

People Aren't Pylons - Preventing Vehicle Collisions at Work Sites

April 1, 2020

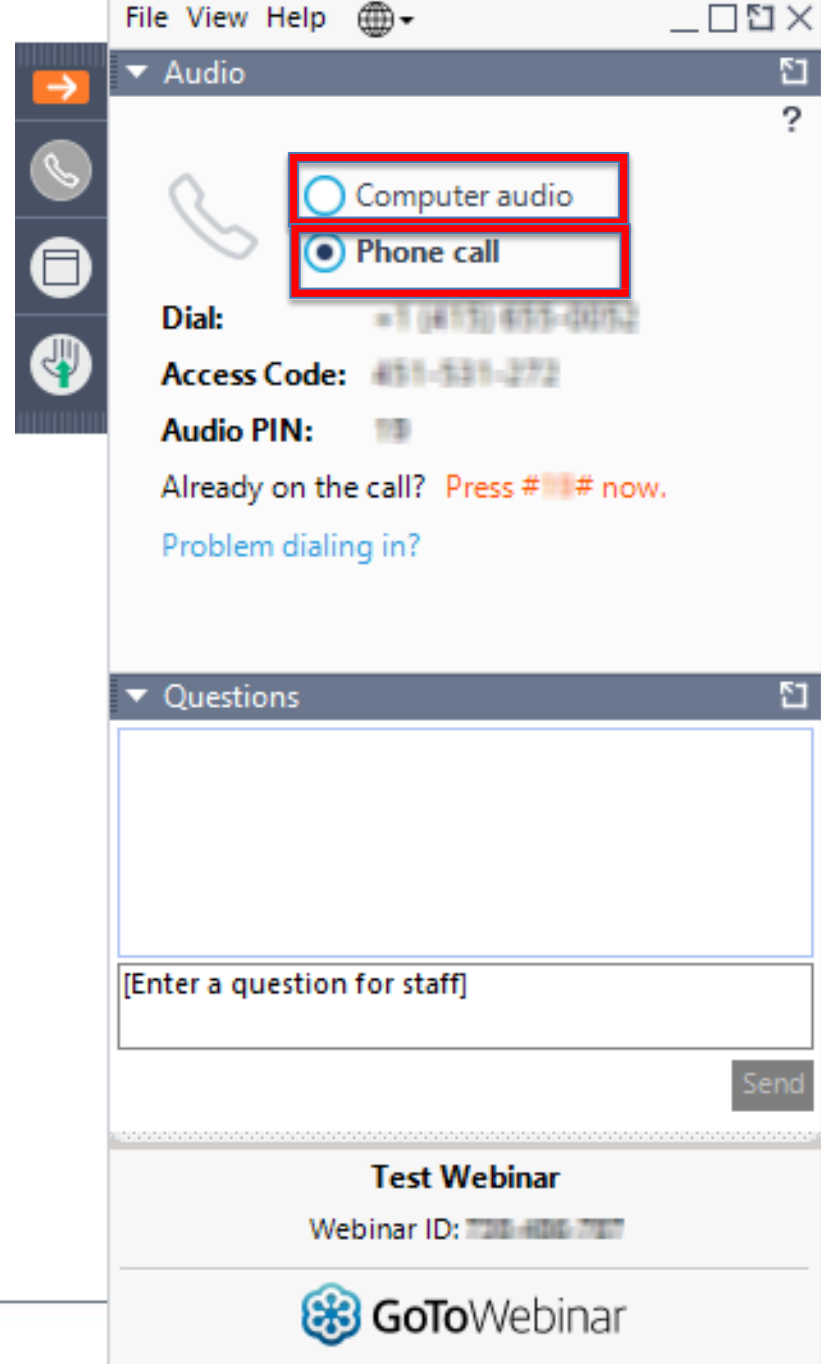


Audio instructions

Select “Computer audio” to use your computer’s sound

OR

Select “Phone call” to dial in



File View Help

Audio

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Phone call

Dial: +1 (415) 855-0052

Access Code: 855-531-272

Audio PIN: 123

Already on the call? Press #123# now.

