Introduction

These guidelines provide practical information on how to prevent pedestrians being struck by powered mobile plant and collisions between powered mobile plant.

In recent years several people have been run over or crushed by reversing mobile plant such as forklifts, prime movers, delivery vans, trucks and construction plant.

These deaths have occurred in a wide range of workplaces. One death involved a pedestrian being struck by a van reversing in a laneway.

To prevent incidents, employers/owners must not only fit adequate warning devices, but also identify and assess the risk of using the plant and then implement control measures to eliminate or reduce the risk.

On 18 June 2017, the Occupational Health and Safety Regulations 2017 (OHS Regulations 2017) replaced the Occupational Health and Safety Regulations 2007 (OHS Regulations 2007), which expired on this date. This publication has not yet been updated to reflect the changes introduced by the OHS Regulations 2017 and should not be relied upon as a substitute for legal advice.

Information on the key changes introduced by the OHS 2017 Regulations can be found in the guidance titled Occupational Health and Safety Regulations 2017: Summary of changes - available at https://www.worksafe.vic.gov.au/__data/assets/pdf_file/0011/207659/ISBN-OHS-regulations-summary-of-changes-2017-04.pdf. However, this guidance document contains material of a general nature only and is not to be used as a substitute for obtaining legal advice.
Fitting of warning devices

Where there is a likelihood of collision, the Occupational Health and Safety (Plant) Regulations 1995 require that a warning device be fitted to powered mobile plant. However the type of warning device required to eliminate or reduce the risk of collision is not prescribed.

In carrying out their duty to fit warning devices, employers/owners should consider:
• the circumstances of the workplace
• the type of plant
• whether a combination of devices is required.

Examples of warning devices

1. Audible alarms
   (forward and reversing beepers)
   These alarms emit a high pitched intermittent sound. They generally work when the gear (or drive) lever is engaged. They are usually fitted to operate while reversing.
   They are versatile and suitable for all powered mobile plant including road registered vehicles (e.g. trucks, mobile cranes) that have restricted vision for reversing.
   The tone must be distinct and clearly audible in the working environment where there may be other sources of noise.
   If several vehicles are using the devices in a busy area or operating in close proximity, it may be difficult to be aware of which vehicle is moving. People may also become desensitised to the warning.

2. Motion sensors
   Motion sensors also warn with sound. They are sensitive to movement and are activated by inertia in any direction. They are commonly used on plant at excavation works and building sites.
   These devices are suitable where plant moves suddenly in any direction or continually changes direction (e.g. rollers, bulldozers, excavators, boom lifts, scissor lifts).
   Some sensors automatically deactivate the alarm after a short time (approximately 8 seconds) because the risk is high only during initial and early movement. The alarm should not be deactivated where the operator has restricted vision for reversing.

3. Lights (forward and reversing lights)
   These lights are wired to operate continuously or in hazard mode (flashing) usually when reversing. They generally work when the gear (or drive) lever is engaged.
   It is important to choose the appropriate intensity and colour of the lights to ensure the mobile plant is seen. For example, an orange warning device would be highly visible inside a warehouse but less visible in sunlight.

4. Rotary flashing lights
   Rotary flashing lights are coloured revolving lights that are usually mounted on top of the cabin. They can be wired to operate continuously or activated by a switch.
   They are suitable for plant that moves throughout the workplace (e.g. forklifts, bobcats).
   It is important to choose the appropriate intensity and colour of the lights to ensure the plant is seen. For example, an orange warning device would be highly visible inside a warehouse but less visible in sunlight.
   Flashing lights may not be suitable for plant that is:
   • stationary for long periods (e.g. delivery vehicles, cranes), or
   • operates in restricted areas, such as trucks travelling on defined site roads (e.g. tip trucks, concrete agitator trucks).
   If several vehicles are using the devices in a busy area or operating in close proximity, it may be difficult to be aware of which vehicle is moving. People may also become desensitised to the warning.

5. Air horns
   Horns are suitable for all powered mobile plant, in particular large plant with long breaking distances.
   Some site procedures require powered mobile plant to “Stop and sound horn before continuing”. This may be appropriate in some work environments.
6. Percussion alarms

Percussion alarms are mechanical devices that are fitted to an axle or gear shaft. When the plant moves an eccentric cam raises a hammer that then drops onto a bell or sounding plate.

