SLIPS, TRIPS, FALLS AND OTHER RISKS

when accessing, egressing or working upon workplace transport

PERC
Off-highway Plant and Equipment Research Centre

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Foreword

Asif Latief

President, The Off-highway Plant and Equipment Research Centre.
Marketing and Strategic Accounts Director, Ashtead Plant Hire Company Ltd.
July 2011

As President of the Off-highway Plant and Equipment Research Centre (OPERC) I am proud, and of course pleased, to present this, the latest in OPERC's published suite of industry-facing technical guides dealing with health and safety aspects relating to workplace transport.

This publication offers practical guidance on slips, trips and other risks when boarding, stepping out of or when working upon, self-propelled off-highway plant and its associated ancillary machinery.

The guide is especially welcome as a product of the recent OPERC initiative to co-fund a plant and equipment research post at the Centre for Business Innovation and Enterprise, Birmingham City University.

According to statistics published by the Health and Safety Executive (HSE), over three million British employees work with or near vehicular transport and in 2008, 1,600 of these were injured and four were killed as a result of falls from vehicles. While more recent health and safety statistics relating to workplace transport injuries show that improvements have been made, other data suggest that certain types of injury remain unacceptably high.

The message therefore is clear. Workplace transport is dangerous and we – all of us who work with or near it – retain a duty to continually educate ourselves, and other members of the workforce who may be less experienced, to promote safe practice at all times and to strive for zero incidents. While the latter may be considered idealistic, through educative publications such as this we will continue to strive nonetheless.

Unique aspects of this guide are its inclusive, intended readership; its focus on a specific group of hazards for which much of the present literature is arguably disparate; and its practical disposition that offers real solutions, for real workers, to the real risks highlighted.

OPERC has an enviable history of supporting research and publishing literature that encourages safer working within all sectors of industry that use workplace transport, particularly those sectors employing off-highway plant and equipment. This guide continues that history. Likewise, the company that I represent is committed to continually providing the most innovative and current information on plant and equipment health and safety issues.

So to introduce this latest OPERC guidance document pleases me on two fronts. First, in my capacity as President of the world's leading plant and equipment research centre that produced it; and second, as the Marketing and Strategic Accounts Director of one of the UK's largest plant, tool and equipment hire companies that will put it to full use.

About the authors

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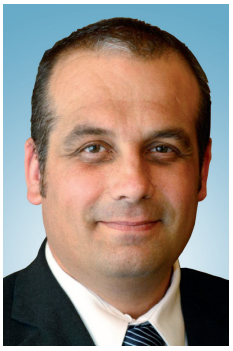
Gary is Professor of Innovation in Machinery Management, at the Centre for Business, Innovation and Enterprise at Birmingham City University.

Gary joined higher education provision in 1990, and since that time has held various university teaching and research-management positions. His primary academic focus is machinery management and innovation, especially relating to construction activity. Specific areas he has studied in this field include excavator productivity, hand-arm vibration exposure, mini-excavator stability, sales demand analysis, and supply chain management. His broader research involvement sits for the most part under the umbrella of construction business management. Products of his academic endeavour have been reported through publication of approximately 160 refereed academic journal and conference papers; six textbooks; numerous industry-facing technical and 'best-practice' guides; and electronic learning materials. His research and consultancy has been funded by university grants, industrial collaboration, government research councils and commercial organisations.



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David is Professor of Industrial Innovation and Director of the Centre for Business, Innovation and Enterprise at Birmingham City University.

David is an internationally leading academic in the field of plant and machinery management and is known for his work in the plant hire, construction, civil engineering and quarry management sectors. His research has been funded through engineering councils, government bodies and industrial collaborations with various multinational blue chip companies. He has published over 130 scientific research papers in leading international journals as well as numerous conference contributions and textbooks. In 2000 David founded the pan-industry professional body OPERC, followed by the OPERC-Safetynet on-line health and safety test (2002), the Hand-arm Vibration Test Centre (HAVTEC) (2005), the trade journal Plant and Equipment Professional (2007) and the Plant and Equipment Management Innovation Conference (PEMIC) (2010). His contemporary areas of specialism include hand-arm vibration, machine stability, all-round visibility, operator training and machinery innovation.

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List of abbreviations and acronyms

AITT	[The] Association of Industrial Truck Trainers
ATP	Accredited training provider
BSI	[The] British Standards Institution
CITB	[The] Construction Industry Training Board
CPCS	[The] Construction Plant Competence Scheme
HSE	[The] Health and Safety Executive
HSSSSR	[The] Health and Safety (Safety Signs and Signals) Regulations
ISO	[The] International Organization for Standardization
ITSSAR	[The] Independent Training Standards Scheme and Register
LOLER	[The] Lifting Operations and Lifting Equipment Regulations
MHSWR	[The] Management of Health and Safety at Work Regulations
NPORS	[The] National Plant Operators Registration Scheme
NVQ	National Vocational Qualification
OPERC	[The] Off-highway Plant and Equipment Research Centre
PUWER	[The] Provision and Use of Work Equipment Regulations
RIDDOR	[The] Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
SMSR	[The] Supply of Machinery (Safety) Regulations
WAHR	[The] Work at Height Regulations

(All legislation, as amended)

Introduction

General introduction and purpose of this guide

This guide deals with issues of health and safety relating to workplace transport. In particular, it focuses on slips, trips, falls and certain other risks, in the specific context of working with, upon, or when accessing, workplace transport.

The term ‘workplace transport’ includes most kinds of driven or operator-controlled vehicles that are used to carry out work. This includes vehicles that ‘normally’ operate on the public highway (such as lorries, vans, cars, some types of cranes, specialist materials handlers, etc.), as well as off-highway plant (such as agricultural equipment, specialist tractors, excavators, dump trucks or telehandlers). See Figure 1.

Figure 1 **Examples of workplace transport that present access, egress and height hazards**

1(a) High access to cab and engine compartment of rigid truck

1(b) High access to cab of loader

1(c) Access requiring operator to climb on tracks of dozer

1(d) Climb required into cab of agricultural machine / loader

(Image courtesy of Health and Safety Executive)

1(e) Climb required to access driving position of heavy goods vehicle (HGV)

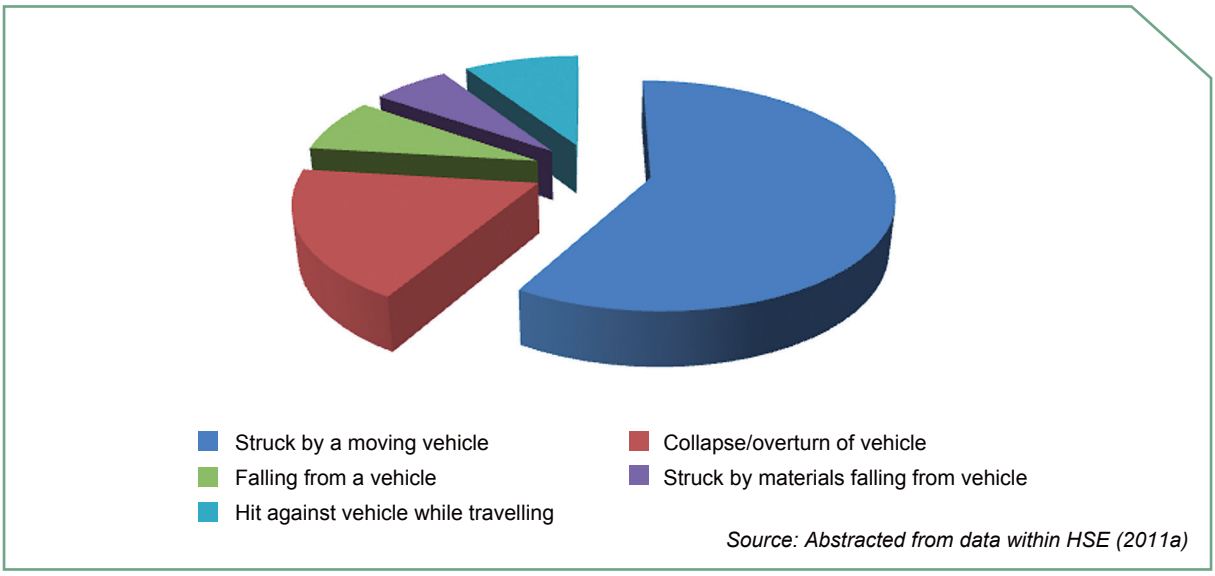
Within this guide, 'workplace transport' should also be taken to embrace any associated equipment used, or designed for use, with these kinds of vehicle. This will include detachable or towed equipment like trailers, bailing machines, bowsers or crushers. Hence, the overriding aim of the guide is to encourage safer working (and safer environments) for all who drive, operate or otherwise 'use' these types of workplace transport and associated equipment.

The guide will be useful to managers of workplace transport and in particular, those charged with designing and overseeing its safe and proper use. However, it is anticipated that anyone who works with or near workplace transport (including managers, procurers, operators, drivers and pedestrians) may all benefit from reading it.

Why a guide on this subject?

Accident and injury statistics relating to workplace transport confirm just how dangerous and costly to employers this type of work activity can be. Figure 2 presents a brief analysis of the reasons underpinning *fatal* workplace transport injuries, for both employees and the self-employed combined, during the period 2007-08. The biggest cause of death was being struck by a vehicle (38 deaths, representing 58% of all fatalities), followed by fatal injury resulting from the collapse or overturning of a vehicle (12 deaths or 18% of fatalities). Noteworthy in the context of this guide is that 8 per cent of fatalities in that reporting year were caused by workers falling from a vehicle.

