HSE GUIDANCE

SAFE USE OF VEHICLES ON CONSTRUCTION SITES

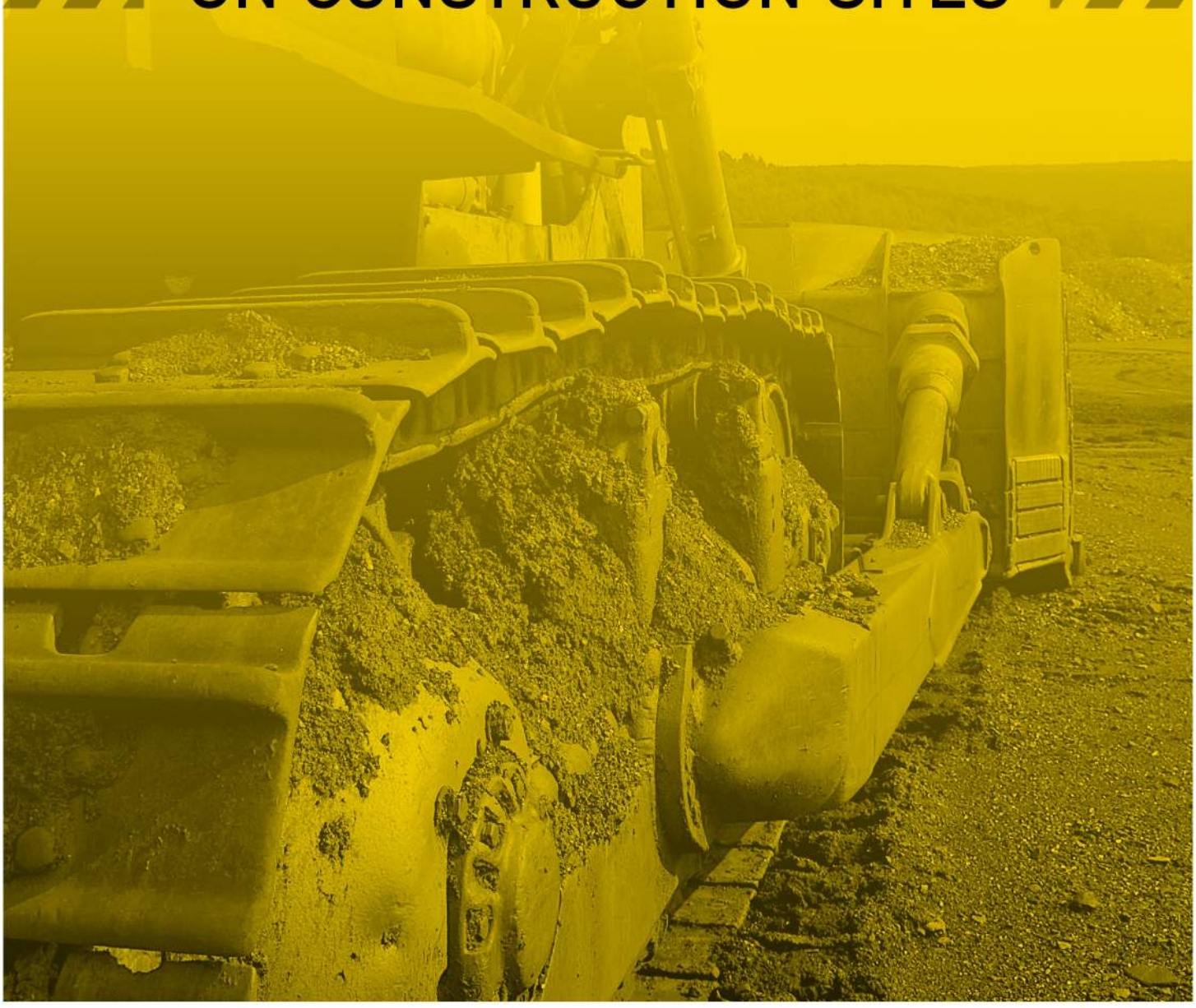

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Table of Contents

Introduction **2**

Relevant Law ..... **Error! Bookmark not defined.**

Safe Workplaces **4**

Pedestrian and Vehicle Separation ..... **Error! Bookmark not defined.**

Loading and Storage Areas 6

Public Protection 7

Information 7

Summary of Control Measures to Ensure Safe Site Traffic Routes 8

Safe Vehicles **9**

Vehicle Selection 9

Vehicle Inspection and Maintenance 10

Safe Driving and Work Practices **11**

Reversing 11

Loading of Vehicles 12

Drivers 13

Signallers 14

Safe Working Practices for Specific Vehicles 15

Managing Construction Transport **19**

Clients 19

Designers 20

CDM Coordinators 20

Principal Contractors 21

Contractors 21

The content of this guide is of general interest only and not intended to apply to specific circumstances. It does not purport to be a comprehensive analysis of all matters relevant to its subject matter. It does not address all potential compliance issues with UK, EU or any other regulations. The content should not, therefore, be regarded as constituting legal advice and not be relied upon as such. It should not be used, adopted or modified without competent legal advice or legal opinion. In relation to any particular problem which they may have, readers are advised to seek specific advice. Further, the law may have changed since first publication and the reader is cautioned accordingly.

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Introduction

Every year in the construction industry, people are killed or injured as a result of being struck by moving plant. Accidents can occur throughout the construction process, from groundworks to finishing works. Managers, workers, site visitors and the public can all be at risk if construction vehicle activities are not properly managed and controlled.

Many construction transport accidents result from the inadequate segregation of pedestrians and vehicles. This can usually be avoided by careful planning, particularly at the design stage, and by controlling vehicle operations during construction work. Inadequate planning and lack of control are the root causes of many construction vehicle accidents, which often involve:

- Vehicles or their loads striking people, particularly when reversing;
- Vehicles striking services and obstructions;
- Manufacturers' instructions for safe use being disregarded;
- Inadequate training of drivers and signallers; and