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Questions

[Enter a question for staff]

Send

Test Webinar

Webinar ID: 7700-4000-7007

GoToWebinar



Asking questions

Click on “Questions”
to expand the
Questions pane

Then

Type your question
to the moderator

The screenshot displays a GoToWebinar interface. At the top, there is a menu bar with 'File View Help' and a globe icon. Below the menu bar, the 'Audio' pane is visible, featuring a telephone icon and two radio buttons: 'Computer audio' (unselected) and 'Phone call' (selected). Below these are fields for 'Dial:' (+1 (415) 655-0052), 'Access Code:' (451-531-272), and 'Audio PIN:' (119). A red text prompt says 'Already on the call? Press #119# now.' and a blue link says 'Problem dialing in?'. To the left of the 'Audio' pane, a vertical toolbar contains three icons: a telephone, a calendar, and a hand with a green arrow. An orange box highlights the top-left corner of the interface, which includes a white square and an orange arrow pointing right. Below the 'Audio' pane, the 'Questions' pane is expanded, showing a large text input area with the placeholder text '[Enter a question for staff]' and a 'Send' button. At the bottom of the interface, the 'Webinar ID: 7728-4886-7207' is displayed, followed by the GoToWebinar logo and name.

Our webinar partner



Teresa Holloran

Quality Assurance Specialist,
Traffic Control Program

April is **Construction Month**



CONSTRUCTION MONTH
APRIL 2020



About BCCSA

- 40,000 employers
- 200,000 workers

BCCSA helps employers save money, make money and protect their money by decreasing financial and human losses associated with workplace injury.

Struck-by incidents are a BIG concern in the construction industry.



Introducing today's guest presenter



Heather Kahle

Human Factors Specialist

Risk Analysis Unit

PREVENTING
STRUCK-BYS

STUBBORN
RISK

FATIGUE RISK
ASSESSMENT

**HUMAN
FACTORS**

MSI
PREVENTION

USABILITY
OF
PROCEDURES

INVESTIGATION
ANALYSIS

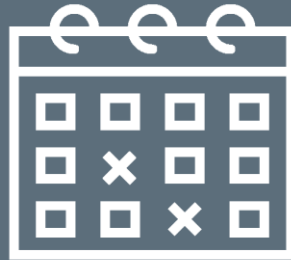
WORK SAFE BC

Webinar Objectives

1. Explore why struck-by incidents occur
2. Highlight legal responsibilities for workplace parties
3. Provide effective risk control options based on the hierarchy of risk controls
4. Identify best practices, tools, resources and links to effectively prevent struck-by incidents

Incidents

2008 - 2017



234 involve mobile equipment



456
Reversing
Incidents

14
Fatal, work-
related struck-
by injuries

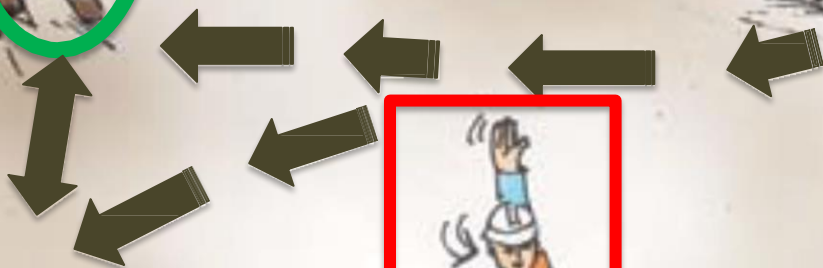
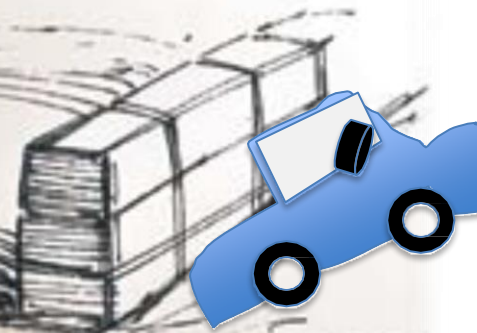
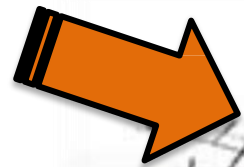
Struck-Bys in the Workplace



Poll Question #1

Do you think alarms are effective in protecting against the hazards of reversing mobile equipment or vehicles?