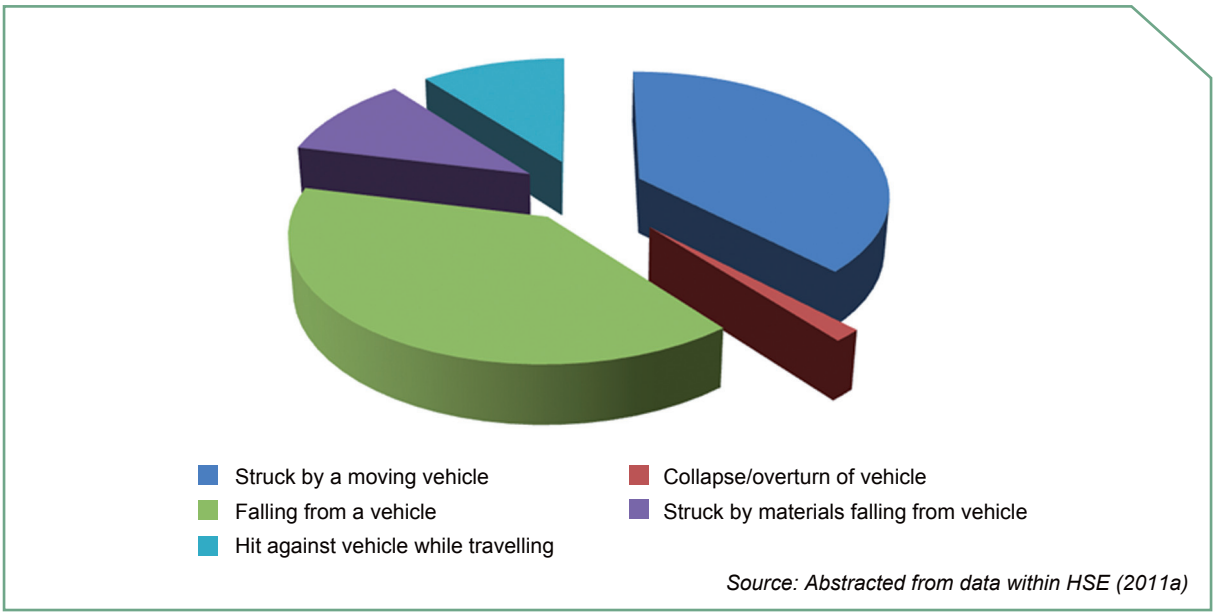
Figure 2 Analysis of fatal workplace transport injuries (employed and self-employed combined) for the period 2007-08



Source: Abstracted from data within HSE (2011a)

Figure 3 meanwhile, shows a breakdown of the total 1,820 major injuries sustained from workplace transport in 2007-08 by employees. In this case, falling from a vehicle represented the biggest source of major injury (719 cases or 40% of injuries), while for just over a third of employees, their injuries were caused from being struck by a moving vehicle.

Figure 3 Analysis of major workplace transport injuries (employees only) for the period 2007-08



Source: Abstracted from data within HSE (2011a)

More recent (provisional) *Reporting of Injuries, Diseases and Dangerous Occurrences Regulations* (RIDDOR) data show that there were 45 fatalities, 1,830 major injuries and in excess of 4,000 'over-three-day' injuries[1] notified during the 2008-09 reporting year for workplace transport (HSE, 2011b). Even these hard-hitting figures underestimate the real extent of the problem because it is generally taken that RIDDOR data are conservative – not all accidents or 'dangerous occurrences'[2] are formally reported in this manner.

Looking at the RIDDOR data historically, in the 2001-02 reporting year approximately 1,700 people were injured as a result of falls from a vehicle. This unfortunate number of injuries grew to just over 2,000 in 2003-04, before then declining year-on-year to approximately 1,700 in 2007-08. Perhaps of concern, is that provisional data indicate a sharp rise in these kinds of incident – in excess of 2,000 workers were harmed by falling this way during 2008-09.

Industry sectors that rely heavily on workplace transport have significantly higher rates of injury among their workers in comparison to other sectors. These industries include storage and communication, agriculture, transport and construction (HSE, 2010).

The resulting costs to industry from health and safety incidents are significant. The Health and Safety Executive (HSE) estimate that for every fatality the 'human cost' (in pain, suffering and grief) equates to approximately £1 million, while the cost of lost output is approximately £0.5 million. For a major injury, the costs are £18,400 and £16,200 respectively, while the cost to employers from an 'average case of ill-health' is £2,700 (HSE, 2011c). With respect to workplace transport health and safety incidents, HSE calculated the combined human and economic cost of falls from vehicles alone during the 2004-05 reporting period, to be in excess of £36.5 million (HSE, 2007a).

The above is but a snapshot of workplace transport death and injury data, but it certainly underlines the need to increase awareness of the hazards facing all who are employed in that sector. Increased awareness, it is hoped, will help to reduce these unfortunate statistics.

A while ago, the HSE launched a *Falls from Vehicles Campaign* (HSE, 2011d) as part of its health and safety guidance provided under the umbrella of targeting vehicles at work. The campaign focuses on encouragement of 'proactive action' at the workplace. Similarly, if this guide helps bring that about, it has to some extent achieved its objective.

A brief description of the guide's content

Given the nature of the issues outlined above, this guide will:

- consider workplace transport risks in general;
- focus upon specific hazards (and resulting risks) that can arise when working upon, or accessing, workplace transport; and
- indicate how the latter risks can be minimised or removed, both in terms of effective health and safety management and by improved worker awareness.

[1] Formal definitions of 'major' and 'over-three-day' injuries are provided in Appendix A under discussion of 'RIDDOR'.

[2] A 'dangerous occurrence' is also known as a 'near miss' this being an incident that occurred whereby nobody was harmed, but clearly could have been. Dangerous occurrences are reportable under RIDDOR.

Some definitions of terms used in this guide

In view of the specific meanings afforded many of the terms used in this guide, the list of definitions presented below should help avoid ambiguity.

First, some well established 'more general' health and safety definitions apply equally in this guide's context, the most relevant of which are as follows.

- **Workplace:** Any location or place where a person is working, or where persons can work. Regarding workplace transport, this might include for example, access / egress roads; loading and unloading bays; a lorry driver or plant operator's cab; haulage routes; and so on. Road-going transport often uses public highways in addition to working off-highway but public roads (and other public places) are normally governed by specific laws (such as road traffic laws), so the decision as to whether they are deemed a workplace or not can sometimes be a complicated one (HSE, 2005).

- **Hazard:** Something with the potential to cause harm to a person. For example, working on the back of a large vehicle may present the hazard of falling from a height, whilst walking across a busy loading area might present a hazard from being struck by a moving vehicle.

- **Risk:** The 'chance' or 'possibility' of being harmed by a hazard, generally expressed subjectively as 'high risk' or 'low risk', where a high risk has greater 'chance' of inflicting harm than a low risk. In addition to these descriptive classifications, quantitative expressions may use numbers to represent the extent of risk, where a larger number generally represents a bigger risk.

- **Risk assessment:** The process of establishing whether or not risks are suitably and sufficiently managed. It normally involves the evaluation of a hazard and the (subjective or quantitative) assessment of the risk(s) presented by that hazard. Risks are assessed to decide what risk removal or control measures might be required. Ideally risks will be removed altogether, but where they cannot be removed, risk controls should as far as reasonably practicable mitigate them. Risk assessment is a function of: (i) the potential of a hazard to cause harm; and (ii) the probable severity of outcome should the risk event occur. It follows that the greater is the potential for being harmed and / or the greater is the possible severity of that harm, then the greater the risk is assessed to be (and *vice-versa*).

In addition to these general health and safety terms – and with respect to workplace transport in particular – specific definitions used in this guide include the following.

- **Slip:** The unintentional loss of a person's footing and / or balance that can cause a foothold, or the person, to slide a short distance. On workplace transport this might happen, for instance, when walking from one kind of surface to another, such as from the flatbed of a vehicle (which is generally of lower slip potential) onto its threshold (generally smooth metal or painted and therefore of higher slip potential) (see Scott *et. al.*, 2006). A slip may additionally lead to a fall (see below).

- **Trip:** When a person catches their foot or footwear on something, such that it causes them to stumble or lose balance. For example, as might happen when walking across an awkward load on a vehicle while attempting to attach slings to it, or when encountering loose sheeting ropes lying on the ground. A trip too, can subsequently lead to a fall.

- **Fall:** To descend from ground level or from a height, unintentionally and awkwardly, such that a risk of injury results. Regarding workplace transport, anyone working upon a vehicle is at risk of falling. Intuitively, one might expect persons working at greater heights to make up most injury statistics from this kind of health and safety incident. However, most 'fall from a vehicle' injuries reported to the HSE happen as a result of falls that have occurred from below 'head height' (HSE, 2007a).

- **Work at height:** Work in any place, while at work, where a person could fall a distance liable to cause personal injury. This will therefore include all kinds of driver or operator cab, including when obtaining access to, or egress from, such place. See the *Work at Height Regulations* as amended (WAHR, 2005), for definitive, legislative guidance on this subject.