They are relatively cheap but require regular maintenance. They are commonly used on road paving rollers and equipment.

7. Radio sensing devices

Radio sensing devices are a new (and expensive) technology developed in the coal industry. A device may be fitted to mobile plant to activate when the driver selects reverse. A light and alarm inside the cabin would alert the driver if a pedestrian is within 30 metres of the rear of the vehicle.

Other new technology, such as a video camera, could be added to the system to eliminate blind spots.

Carrying out hazard identification and risk assessment

In addition to fitting warning devices, employers must carry out a hazard identification and risk assessment on all powered mobile plant over which they have control.

Where risk of powered mobile plant striking pedestrians or colliding with other powered mobile plant is identified, employers must implement control measures to eliminate the risk, or if not practicable, reduce it as far as practicable.

The Code of Practice for Plant has guidance on hazard identification and risk assessment.

Additional control measures for managing risk

Control measures or systematic ways of managing risk should be used in conjunction with warning devices fitted to the plant to eliminate or reduce the risk. There are also certain prerequisites that need to be in place to effectively control risk.

Prerequisites for controlling risk

1. Employee induction

It is essential that new employees and contractors are inducted into the workplace.

This workplace familiarisation is the opportunity to outline expectations about systems of work, work practices and procedures, plant and equipment, and safety in general.

Induction should include all powered mobile plant used in the workplace and methods used to control the risk of collision.

2. Health and safety committees and representatives

Workplaces should involve employees in identifying hazards and establishing health and safety management systems by electing representatives and establishing committees for work groups.
3. Job Safety Analysis
The job safety analysis (JSA) is an easily understood method for employers to manage health and safety as part of their work. It is useful for all activities involving powered mobile plant.

Steps to developing a JSA:
• Document the job.
  Involve employees in a specific job and write down in sequence the tasks that make up the job.
• Identify the hazards.
  For each task identify what may cause injury to those engaged in the task or others in the vicinity.
• Document control measures.
  For each hazard, assess the level of risk, and then list the control measures required to eliminate or reduce those risks.
• Identify who is responsible.
  Name the person responsible for implementing control measures.
• Monitor and review.
  Supervise the job to ensure the documented process is followed. Review the manner in which it is carried out, when there is any change, new personnel or after an appropriate length of time.

4. Training, instruction and supervision
Employers must ensure that employees can operate powered mobile plant competently and safely.

Employers must also monitor use of equipment and provide regular refresher training as needed to ensure safe systems of work and work practices are being followed.

Certain types of plant require National Certificates of Competency to operate and these certificates should be viewed as minimum qualifications for this work.

An operator's industry experience and knowledge should be assessed and matched against that which is required, expected and desired and then training, instruction and supervision used to bridge any gap.

Systems and methods for controlling risk
1. Isolating pedestrians from plant
The elimination or reduction of activities that conflict with the movement of plant in a work area is the best solution but it may not be practicable for all workplaces. It makes good sense to prevent access to specified areas while work involving mobile plant is being undertaken.

Examples of preventing access are:
• Barricading, fencing and to a lesser extent witches hats and coloured/reflective tape
• restricted zones
• lockouts
• keeping unrelated trades/activities apart through job programming

2. Traffic management systems
Traffic management systems control the movement of plant and pedestrians. They can encompass the entire workplace or be for a specific area.

Large, permanent workplaces require more sophisticated systems than smaller workplaces. The extent and sophistication of a system also depends on the work conflicts.

Traffic management systems rely on a detailed assessment and knowledge of the workplace in conjunction with careful planning.

When developing a traffic management system, consider:
• workplace layout and suitability
• traffic volumes
• traffic destinations
• traffic prioritisation
• identification of high risk ‘black spots’
• traffic flow (ie. shared, one way, divided way, priority, ‘no go’ areas)
• separation (delineation of walkways, roadways, pathways, aisles etc)
• signage, signalling
• speed limitations.