- Yes
- No
- I don't know

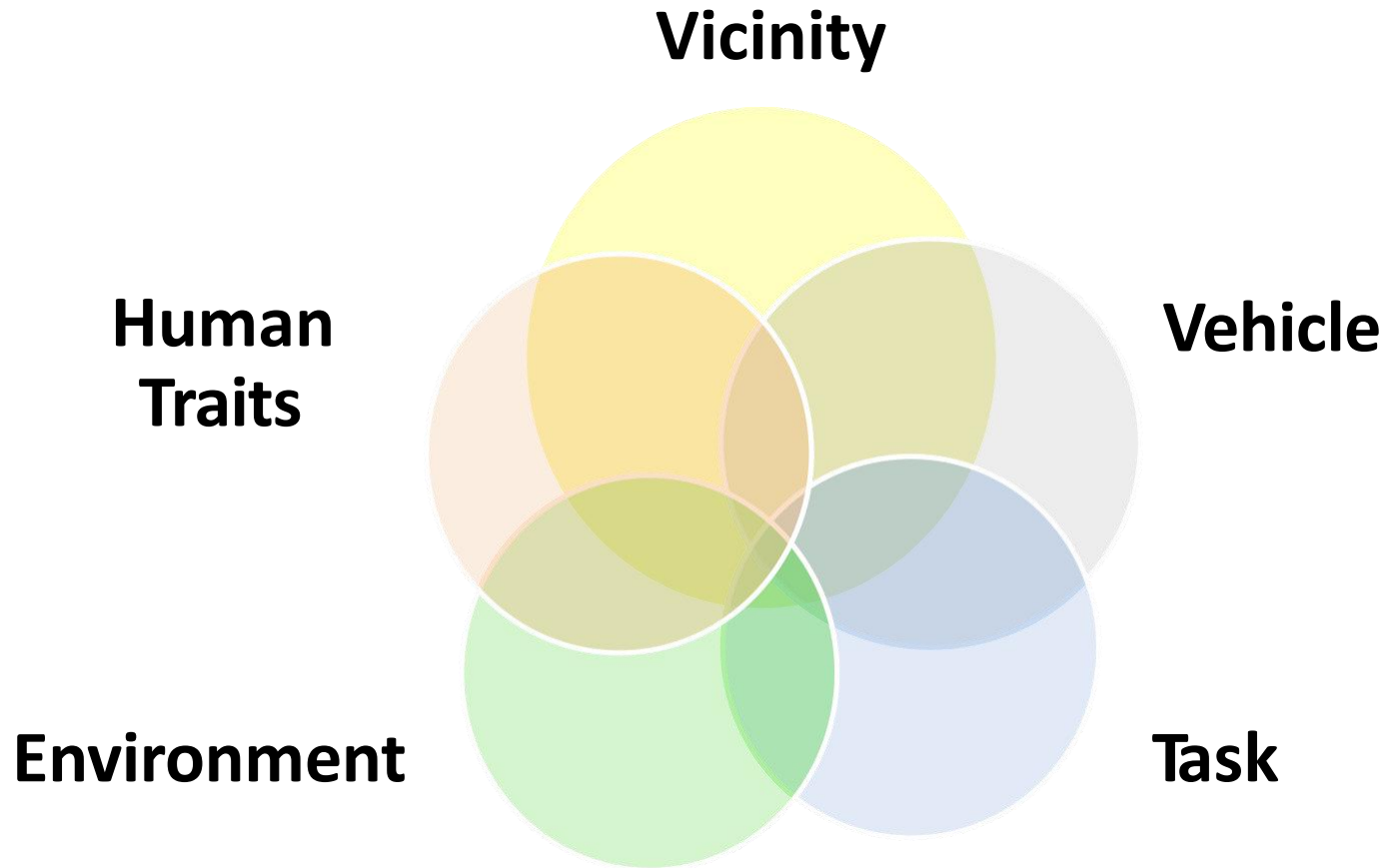


Poll Question #2

What do you think is the main reason for struck-by incidents on work sites? Choose one.

- Workers are focused on other tasks**
- People are working in proximity to vehicles**
- Traffic control plans missing**
- Alarms are not heard**

5 Elements Contributing to Workplace Struck-By Incidents



Vicinity

Vicinity

- Workers and vehicles working in close proximity
- Multiple contractors on site
- Work location
- Mixed traffic
- Traffic control plan



Vehicle

Vehicle

- Size, type, purpose
- Blind spots, obstructed view
- Feedback to driver - cameras
- Mirrors – position, size, shape, angle, maintenance, cleanliness, impacts depth perception
- Audible reverse alarm (to others nearby)