- **Working upon or 'accessing':** Any situation where an employee is upon, or is attempting to get upon, under, within or otherwise access or egress any part of an item of workplace transport for the purpose of performing work, for example, to check it, inspect it, drive it, maintain it, load / unload from it and so on.

In addition to the above definitions, the reader is also directed to the list of commonly used abbreviations and acronyms listed earlier in this guide.

Relevant legislation

As well as there being many different types of workplace transport, there are also numerous combinations of working environment and task that these machines can be applied to. There exists a broad array of health and safety legislation therefore that is applicable to workplace transport.

Some of the principal legislation includes the following.

- *The Health and Safety at Work etc. Act (1974)*
- *The Management of Health and Safety at Work Regulations (1999)*
- *The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (1995)*
- *The Provision and Use of Work Equipment Regulations (1998)*
- *The Lifting Operations and Lifting Equipment Regulations (1998)*
- *The Supply of Machinery Safety Regulations (2008)*
- *The Health and Safety (Safety Signs and Signals) Regulations (1996).*

A general overview of this health and safety legislation can be found in Appendix A.

(Image courtesy of Spillard Safety Systems & Lafarge)

The nature of workplace transport risks in general

Chapter introduction

This chapter looks at workplace transport health and safety risks in general; at specific risks relating to the construction sector; and what in broad terms the Health and Safety Executive (HSE) advise regarding workplace transport safety.

Principal aspects of workplace transport risks in general

Due mainly to its physical size, weight, mechanical nature and often complexity, workplace transport and its associated equipment can present a multitude of workplace hazards and associated risks.

These include 'generic' hazard areas such as:

- **mechanical machinery** – relating to issues of repair, maintenance, electrical, pneumatic and hydraulic hazards;
- **moving parts** – which can harbour guarding hazards and possible risks of entrapment, entanglement or crushing;
- **operator competence**[3]– relating to an individual's operation and safe use of workplace transport;
- **falls** – i.e. from any transport and its associated equipment (also including falls into dangerous, confined or awkward spaces or situations, e.g. when walking across a load to sheet it);
- **vibration** – especially, in the case of self-propelled off-highway plant, whole-body vibration[4];
- **safe working areas** – in particular for pedestrians or anyone else working in the vicinity of transport, with respect to being struck, crushed, trapped or run over by a vehicle; and
- **being struck by a flying object** - which can be associated with unsafe loads, lifting activities and loading / unloading, for example.

Whilst this is not an exhaustive list, it certainly helps to demonstrate the complex nature of workplace transport risk identification and its subsequent removal or mitigation.

Risk identification (and assessment) underpins all workplace transport health and safety management. This is because it is not until risks have been identified, competently assessed (i.e. quantified in some way) and compared against existing control measures, that they can they be mitigated further if necessary or better still, removed altogether. While detailed discussion on risk assessment techniques is beyond the scope of this guide, an overview of good practice is provided in the HSE's leaflet called *Five steps to risk assessment* (HSE, 2011e).

For workplace transport, the act of risk assessment will involve everything associated with the transport item(s) and its working environment which, when referring back to the indicative list of hazard areas above, confirms that this can be quite a comprehensive exercise. It will include assessment of things like driver access to the driving position or cab, matters relating to the vehicle itself (such as ease of access for maintenance), any ancillary mechanical equipment, the entire vehicle operating area, and risks associated with anyone, or anything else, within (or that may come within) that area.

[3] For more detailed guidance on the subject of operator competence see OPERC's: *Voluntary Code of Practice for Plant and Equipment: Operator Training* (OPERC, 2002).

[4] For more detailed guidance on the subject of whole-body vibration see OPERC's: *A Guide to Whole-body Vibration* (OPERC, 2005).

A typical format for a workplace transport risk assessment record sheet, showing some hypothetical example insertions, may be viewed in Figure 4. This example shows that the risk assessment has identified two hazards (column 1): one relating to falls from a height from the access steps and the other concerning vehicles reversing into the loading bay. For each hazard the proforma lists who will be at risk (column 3), how they might be injured (column 2) and the risk controls currently in place (column 4). From this information new controls are suggested (column 5) and importantly, who will action them and by what date. This is but a simple example: a risk assessment proforma should be designed to accommodate the specific requirements of the company and / or the workplace to which it will apply. *If in doubt, advice should be sought from a health and safety professional.*

The completed risk assessment document is worth little if it is not acted upon, in good time. Of course, the more severe the perceived risk, the more urgently it should be addressed. Guidance in this respect, with regard to workplace transport risks in the specific context of slips, trips, falls and other risks when working upon, or accessing workplace transport, is discussed in the following chapter.

Figure 4 **Specimen workplace transport risk assessment with example insertions**

Company/place item: A.N Other Logistics, Loading bay 3
Date: 19 February 2011
Person(s) carrying out assessment: Lynda T. H&S Manager
Comment(s): New loading bay

Hazard	Risk	At risk	Present controls	Required controls	Action by / when	Completed by / when
Access steps: fall from height	Injury from fall (1.0M)	All (drivers, loaders, visitors)	None	Handrail around perimeter of access steps with suggested detail as per existing Bay 2	J. Smith ASAP	J. Smith 31-02-11
Vehicles reversing into loading bay 3	Being hit by vehicle, or run over, and /or entrapment	Any pedestrian(s) in bay area	Some signage	Immediate: Assign responsible person to control reversing of all vehicles	M. Neil 20-02-11	M. Neil 20-02-11
d/o	d/o	d/o		Permanent: Install CCTV with monitors fixed adjacent drivers' cabs on wall above side entrance. "Keep clear" and hatching to loading bay floor. "No pedestrians" signage installed adjacent each side of hazard area. Implement "no reversing unaided" system and associated signage.	Item (1) J. Smith 20-03-11 Items (2) and (3) M. Neil 20-03-11	
Etc...						

Workplace transport risks in construction

St John Holt (2005, p182), in addressing construction safety, highlighted that accidents involving site transport in particular often resulted in fatalities, and that a site traffic management plan should be part of any larger project safety plan (for instance, employing appropriate transport and pedestrian segregation and signage[5]).

It has been suggested that significant hazards associated with construction site transport include:

- potential for contact (by workplace transport) with electrical sources – such as overhead (or in the case of excavators, underground) power lines;
- the risk of overturning – 'overturn' is defined as 'rollover' where a vehicle turns ≤ 90° from the vertical onto its side or end, or 'turnover' where it turns through > 90° (HSE, 2008);
- possible collisions with structures, other vehicles and pedestrians - often arising due to lack of all-round awareness on the part of the operator or driver[6]; and
- perhaps unique to construction, the possibility of causing the collapse of open excavations, or of a vehicle falling into open excavations (*op. cit.*, p220).

Injuries to workers from mobile equipment used for construction activities have been listed by Hughes and Ferret (2007) and identified as resulting in the main from several key events, as detailed in Table 1.

Referring to Table 1, lack of maintenance is principally a function of poor transport management, which in addition to negatively contributing to safety, can also have a detrimental impact on transport working life, its production efficiency and its residual value (see Edwards *et. al.,* 2003). However, operators also have a duty here by, for example, carrying out proper pre-shift checks and reporting maintenance (or other) defects appropriately and in good time for remedial action to be implemented (or in the case of more extreme risks, for the workplace transport to be taken out of service until such remedial work has been completed).

Poor visibility is also a shared responsibility: for owners of transport to fit and maintain the necessary all-round visibility equipment, such as convex mirrors and reversing cameras; for operators to use these as intended and maintain awareness; and for others to keep clear of the operating envelope of the workplace transport as far as is practically possible.

The nature of the work environment can present significant hazards in terms of vehicle instability. In extreme cases, this can cause transport to tip over onto its side or even worse, cause turnover (where a machine rolls through more than 90° from its normal vertical operating position). In such instances, the resulting risks of injury to both driver and others in the vicinity are apparent. The risks are exacerbated where the machine is working in a hazardous environment, such as near an excavation, power source or water.

Injury from carrying passengers is often a result of poor operator and other worker practice, that is, by their joint agreement to the carrying of people on transport not designed for passengers. Only designated passenger seats should be used and only then, when fitted with appropriate restraint systems (e.g. lap strap or safety belt).

[5] By law, every workplace must be organised such that transport and vehicles can circulate in a safe manner (HSE, 2005, p20).

[6] For more detailed guidance on the subject of operator all-round awareness see OPERC's: *A Practical Guide to Enhancing the All-round Awareness of Plant Operators* (OPERC, 2004).

Lack of a safety belt can sometimes lead to another form of accident and resulting injury, which is persons exiting from transport unintentionally. This is forcible or unintentional ejection resulting from for example, vehicle impact with another object when the occupants are not properly seated and / or restrained.

The risk to pedestrians and other workers near workplace transport is an ever-present one, which is why transport / pedestrian segregation should always be put in place where possible. People can be either hit by the transport itself, or any ancillary part of it. The boom and bucket is particularly dangerous in the case of an excavator when it is slewing, as is any part of a poorly secured, or unsecured, vehicle load. Specific risks here include being struck, being run over and entrapment.

