

# Reducing the risk of workers being struck by vehicles or mobile equipment

Every year, serious injuries and fatalities occur when workers on foot are struck by vehicles or mobile equipment (such as forklifts, excavators, trucks, and graders) on worksites. These events are known as *struck-by incidents*. In B.C., more than 550 struck-by incidents occurred in the past 10 years.

Working near or interacting with vehicles or mobile equipment puts workers at high risk of being struck because:

- Workers cannot consistently notice, see, hear, and respond to all changes around them.
- Workers engaged in and focused on a task have even less capacity to notice or pay attention to changes around them, such as people or vehicles approaching.

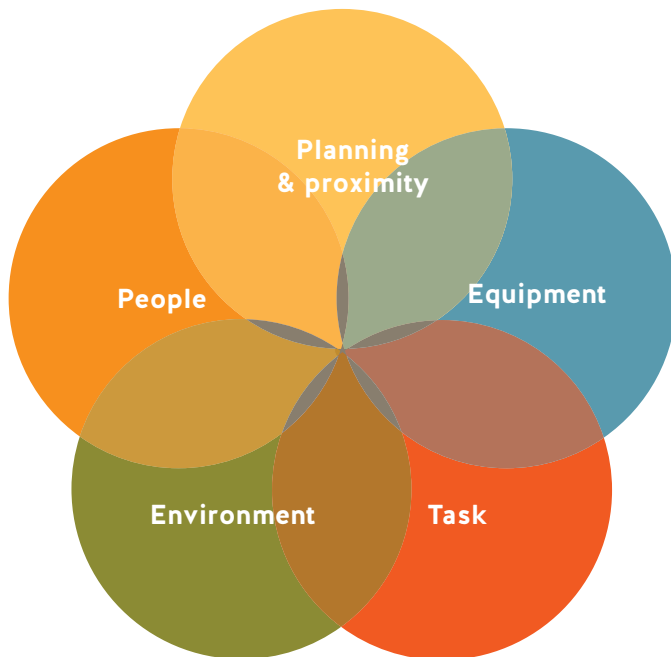


Figure 1: Factors that may contribute to the risk of struck-by incidents

This document aims to do the following:

- Raise awareness of the factors that contribute to struck-by incidents.
- Outline effective options to reduce the risk.

## Identifying factors that may contribute to the risk

Preventing these incidents begins with identifying and understanding factors that influence how work is performed. Several key factors can play a role. These factors interact (see Figure 1) and may influence the risk of struck-by incidents. Consider how these factors interact at your workplace.

Factor	Things to consider
● Planning & proximity	Traffic, pathways, proximity of work or workers to vehicles, training, procedures, reporting, contractor overlap, schedules, etc.
● Equipment	Condition and suitability of vehicles, attachments, mirrors, cameras, safety devices (if any), controls, seating, etc.; phones
● Task	Goals or objectives, work or task locations, timing, pace or incentives, technology use, interactions, etc.
● Environment	Site layout, space, traffic and pedestrian paths, lighting, noise, time of day, visibility, blind spots, blind corners, weather, etc.
● People	Workers, team, supervisors, line of sight, focus of attention, hearing, eyesight, posture, personal protective equipment (PPE), communication, etc.

## Managing the risk

As an employer, you can manage the risk of struck-by incidents involving vehicles or mobile equipment by taking three key steps:

- 1 Identify the factors that contribute to the risk in your workplace. (Pay close attention to areas where workers work with or near vehicles or mobile equipment. Note the movement patterns of vehicles or mobile equipment and workers, as well as the layout of storage and loading areas.)
- 2 Assess those factors to determine the degree of risk to workers. The risk is the chance — high, medium, or low — that workers could be injured, as well as how serious the harm could be.
- 3 Control the factors to reduce the risk.

## Controlling the risk

The hierarchy of controls (Figure 2) ranks control options from most effective to least effective.

At the top of the hierarchy, elimination (complete removal of the hazard) is the most effective category of controls. At the bottom of the hierarchy, PPE is the least effective category of controls. Always aim to implement controls from the elimination, substitution, or engineering categories.