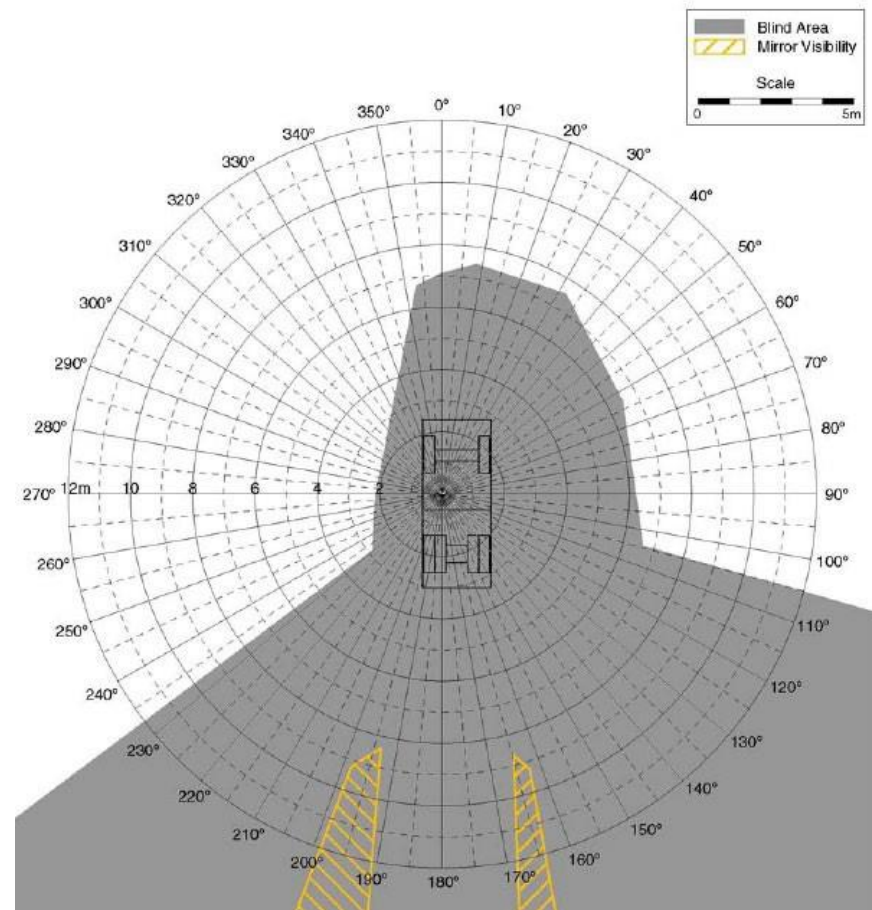


What is a Blind Spot?



Dump Truck (Manufacturer and Model)	GMC 3500HD
GVW	15,000 lb

<https://www.cdc.gov/niosh/topics/highwayworkzones/bad/pdfs/catreport2.pdf>




Task

Task

- Task requirements/complexity
- Positioning
- Focus of attention/line of sight
- Communication
- Personal Protective Equipment requirements



Environment



Environment

- Worksite Layout
- Hills or ramps
- Pathways
- Blind corners
- Location – congestion, busy, multi-use
- Obstructions
- Light levels
- Noise
- Distractions
- Weather