Table 1 **Main sources of worker injury from workplace transport used in construction**

Source	Commentary / examples
Lack of maintenance	Especially regarding defects relating to brakes, tyres, steering systems and safety systems
Impaired or poor levels of driver or operator visibility	A lack of awareness on either the part of the machine operator or anyone else in the vicinity of the machine leads to risks of machine / pedestrian collision
Work area topography	Injuries to the operator or others, from workplace transport overturn. Risks to inherent stability of (especially tall such as extended MEWPs or cranage) plant and mobile equipment while working on weak ground. Sliding and impaired braking on contaminated ground, especially slopes
Carrying of passengers	Especially in cases where the workplace transport is not fitted with a dedicated passenger carrying facility (normally a seat and person restraint as a minimum requirement)
Unintentional exit from workplace transport	Being physically and unintentionally ejected from the vehicle or equipment with secondary risks from, for example, impact with other physical objects or becoming trapped under, or crushed by, the vehicle
Being run over	Physical contact with, or becoming trapped under, or crushed by, workplace transport
Struck by part of the workplace transport	Can include collision with a moving vehicle, collision with part of a vehicle (such as the bucket while it is being slewed on an excavator) or collision with something attached to or being carried (e.g. an unsafe load) by the workplace transport
Other	Mainly resulting from poor working procedures arising from any mix of bad management or unsafe working conditions or systems of work

Source: Developed from Hughes and Ferret (2007, p199).

Broad HSE guidance on workplace transport risks

In its guidance on workplace transport safety the HSE identifies three foci in striving to achieve safe working:

- the working environment ('safe site');
- the transport being put to work in that environment ('safe vehicles'); and
- those who drive or otherwise operate workplace transport ('safe driver') (HSE, 2005).

The following discussion considers these three aspects further.

A safe working environment

A safe site is one that implements a traffic management plan, as identified earlier in this chapter. While each workplace is different, key aspects to consider will include:

- traffic routes – these should be appropriately signed and separated from pedestrians and other hazards;
- sensible speed restrictions – reinforced where necessary by things such as speed humps, good signage and site induction talks;
- road and other directional markings – such as 'Stop' signs, limits on transport types in certain areas and identification (delineation) of particularly hazardous areas with colour coded line painting or hatching;
- other necessary infrastructure – such as weighbridges (with limits on loads for example, on steep gradients), sensible parking (to avoid or minimise reversing activities), good lighting and physical barriers;
- centralised vehicle control – such as centralised vehicular key access;
- designated unloading areas with appropriate fall arrest equipment; and
- suitably provided, designated maintenance / loading / sheeting areas.

Safe workplace transport

Safe workplace transport is that which is appropriate for the work to be undertaken by it and that is appropriately 'looked after' by both the owner and all who use it. Points to consider include the following:

- safe workplace transport in general – well maintained, clean, efficient in use and periodically checked in accordance with relevant legislation and good working practice;
- suitability – workplace transport should be chosen such that it will be able to work effectively and safely for the proposed work;
- proper ancillary equipment – such as the required visibility aids and other safety related features; and
- the use only of attachments or ancillary equipment that are suitable by design and in full accordance with manufacturer guidance (if in doubt, ask!).

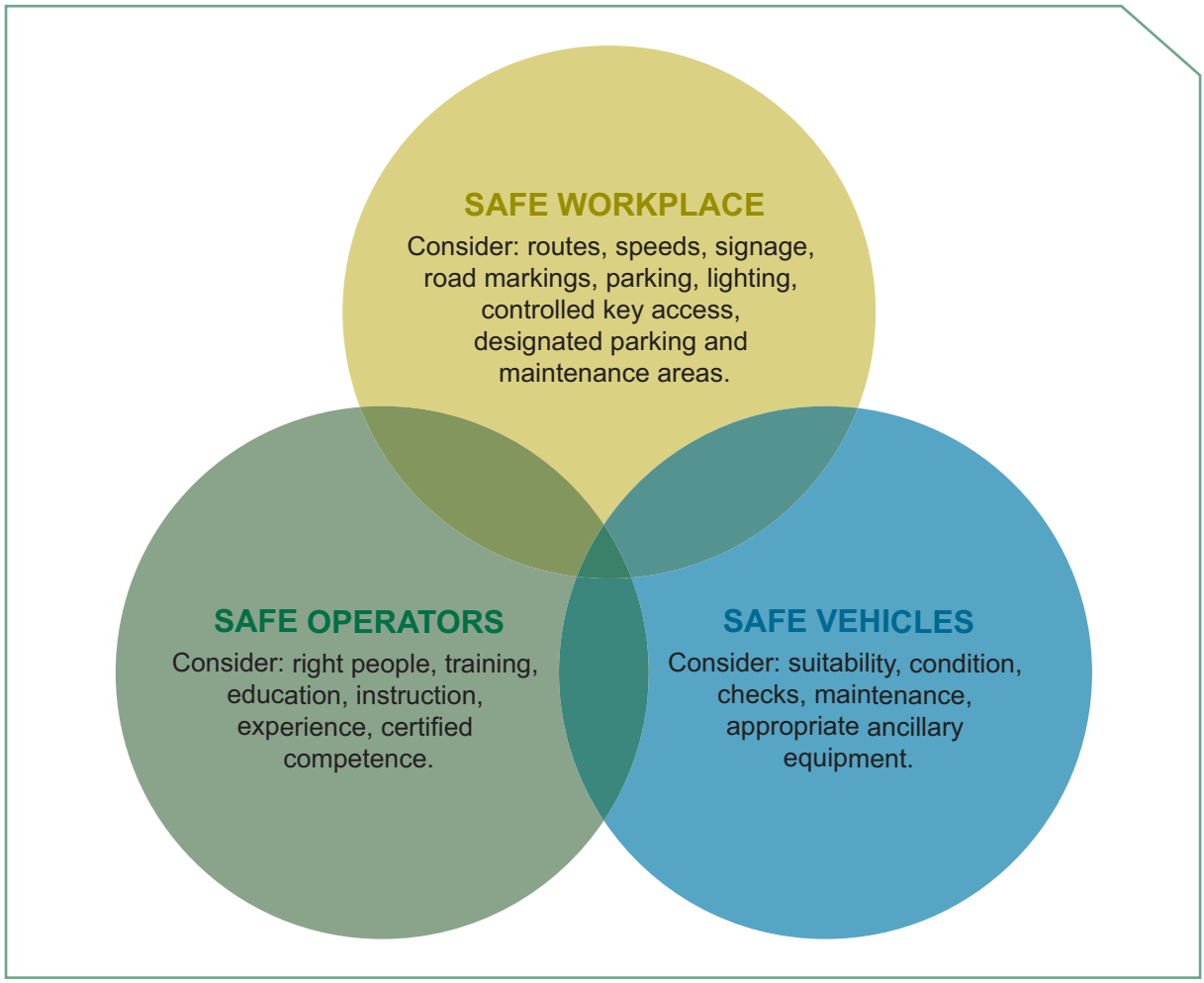
Safe drivers and operators

All workers, not just drivers and operators, must by law be competent and appropriately trained / advised in the equipment they are to operate. Other aspects to consider include:

- choosing the right person for the job – taking into account the nature of the work and the operator's past experience (for example on a particular type of transport) and formal measures of competence (see next section);
- fitness to drive or operate – taking into account eyesight, potential influence by alcohol, potential influence by drugs (prescription or otherwise) and medical conditions;
- information – drivers should be given instruction both:
  - at the commencement of work (e.g. at site induction, before commencing a new kind of driving job or before operating a new type of transport) and,
  - periodically as appropriate by way of refresher training, or when having to use new ancillary equipment (such as a quick-hitch on an excavator or a hydraulic lifting arm on a lorry-loader).

Figure 5 shows graphically the interrelationship of these three foci of general workplace transport health and safety guidance.

Figure 5 **Good workplace transport health and safety: the interrelationships of workplace, operators and vehicles**



Source: Adapted from HSE Guidance (HSE, 2005)

A note about operator competence

With respect to workplace transport accidents and worker injuries, a recurrent theme among the literature is that of operator competence.

> It is a legal requirement that employers take account of employees' capabilities when assigning them work tasks (HSE, 2005, p49). Additionally, the Construction (Design and Management) Regulations (2007) (CDM, 2007) place specific duties upon contractors and principal contractors to be satisfied that workers are indeed competent and where this is not the case, workers should be given the necessary training (HSE, 2007b, §234).

Arguably, for the case in point, competence can to a major extent be assessed by the driver (or operator) possessing an approved and recognised certificate of competence to operate the class(es) of workplace transport they will be assigned to. Previous experience and track record will also play a role (*ibid.*, p47).

The Health and Safety Executive recognises certain accredited training providers (ATPs) for this purpose, the intention being to, "*…promote professional, consistent training standards and to help employers select good quality training*" (HSE, 2011f). These ATPs are listed in Table 2. Each ATP has a presence on the web and a search by name will identify their location. Alternatively, see the URLs provided in the Table which were correct at time of this guide's production in early 2011.