- Unsafe loading and transportation of materials on vehicles.

Successful, safe management of construction vehicle activities is based on the provision and maintenance of workplaces, vehicles, drivers and work practices.

Much of the occupational health and safety law relating to construction transport operations is qualified by the term 'so far as is reasonably practicable', the same qualification applies to most of the guidance given here. The precautions that are required in a specific situation will depend on the extent and nature of the particular risks involved. High-risk situations require higher standards of precautions than low-risk situations. The examples of hazard elimination and risk control given in this guidance do not cover every possible situation and may not be relevant to all sites, but they can still be good practice.

The following is practical guidance on how to prevent vehicle accidents on construction sites and reflects the Construction (Design and Management) Regulations 2007 (also 2007 in Northern Ireland). It provides information on planning and managing vehicle operations; selecting and maintaining vehicles, and safe driving and working practices. It will be useful to clients, designers, employers, managers, the self-employed, employees, safety representatives and plant hirers.

The key message of the guidance is:

> **Construction vehicle accidents can be prevented by the effective management of transport operations throughout the construction process.**

This guidance is divided into four main sections:

1. Safe workplaces;
2. Safe vehicles;
3. Safe driving and work practices; and
4. Managing construction transport.

For more detailed guidance, please look to the regulations and any approved codes of practice. Make sure to also consider other health and safety regulations that may apply.

Relevant Law

A legal framework for the management of construction transport risks is contained in the following legislation. This list is not exhaustive.

- Health and Safety at Work etc Act 1974 (HSW Act) or Health and Safety at Work (Northern Ireland) Order 1978;
- Management of Health and Safety at Work Regulations 1999 (2000 in Northern Ireland) (the Management Regulations);
- Construction (Design and Management) Regulations 2007 (also 2007 in Northern Ireland) (CDM);
- Work at Height Regulations 2005 (also 2005 in Northern Ireland);
- Supply of Machinery (Safety) Regulations 2008; and
- Provision and Use of Work Equipment Regulations 1998 (1999 in Northern Ireland) (PUWER).