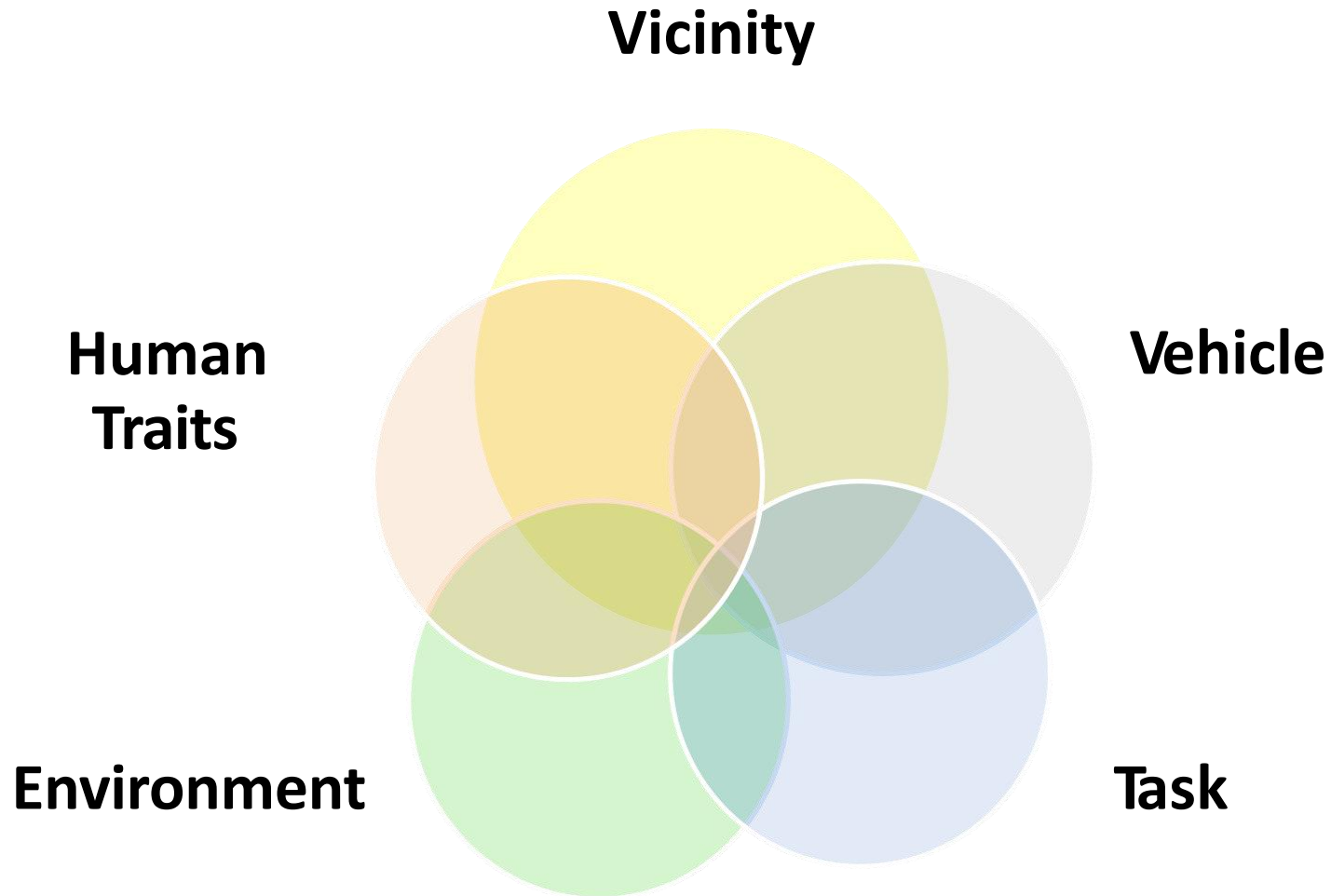
Human Characteristics

Human Traits

- Expectations
- Attention
- Line of sight
- Distance perception
- Hearing/loss



Consider ALL Elements



Workers Compensation Act

Owner	Maintain the premises to ensure the health and safety of people on site Disclose full details of any potential workplace hazards so they can be eliminated
Employer	Ensure a healthy and safe workplace Provide OHS Program including training, supervision, safe work procedures, etc.
Prime	Written agreement to act as prime Coordinate H&S activities of all Establish and maintain H&S requirements

Workers Compensation Act

Supervisor

Ensure the health and safety of all workers under your direct supervision
Know and meet the WorkSafeBC requirements that apply to workers you supervise

Worker

Report hazards immediately
Follow safe work procedures
Use the protective clothing, devices, etc.
Co-operate with H&S representatives, WorkSafeBC

<https://www.worksafebc.com/en/health-safety/create-manage/rights-responsibilities>



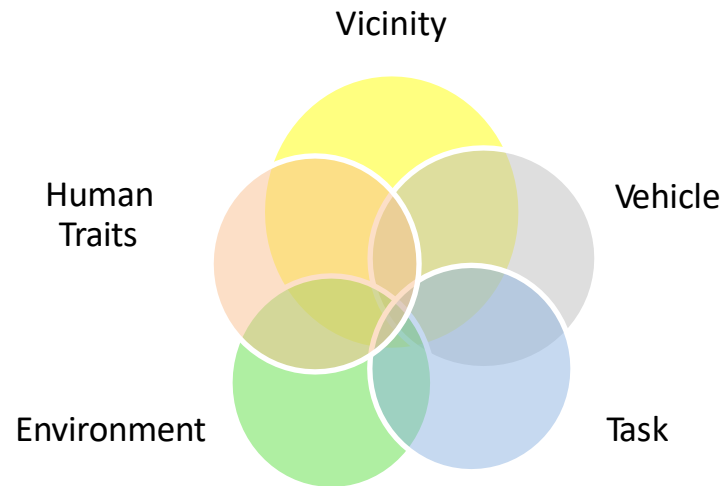
Additional OHSR Requirements

- **Part 16.43 Separate pedestrian and mobile equipment traffic**
- Part 4.33 Arrangement of work areas – for safe movement of people, equipment, materials
- Part 18.2 – requirement to provide effective traffic control; adherence to the traffic control manual is “effective”
- Part 8 - PPE



Investigations

- WCA Sections 68 - 72
- Consider all elements of the workplace system
- Assess all elements that contribute to incidents



Factors to Consider

Task

Job requirements, line of sight
Location, position, PPE
Communication,
Policies, procedures

Vehicle

Type, use, driver feedback
Blind spots, mirrors, lights
Alarms, CCTV, traffic plans

Environment

Area congestion, hills, ramps
Obstructions, lighting, contrast
Pathways, noise, weather
Visibility, dust