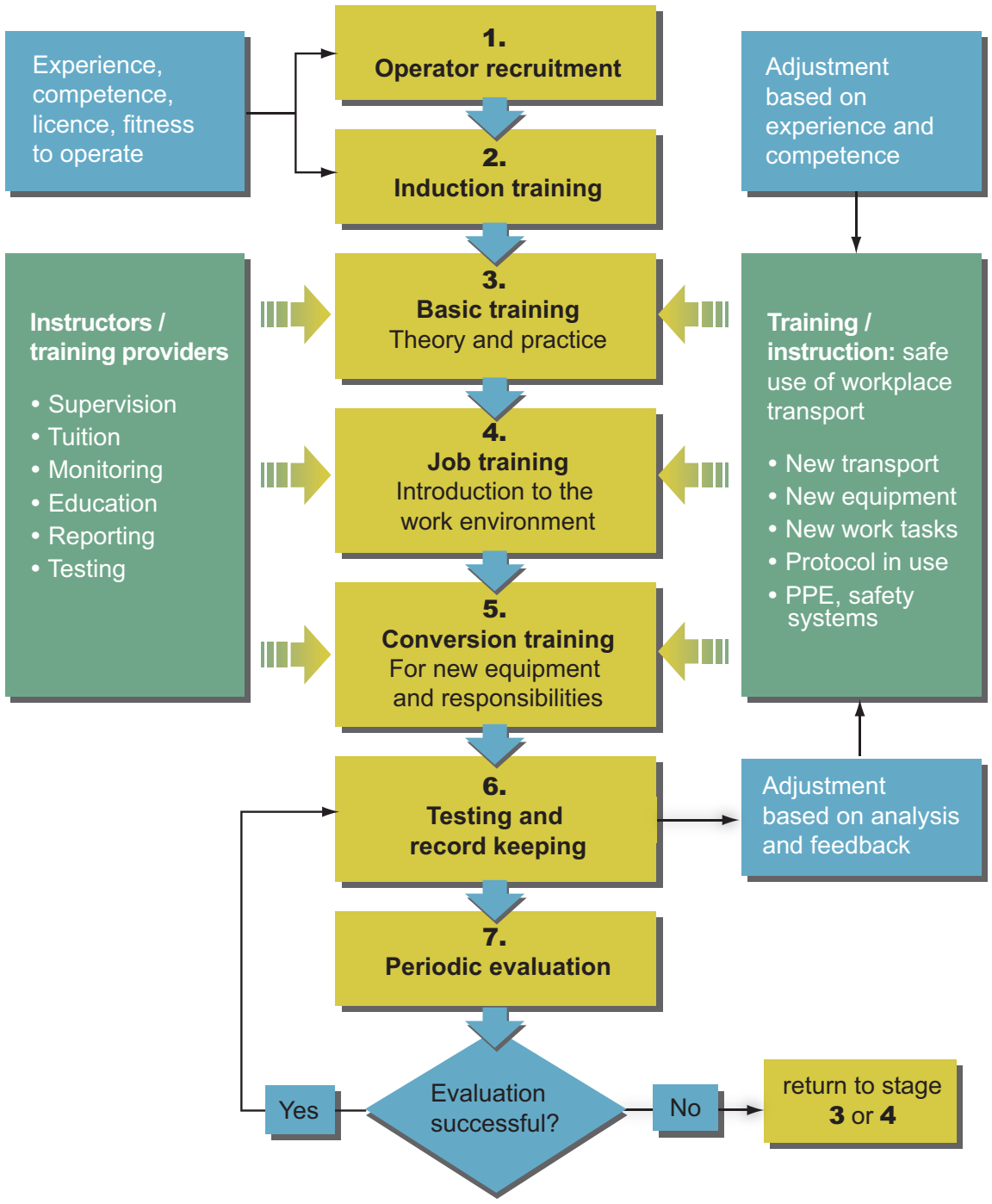
Table 2 **Accredited training providers (ATPs)**

ATP	Comment	Website address
The Association of Industrial Truck Trainers (AITT)	Accredits training organisations to offer industrial truck training services	www.aitt.co.uk/
The Construction Industry Training Board (CITB)	Through which the *Construction Plant Competence Scheme* (CPCS) may be accessed for plant operators	www.cskills.org/education/cpcs or www.citbni.org.uk
The Independent Training Standards Scheme and Register (ITSSAR)	Includes training for industrial trucks and construction workplace transport	www.itssar.org.uk
Lantra Awards (LANTRA)	Includes agricultural, ground care and construction machinery	www.lantra-awards.co.uk
National Plant Operators Registration Scheme (NPORS)	Accredits organisations to train and certify plant operators	www.npors.com
RTITB (formerly The Road Transport Industry Training Board)	Accredits organisations to train / certify, including fork lift trucks / power handling workplace transport	www.rtitb.co.uk

The National Vocational Certificate (NVQ), Level II Plant Operations is a recognized certificate of competence for plant and machinery operators (LANTRA, 2011), but employers can run their own competence scheme if they wish.

OPERC has previously published two booklets on operator training: one looks at the subject in broad terms (OPERC, 2002), the other is aimed specifically at plant instructors (OPERC 2003). These offer practical guidance to help with design and delivery of plant related training solutions. A schematic of workplace transport training and its relationship to several external factors (that is also based on OPERC guidance) may be viewed in Figure 6.

Figure 6 **Model of operator / driver training for workplace transport**



Source: Adapted for workplace transport from OPERC (2007)

Specific hazards and associated risks when accessing, egressing or working upon workplace transport

Chapter introduction

This chapter first identifies the specific hazards (and their resulting risks) from working upon or accessing workplace transport that are the focus of this guide. Practical examples of these risks are given, by suggesting where they might be found on various forms of workplace transport. The chapter proceeds to provide guidance on how to remove or minimise these risks in a workplace transport environment, by adopting an inclusive approach that embraces managerial, administrative and operative / driver involvement.

Specific hazards and associated risks

If a hazard can be identified, then the risk associated with it can be assessed by a competent person(s) and appropriate action taken to remove it. Where a risk cannot be removed altogether, then it should be reduced, or mitigated, to be as low as reasonably practicable (ALARP). For a more complete description of the ALARP concept (which is fundamental to risk reduction from an employer's point of view regarding 'liability' for risk), in the first instance see HSE guidance (HSE, 2011g).

Regarding workplace transport, the best way to understand where hazards possibly lurk, is to consider some real life examples in relation to slips, trips, falls, and working upon or accessing workplace transport, respectively.

Examples of slip hazards

Slip hazards are present in all forms of workplace but arguably, can be more so in the case of workplace transport because of the nature of the work and the vehicles or loads that they deal with. Some practical examples of where, or in what circumstances, slip hazards may be found include the following. *(Note, many of these practical examples describe poor working practice and so should not be considered 'the norm' or acceptable – see advice on risk removal later)*.

- Moving around on transport that has varying types of surface - and hence surface grip - such as when walking about on a timber flatbed trailer that has a (more slippery) steel perimeter to it. This hazard is exacerbated where surfaces are contaminated and / or are inclined to the horizontal.
- Working on areas of transport that are not provided with slip-resistant surfaces, such as when climbing onto an engine cover (or any other part of a vehicle for that matter) to check or adjust something, or to carry out maintenance.
- Standing, or otherwise moving around, on a load with slippery surfaces, as might be the case when attaching hooks or slings to steel frame building components being unloaded from a lorry.
- Working on any other kind of slippery surface that is not intended for pedestrian traffic by design, for instance, when walking on load sheeting or covering. (Such activity is especially dangerous and should be avoided because it is often impossible to see what other hazards lurk below the sheet, such as protruding materials or openings through which persons can fall or become trapped).
- Any instance where a surface has become contaminated, such as when wet due to rain, icy due to frost or where other contaminants or fluids have been accidentally spilled. Footwear too can act in this manner if the wearer has walked in similar kinds of contaminant or fluid earlier. Equally, the wrong type of footwear for the given surface conditions can also present a slip hazard.

Examples of trip hazards

As with slips, the risk of tripping is often present at the workplace and can best be avoided by 'good housekeeping', that is, by striving to maintain an uncluttered and tidy workplace at all times. Some specific examples of trip hazards when working with workplace transport include the following.

- Working among, or upon, untidy or uneven surfaces, which can include the inside of any transport, the surface of any associated equipment, or any other area that a driver or operator may enter to undertake their work. (So this doesn't just mean the transport itself, but also any other working area that employees might use).
- Moving about on uneven or awkward surfaces, such as between parts of an uneven load; around slinging or anchor points on a trailer (or any load upon it); or when manoeuvring around vehicle service cables, hydraulic / pneumatic hoses or sheeting ropes / straps.
- Walking or moving around when otherwise distracted can amplify trip (and other) hazards, such as when looking elsewhere to direct a lifting operation or when talking to a colleague. Equally, the ability to notice hazards may be significantly impaired where a worker is attempting to manually move an awkward load, or their vision is impaired by it (e.g. due to its size or shape).
- Associated workplace transport equipment (such as lifting gear, slings, chains, ropes, harnesses or tools), will represent a significant trip hazard if left lying around, whether upon the transport itself or anywhere in the working environment.

Examples of fall hazards

Work at height is defined as work in any place where a person could fall a distance liable to cause personal injury, including a place at or below ground level and including obtaining access to or egress from such place while at work (WAHR, 2005). In the context of workplace transport this description could apply to many kinds of work activity which in turn therefore, will present work at height hazards and the risk of falls.

It is a misleading notion to think that a substantial height is necessary to represent significant fall from height risk. Most of the fall incidents reported to the HSE occur from below head-height. Accordingly, the HSE have pointed out that particular areas of transport where falls tend to occur are load areas, cab or operator driving positions, and fifth wheel catwalks (HSE, 2008). Other practical examples include the following.

