Crash Investigations

Investigations are an important part of every successful safety program. Done properly, they help uncover underlying factors and conditions that cause or contribute to crashes. Those results enable the organization to take actions to prevent similar crashes and avoid injuries and other costs.

This guide provides step-by-step information, diagrams, and examples to help employers do thorough investigations. Complete our **Investigating Motor Vehicle Incidents Online Course** to learn more.

To help you get started, download and review our **Motor Vehicle Near Miss Report and Incident Investigation Form**. It will help you gather and record the information you need.

Table of Contents

Conducting an investigation for your organization

Step 1: Respond to the incident

If you're personally involved

The first thing you should do is to check yourself and your passengers for injuries. If you or someone else is able, do the following:

- Secure the scene. Take steps to help ensure no further harm comes to you or anyone around you. For example, put out emergency triangles or flag down another driver to help.
- Contact 911.
- Provide first aid or other care to injured people.
- Notify your supervisor.
- Begin collecting information (see Step 2: Gather information).

If you're a manager or supervisor

As soon as you know about a crash, mobilize an appropriate emergency response or verify it is underway. Then, check your Emergency Response Plan to see if you or another representative should go to the crash scene.

It might not always be safe or effective to do that. For example, if the crash is weather-related, the risks of driving to the crash scene might outweigh the benefits. If it's a long way to the crash scene and it's not a serious incident, it may be cleared by the time you could get there. If that's the case, you might not be able to gather much useful information.

If you're part of the emergency response or investigation team dispatched to the crash scene

When you get to the scene, take the following steps:

- Verify the site is safe and secure.
- Help provide first aid or care for others.
- Begin or assist with collecting information.
- Cooperate with enforcement officers and first responders.
- Report the incident to authorities as needed (e.g., police, insurance company, WorkSafeBC, Provincial Emergency Program, etc.).

Step 2: Gather information

Look for information that helps explain the order of events: what happened before, during, and after the crash. Clear, organized information helps you re-create events and understand what happened. Crash scenes are chaotic so be prepared. Know what information to collect, and how to collect it.

What to do first

An employee who is already at the crash scene may be able to gather information. To help them be prepared, download our **What to do if You're Involved in a Crash Checklist**. Keep a copy in each work vehicle.

If you send an organization representative or a third party to gather information, have them follow these steps when they arrive:

- Park on the shoulder or a side road so the vehicle doesn't restrict visibility or access.
- Check the area for hazards and only enter if it's safe to do so.
- Wear appropriate safety gear (hi-visibility vest, protective eyewear, footwear, headwear, gloves).
- Identify who you are and why you are there.
- Cooperate with police and emergency responders. Be careful not to move or destroy evidence.

Examine the site

First, survey the scene to get an overall perspective. This will help you identify the information you want to gather and help you build a plan to do that.

Look closely for clues. What looks unusual? What do tire tracks tell you? Look inside the vehicle(s). Is it well-organized or cluttered with items that may have obstructed the driver? Is there a phone with a half-finished text? If you think it may help piece the events together, take a photo or make notes.

Look for clues that fall into these 3 categories:

Physical factors

Did mechanical, environmental, or other physical factors contribute to the incident? For example:

- Unfit vehicle, cluttered cab.
- Unsecured load.
- Worn out tires.
- Hazardous weather or road conditions.
- Pothole, loose gravel, defective traffic control device.

Human factors

Is there evidence that something a driver, passenger, or another road user did or did not do contributed to the crash? For example:

- Fatigue or another form of impairment.
- State of mind (hurrying, complacency).
- Driving knowledge or abilities.
- Distractions such as a phone, or spilled coffee or food on the floor.
- Speeding, ran a stop sign, tailgating, etc.

Organizational factors

Did you hear or see things that cause you to wonder if gaps or deficiencies in the organization's processes contributed to the incident? Think about:

- Policies or procedures
- Training
- Supervision
- Management priorities

Developing your own initial theory of what happened can guide you to collect necessary information. However, don't let your theory (or anyone else's) lead you to ignore contradictory information. Look for facts.

Take photographs

Photographs are one of the best ways to document information. Take photos of the:

- Position of vehicles involved
- Damage to vehicles, inside and outside
- Locations of crash-related debris
- Injuries to any person (get consent before taking photos)
- Position of injured persons, if thrown from the vehicle
- Viewpoints of any eyewitnesses
- Environmental conditions and factors (e.g., setting sun, icy patch of road, unsecured load, defective brake parts, etc.)