Safe Workplaces

Planning a safe site should begin before the construction phase. There are specific duties placed on all individuals involved in the construction process, including clients, designers, CDM coordinators and contractors. The section ‘Managing Construction Transport’ explains these roles in more detail.

This section gives guidance on how to establish a safe workplace for vehicle operations. The overall message is simple—safe workplaces are achieved by separating pedestrians and vehicles and providing hazard-free traffic routes.

Pedestrian and Vehicle Separation

Regulation 36 of CDM requires that ‘every construction site shall be organised in such a way that, so far as is reasonably practicable, pedestrians and vehicles can move safely’.

Principal contractors should ensure that pedestrians and vehicles are adequately separated by establishing:

- Pedestrian-only areas from which vehicles are completely excluded;
- Designated pedestrian routes to work locations;
- Vehicle-only areas, especially where space is limited or traffic is heavy; and
- Vehicle routes around the site.

Pedestrian Routes

Establish pedestrian routes on-site that provide safe pedestrian access to work areas. Pedestrian routes should either be located a safe distance away from areas of vehicle activity or should be provided with appropriate physical protection, such as substantial fencing and/or kerbs, in order to prevent pedestrians from being struck by vehicles or their loads. Pedestrian routes should:

- Be clearly separated from vehicle routes by fencing and/or a kerb, or other suitable means;
- Be wide enough to safely accommodate the number of people likely to use them at peak times;
- Allow easy access to work areas;
- Be kept free from obstructions and tripping hazards;
- Have clear signs;
- Ensure pedestrian safety where they cross main vehicle routes;
- Provide pedestrians with a clear view of traffic movements at crossings and where gates used by pedestrians lead onto traffic routes; and
- Clearly mark separate access points for pedestrian use at loading bays and site gates that are used regularly by construction vehicles.

Chestnut paling, metal barriers or plastic fencing will be adequate to separate pedestrian routes that are a safe distance away from the edge of vehicle routes. Where vehicles are present for only short periods, and the work

presents little risk to pedestrians, satisfactory segregation can be achieved by using traffic cones and warning tape or similar means to identify the working area from which pedestrians are prohibited.

At points where large numbers of pedestrians cross busy vehicle routes—eg near site welfare facilities, appropriate traffic control measures should be implemented, such as designated pedestrian crossing points and traffic control systems. Vehicle movements around the site can be restricted to specified times. Pay special attention to pedestrian routes that individuals with disabilities may use, in order to ensure their safety—for example, by providing ramps for people in wheelchairs and tapping boards for the visually impaired.

In some circumstances, it may not be reasonably practicable to achieve physical segregation between pedestrians and vehicles—eg during infrequent, short-duration, low-risk unloading operations. In such cases, signallers and safe systems of work should be used to control vehicle and pedestrian movements. Systems of work should ensure that:

- Drivers and signallers are in contact at all times;
- Drivers and signallers understand the appropriate signals and site rules;
- The signaller controls the vehicle movements and gives clear warnings to pedestrians; and
- The signaller is in a safe place.

Vehicle Routes

Establish vehicle routes on-site that:

- Are segregated from pedestrian routes;
- Minimise the need for reversing operations with one-way systems and turning points;
- Are adequate for the number, type and size of the largest vehicles that may use them;
- Have firm surfaces, adequate drainage and safe profiles to allow for safe vehicle movements;
- Are kept clear of obstructions and other hazards;
- Avoid steep gradients and tight bends;
- Avoid hazards such as excavations, edges of structures, and fuel or chemical storage areas;
- Have the minimum necessary number of junctions;
- Are clearly signed with signposts, and where appropriate, road markings (eg on concrete or tarmac roads) showing the right of way, etc;
- Have speed limits and speed control measures specific to site conditions and the types of vehicles using the route—eg some lift trucks may be unsuitable for passing over road humps; and
- Keep site vehicles, delivery vehicles and private vehicles apart, where possible, by establishing private vehicle parking areas, specified delivery routes and storage areas.

