

ANATOMY OF A ROAD CRASH

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Almost all of us have passed by a collision on our daily commute or while running errands. It's that moment when traffic slows down, and vehicles are forced to squeeze into fewer lanes just to get through. Worse still, is being stuck on the side of the highway during a road trip or vacation, holding your breath and hoping it is a minor delay and not the dreaded road closure and detour. The dismay and disappointment of being informed we will be late to our destination, possibly by hours, is a frustration we can all relate to in some form or another.

But few of us understand what happens while we wait, or what is to come long after we pass by a crash. Rarely do we pause to consider the police officer or first responder who delivers the bad news to waiting motorists and then remains at the crash scene as we continue our journey. Even crash victims are not aware of the carefully choreographed features of crash scene management which extend well beyond victim care, rescue (surviving crash victims) and recovery (fatal crash victims).

The anatomy of a road crash scene and how it unfolds is a mystery to most of us. This fact sheet describes the workplace of first responders and explains what happens during a crash as well as reasons for delays, detours and road closures. It also includes tips for motorists to help keep first responders safe at collision scenes and reduce the risk of secondary collisions. Public awareness of crash scene management can instill a sense of personal responsibility in all of us to reduce risks, avoid preventable crashes, and keep the professionals who protect us safe on the road.



The call

Police services receive reports of crashes through dispatchers in their call centre. Initial facts are limited to what information callers are able to provide and reports are often fragmented and contain incomplete information about the number and type of vehicle(s) and victims involved. The appropriate agency or agencies are assigned to the crash on this basis, and first responders receiving the notification must assess the location and distance to the scene as well as the safest route to get there. Traffic patterns and congested areas

must be assessed on the way, and first responders must contend with drivers who may not see them, or who choose to ignore lights and sirens and fail to pull over or stop at intersections.

The scene

Crash scenes are dynamic and professionals arriving at the location first must coordinate diverse responsibilities. Decision-making is critical and rapid-fire in order to preserve life and prevent further loss which are their primary goals. This applies not only to road crash victims but also

other road users and first responders performing their duties. Their job is to provide lifesaving measures, to protect the dignity of the dead, and to collect evidence. In doing so, they also commit themselves to the hours and weeks that follow until they figure out what happened and can tell family members why. Understanding why and how collisions occurred is essential to bring closure to families and prevent tragic events in the future.



Immediate tasks for responders first on scene include strategic positioning of emergency vehicle(s) with flares, traffic cones and flashing lights on to alert oncoming traffic. Once accomplished, they turn their attention to re-directing vehicles to manage traffic flow, control of fire and hazardous materials, and ensure the safety of first responders as they work. They are tasked with securing the scene, preserving evidence, and re-adjusting priorities as more information is gathered. Deceased victims and vehicle licence plates are covered to respect victims and protect families from learning about crashes on social media or news reports. The keys to vehicles must also be secured from the ignition to prevent starting of the vehicle. This ensures black box data can be retrieved later.

In tandem with these activities, first responders begin determining how best to assist victims in the safest way possible. They call in pertinent information to the dispatcher who ensures the necessary manpower, equipment and agencies are on their way. The severity and complexity of the crash scene may require the coroner or medical examiner, natural resources management, hydro utilities, environmental clean-up, and commercial

vehicle inspectors. Tow trucks may also be needed but often they cannot remove damaged vehicles until after victims are extracted or recovered, unless the circumstances necessitate it (e.g., immediate environmental risk or risk to victims and first responders).

The assessment

Crash scenes are very fluid and can change rapidly, posing risk to everyone in the vicinity. Hence first responders must be methodical and thorough in their situational assessment and this takes time. Constant monitoring and adjustment of priorities are a part of the process. Experienced first responders have learned not to let the severity of vehicle damage dictate how severe the crash may be for the victim(s). An intact vehicle upon arriving on scene only to find the occupants deceased is not an unheard-of scenario. Likewise, for survivors standing outside the vehicle; their lack of visible injury is not always a good indication of the extent of their physical (possibly internal) and/or psychological trauma.

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Vehicles involved in the collision may also pose safety risks. They may be at risk for further movement depending on the position and location of the vehicle. The presence of dangerous goods requiring environmental protection or unsecured goods is also a consideration. Dangerous goods may not always be readily apparent with an initial inspection, and heavy or fragile cargo and livestock can pose unique challenges.

