Introduction

Every year, about 50 people are killed and more than 5000 people are injured in accidents involving workplace transport (www.hse.gov.uk/statistics). The most common causes are people falling from or being struck by a vehicle, objects falling from a vehicle, or vehicles overturning.

This guide provides basic advice for employers-employees on what they need to do to comply with the law and reduce risk. It will also be useful for managers, supervisors, employees and their safety representatives, self-employed people, contractors, vehicle operators and other organisations concerned with workplace transport safety.

For a brief introduction to workplace transport safety, look at HSE's leaflet *Workplace transport safety: A brief guide*.[1] For basic, general information for small businesses on managing health and safety, look at HSE's 'Health and safety made simple: The basics for your business' (www.hse.gov.uk/simple-health-safety).

'Workplace transport' means any vehicle or piece of mobile equipment used in any work setting. It covers a very wide range of vehicles, from cars, vans, lorries and lift trucks to fewer common vehicles and plant such as straddle carriers and rubber-tyred gantries.

Vehicles moving on public roads are not usually classed as 'workplace transport', because road traffic laws cover any associated risks in more detail than general health and safety law. However, public roads are often used as temporary workplaces, for example during roadside deliveries, road works or breakdown assistance, so health and safety law applies.

Safe site – design

Every workplace must be safe for the people and vehicles using it. A well-designed workplace that ensures vehicles and pedestrians are segregated will make transport accidents less likely. If you don't have the competence in-house when considering site design, ask for professional advice.

Traffic routes

In the Workplace (Health, Safety and Welfare) Regulations 1992, a ‘traffic route’ is defined as ‘a route for pedestrian traffic, vehicles or both’. In the broader context of the Regulations, it also includes any stairs, staircase, fixed ladder, doorway, gateway, loading bay or ramp.

When planning workplace traffic routes, take account of the following requirements from the Regulations:

- ˜ They must be suitable for the people and vehicles using them and organised so that they can both move around safely.
- ˜ Where vehicles and pedestrians share a traffic route, there must be enough separation between them (segregation).
- ˜ Pedestrians or vehicles must be able to use a traffic route without causing danger to the health or safety of people working near it.
- ˜ Vehicle routes must be far enough away from doors or gates that pedestrians use, or from pedestrian routes that lead on to them, so the safety of pedestrians is not threatened.
- ˜ Every traffic route must have a well-drained surface that is suitable for its purpose and must not be so uneven, potholed, sloped, or slippery that it might expose anyone to a risk to their health or safety.
- ˜ They must, so far as is reasonably practicable, be kept free from obstructions and anything that may cause anyone to slip, trip or fall.
- ˜ They must have appropriate markings and signs where necessary for health or safety reasons.

  The Approved Code of Practice (ACOP) text accompanying the Regulations states there should be enough traffic routes with enough width and headroom to allow vehicles to circulate freely without having to leave the route. Routes should:

- ˜ avoid steep slopes (or ensure they are properly signposted if they are unavoidable).
- ˜ avoid sharp or blind bends (or use measures such as mirrors to improve vision if they are unavoidable).
- ˜ be made of a suitable material, firm and even, and able to safely bear the loads that will pass over them.
- ˜ be maintained to provide good grip for vehicles or people, eg gritted or sanded if slippery, with no obstructions, holes or loose materials;
- ˜ give prominent warning to limited headroom, both in advance and at the obstruction itself.

- ˜ avoid passing close to:
  ˜ any edge, or anything that is likely to collapse or be left in a dangerous state if hit (such as cast-iron columns or storage racking), unless it fenced or adequately protected.

˜ potentially dangerous items unless they are well protected (eg fuel or

chemical tanks or pipes).

The law that requires traffic routes to be wide enough for pedestrians and vehicles to circulate freely only applies to routes laid out since 1 January 1993. On traffic routes that existed before that date, where it is not practical to widen the route, consider vehicle passing places, traffic management systems (such as one- way systems), or restrictions on parking.

Look at HSE's ACOP and guidance *Workplace health, safety and welfare*[4] for more information. For traffic routes in construction sites, look at regulation 36 of the Construction (Design and Management) Regulations 2007 – see HSE's ACOP *Managing health and safety in construction*[5] and HSE's publication *The safe use of vehicles on construction sites*.[6]

One-way systems

One-way systems are designed to limit reversing and prevent conflicting movements caused by 'two-way' traffic flow. They should work clockwise around a site, as this is the direction most drivers will expect, unless there are reasons why this would not be a safer option. They need to be clearly marked out using road markings and signs so that drivers can follow them easily. The advantages of one- way systems are:

- ˜ they help pedestrians know which direction vehicles are likely to be coming from.
- ˜ routes can be arranged to allow for good visibility around corners and at crossing points.
- ˜ they are easy to enforce.
- ˜ they are particularly useful where site access roads are narrow, and visibility is poor.