Primary vehicle routes should be established to handle the most common vehicle movements on site—eg deliveries and access to principal work areas. Primary vehicle routes should be located away from the main pedestrian routes, wherever possible. Where risks are high because of the number and nature of vehicle movements, control measures can include setting up different routes for different vehicle types and activities—eg for muck-away operations and material delivery. Establish secondary vehicle routes leading to temporary work areas that ensure vehicle and pedestrian safety.

Where vehicle routes cannot avoid hazards to construction vehicle operations, measures should be taken to reduce and control the risks they present. The following table outlines examples of the control measures that can be applied to reduce the risks arising from common vehicle route hazards.

Common Vehicle Route Hazards On-site	Control Measures
Contaminated land and muddy sites	Establish primary routes which avoid hazardous areas and prevent vehicles from becoming bogged down. Provide vehicle wash-down facilities and road sweeping machines to maintain site transport routes (and the public motorway) in a safe condition.
Areas of restricted visibility, width or weight limits	Prevent unsuitable vehicles from using routes. Provide warning signs, visibility aids, such as mirrors, and suitable traffic control measures—eg traffic lights, passing points or one-way systems.
Temporary structures, liquefied petroleum gas (LPG) storage areas, areas of limited headroom, electric cables, pipelines, etc	Provide physical protection and warning signs in all situations which have significant danger potential if struck by vehicles—eg safety barriers to protect LPG storage areas as well as goalposts, bunting and barriers where there is a risk of overhead services and other hazards being struck by vehicles.
Edges of roadways, excavations, pits, watercourses, spoil heaps, etc	Provide physical barriers such as safety banks or stop blocks to restrain vehicles. Timber baulks and wheel stops should be fixed in position to avoid displacement.

Signs should be provided to warn pedestrians and drivers of hazards, to give instructions on safe work practices and to indicate the correct routes to follow. Signs and road markings should be clear, follow the standard road traffic signs and comply with the Health and Safety (Safety Signs and Signals) Regulations 1996 (also 1996 in Northern Ireland).

Loading and Storage Areas

On-site work should be planned to minimise vehicle movements and to avoid unnecessary deliveries as well as the double-handling of materials on-site. The location of loading and storage areas needs to be carefully considered. When there is little on-site storage space, off-site storage areas may be required for the temporary storage of materials. Loading and storage areas should:

- Be located away from pedestrian-only areas and main pedestrian routes;
- Exclude pedestrians so far as reasonably practicable;
- Have one-way systems and safe exit points;

- Have sufficient room for vehicle movements; and
- Have adequate fixed lighting, signs and appropriate visibility aids for drivers.

Public Protection

Relevant precautions should be taken in order to prevent construction vehicle operations from endangering the public. Depending on the nature of the site and work, include the provision of:

- Suitable vehicles;
- Appropriate pedestrian and vehicle traffic management systems;
- Site fencing;
- Signallers or security guards; and
- Effective vehicle immobilisation systems with key custody procedures.

Measures need to be taken to protect members of the public where vehicles cross the public footway, and control their movement to ensure safety—eg by using barriers and a signaller. Drivers, particularly when working in public areas, should always remove the keys from the ignition when they park and leave their vehicles.

Where there are many pedestrians or vulnerable groups passing the site—eg close to schools, hospitals and major shopping centres, restrictions may have to be placed on traffic movements to and from the site. Deliveries to the site can be restricted to specific times in order to prevent congestion at peak times. Site security measures should ensure unauthorised persons, especially children, do not have access to sites.

Traffic routes on partially occupied housing sites require careful management to protect the public, particularly children, from construction vehicle operations. The following measures can reduce the risks to the public on partially occupied sites:

- Phase occupation of dwellings so that site traffic can be excluded from occupied areas;
- Segregate public vehicle and pedestrian routes from site vehicle and site worker routes;
- Provide safe places for public parking and safe access to show homes;
- Provide relevant information for visitors on public safety; and
- Update information to take account of any changes in traffic routes that may affect the visiting public and residents.

