impoundment program for driving while suspended for impaired driving.

In addition, insurance is generally expensive in Canada, particularly in jurisdictions with private systems, such as Alberta and Ontario. As such, the high cost of insurance for impaired drivers should not be such to disincentivize offenders, leading to them dropping out of the licensing system and driving illegally. In light of the crash reductions shown with the use of alcohol interlocks, there is a case to be made for offering impaired drivers affordable insurance premiums, both to encourage participation and reflect the reduced risks they pose while driving an interlock-equipped vehicle.

Alcohol interlocks are underutilized in many jurisdictions

Interlock programs are largely underutilized across Canada. Although almost all jurisdictions have an interlock program, with few exceptions, even so-called mandatory programs are not truly mandatory, allowing some, or in the case of Ontario, all drivers to opt out of participating. In other words, impaired drivers can avoid interlock installation and still reinstate their driver's licence at the end of the suspension period. As a result, the proven crash and recidivism reduction which make roads safer are not being maximized because some impaired drivers simply do not install an interlock.

For context, in Canadian provinces, the installation rate per 100,000 licensed drivers ranges from 49.2 (Ontario) to 475.9 (Quebec). The interlock program is mandatory for all impaired drivers in Quebec, Saskatchewan, New Brunswick, Newfoundland, and Prince Edward Island. However, in British Columbia, Alberta, Manitoba, and Nova Scotia programs are only mandatory for repeat impaired drivers, and programs are voluntary in Ontario, Northwest Territories, and Yukon Territory. Nunavut does not currently have a program. The highest rates of interlock installation per 100,000 licensed drivers are in jurisdictions with mandatory programs, including Quebec (475.9), Saskatchewan (352.6), and Prince Edward Island (220.5). Conversely, while Ontario is the province with the largest population in Canada, it has one of the lowest rates of installed interlocks per 100,000 licensed drivers at 49.2.[1]

When comparing interlock installation rates per impaired driving charge, the rates still show room for improvement across provinces. However, it remains the highest rates of interlock installation per impaired driving charges are in jurisdictions with mandatory programs, including Quebec (339%), Prince Edward Island (118%), and Saskatchewan (94%). [2] While Ontario has a low rate of installed interlocks per impaired driving charges at 44%, the lowest installation rate is in British Columbia, at 27%.

The bottom line is much more work is needed to improve participation rates for interlock programs across Canada.

Examples of effective alcohol interlock programs

Program effectiveness is linked to higher participation rates. Research shows the most inclusive programs that are applicable to the largest number of impaired drivers are linked to the highest rates of interlock participation (Chamberlain, Solomon, & Murie, 2013). Features of effective programs often include all-offender legislation, strong data management and communication with agencies, a vendor oversight program, compliance-based removal, and making use of advanced technology (i.e., camera, GPS, real-time reporting). Some examples of effective programs and their successes are summarized below.

Colorado. The Colorado interlock program is overseen by the Colorado Department of Revenue (DOR), Department of Motor Vehicles (DMV). Alcohol interlock program eligibility criteria for all impaired drivers are uniformly applied across Colorado and eligibility requirements are defined in State statute. Impaired drivers seeking reinstatement of their driving privileges must install an interlock and comply with all other reinstatement requirements associated with their licence suspension or revocation in order to be eligible. Interlock-restricted licences that are issued are the only Colorado licence on which the word "restricted" appears at the top of the face of the licence. This notation alerts law enforcement that drivers must have an interlock installed on the vehicle they are driving. Colorado has a rate of 990 installed interlocks per 100,000 residents. A comprehensive report about the Colorado program can be found online: tirf.us/projects/colorado-ignition-interlock-program-evaluation.

Minnesota. Minnesota's interlock program is administrative and jointly run by the Office of Traffic Safety and Driver and Vehicle Services (DVS) Divisions of the Department of Public Safety. DVS manages enrollment, oversees device use and implements sanctions for participants who violate program requirements. OTS provides financial support, communication, education and outreach. DVS also manages the ignition interlock website, which facilitates enrollment, education and partnerships. Minnesota's interlock program follows several evidence-based practices to increase participation and effectiveness, including: all-offender eligibility, removal of hard suspension periods, compliance-based removal, and treatment, alcohol education or both. Minnesota has a rate of 329 installed interlocks per 100,000 residents. A comprehensive report about the Minnesota program can be found online: tirf.us/projects/minnesota-ignition-interlock-evaluation.

Washington. The Washington State Patrol is the regulatory authority of ignition interlock devices, interlock service technicians and interlock service centers throughout Washington State. The ignition interlock program of the Washington State Patrol is operated out of the Forensic Laboratory Service Bureau's Impaired Driving Section and consists of law enforcement officers and support staff dedicated to interlock compliance and public safety. Washington's interlock program follows several evidence-based practices to increase participation and effectiveness, including all-offender eligibility, removal of hard suspension periods, compliance-based removal, and treatment, alcohol education or both. Washington has a rate of 416 installed interlocks per 100,000 residents.

Conclusion

Given the increase in self-reported impaired driving since 2019, greater participation in interlock programs across Canada is imperative to improve road safety. Mandatory interlock requirements are linked to increased program participation and implementing mandatory programs in all Canadian jurisdictions would very likely result in higher participation rates, thereby decreasing impaired driving and impaired driving crashes. As of 2021, provinces with mandatory programs have the highest installation rates, proving that mandatory interlock requirements are effective in increasing participation among impaired drivers.

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[1] Territories are excluded here due to much smaller populations.

[2] Percentages over 100% may be due to administrative licencing low-BAC sanctions which impose interlock requirements in addition to impaired driving charges.

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Acute impairing effects of alcohol on driving skills

- Risk-acceptance / risk-taking[1,2]
- Aggressive driving[3]
- Loss of auditory information processing[4]
- Inability to gauge impairment[5]
- Inconsistent speed / slowed thinking[4,6]
- Declines in visual function & blurred vision[7]
- Slower reaction time & reduced coordination[8]
- Difficulty staying in lane[9]
- Disorientation / paranoia affecting situational awareness[10]
- Greater headways / slower speed[11]
- Reduced attention span / awareness[12]
- Memory issues[13]

Acute impairing effects of cannabis on driving skills

Not all drugs have the same impairing effects.
Combining them can increase your risk.

Project: tirf.ca/projects/idcc | Learn more: sobersmartdriving.tirf.ca

[1 & 12] Broyd et al. (2016)
[2] Brevers et al. 2014
[3] Upile et al. 2007 and NHTSA 2021
[4] Lyon & Robertson (2020)
[5 & 9] Sewell et al., (2009)
[6] Starkey and Charlton, (2017)
[7] Ortiz-Peregrina et al. (2022)
[8] Compton (2017) Bourque & Potvin (2021)
[10] Englund et al. (2013)
[11] Compton 2017
[13] Dellazizzo et al. (2021)

Visit tirf.ca to view sources

Full-size PDF available at tirf.ca/download/impaired-alcohol-cannabis

Impaired Driving Coalition of Canada

TIRF.CA

The vision of the **Traffic Injury Research Foundation (TIRF)** is to ensure people using roads make it home safely every day by eliminating road deaths, serious injuries and their social costs. TIRF's mission is to be the knowledge source for safe road users and a world leader in research, program and policy development, evaluation, and knowledge transfer. TIRF is a registered charity and depends on grants, awards, and donations to provide services for the public.

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DIAGEO

TIRF & Diageo North America formed the IDCC to tackle impaired driving in Canada.

Traffic Injury Research Foundation