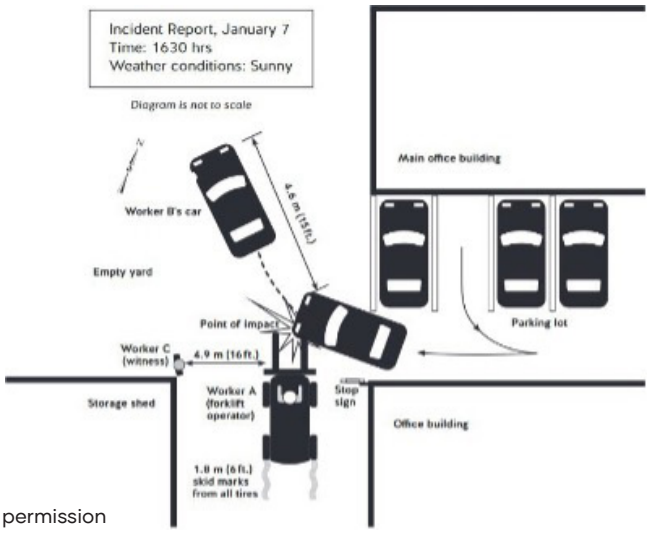
Take photos from multiple angles:

- From a hill or other elevated area.
- At multiple distances (25 metres, 50 metres, 100 metres).
- From the eye level of the driver.
- Include a common reference point or object to show scale or proximity to other objects.

Make sketches

Sketches are very valuable tools. A good site sketch provides an overall view of the crash scene and highlights key pieces of information. Start with a rough sketch to capture information before it moves or disappears. Later, use the measurements you collect to build a more detailed scale diagram.

Here's an example. Other examples, "how to" videos, and site sketch tools are available online.



Interview witnesses

Interviews are essential sources of information. Often, they are the only way to find out what happened and why. Speak with anyone involved in the incident or who saw it happen. Most people can't recall every detail of the incident so interviewing multiple people helps you stitch together a credible sequence of events.

Keep in mind that once witnesses leave the scene you might not be able to find them, or they may forget what they saw or heard. Speak with witnesses as soon as you can.

Ask questions that help you determine:

- Where the incident occurred: the locations of other vehicles, pedestrians, etc.
- Where the witness was when the incident occurred
- What they saw and heard
- When specific events happened and the order of events

Consider who else you can interview. For example, a supervisor or co-worker may have information about the driver's state of mind before they started driving.

Interviewing is a skill. Here are some tips to be more successful:

- Talk with observers as soon as possible. If they're injured or too upset to answer your questions, get their contact information and arrange to chat with them later.
- Conduct interviews individually and privately without interference from others.
- Don't demand information. Simply ask them to describe what happened.
- Ask open-ended questions, like "What happened next?" or "Was that before or after?"
- Ask "Why do you think that happened?" or "What could have been done to avoid this incident?"
- Avoid interruptions. Let the interviewee finish before asking follow-up questions.
- Periodically summarize and repeat details back to the person to make sure you have it right.
- Offer to show them your notes so they can confirm you have captured their words correctly.
- Give them your contact information. Ask them to call if they think of anything else.
- Ask if they have any photos or videos of the incident they can share.
- Thank them for their help.

Check technology

Nearly all new cars sold in Canada today have some type of event data recorder (EDR). They track a range of data, including vehicle speed, steering and braking actions, acceleration, seatbelt use, and other information that can establish key facts and valid evidence. Vehicle owners may be able to work with their local dealership to retrieve data that may be useful.

Check if the vehicles involved in the crash have dash cams and other on-board or in-vehicle technologies. Check with other motorists for dash cam footage that may catch some or all of the events.

Step 3: Map the sequence of events

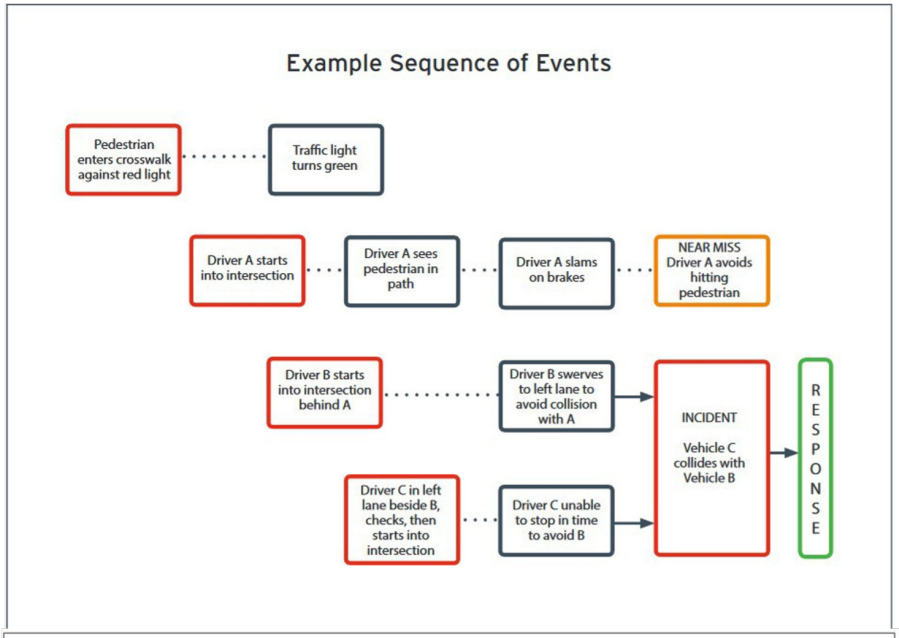
Use the information you gathered to re-create the incident. Use a flowchart to create a timeline of events that shows what happened before, during, and just after the incident. The flow chart below provides a framework.