Information

All drivers and pedestrians entering a site need to be informed of any site transport hazards and relevant site rules, including the correct traffic routes to use. The amount and detail of information given needs to reflect the nature of site hazards. Information can be provided by:

- Verbal instructions upon arrival at site;
- Site induction;

- Issue of site maps to drivers;
- Giving site-specific delivery instructions when ordering materials from suppliers; and
- Displaying maps and site rules at site entrance points and elsewhere—eg in canteens.

Any changes made to site traffic routes need to be communicated to site workers and visiting drivers. Workers and their safety representatives should be consulted on any changes which may significantly affect their health and safety. The information on transport management contained within the workplace transport plan will need to be updated as the project progresses and traffic routes and site rules change.

Summary of Control Measures to Ensure Safe Site Traffic Routes

Description	Vehicle Routes	Pedestrian Routes
Site entrance and exit	Ensure adequate sight lines, signs, maps, security and vehicle management procedures.	Separate entrance point, signs and instructions.
Parking areas	Separate site vehicle, delivery and worker parking areas. Provide a temporary lorry parking/holding area by the site entrance to manage deliveries and allow vehicles to turn away from the site if not allowed to enter the site.	Provide safe pedestrian routes from parking areas to offices, welfare facilities and workplaces. Provide clear signs and instructions to workers.
Offices and welfare facilities	Establish offices and welfare facilities and other areas of frequent pedestrian activity away from primary site traffic routes. Provide signs and pedestrian and vehicle control measures where vehicle routes cross pedestrian routes.	Provide safe pedestrian routes from parking areas to workplaces. Provide clear signs and instructions to pedestrians.
Primary traffic routes	Primary traffic routes should allow the safe passage of site and delivery vehicles away from pedestrian routes. Establish one-way systems where possible.	Establish primary pedestrian routes that provide safe access to work areas away from main vehicle routes where reasonably practicable. Provide physical protection where pedestrians are at risk of being struck by vehicles or their loads. Establish crossing points and pedestrian control measures where necessary.
Secondary traffic routes	Define safe routes for all vehicle operations on-site.	Provide protected pedestrian routes in areas where vehicles regularly pass.
Storage areas and loading bays	Establish storage and loading areas away from areas of frequent pedestrian activity.	Provide separate pedestrian access, clear signs and instructions for workers.
Vehicle facilities	Establish vehicle washing areas, sheeting gantries and weighbridges off primary vehicle routes.	Provide safe pedestrian access across vehicle routes to all places of work.

Safe Vehicles

This section provides guidance on health and safety aspects of selecting and maintaining construction vehicles.

Vehicle Selection

The design of some vehicles presents hazards, such as restricted visibility and lack of driver protection from the effects of overturning, noise and vibration. Some old designs of site dumpers allowed the vehicle to be knocked easily into gear as the driver dismounted.

Choosing the right vehicle for the job is an essential part of effective vehicle management. The selected vehicle needs to be capable of performing its designated tasks safely. The following are important factors to consider:

- Stability under all foreseeable operating conditions;
- Safe access to and from the cab and other working locations on the vehicle;
- Effective braking systems;
- Adequate visibility for the driver all around the vehicle;
- Headlights, a horn, windscreen wipers and warning devices—eg reversing alarms;
- Physical guards to protect dangerous parts such as power take-off shafts, chain drives, trapping points and exposed exhaust pipes;
- Protection for the driver from work hazards—eg working at height and falling from the vehicle, falling objects and the effects of the vehicle overturning; and
- Protection for the driver from the weather, noise, vibration, noxious fumes and dusts.

Manufacturers' specifications need to be considered when choosing vehicles for construction and civil engineering work. In particular, load and stability limits need to be taken into account when choosing vehicles for use on uneven and sloping ground. Some vehicles, especially those involved in lifting operations (such as some lift trucks and telescopic handlers) require flat, compacted surfaces to operate safely.