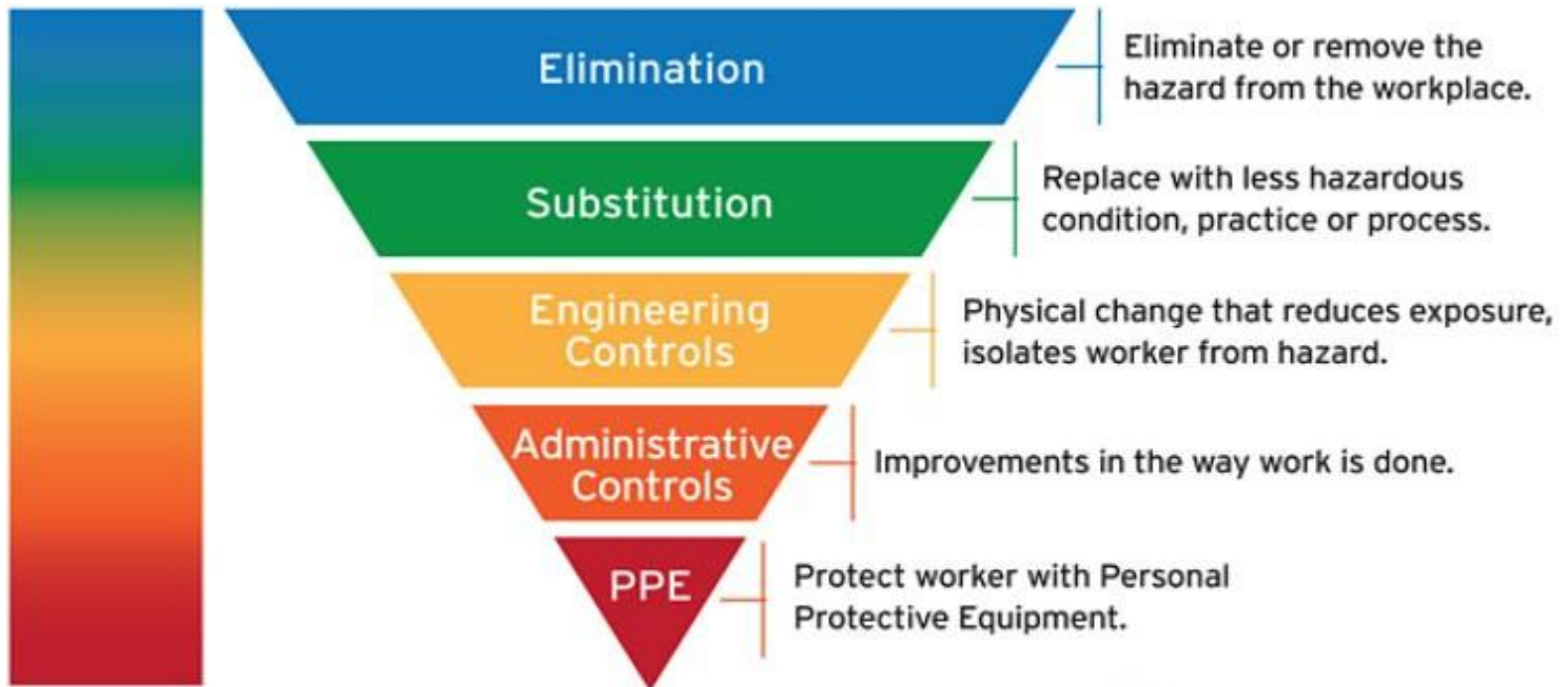
People

Focus of attention
Line of sight (both), hearing
Perception of distance

Hierarchy of Controls

MOST
Effective
Reliable
Sustainable

HIERARCHY OF CONTROLS



LEAST
Effective
Reliable
Sustainable



Elimination / Substitution

Separate vehicles from people

- **OHSR 16.43 Separate pedestrian and mobile equipment traffic**
- Plan and organize every project, yard, parking lot, so that vehicles and people are kept separate
 - DO NOT reverse or turn around.
 - DO NOT reverse from a side road into a main road.
- Develop and provide traffic control plans
- Substitute: vehicles



Control Hierarchy: Engineering

- Close proximity, motion sensors
- Blind spot detection systems
- Alarms, cameras
- Buffer vehicles, barriers
- Mirrors



Poll Question #3

Have you heard a broadband alarm before?