The road delay, detour or closure

Depending on the location and severity of a collision, roads may be closed partially, briefly or entirely for an indeterminate period of time. Often, circumstances make it possible for traffic to continue to flow, albeit more slowly, or to be rerouted. But at times first responders have no choice but to close the road which may last

several hours. Drivers' reactions to the news can run the gamut from empathy to outrage. While many of them express concern and understanding, others struggle to contain their frustration. This is particularly true when drivers observe what appears to be first responders just standing around at a collision scene. Drivers may misinterpret this to mean no one is doing anything and conclude the road can simply be re-opened.

But in fact, at these times first responders are undertaking that complex choreography mentioned earlier. Each of them is working to expediently perform required tasks in the correct sequence and waiting patiently for their turn in the process. Moreover, professional services and equipment cannot be released until their job is done and first responders must remain until essential steps are completed and the scene can be cleared.

First responders must also be on guard when allowing drivers to pass, often alternating single file. Some drivers are unable to resist temptation and creep along to rubberneck, extending delays for everyone. Worse yet are those individuals who pull out their cell phones to capture photos or video of the crash scene. Not only do these behaviours increase the risk of everyone responding, but the posting of images to social media can be devastating for family, friends or colleagues of victims who are unprepared for the news. It is common for media to pay for tips, photos and videos of newsworthy incidents. However, this practice should be discouraged when it comes to crashes out of respect for victims. Sharing images is a thoughtless choice that can cause irreparable harm to individuals who recognize the victims.

The extraction, rescue and recovery

Depending on the severity of an incident, first responders may have to extract victims trapped in their vehicle. Live victims are referred to as a rescue whereas fatalities are described as a recovery. Extraction options for injured victims can range from prying open a door to much more complex, challenging and time-consuming approaches to limit further injury and prevent loss of life. In response to fatalities, the extraction process and

recovery of victims is tackled with the respect and due care we all want for a family member.

During these operations, first responders work collectively to maintain the safety of victims while police services manage the scene to protect first responders. Depending on whether the crash occurred in an urban or rural environment, there may be local scene management as well as external scene management involving roadblocks and detours. In urban centres, this may require blocking intersection to intersection where a re-route may include sightline of the collision. However, in rural areas, roadblocks may be set up at some distance from the actual incident with no sightline of the collision.

The evidence

Once a crash scene has been assessed, an important priority is to gather, document and photograph evidence. Crash scenes involving high speeds are often spread across a large area which can make it challenging to locate and collect it. Collision reconstruction professionals may be called out at crashes resulting in fatalities and severe injuries. Critical steps include mapping and measuring the scene, gauging tire marks to determine speed and braking patterns and identifying points of impact. This also enables them to determine the direction of travel and placement of victims in the vehicles in the event they were ejected, and ultimately, fault.



Police officers also interview witnesses who may have observed the collision, who may be injured themselves, or who may have arrived after the crash occurred. Witnesses should not

underestimate the importance of what they witnessed leading up to, as well as following a collision. All observations and information, including dashcam footage, should be provided to investigators.

In anticipation of investigating and analyzing the evidence from a collision, police officers must ensure chain of custody is protected for all the evidence collected. They must track which medical facilities victims are taken to by paramedics. Depending on the incident location and distance to the closest medical facility with needed equipment, other police services may be called upon to provide investigative support in securing statements. For critically injured victims who may not survive, statements must be taken as quickly as possible. These steps are always followed by the heart-wrenching identification of victims and, when necessary, death notifications.



Roadways are cleared and opened once it is safe for everyone. They must be returned to the safe condition that existed prior to the collision. Even though there may be no injuries, if there is battery acid or oil/fuel on the road, it must be cleaned up before it can be opened. Sweeping debris aside or into a ditch is not an option for environmental reasons and proper absorption materials must be used to ensure appropriate clean-up. While the reason for delays may be unclear to passersby, they should know first responders are taking all necessary steps to preserve life, safely manage collision scenes and secure evidence.