Effective braking systems, including parking brakes, are essential for the safe use of vehicles. Parking brakes should be fitted on trailers over 0.75 tonnes maximum gross capacity. Where parking brakes are not fitted, trailer wheels need to be chained or locked to prevent movement when the trailer is parked. Wheel chocks should be used to prevent unintended vehicle and trailer movements when parked on sloping ground. Trailers with maximum gross weights between 0.75 tonnes and 3.5 tonnes should have at least an overrun brake (ie an inertia brake), while trailers over 3.5 tonnes should be fitted with braking systems linked to the towing unit.

Where the risk of vehicles overturning is significant—eg dumpers used on sloping ground, vehicles should be fitted with rollover protective structures (ROPS). Where there is a significant risk of falling materials endangering the driver, e.g. excavators used in demolition work, vehicles should be fitted with falling-object protective structures (FOPS).

Adequate visibility for the driver is a key factor in the safe use of vehicles on-site. Adequate visibility from the driving position is judged on the basis of risk and the state-of-the-art technology. Visibility aids such as closed-circuit television (CCTV) and convex mirrors should be fitted to vehicles to overcome significant blind spots along the sides and at the rear of large vehicles, particularly where pedestrians are at risk.

Vehicle Inspection and Maintenance

Construction vehicles are used in harsh environments and require effective maintenance regimes to prevent defects from developing. A programme of daily visual checks, regular inspections and servicing schedules should be established according to the manufacturer's instructions and the risks associated with each vehicle.

Plant hire companies need to provide information with all plant and equipment they supply in order to enable it to be used and maintained safely. Contractual arrangements between user and employer should set out who is responsible for maintenance and inspection during the hire period—these should be made clear to all parties.

Vehicles should have a maintenance log to help manage and record vehicle maintenance operations. Employers should establish procedures designed to encourage drivers to report defects or problems, and ensure that problems with vehicles are corrected. Planned inspection and maintenance needs to follow the manufacturer's instructions and include, where appropriate:

- Braking systems;
- Seat belts;
- Tyres, including condition and pressures;
- Steering;
- Convex mirrors, CCTV and other visibility aids;
- Lights and indicators;
- Safety devices such as interlocks;
- Warning signals;
- Windscreen washers and wipers;
- Firefighting equipment;
- Condition of cab protection devices, eg ROPS and FOPS;
- Functional checks on the vehicle, including controls and starting systems;
- Correct location of guards and panels on the vehicle; and
- Other accessories, such as quick couplers and their locating pins, correctly fitted and in place.

Safe Driving and Work Practices

This section gives advice on safe work practices. It contains guidance on managing the risks arising from the use of vehicles, including reversing, loading and vehicle signalling. It briefly covers safe work practices relating to types of construction vehicles, but in all cases the manufacturer's guidance on safe use should be followed.

The main duty to manage transport risks on-site rests with the principal contractor. However, subcontractors, drivers and signallers all need to follow safe working practices. All employers need to carefully select, train and supervise drivers and signallers, and monitor working practices.

Reversing

Vehicle reversing operations cause a third of all fatal transport accidents in the construction industry, producing an average of five deaths and 20 major injuries per year. The most effective way of managing the risks from reversing is to avoid the need for reversing manoeuvres by providing one-way systems, turning areas and drive-through loading and unloading areas.

When planning and controlling site vehicle operations, the hierarchy of control measures for reversing operations (below) should be followed. Vehicles required to reverse on-site should provide adequate visibility around the vehicle for the driver to ensure safety. Safe systems of work need to be devised and followed for all reversing operations, particularly when signallers are used to control third-party risks or assist in the accurate positioning of the vehicle. Warning systems offer the lowest level of protection in the hierarchy and, if they are the only precaution used, are only appropriate for low-risk situations.