YES

NO

Tonal



Broadband



- Volume of 97 dB 112 dB SPL
- Typical freq ranges 1000 to 3000Hz
- Heard upto 3km
- Single tone
- Poor audibility with HPDs
- Difficult to localize
- Habituation

- Multiple tones “pschtt – pschtt”
- Easier to locate/less confusion
- Reduced environmental noise ‘annoyance’
- Sound dissipates

Warning Signs - Passive



- Location, language
- Must be first noticed
- Time needed to encode, comprehend and comply
- Must be able to override context/goals
- Characteristics must be different from environment

Administrative Controls

- Traffic Control Plans
- Journey management
- Safe Work Procedures
- Policies (e.g. designated work areas, use of electronics, using seatbelts, etc.)
- Supervision
- Training (e.g. driver training)

Personal Protective Equipment



Your Last Line of Defence

Summary

- ✓ **Vicinity** – Separate vehicles and pedestrians
- ✓ **Vehicle** – Use technology to reduce risk
- ✓ **Tasks** – Requirements influence position, focus, etc.
- ✓ **Environment** – Identify factors that can increase the potential for incidents
- ✓ **Humans** – conditions affect what is heard, seen and responded to

Take-Aways

- ✓ Understand why incidents happen
- ✓ Seek input
- ✓ Apply the hierarchy of controls
- ✓ Find resources for effective prevention at roadsafetyatwork.ca and worksafebc.com

Questions and Discussion



Hand-outs and Resources

We will be sending out the resources mentioned in the presentation along with supplementary materials and resource links.

BEST PRACTICE FOR SAFE BACKING & EQUIPMENT BLIND SPOTS

INTRODUCTION

Incidents at construction sites involving vehicle/equipment backing over or striking workers highlights a critical need for revision to continually assess hazards, and review safe work practices & procedures. Poor sight lines and lack of visibility are inherent in most vehicles and equipment used on construction sites. This is especially true when the vehicle/equipment is backing up, or moving in areas where space is limited and the warning radius is tight. Warning devices such as back-up alarms are provided on trucks and mobile equipment, but this is not always sufficient to ensure worker safety.

THE ISSUE

In the summer of 2016 three workers were struck by vehicles or mobile equipment on work sites in BC, two of those workers died as a result of their injuries.

POTENTIAL SOLUTIONS

The BC Construction Safety Alliance has created this Best Practice to help companies develop effective risk assessment procedures and corrective actions to help prevent these occurrences.

1. Assess the site hazards and organize the work to ensure safe movement of vehicles and equipment. Whenever possible, plan the work to allow for drive-through operations that will not require vehicles to back up.
2. Establish designated travel areas, clearly with barriers or other means to set them apart from other work locations.
3. Reduce foot traffic in areas where dump trucks and mobile equipment are to be working.
4. Establish a system to control movement of vehicles and equipment on site if it is necessary to have workers and dump trucks and/or mobile equipment working in the same area.

Control Blind Spots (plan view)

Drive Blind Spots (plan view)

CCCSA
Construction Safety Alliance
604.636.3723 | 1.877.860.3825 | info@cccsa.ca | www.cccsa.ca

Safety at the Roadside: What Workers Need to Know

Additional Tools

- For Employers and Supervisors
- For Workers

WORKSAFE BC

Human Factors

WORKSAFE BC
wishes to see a successful
worksafebc.com

HUMAN FACTORS
worksafefbc.com

Reversing safely

Q1) Least driver safety fact sheet

The majority of drivers spend a very small amount of their driving time in reverse gear, but the vehicle damage which occurs while reversing is one of the largest contributors to motor vehicle insurance claims in terms of both the frequency of collisions and the total cost of the repairs.

The damage usually results from the insured vehicle being reversed into an object, a building or another vehicle. In the very worst cases a child or other pedestrian can be the victim.

Reversing and the law

A driver who does not reverse a vehicle safely is breaking the law:

Transport Operations (Road Use Management – Road Rules) Regulation 2009 Part 16 Miscellaneous road rules

298 Driving a vehicle in reverse

(1) The driver of a vehicle must not reverse the vehicle unless the driver can do so safely. Maximum penalty—20 penalty units.

(2) The driver of a vehicle must not reverse the vehicle farther than is reasonable in the circumstances. Maximum penalty—20 penalty units.

Employers also have obligations under the Work Health and Safety Act 2011. If drivers are regularly having collisions while reversing a work vehicle there is a requirement for a risk assessment to be carried out to identify the measures needed to minimise the risk.

FACTS 16

European Agency for Safety and Health at Work

Preventing Vehicle Transport Accidents at the Workplace

Every year about 1200 people are killed or seriously injured in the EU, with about a third as a result of transport (1). These include road traffic accidents involving trucks and other heavy vehicles (2). The incidence of accidents is higher in Small and Medium Enterprises (SMEs) with fewer than 50 employees. The extent of the fatalities is related to vehicle transport in all types and sizes of enterprises.