The investigation

The investigation process begins with the crash but can continue for days, weeks or months following the incident. Long after the scene is cleared and the road re-opened, police services analyze the evidence to identify contributing factors, determine responsibility and help victims find justice. Important tasks include submitting biological samples for analysis and waiting for test results. Vehicle data are analyzed and vehicles are assessed for damage and possible defects or failures that may have played a role. Facts are verified as witness statements are cross-referenced with physical evidence in order to piece together the events leading up to a collision.

No amount of training ever prepares first responders for the visceral reactions to injuries and death involving real people.

In the last two decades, crash scene management has evolved into emergency preparedness with first responder agencies cross-training and running practice drills. These activities are designed to ensure responses are coordinated and seamless in real-life situations. However, no amount of training ever prepares first responders for the visceral reactions to injuries and death involving real people.

Road crashes are a leading cause of death for first responders

Perhaps most concerning is the fact first responders perform these duties at considerable personal risk. One of the leading causes of death among all first responders is traffic collisions. Analysis of data provided by the Canadian Police and Peace Officers Memorial shows that since 1975, 88 out of 284 officers (31.0%) killed perished in a motor vehicle collision.¹ Similarly, data on police officers killed between 2009 and 2018 in the United States, reveal that 33.6% of officers died in motor vehicle crashes compared to 33.4% who died of gunshot wounds.²

A total of 63 first responders died in motor vehicle crashes in Canada between 2000 and 2016,

including 51 police officers, six paramedics, and six firefighters. Most of the fatally injured police officers were drivers or passengers (36 and six, respectively). The remaining nine police officers who died were pedestrians who had been struck by a vehicle while they were engaged in activities such as directing traffic, placing spike belts, or investigating a previous collision. Four of the six fatally injured paramedics were drivers and two were passengers. Lastly, among the fatally injured firefighters, there were four drivers, one passenger and one pedestrian. It should be noted that among the four firefighters who died behind the wheel, two were driving their personal vehicles on their way to a call³.

Call to action

Everyone plays a role in protecting first responders and preventing secondary collisions at crash scenes. Studies show secondary collisions are often a vehicle rear-ending another vehicle as drivers approaching a primary collision might not be attentive to the dangers ahead. These collisions can have significant consequences when victims from the primary crash remain on the roadway in a vulnerable (immobilized) state.

Steps we can all take when encountering collisions on the road to keep others safe include:

- > Avoid crash locations announced on radio or social media. Traffic congestion at a collision scene increases risk of secondary collisions and jeopardizes the safety of first responders who are working to provide the best care to save victims.
- > Exercise patience when facing road delays, detours or road closures due to a serious collision.
- > Pay attention to the presence of other vehicles and people around your vehicle. This is not the time to be distracted.
- > Listen to and follow instructions from first responders to safely pass a collision scene and reduce delays.
- > Resist the temptation to rubberneck and absolutely DO NOT take pictures or record video under any circumstances. No one wants to find out about an injured or killed

loved one through a social media post, and you will never forget things you wished you had not seen.



Crash scenes are a first responder's place of work and we need to let them do their jobs. Their efforts not only help prevent the future loss of life, but also provide victims with the care and families with the answers to help them move forward.

We extend our gratitude and respect to the first responders who serve Canadian communities every day and offer our appreciation to all Canadians who help prevent collisions as well as helping keep everyone safe at crash scenes.

¹ Marcoux, J., Nicholson, K. (2018). Four decades of Canadian police homicides by the numbers. Canadian Broadcasting Corporation. August 10. <https://www.cbc.ca/news/canada/manitoba/4-decades-of-canadian-police-homicides-by-the-numbers-1.4781581>

² National Law Enforcement Officers Memorial Fund. (2019). Causes of Law Enforcement Deaths over the Past Decade (2009-2018). <https://nleomf.org/wp-content/uploads/2019/05/Causes-Law-Enforcement-Deaths-2009-2018.pdf>

³ Traffic Injury Research Foundation. (2020) TIRF National Fatality Database.

Traffic Injury Research Foundation

The mission of the Traffic Injury Research Foundation (TIRF) is to reduce traffic-related deaths and injuries. TIRF is a national, independent, charitable road safety research institute. Since its inception in 1964, TIRF has become internationally recognized for its accomplishments in a wide range of subject areas related to identifying the causes of road crashes and developing programs and policies to address them effectively.

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