Visibility

- Visibility needs to be good enough to allow drivers to see and avoid hazards. It is related to the speed that vehicles are travelling and affects the distance they need to avoid hazards by stopping or changing direction safely. It is also affected by, for example, poor light, bad weather and dust.
- Avoid sharp or blind bends on vehicle routes as far as possible. Where you cannot avoid them, there should be enough visibility at junctions and bends to allow drivers and pedestrians to see each other and any additional hazards. Consider measures such as convex mirrors to help achieve this.

Speed

- Limiting the speed of vehicles in the workplace is an important part of controlling traffic. The best way to do this is to use fixed traffic-calming measures such as speed humps, narrowed routes (using bollards, raised kerbs or chicanes), and 'rumble' devices (such as rumble strips, rumble areas or jiggle bars). Any measures you use should be signed and clearly visible and, where appropriate, illuminated, or reflective.
- When deciding on the type of traffic-calming measure to use, be aware that they can sometimes increase risks, for example by affecting the stability of some vehicles.

Signs, signals, and markings

- Signs are necessary to inform drivers and pedestrians about potential hazards and what they need to do. Road signs used to warn or give information to drivers in private workplaces must be the same as those used on public roads, wherever a suitable sign exists. These are set out in the *Highway Code*,[10] the Traffic Signs Regulations and General Directions 2002[11] and the *Traffic signs manual*.[12]

- ## Lighting

- Every workplace must have suitable and sufficient lighting. All traffic routes, manoeuvring areas and yards should be adequately lit, particularly near junctions, buildings, plant, and pedestrian routes. Where vehicles move around when it is dark, ensure the site is adequately lit, without being a nuisance to people in the local area.

Slopes

Steep gradients can make operating vehicles difficult, especially if the surface is made slippery, for example in poor weather. They can also affect how easy it is to manage wheeled objects such as waste containers, roll cages or pallet handlers. In certain circumstances you may need to provide edge or impact protection.

Some vehicles can become particularly unstable on slopes. Examples include:

- ˜ most lift trucks.
- ˜ raised tipper lorries.
- ˜ raised-body tankers involved in transferring powder or bulk solids.
- ˜ vehicles with a trailer containing liquids (such as a bowser or a slurry tanker) without effective baffles.

  Loading and unloading operations taking place on steep slopes may result in both the load and the vehicle becoming unstable.

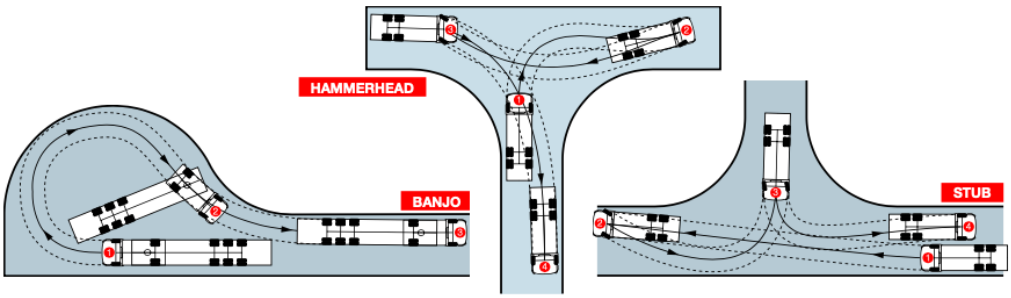
Safe site – activity

Reversing

Many deaths and serious injuries involving vehicles at work happen during reversing, with poor visibility being the main cause. There are several measures that can help to reduce the risk of reversing accidents but removing the need for reversing is the most effective.

Adopting a one-way system is one of the best ways to reduce reversing operations If a one-way system is not possible, consider:

- ˜ establishing drive-through loading and unloading zones, and parking areas with entrances and exits on either side.
- ˜ providing turning areas to allow vehicles to turn and drive forwards for most of the time, ideally a roundabout or ‘banjo’ type, although ‘hammerhead’ or ‘stub’ arrangements are also suitable.



If reversing cannot be avoided:

- ˜ establish and clearly mark dedicated ‘reversing areas’ using longitudinal guides or white lines that are clearly signposted for both drivers and pedestrians.
- ˜ design or modify existing reversing areas, eg by making them larger, to improve visibility for both drivers and pedestrians;
- ˜ exclude non-essential personnel from areas where vehicles are reversing.
- ˜ fit fixed mirrors or other visibility aids in the workplace to improve visibility around vehicles.
- ˜ consider installing reversing aids on vehicles, such as CCTV and reversing Sensors
- ˜ use a trained banksman (signaller), but only when all other options have been exhausted.

Banksmen (signallers)

Banksmen should only be used when there is no other way to control reversing risks. Because they often have to stand relatively close to a vehicle when it is reversing, it is very important that they are properly trained and competent. In some industries, banksmen are only used in exceptional circumstances because of the size of vehicles involved.

Banksmen should use the standard hand signals used across Europe. These signals may not be enough to cover every situation and the law also allows for specific alternatives to be used if they are more appropriate, including BS 6736: 1986 *Code of practice for hand signalling for use in agricultural operations*.[17]

If these signals are still not enough, further signals can be used based on existing signalling practice. Whatever signals are used, it is important that both banksman and driver should agree and understand them before any manoeuvres start.