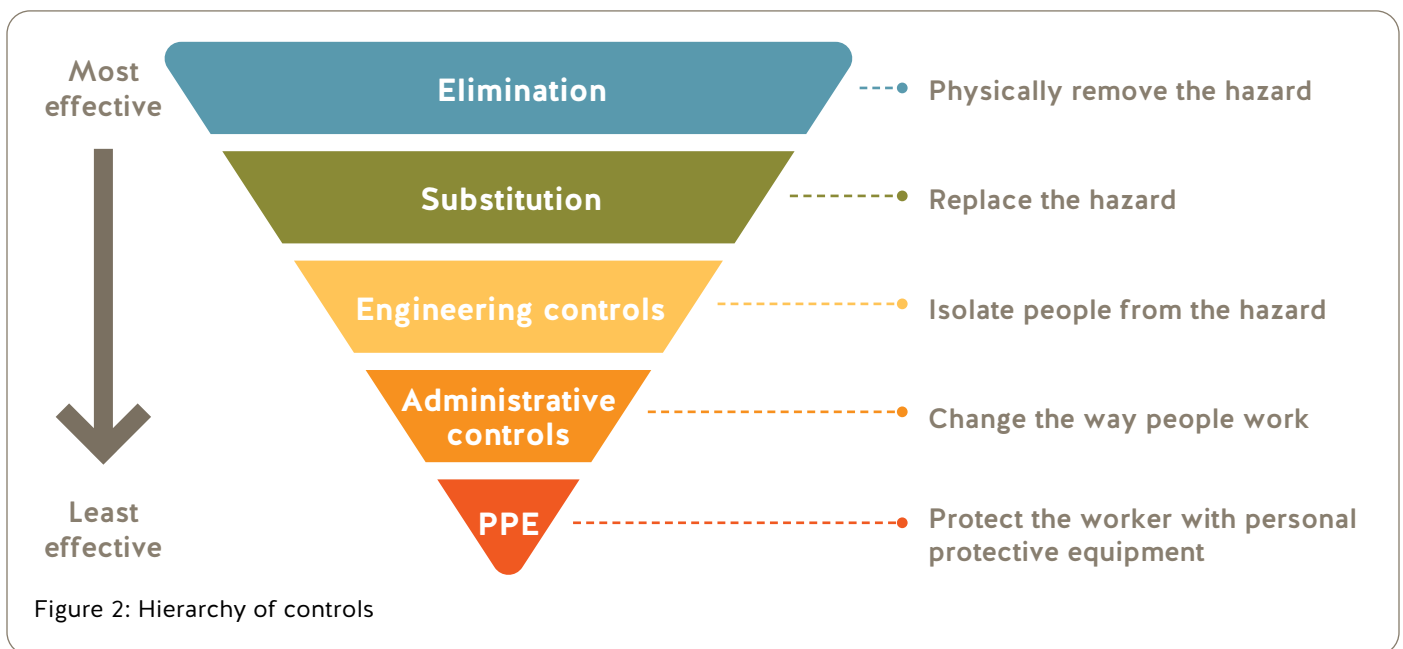
The most effective way to reduce the risk of struck-by incidents involving vehicles or mobile equipment is to design the work and the worksite to eliminate or limit interactions between workers and vehicles. This means putting in place a combination of elimination, substitution, and engineering controls, as outlined in the sections that follow.

### Elimination or substitution

- Eliminate the use of vehicles or mobile equipment where possible.
- Create vehicle-only areas to eliminate interactions between pedestrians and vehicles.
- Eliminate the need to reverse (e.g., implement one-way systems).
- Provide separate vehicle and pedestrian entrances and exits.

### Engineering controls

- Designate safe working, parking, and standing areas that limit access near or behind vehicles or mobile equipment.
- Use movable protective barriers or guardrails, fencing, and/or concrete sections to set vehicle and pedestrian routes apart.



- Install laser, radar, or ultrasonic sensors to stop vehicles when they sense a person or an object while reversing.
- Install trip sensors to detect people or objects.
- Secure vehicles from moving while they are being loaded or unloaded.
- Provide adequate space when reversing is necessary.
- Limit the speed of vehicles in the workplace with speed bumps or other means.

### Administrative controls

- Use warning devices to call attention to hazards, and train workers to use and recognize these warnings. Examples include the following:
  - Use tonal or broadband audible reversing alarms to warn workers nearby.
  - Fit vehicles with additional lights, reflectors, and flashing or rotating beacons (as well as horns for drivers to warn others that they are approaching).
  - Install vehicle cameras, mirrors, or other visibility aids to provide feedback to drivers.
  - Use high-visibility markers to draw attention to workplace hazards.
  - Place fixed mirrors in reversing areas.
  - Provide clear markings and signs to increase awareness and visibility and set apart pedestrians and vehicles.
- Develop a traffic control plan to coordinate the movement of all traffic on site, including visitors.
- Ensure all workplace parties plan, communicate, and supervise their activities to eliminate or minimize interactions between pedestrians and vehicles.
- Schedule collections and deliveries so they don't occur at the start or end of shifts (to avoid crowds).
- Inspect, test, and maintain alarms, sensors, CCTVs, wipers, lights, mirrors, etc.

- Restrict the size of vehicles permitted on site.
- Provide education and training to all workers on the risks of struck-by incidents and effective prevention measures.
- Include questions on monthly inspections that can help prevent struck-by incidents.

### Personal protective equipment

- Provide workers on foot with safety gear equipped with radio-frequency identification (RFID) tags that can be detected by approaching vehicles and alert the drivers.
- Provide high-visibility vests to ensure workers on foot are more easily seen. These vests must meet the requirements of Part 8 of the Occupational Health and Safety Regulation.

### Regulation requirements

The most relevant sections of the Regulation for vehicles and mobile equipment are as follows:

- [Section 4.33, Arrangement of work areas](#)
- [Sections 8.24 and 8.25, High visibility and distinguishing apparel](#)
- [Section 16.6 Obstructed views and pedestrians](#)
- [Part 18, Traffic control](#)

### For more information

- [Managing Risk](#) (WorkSafeBC)
- [People Aren't Pylons](#) (Road Safety at Work)
- [Workplace Transport Safety: Reversing Vehicles](#) (Health and Safety Authority, Ireland)
- [Struck-By Incidents and Heavy Equipment](#) (Infrastructure Health & Safety Association, Ontario)
- [Reversing Safely](#) (Queensland Government, Australia)