Accidents can be avoided by effective management and prevention measures:

1. Addressing the recurrent, widespread or immediate safety and health requirements for emergency routes and exits, traffic lights, signage, barriers, cones, etc.
2. Ensuring safe work equipment (correct loading, unloading, safety harness, ladders, lashing and chainbrake inspection and maintenance). These are critical requirements for mobile work equipment (e.g. telehandlers) being used on rolling stock.
3. Providing safety and/or health signs where hazards could be avoided or adequately reduced by preventive measures.
4. Implementing a general framework to control health and safety, including assessment and prevention of risks, giving priority to reducing the most serious risks, and consultation with employees, providing information and training, and, in addition, regular maintenance.

The minimum requirements set by Directive have been endorsed by national legislation that may include additional requirements.

Employers have duties to cooperate actively with employees' representative bodies, following instructions in accordance with training given.

Concerning the worker is a requirement, using their own initiative, to take hazards and controls visible and audible solutions presented.

Practical accident prevention:

The first step is a suitable and sufficient risk assessment:

1. Identify the hazards associated with activities involving workplace vehicles (e.g. reversing, backing, loading and unloading the 'load') (e.g. 'What might go wrong and why?').
2. Identify who might be harmed by each hazard. This is a duty to identify all other workers, and not just the vehicle driver and the public.

There is a requirement for training, instruction and supervision?

Is there a requirement for in-vehicle parking aids such as reversing parking sensors or reversing cameras?

Distracted attention — mobile phone use and walking

This bulletin looks at how using a mobile phone can affect a pedestrian's attention, body position, visual field and safety. Widespread research shows that it is increasingly recognized that pedestrians, whose attention is distracted because they are talking on a mobile phone, increase their chances of being involved in an accident.

After leaving his vehicle, the manager walked across the landing to check the height of the settlement gauges. While he was walking, he made a call on his mobile phone to the engineer about the gauges. Meanwhile, the truck was still reversing and the backup alarm was sounding normally. The driver was in visual contact with the spotter through his side-view mirror. The spotter braked away from the reversing dump truck to check behind him, and at the same time, the manager crossed behind him and into the path of the truck. The spotter did not notice him. Still talking on the phone, the manager stopped with his back to the truck, unaware that it was backing up immediately behind him. The truck's rear tires snagged the back of his leg and pulled him under the truck. He later died from his injuries.

What happened?

At an active construction site, sections of land were being preloaded with sand and gravel. Settlement gauges had been installed. The section manager arrived and parked at the worksite. While the manager was parking the vehicle, two loaded dump trucks with trailers approached the staging area. One truck waited at the driver of the second truck unhooked the trailer and reversed towards the landing to release its load. After leaving his vehicle, the manager walked across the landing to check the height of the settlement gauges. While he was walking, he made a call on his mobile phone to the engineer about the gauges. Meanwhile, the truck was still reversing and the backup alarm was sounding normally. The driver

* Settlement gauges show the depth of the pre-load. As the depth increases, height extensions are added to the gauges so they remain visible.

Page 7 of 2
WORKSAFE BC Human Factors Bulletin 2013-03

Contact us with your questions



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Visit our websites for more
tools and resources



<https://roadsafetyatwork.ca>



<https://www.bccsa.ca>

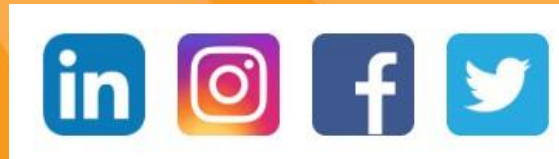


<https://www.worksafebc.com>

Thank You!

See next slide for a list of links to resources mentioned in this webinar

Follow Us On



Links to various resources mentioned in this webinar

BCCSA

[Safety bulletin: Best Practice for Safe Backing and Equipment Blind Spots](#)

Centers for Disease Control and Prevention

[Construction Equipment Visibility](#)

Cone Zone

[Safety at the Roadside: What Workers Need to Know](#)

European Agency for Safety and Health at Work

[Preventing Vehicle Transport Accidents at the Workplace](#)

Health and Safety Authority

[Workplace Traffic Management](#)

Infrastructure Health & Safety Association

[Struck-by Hazards](#)

Road Safety at Work

[Investigating Motor Vehicle Incidents Tool Kit](#)
[Tool Kits Directory](#)

WorkSafeBC

[Distracted Attention - mobile phone use and walking WorkSafeBC Bulletin](#)

Note: Links have not been updated since this webinar was presented