- Getting into, or out of, any kind of vehicle.
- Getting into, or onto any other part of, a vehicle (such as to carry out maintenance or to clean it) where a fall could cause injury. Accessing the 'fifth wheel' area of haulage vehicles is notoriously hazardous in respect of falls, according to accident statistics.
- Working where extra working height is demanded (presenting particular risks of falling from a height), such as may be experienced from accessing:
  - multiple deck or bespoke multi-level trailers;
  - demountable loading equipment like truck-mounted forklifts;
  - dedicated on-road load handling equipment like crane loaders and grabs; or
  - when using tail lifts.

Examples of hazards when working upon or accessing workplace transport

There are many times when a worker will be exposed to multiple hazards simultaneously when working upon or accessing vehicles. These multiple exposures will essentially represent any simultaneous combination of the above listings. A maintenance fitter working on the surface of a vehicle above ground level for example, can be at risk of slipping, tripping or falling from a height.

The act of getting into, or out of, a vehicle is of special relevance in the context of falling and this becomes more so, the bigger the vehicle - and hence normally, the higher an operator has to climb to get in and out of it. Large articulated dump trucks such as those used in the quarrying and mining industries are a particular case in point. Similar specific hazards are also presented regarding large excavating machinery, much of which does not provide well designed access steps, rungs and handholds by design. In cases such as this, the operator will often use wheels, tracks and any other 'convenient' part of a machine to gain a handhold or foothold when attempting access or egress. See Figure 7 for some examples of these kinds of large workplace transport.

Equally, the act of jumping down from a cab or driving position when leaving it (often because no convenient dedicated demount facility is provided) will present significant risks in itself. This includes the risk of landing awkwardly or falling, for example. Also, the repeated 'shock' to the spine that a worker receives from jumping down in this way, especially from doing this many times over a longer period, can cause significant back injuries.

Figure 7 Examples of large vehicles and poor operating access / egress

7(a) Awkward climb required to access crawler excavator

7(b) High step and climb

7(c) Steps and handholds requiring strength and balance!

(Images courtesy of Lafarge)

Removing or reducing specific hazards and associated risks

Having focussed on where the hazards associated with workplace transport might be harboured, this section presents practical guidance on ways to remove or reduce the hazards and their associated risks.

Every workplace is different and will require its own set of risk removal strategies or controls to best match the nature of risks it presents, so the following guidance can only be 'general' in nature and should not be construed as optimal health and safety advice. For similar reasons, only competent health and safety advisors can give definitive guidance so if in doubt, professional opinion should be sought and will take precedence over anything presented in this guide.

Removing or reducing slip hazards

Some basic guidance is as follows:

- Workers should not walk, or otherwise work, upon any surface that looks as though it might be slippery. If access to such an area is required, then workers should seek direction from a supervisor before attempting to access it and before work is started. Generally, the surface will require cleaning or treatment and / or specialist footwear and / or a passive safety device installing.

- As with many other types of risk, slipping is more likely to occur if a worker is rushing and not concentrating fully. Workers should always take (and managers should always ensure!) adequate time to complete a task in an unrushed, methodical and careful manner.

- Some surfaces, for instance aluminium chequer plate, which are not 'normally' slippery, will become so when wet, frozen or contaminated - spilled diesel oil and lubricants are a particular problem with workplace transport in this context. The more slip-resistant surfaces tend to be 'gridded' or of punched metal in nature. Resin coated surfaces that are impregnated with aggregate tend to offer the best kind of anti-slip surface. Workers should also avoid stepping onto other kinds of contaminated vehicle parts when getting into off-highway plant, for instance 'make-do' footholds like muddy wheels and tracks.

- It is vital that a worker wears suitable footwear, but what is suitable in one situation may not be so in another and even good footwear can become a slip hazard when contaminated (oil again is a particular risk). Workers should always adopt a cautionary approach and if in doubt about footwear suitability, seek guidance from a superior (managers should encourage this kind of worker awareness and enquiry). Employers can in turn ask for guidance from specialist footwear manufacturers if needed and may also wish to test different solutions to identify what is optimal in their particular given working conditions.

- Leading on from the last point, employees must remember that they have a legal obligation to comply with any health and safety controls or advice given them by employers, so if provided with specialist footwear they should wear this at all appropriate times, keep it clean and in good condition, and report any loss or defects immediately. Managers should reiterate this to the workforce wherever possible.

- Areas presenting particular slip hazards can be retrospectively treated with anti-slip paint or abrasive type tapes to help mitigate the risks. As with footwear, specialist advice should be sought from manufacturers of such products where necessary. Employers can also highlight these risk areas with attached signage such as 'Slippery when wet'.

Removing or reducing trip hazards

Some basic guidance is as follows:

- Many trip hazards result simply from poor housekeeping, i.e. untidy working on the part of the employee and less than optimal management of the work environment by the employer. All workplace transport ancillary equipment should be kept in good condition and tidy. Leaving items such as hand tools, sheeting and ropes, chains, slings, hooks, covers and so forth, lying around can cause trips to occur, as can trailing leads, hydraulic hoses, fuel refilling pipes and such like.

- In addition to being tidy, the general working environment should be well lit with good walking surfaces that are well maintained and suitably covered. These walking surfaces need to be appropriate for the work being undertaken and kept free from loose covers, rubbish, spills and any turned-up edges. With regards to light, very shiny surfaces can cause reflective glare, which in certain conditions might negatively affect workers' sight or distract them enough to contribute to slip / trip hazards.

- Steps, footholds, ladders and other pedestrian access mechanisms should be well designed and intended for the specific vehicle on which they are being used. Poor access facilities (such as steps of varying riser height and / or width) can encourage trip hazards. Equally, good access should have adequate handrail and / or hand-hold provision, such that three points of body contact can be maintained at all times it is in use and so that people can steady themselves should a trip (or slip) occur. See *BS EN ISO 2867:2006 Earth-moving machinery: Access Systems* (BSI, 2006) for further information.

- Previous comments regarding appropriate footwear apply here also.

Removing or reducing fall hazards

Where a potential fall from a height exists, the control approach should follow a hierarchy. This is as follows:

1. Avoid (or reduce the required amount of) work at height if possible. For example, by extracting a vehicle part that requires servicing using a mobile elevating work platform (MEWP) and subsequently servicing it at ground level rather than doing all of the work at height. See Figure 8.

2. Where work at height cannot be avoided altogether, then the potential hazard of falling should as far as reasonably practicable be removed. For instance, by using bespoke access equipment with safe working platforms and guarding to carry out maintenance to a high vehicle. See Figure 9.

3. After (1) and (2) above have been implemented to their full extent (that is, in the context of reducing risk to ALARP), then where any possible risk of a fall remains, work equipment should be employed to minimise the potential fall distance and / or the consequences of a fall. An example would be the use of safety netting or air bags placed around the perimeter of a vehicle that is being unloaded (more detail on these options later).

Regarding points (2) and (3), passive 'collective' controls are preferred to active 'personal' ones. For example, collective guarding and handrails are preferable to an active restraint and lanyard system. This is because collective measures tend to protect more than one person at any time and tend to function without required action on the part of an individual. For example, the 'active' restraint and lanyard system relies on the user to wear it and keep it hooked up to a secure anchor at all times, for it to remain effective.

Figure 8 The use of a MEWP to avoid work at height

(Image courtesy of Lafarge)

Figure 9 Examples of bespoke access equipment for work at height

9(a) For a large loading shovel

9(b) For maintenance to a large wheel

(Images courtesy of Lafarge)

Removing or reducing hazards when working upon or accessing workplace transport

The risks are essentially any combination of all those that have been described above, but particularly hazardous aspects include working on large transport for maintenance, getting in and out of large vehicles, and carrying out loading and unloading activities.

Maintenance should be conducted in a designated area, equipped with appropriate workplace, access and safety equipment for the vehicle(s) being worked upon. The area should be kept clear of other persons who are not directly involved with the work. Internal workshops are favoured because they help protect workers from the elements, particularly the wet or icy conditions that can cause worker distraction and / or contribute to slippery work surfaces (at ground level, on working platforms or on parts of a machine). Vehicle travel routes should be designed so as to minimise vehicle manoeuvring (especially reversing) and where possible, a pedestrian / vehicle segregation system should be in place.

For work in awkward or inaccessible places on workplace transport, retrospective engineering solutions can be considered to aid fitter access. For example, Figure 10 shows how a fold-away ladder, walkway, safety chains and grab rails have been provided to an excavator in order to give the operator safe access to the cab, and so that fitters can more safely get around the machine for maintenance.

Alternatively, bespoke access systems and working platforms such as that shown earlier in Figure 9 should be considered for larger operations. A further example of such a bespoke system – a truck-mounted scissor lift working platform for use with a large dump truck – is demonstrated in Figure 11.

Getting in and out of large vehicles can be particularly dangerous; sometimes requiring the driver to use advanced climbing skills! Here again, retrospective systems can be designed and fitted by specialist suppliers. As examples of these, Figure 12 shows two types of stairway access for a large dump truck. These can be folded away when the vehicle is being used. Note also in photo 12(b) the dedicated steps and grab rails to allow safer access onto this vehicle's engine cover area. Figure 13 demonstrates similar 'in use' and 'folded away' configurations of steps and guard rails for rear access to a small dozer.

Loading and unloading activities bring a whole new set of hazards of their own, the majority of which relate to falls from a height for workers securing, slinging, sheeting or otherwise dealing with the load. Where lifting equipment is being used, the act of signalling (or watching the signaller) can also take away concentration from what is happening in the general vicinity and this too can lead to increased hazardous situations.