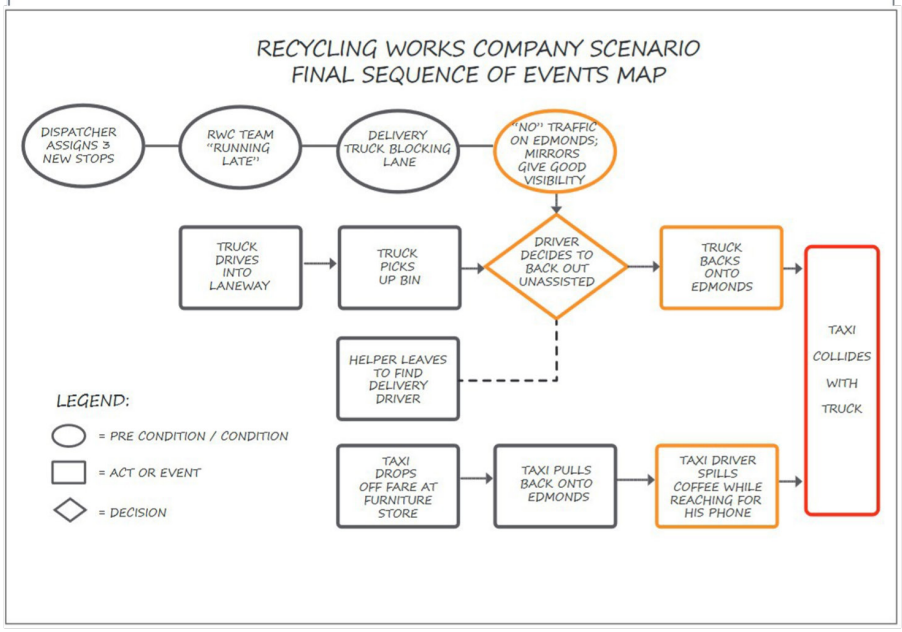
Your timeline should start well before the incident. Often, critical decisions and key events that happen before the crash have significant bearing on the crash. Your sequence of events map should include all the facts you've gathered, even if you don't initially see their relevance to the incident.

For each event, ask whether another event should have happened before or after it. For example, a left turn should be preceded by the driver using the left turn signal. If something that should have happened didn't, make a note and find out why.

The sequence of events has 2 key purposes:

1. It's a visual summary of what happened. People can review the diagram to check that it matches what they saw.
2. It provides a framework for asking important questions.





Step 4: Determine underlying causes

Each fact established in the previous steps is an opportunity to ask, "Why?" The sequence of events diagram helps the investigation team ask questions, discover facts, and test their theories.

It's an iterative process. Your first series of questions will help you see the immediate causes of the crash. Start with questions such as:

- Why did that happen?
- Why did the driver do that?
- Why do you think they did that?

You may discover the unsafe conditions, acts, or procedures that contributed to the incident. As you ask questions, you will think of others. Explore details, even when they aren't obviously key facts.

By continuing to ask "why," you can achieve the primary goal of the investigation: Discovering the root or underlying/immediate cause(s).

What is an immediate cause?

Immediate causes are symptoms of the underlying causes. They are the unsafe or substandard acts, practices, or conditions that led to the incident. This may include:

- Losing control of vehicle on slippery winter roads
- Running a red light while hurrying to an appointment
- Giving an employee a driving assignment they don't have the necessary skills to safely complete

What is a root cause?