They need to be visible to drivers at all times. Precautions for visibility are especially important in low-light conditions and should include, where appropriate:

- high-visibility equipment, such as bats, batons, or flags;
- a high-visibility vest that will distinguish them from other site workers;
- vehicle- or site-fixed visibility aids (such as mirrors, cameras etc).

They need to stand in a safe position where they can guide the reversing vehicle and be visible to the driver at all times. If a driver loses sight of a banksman they should stop immediately. In some circumstances, portable radios or similar communication systems can be helpful, although the banksman should still be visible to the driver at all times.

Case study – Reversing

A company was fined after a reversing vehicle at its site killed a delivery driver.

The driver was delivering goods when the accident happened. Standing by the side of his lorry after overseeing the removal of its load, he was struck by a reversing lift truck. He died instantly.

The company had failed to carry out a suitable risk assessment for the movement of loads at the site. This would have shown the need for lift trucks to avoid reversing for long distances, and that drivers should be removed from the danger area. They should have installed suitable barriers to prevent pedestrians gaining access to areas where vehicles were working and established a formal system for supervising site visitors.

It had also become common practice for heavy goods vehicles to reverse onto the site from the public highway, putting pedestrians at further risk of being struck by vehicles.

Since the death, the company has issued health and safety guidelines to all visitors and has improved the supervision of vehicle and pedestrian movements on site.

Overhead power lines

The most effective way to prevent vehicles coming into contact with overhead lines is by not carrying out work where there is a risk of contact with, or close approach to, the wires. The law requires that work may be carried out in close proximity to live overhead lines only when there is no alternative and only when the risks are acceptable and can be properly controlled. See HSE publications *Avoiding danger from overhead power lines*[27] and *Working safely near overhead power lines*[28] for more information.

If a vehicle makes contact with an overhead power line and the situation cannot be made safe immediately, drivers should:

- ˜ leave the vehicle by jumping as far clear as possible.
- ˜ **never** make contact with the ground and the vehicle (or anything touching the vehicle) at the same time as this could complete an electrical circuit and may cause serious injury or death.
- ˜ immediately make sure no one else comes into contact with the vehicle, or anything touching it, while it is still touching the power line and make sure the surrounding area is cordoned off.
- ˜ contact the local electricity supplier to arrange for the power supply to be cut off. If you don't know the electricity supplier's number, call 999.

Vehicle visibility and reversing aids

It is important that drivers are able to see clearly around their vehicle, so they can see hazards and avoid them. Vehicles should also be clearly visible to pedestrians and other vehicles in the workplace, so consider fitting, for example, additional lights, reflectors, and flashing (or rotating) beacons (as well as horns for drivers to warn others that they are approaching).

Some types of vehicles (such as straddle carriers, large shovel loaders and some large quarry vehicles) often have poor visibility from the cab. Visibility can be poor to the side or front of a vehicle as well as behind and loads on vehicles can severely limit visibility from the driving position. Consider fitting extra mirrors, reversing alarms or sensors, and CCTV where visibility is reduced. Lift trucks and compact dumper vehicles in particular have reduced forward visibility when they are transporting bulky loads.

Closed-circuit television (CCTV)

CCTV can cover most blind spots and may be appropriate for some vehicles where the driver cannot see clearly behind or around the vehicle. Colour systems can provide a clearer image where there is little contrast, for example outside on an overcast day. However, black-and-white systems normally

provide a better image in lower light or darkness, and usually come with infrared systems, which can be more effective than standard cameras. Multiple-camera systems are being developed to provide a 360-degree view on a single monitor.

Monitors should have adjustable contrast, brightness and reverse image selection and may need a hood to shield them from glare. CCTV reversing cameras fitted in a high position in the rear of the vehicle provide a better angle for the driver to judge distance and a greater field of vision. This will also keep the camera clear of dust and spray and out of the reach of thieves or vandals.

CCTV systems have the following limitations:

- ˜ they require drivers to check them regularly and react to any obstructions.
- ˜ camera lenses need to be cleaned regularly to be effective and may be affected by bright sunlight or reflections from wet surfaces.
- ˜ it can be difficult for drivers to judge heights and distances on CCTV monitors.
- ˜ the area covered by the camera may not cover all blind spots.
- ˜ drivers may become complacent about checking behind them and rely too much on the CCTV;
- ˜ operators of CCTV need to be trained to use the equipment properly.

Reversing sensors and alarms

Sensing systems are increasingly being fitted to road-going vehicles as parking aids. Some workplace vehicles use laser, radar or ultrasonic sensors to slow down or stop vehicles when they sense an object or person while reversing (eg some lift trucks, construction and quarrying vehicles). Some systems also give an audible or visual warning to alert the driver. Sensing systems may not be as effective where they would be set off very often, although some now incorporate features to prevent unwanted alarms. It is important that they are tested regularly.

If reversing alarms are fitted, they should be kept in good working order and be loud and distinct enough so they can be heard. Sometimes they may be drowned out by other noise or may be so common on a busy site that pedestrians do not take any notice. It can also be hard to tell exactly where an alarm is coming from.