As with maintenance activities, loading and unloading activities should be carried out in a safe designated area(s) equipped with appropriate workplace access and safety equipment, and the area kept clear of other persons who are not directly involved with the work. Internal areas are favoured if possible for reasons previously stated, although in practice this will obviously not always be possible. Earlier comments about vehicle movements and segregation apply here too.

Figure 10 Retrospective engineering solutions to aid accessibility to an excavator

10(a) To the engine housing...

10(b) Side access to the engine housing and cab...

10(c) View along the side access...

(Images courtesy of Spillard Safety Systems)

Figure 11 Bespoke access system: truck-mounted scissor lift working platform

(Image courtesy of Lafarge)

Figure 12 Fold-up stairway access for a large dump truck

12(a) Example of side access

12(b) Example of front access

(Images courtesy of Spillard Safety Systems)

Figure 13 Fold-up stairway access for a dozer

13(a) Ready for use…

13(b) Folded away

(Images courtesy of Spillard Safety Systems)

Regarding risk of falls, the HSE state that vehicle-fitted controls are favourable to site-based systems. One such vehicle-fitted system uses a rail, or line, that runs the length of a lorry trailer to which is attached a lanyard and worker harness. Worn by workers on the trailer, it allows them to move freely along the length of the vehicle but will stop them from falling should they lose their footing or trip – see Figure 14(a). An alternative option is fall arrest netting temporarily fixed to the perimeter of the trailer during loading or unloading activities. This is shown in Figure 14(b).

Site-based loading and unloading control systems include harness, lanyard and fall-arrest mechanisms that are attached to workers on vehicles during unloading – see Figures 15(a) and 15(b). Other systems include temporary perimeter safety rails and / or access steps (Figure 15(c)) or temporary bays between which trailers are parked to unload (Figure 15(d)). Air bag systems are another option, where air-filled bags are placed around a vehicle during unloading to cushion a landing should a worker fall.

Figure 14 Vehicle-fitted fall arrest systems for loading and unloading operations

14(a) Harness and lanyard attached to running line on vehicle

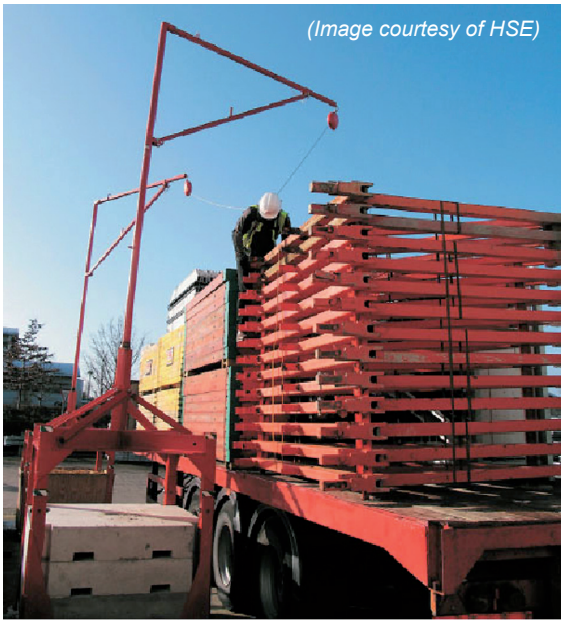
14(b) Net fan to perimeter of vehicle

(Images courtesy of HSE)

Figure 15 Examples of site-based loading / unloading fall control systems

15(a) Harness and arrest mechanism adjacent vehicle

15(b) Example of harness and fall arrest mechanism showing set up on site



15(c) Safety rails to sides of trailer and access platform/ steps to end

15(d) Safety rails erected between which trailer is parked during unloading

Wherever possible, vehicle ancillary systems (such as mechanical grabs or lift arms) should be operable from ground level, thereby saving an operator from having to climb to enter an operating position or seat. Likewise, ancillary plant such as refrigeration units on frozen goods delivery vehicles, which require frequent periodic maintenance, should be located such that they can be accessed for maintenance at ground level. This is favourable to cab-mounted ancillary equipment that requires an operator to access the 'fifth-wheel' area or climb ladders to get at them.

Chapter summary

The hazards and associated risks from working with or near to workplace transport are numerous, but those in particular which especially present significant hazards include access and egress; large plant or vehicles; and loading and unloading.

The specific risks associated with particular plant, or particular methods of work, need to be adequately assessed by competent person(s), in order that appropriate controls and procedures may be put in place to remove or minimise them.

There is a need for proactive health and safety management by workplace transport employers and managers; this will incorporate a well thought out and managed transport safety plan.

It is the responsibility of employers to ensure that such safety regimes are adequately communicated to the work force and to ensure that they are observed and acted upon fully. Controls that are not adhered to, or with, are not controls at all.

Equally, all operators and drivers of workplace transport should be adequately experienced, competent and informed, and comply at all times with any risk control measures that are put in place to protect them.

In addition to managerial, administrative and operator-related control aspects, employers should strive to procure only the safest and appropriate equipment. Where possible, professional opinion should be sought and often the best place to obtain advice is from specialist manufacturers, who may be utilised to retrospectively design and fit many forms of safety system to mitigate the hazards identified.

Concluding summary

Workplace transport embraces most kinds of driven or operator controlled vehicle, including on- and off-highway plant, and any associated ancillary equipment that such plant may use from time-to-time.

The main focus of this guide has been the health and safety issue of slips, trips, falls and certain other risks, in the context of working upon or accessing workplace transport.

The overriding aim of the guide is to highlight these kinds of hazards and their risks and encourage safer working by all who operate, or otherwise enter the working vicinity, of workplace transport.

Additional motives for the guide include a desire to help reduce the accident statistics for workplace transport, together with commensurate direct and indirect costs of these accidents.

Workplace transport presents many 'generic' hazard areas including those normally associated with mechanical machinery, moving parts, operator competence, falls, vibration, safe working areas and being struck by flying objects.

Specific hazards related to workplace transport use in construction include contact with electrical sources, vehicle overturn, collisions with objects, collisions with people and collapse of, or falling into, open excavations.

Other aspects to consider in workplace transport health and safety include vehicle maintenance, operator experience / competence, the exact nature of the work and its environment, the carrying of passengers and risks to pedestrians.

Whatever the setting, in striving to make workplace transport as safe as possible, all aspects of it – and its working environment – will require risk assessment by competent person(s). This is the precursor to design and implementation of appropriate risk removal and / or control mechanisms.

Broad guidance on workplace transport from the Health and Safety Executive is based on encouraging a safe working environment, safe transport and safe people.

Safe working environment includes focus on traffic routes, speed, directions, signage, infrastructure, centralised vehicle (key) control and designated work (maintenance / loading / unloading) areas.

Safe transport includes focus on maintenance and cleanliness, suitability for the job, appropriate equipment procurement and safe associated (or ancillary) equipment.

Safe people includes focus on the right people (experience, ability, competence), fitness to operate and adequate information / instruction.

It is a legal requirement for employers to take account of employees' capabilities when assigning them work. Where capability is lacking, a host of approved training providers are available to service all specific aspects of the workplace transport sector.

Specific hazards and associated risks relating to workplace transport include slips, trips, falls and other risks when working upon / getting in or out of the workplace transport.

Workplace transport slip hazards can arise in various ways: moving around on poor surfaces, working on areas not provided with anti-slip surfaces, moving about on surfaces not designed for pedestrian movement and moving about on contaminated surfaces (or with poor or contaminated footwear).

Ways to control slip hazards include observing the type of surface and avoiding poor or slippery ones; working methodically and with good concentration; taking account of water, ice and other surface contaminants; and wearing the appropriate footwear.

Workplace transport trip hazards can occur from various means: trailing equipment (or hoses and so forth), working on uneven surfaces, working on awkward surfaces or in awkward positions, being distracted or losing concentration and working in an untidy work area.

Ways to control trip hazards include good housekeeping, cleanliness and tidiness, good lighting with no glare, good access equipment and handrails used as appropriate (retrospectively fitted if necessary) and appropriate footwear.

Workplace transport fall hazards can occur from any place where a person could fall a distance that is liable to cause personal injury. This includes getting into or out of a place or work and when working at or below ground level. Particular risks arise where extra work height is needed including multiple deck transport, demountable equipment and sit-on dedicated load handling equipment.

The first way to control fall from a height hazards is to remove the need to work at height. Where the hazard can't be removed, then the next step is to introduce controls to stop falls from happening and, where a risk remains, to introduce measures to minimise the possible consequences of a fall. Collective, passive controls are preferable to active, personal controls.

Other risks from working upon or accessing workplace transport are exacerbated where the transport is large and may require climbing to get in or out of it, and particular risks can be attributed to loading and unloading activities.

Ways to control other access and unloading risks include to procure equipment with appropriate means of access and egress, retrospectively fit engineering access equipment (such as steps, guardrails and grab rails), avoid jumping down from the driving position and use control methods for avoiding or arresting falls during loading / unloading activities.

Due to the broad variance in types of workplace transport, its working environment, and the kinds of work undertaken, an equally broad range of health and safety legislation applies to it.