Root causes explain why the immediate causes happened. They are the circumstances that allow unsafe conditions to exist, the conditions that facilitate unsafe decisions, and the fundamental reasons behind unsafe actions. For example, using the above immediate causes as examples, the underlying causes might include:

- Incomplete system: No process to make sure work vehicles have winter tires.
- Inadequate planning: Trip planning does not include checking highway conditions.
- Unrealistic work demands: Drivers are expected to arrive on time, no matter what.
- Incorrect procedure: Driver not following distracted driving procedure.
- Incomplete system: No driver assessments to verify skills, or no orientation/training process.

Step 5: Recommend corrective actions

The main reason for examining crashes is to find out how to prevent similar crashes in the future. Corrective actions should address the underlying cause(s) you identified in the previous step.

Rather than drafting a long list of corrective actions, focus on the one or 2 essential things that need to happen to prevent a similar incident. Here are some possibilities.

Consider organizational factors

These corrective actions focus on strengthening the organization's processes, such as:

- Leadership
- Supervision
- Driving policies, procedures, and practices
- Trip planning
- Orientation and training
- Employee workload, unrealistic expectations

Consider human factors

These corrective actions acknowledge that drivers are humans and focus on measures to change or improve how safely they do their work, such as:

- Building work schedules that avoid long driving assignments
- Decreasing employee fatigue by assessing workload
- Ensuring employees check with their supervisor before taking on driving that they feel is too risky
- Making sure staff have the driving knowledge, skills, and attitudes they need for work

Consider physical factors

These corrective actions look at the equipment your employees use.

- Are work vehicles properly equipped and fit for the purposes for which they are used?
- Will better inspection and maintenance processes help ensure work vehicles meet expectations?
- Do work vehicles have the right safety features and emergency equipment?

When the incident isn't your driver's fault

Your investigation might show that the crash was not the result of something your employee did or did not do. Another party is at fault. Even when that's the case, there may be opportunities to reduce crash risks. Can you finder safer routes? Can crash avoidance training help? Can you eliminate unnecessary driving?

Step 6: Write your report

There are several formats you can use. Choose one that works well for your organization. A well-structured investigation form can serve as a starting point. Your report should include the following sections.

Pupose and objectives

Explain why the organization conducted the investigation and what it expected to achieve. The core objective is to identify root causes and find ways to prevent similar incidents. There may also be legal requirements, organizational policies, and other reasons to consider.

Incident description

Briefly describe the events that happened before, during, and immediately after the crash, including:

- A list of people and vehicles involved.
- The sequence of events. Include suitable photos of the scene.
- The date and time of the incident. State day of the week or "day 11 of 12-day shift."
- The location and address of the incident. Add descriptors if relevant (e.g., busy street, steep hill).
- Names and roles of people investigating the crash.

It's usually appropriate to exclude or redact names and other personal information. Identify people as Driver A, Pedestrian B, Observer C, etc.

Investigation methods

Identify names, positions, and qualifications of your investigation team. Explain site visits. Insert photographs, sketches, and diagrams that contribute to the explanation. Describe interviews conducted and summarize what was learned. If you conducted any simulations, tests, or reconstructions, include the results here.

Findings

Provide an overview of why the incident occurred. Summarize the immediate and underlying causes. Identify contributing factors. Ensure readers can understand the logic used to develop the recommendations.

Recommendations

List the main recommendations aimed at preventing similar future events. Use a table that links each recommendation to the condition or finding that prompted it.

Appendix

Put information here that's important to the investigation but not essential to understanding the report. This could include:

- Raw data and statistics
- Supporting diagrams and photos
- Interview summaries
- A root cause analysis chart
- Copies of relevant documents

Step 7: Implement corrective actions

Your investigation team should review its report with management and present corrective actions. Management needs to act on the recommendations. Some can be easily implemented.

Recommendations that address deep-rooted or systemic causes can take considerable time.

Use a tracking system to ensure corrective actions are done on time. Here's an example of a table you can use:

As each corrective action is implemented, periodically check to see it is still being applied and how effective it is. Are the actions achieving intended results? Do you need to make adjustments?

Urgency	Corrective action	Assigned to	Target date	Completion date
Immediate	Review incident with team. Focus on: • Underlying causes and circumstances that contributed to the incident • Changes the organization will make to prevent similar events	Raj (safety coordinator) Include Michelle and/or Carl	March 30	March 19
Immediate	Request that owner of garbage bin relocate it to the back of restaurant.	Tina (operations manager)	March 10	April 4
Near Term	Reinforce organization's expectation that employees make safe decisions and follow procedures.	Lorne (senior VP)	April 15	April 15
Near Term	Develop a process so that: • Supervisors and dispatchers work with crews to build realistic routes and schedules • Supervisors review route and schedule changes with the driver before assigning that work	Tina (operations manager)	May 15	In progress