3. Flagmen/spotters
Flagmen/spotters are effective for controlling traffic in localised areas where high risk exists.

Such people should be appropriately equipped, as is necessary, with whistles, reflective vests, flags, torches, lights, radio communication equipment etc.
4. Staff systems
These systems evolved in the railways so that engine drivers could travel safely on single lines without the risk of meeting other trains head on. A token, called a ‘staff’, was given to the train driver as authority to proceed.

This system can be used in limited circumstances in workplaces with mobile plant.

5. Reflective vests
Reflective vests are personal protective equipment and not a control system as such. Vests should be required where employees work near powered mobile plant.

Examples of control systems

Controlling risk in a distribution warehouse
Control systems implemented include:

- General workplace protocols
  - induction training for all workplace personnel
  - no visitors or delivery drivers permitted beyond loading dock (ie no public access to warehouse)
  - forklifts not permitted beyond front of loading dock (ie prohibited in car park)
  - ‘in’ and ‘out’ doorways for forklifts
  - keep to the left at all times
  - forklift speed restricted to 5 km/h

- Warehouse controls
  - pedestrian pathways leading to/from office area and amenities
  - zebra crossings where required
  - one-way traffic in narrow aisles
  - reflector mirror placed at high risk blind spots
  - large warning signs

- Requirements for pedestrian/employees
  - operating plant not permitted without having the relevant National Certificate of Competency
  - no entry to one-way aisles where forklifts operate
  - barricades erected when people are working in one-way aisles

- Requirements for powered mobile plant
  - forklifts fitted with horns, flashing lights and reversing beepers
  - order pickers fitted with horns and motion alarms

- Requirements for plant operators
  - operators must hold the relevant National Certificate of Competency
  - do workplace induction training
  - prohibited from operating plant and must undergo re-induction where there has been a breach of safety procedures

Controlling risk on a large construction site
Control systems implemented include:

- Site traffic management plan
  - designated parking area for staff and visitors away from work
  - ‘in’ and ‘out’ gate for vehicles controlled by a gatekeeper
  - site office at front of site away from work areas
  - amenities and store sheds away from work areas
  - undercover walkways to works areas
  - designated crane loading bay
  - designated delivery area
  - material storage compound controlled by storeman
  - signage erected where risk identified

- Induction training for all site personnel including contractors

- Requirements for vehicles entering the construction area
  - maximum speed limit of 10 km/h
  - all trucks fitted with air horns and reversing lights/beepers
  - headlights on when driving on the site

- Requirements for powered mobile plant operating in the construction area
  - all earthworks sites must be barricaded
  - motion alarms on all boom and scissors lifts
  - skid steer loaders fitted with reversing alarms

- Requirements for employees
  - JSA to be undertaken before any activity begins
  - employees working inside barricades must wear reflective vests

- Requirements for plant operators
  - operators must hold the relevant National Certificate of Competency
  - do site-specific induction training
  - prohibited from operating plant and must undergo re-induction where there has been a breach of safety procedures

Warning devices and other safety measures for mobile powered plant
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More information

Victorian WorkCover Authority
Level 24, 222 Exhibition Street
Melbourne, Vic 3000
GPO Box 4306
Melbourne, Vic 3001
Tel 9641 1555
Fax 9641 1399
Toll-free 1800 136 089

World Trade Centre
Corner Flinders and Spencer Streets
Melbourne, Vic 3005
Tel 9628 8115

Publications
Tel 9641 1333
Fax 9641 1330

Website
www.workcover.vic.gov.au

Email
info@workcover.vic.gov.au

Local WorkCover offices
Ballarat 5337 1400
Bendigo 5443 8866
Geelong 5223 2300
Melbourne 9628 8115
Mildura 5021 4001
Mulgrave 9565 9444
Preston 9485 4555
Shepparton 5831 8260
Traralgon 5174 8900
Wangaratta 5721 8588
Warrnambool 5562 5600

WorkCover Advisory Service
Level 24, 222 Exhibition Street
Melbourne, Vic 3000
Tel 9641 1444
Fax 9641 1353
Toll-free 1800 136 089

Victorian acts, regulations and codes of practice
are available from

Information Victoria
356 Collins Street, Melbourne, VIC 3000
Tel 1300 366 356
WorkCover Safety
...think it, talk it, work it
State Government Victoria
Guidelines for powered mobile plant
Warning devices and other safety measures

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