Some of the principal legislation includes: *The Health and Safety at Work etc. Act (1974); The Management of Health and Safety at Work Regulations (1999); The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (1995); The Provision and Use of Work Equipment Regulations (1998); The Lifting Operations and Lifting Equipment Regulations (1998); The Supply of Machinery Safety Regulations (2008); and The Health and Safety (Safety Signs and Signals) Regulations (1996).*

Legislation should be considered in the relevant context of any specific workplace and where doubt or uncertainty exists, professional advice (for example, to ensure employer compliance with legal obligations) should be taken.

Appendix A: Overview of some workplace transport health and safety legislation

What law applies to workplace transport?

Due to the wide-ranging types of workplace transport available and in use – and the many varied types of work environment within which they can be deployed – an equally diverse volume of health and safety legislation can impact such deployment. Hence, the following discussion must not be considered to represent a complete listing of relevant health and safety law and does not attempt to provide any indication of 'relative importance' or 'relevance' among that legislation.

For these kinds of reason, this overview should be viewed as providing only a brief background to the subject of workplace health and safety law. Only appropriately qualified and competent persons can offer definitive advice on such matters, having for example, taken into account the specific conditions of a particular workplace environment alluded to above.

Health and safety legislation relevant to workplace transport includes:

- The Health and Safety at Work etc. Act (1974) (HASWA, 1974);
- The Management of Health and Safety at Work Regulations (1999) (MHSWR, 1999);
- The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (1995) (RIDDOR, 1995);
- The Provision and Use of Work Equipment Regulations (1998) (PUWER, 1998);
- The Lifting Operations and Lifting Equipment Regulations (1998) (LOLER, 1998);
- The Supply of Machinery Safety Regulations (2008) (SMSR, 2008); and
- The Health and Safety (Safety Signs and Signals) Regulations (1996) (HSSSSR, 1996).

(All the above, as amended).

The following considers the main characteristics of these particular legislative instruments.

The Health and Safety at Work etc. Act (1974) (HASWA)

Within Great Britain, HASWA is the 'mainstay' of occupational health and safety, placing a 'duty of care' on all at work including employers, employees and self employed people.

Section 2 of the Act is relevant to the duties of employers, requiring them to "…ensure, so far as is reasonably practicable, the health, safety and welfare of all employees" (HASWA, 1974). With relevance here, this includes:

- the safe provision and maintenance of plant (and by inference equipment and machinery);
- safe arrangements in connection with the use, handling and transport of articles and substances; and
- provision of appropriate training and supervision.

Section 7 of the Act is relevant to the duties of employees, requiring them to take reasonable care for the health and safety of themselves and of any other persons who may be affected by their acts or omissions while at work. So in striving to work safely, it is not only important what a worker does do, but also what they might omit to do, such as adhere to safe working practice. To give an example in the case of workplace transport, this would require workers to unload a vehicle safely (e.g. using a safe system of work and employing appropriate passive safety systems) so as not to endanger themselves, or anyone else working or simply passing nearby.

Section 7 also requires employees to co-operate with their employer in fulfilling any health and safety legal obligations. This could include for example, to adhere to a specified method of operation, as has been deemed necessary by the employer for the safe use of a certain item of machinery.

The Management of Health and Safety at Work Regulations (1999)

These regulations complement HASWA by specifying management requirements for health and safety in the workplace and would apply to virtually all aspects of workplace transport. Their underlying doctrine emphasizes systematic and formal analysis of workplace risks to inform the design, implementation and review of appropriate risk removal mechanisms, or control(s).

Regulation 3 deals with risk assessment methodology and requirements. Regulation 4 sets out 'principles of prevention' where risk avoidance and the combating of risks at source take precedence, while Regulation 5 places a duty on employers, as part of their health and safety arrangements, to ensure that employees are instructed in the principles of accident prevention.

Other aspects of this particular legislation include employee health surveillance, necessary procedures for 'serious and imminent dangers', providing appropriate information to employees and special provision for younger (less experienced) workers (list not exhaustive).

The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (1995) (RIDDOR)

RIDDOR places a legal requirement on employers, the self-employed and anyone in control of work premises, to report certain workplace incidents and to keep formal records of the same. These incidents are:

- a workplace fatality;
- a major injury;
- an over three-day injury;
- certain diseases; and
- a dangerous occurrence (HSE, 2011h).

According to the regulations, major injuries include:

- fracture;
- amputation;
- dislocation of the shoulder, hip, knee or spine;
- loss of sight;
- chemical or hot metal burn to the eye;
- any penetrating injury to the eye;

- injury resulting from an electric shock or electrical burn leading to unconsciousness, or requiring resuscitation or admittance to hospital for more than 24 hours; and
- any other injury leading to hypothermia, heat-induced illness or unconsciousness, or requiring resuscitation, or requiring admittance to hospital for more than 24 hours (RIDDOR, 1995, Sched.1) (above list not exhaustive).

An over-three-day injury is one which is not major as defined above, but that results in the injured person being away from work (or being unable to do their full range of normal work duties) for a period greater than three days (HSE, 2011j).

The Provision and Use of Work Equipment Regulations (1998) (PUWER)

PUWER defines work equipment as any machinery, appliance, apparatus or tool used at work – so they have particular relevance to workplace transport. All work equipment must be safe and meet the requirements of these regulations.

Regulation 4 requires that work equipment is constructed or adapted so as to be suitable for the purpose for which it is to be used. It should be selected taking account of the working conditions that exist or might be encountered, and should take account of any additional risk that might be posed by its use.

Regulation 5 requires that work equipment is maintained so that it works efficiently and safely and that where the equipment has a maintenance log, then that log should be kept up to date. Regulation 6 requires work equipment to be inspected at suitable intervals to ensure its safety, and so that any defects found can be remedied in 'good time'. Suitable intervals include after installation, before being used for the first time (i.e. following that particular installation) and after any event occurring that might have jeopardised its safety (for instance, following a plant item's involvement in an accident).

Regulation 8 places a duty on employers to ensure that anyone who uses, supervises or manages work equipment is given adequate information and instruction relating to such use. Linked to this issue somewhat, Regulation 9 identifies that employers shall ensure that all users of work equipment have received adequate training for purposes of health and safety. (This includes methods to be adopted in use, risks which may be presented and necessary precautions).

The Lifting Operations and Lifting Equipment Regulations (1998) (LOLER)

LOLER defines lifting equipment as *"…work equipment for lifting or lowering loads and includes its attachments used for anchoring, fixing or supporting it"*. Hence, any workplace transport that lifts loads – such as dedicated cranage, lorry mounted booms, excavators fitted with a quick-hitch lifting eye, winches and so on – would all be impacted upon by this legislation.

Regulation 4 requires that lifting equipment should provide adequate strength and stability for the load. All parts of a load and anything attached to it (such as retaining straps, chains or slings) must also be of adequate strength.

Regulation 6 requires that lifting equipment must be positioned such that, so far as reasonably practicable, risks are minimised from either the equipment or load striking a person, or from the load drifting (e.g. in transit), falling (e.g. during the lift) or otherwise being released unintentionally.

Regulation 7 states that machinery and accessories for lifting loads must be clearly marked to show their safe working load (SWL). Further, that where the configuration of machinery can affect its safe working load, the SWL of each configuration is either marked on the machinery itself or such information is kept with the machinery (e.g. within the operator's cab).

Regulation 9 requires lifting equipment to be thoroughly examined before use for the first time (i.e. after its installation in a new place) and at certain other specified times, to ensure its safety and so that any deterioration found can be remedied in 'good time'. The concept of 'thorough examination' also relates to lifting equipment accessories, in which case this form of examination must take place at least every six months and / or each time an 'exceptional circumstance' occurs (similarly to PUWER above, this is a circumstance that is liable to have jeopardised the safety of the lifting equipment).

The Supply of Machinery Safety Regulations (2008) (SMSR)

These regulations mean that most types of work machinery used within the UK – and this also relates to any imported machinery – must comply with specified health and safety criteria. Due to their 'broad' definition of machinery, the regulations apply to many types of workplace transport and components of that transport.

SMSR underpin the European Community Declaration of Conformity (most commonly known and recognised as a 'CE' mark) which briefly summarised, means that any machinery carrying that mark complies with relevant essential health and safety requirements. Some of these requirements relate to materials used in machinery construction, control systems, stopping devices, protection against mechanical hazards, guards and protection devices and protection from specified hazards (list not exhaustive).

The Health and Safety (Safety Signs and Signals) Regulations (1996)

These regulations deal with the provision of safety signage and signals at the workplace. They require that safety signs are used where a risk to health and safety might remain, after all other preferred methods of risk removal or control (e.g. passive and active systems) have been implemented.

Safety signage that may apply to workplace transport includes:

- red prohibition signs to prevent dangerous behaviour, such as "No forklift trucks" [beyond this point];
- yellow warning signs to encourage precautions to be taken, such as [beware of] "Overhead load";
- blue mandatory signs, such as "Ear protection must be worn" [in this area or beyond this point]; and
- green emergency signs such as those showing the location of medical facilities and those indicating emergency exits.

The Health and Safety Executive advise that: "By law, road signs used to warn or give information to traffic in private workplaces must be the same as those used on public roads, wherever a suitable sign exists...Drivers and pedestrians should be able to expect that the layout, signs, road furniture and markings on site will be similar to those on public roads" (HSE, 2005: p53).

With particular relevance to slingers, signallers and banksmen, The Health and Safety (Safety Signs and Signals) Regulations also furnish guidance on acoustic signals, verbal communication, and hand signals to be used.

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