Hierarchy of control measures for reversing operations

1. Eliminate the need to reverse.
    - Implement one-way systems around the site and in loading and unloading areas.
    - Provide designated turning areas.
2. Reduce reversing operations.
    - Reduce the number of vehicle movements as far as possible.
    - Instruct drivers not to reverse, unless absolutely necessary.
3. Segregate vehicles and pedestrians.
    - Design vehicle reversing areas that allow adequate space for vehicles to manoeuvre safely, exclude pedestrians, and are clearly signed to have physical stops or buffers to warn drivers that they have reached the limit of the safe reversing area.
4. Ensure safe systems of work are followed.

- Fit CCTV, convex mirrors, Fresnel lens, etc in order to overcome restrictions of visibility from the driver's seat, particularly at the sides and rear of vehicles.
- Fit radar proximity devices to vehicles to indicate to drivers when there are objects near the vehicle.
- Ensure everyone on-site understands site rules on vehicle safety.
- Drivers and signallers need to be in constant communication during reversing operations.
- Signallers should not be put at risk from vehicle movements—eg by standing directly behind reversing vehicles.
- Ensure all vehicles on-site are fitted with appropriate warning devices.

5. Provide warnings when vehicles are reversing
    - Ensure reversing warning lights and alarms are in good working order, and instruct workers to keep clear of moving vehicles.

Loading of Vehicles

Load and unload vehicles on level ground in areas away from passing traffic, pedestrians and overhead hazards—eg bridges, pipelines or electrical cables. Loads need to be:

- Of suitable height and width for the vehicle and road conditions on-site;
- Secured to prevent movement;
- Evenly loaded and distributed to keep the centre of gravity as low as possible and to prevent stresses on vehicle structures;
- Positioned on vehicles and transported so that they do not adversely affect vehicle stability; and
- Checked to ensure they will not fall uncontrollably when restraints are removed during unloading.

No vehicle should be loaded beyond its safe working capacity. Loads that project out from the body of the vehicle should be indicated by a warning flag or sign.

Gantries that fit closely to the vehicle can provide safe means of access for workers during the manual sheeting of wagons. They are particularly appropriate for regular sheeting operations on similar vehicles.

The precautions necessary for managing the risks presented by hazardous loads when transported by road need to be followed on-site and supplemented as necessary in relation to site risks; for example, lorries carrying LPG cylinders should not be parked near scaffolds where there is a risk of falling objects striking them. Site rules should require visiting drivers to inform site management of any hazardous loads on their vehicles. Appropriate fire precautions need to be instituted for loads that contain substances with specific fire hazards—eg fuels and solvents. Information about the hazards of dangerous loads and necessary precautions in the event of an accident should be issued to all site drivers.

Where vehicles are transported on-site on low-loaders, they should be:

- Dismantled so far as possible to keep them within the dimensions of the carrying vehicle;
- Emptied of fuel, so far as possible;

- Relieved of hydraulic pressure by moving all control levers through all positions, twice, before transportation; and
- Secured and restrained to prevent movement, with their parking brake applied and wheels and rollers chocked. Moveable assemblies, such as jibs, dismantled parts and ancillary equipment, need to be secured following the manufacturer's recommendations.

Loading and offloading areas should be of sufficient size to allow vehicles to move without striking obstructions or causing hazards to others. Access ramps used for getting vehicles on and off low-loaders should be of adequate strength and size.

Drivers

Many accidents are the result of untrained or inexperienced workers driving construction vehicles. Employers need to ensure that all drivers are competent to perform the work they are given.

Driver competence may be judged on the basis of experience, recognised training and testing of knowledge and ability. Certificates of training from recognised training schemes help demonstrate competence. Driver training records should be kept up to date.

The following points need to be considered when selecting people to drive construction vehicles:

- Drivers should be competent in the safe operation of the vehicles and their daily maintenance checks;
- Training certificates should be checked for validity;
- Training alone is not competence and you should ensure that the operator has enough experience on the class of the machine to operate it safely and enough time to familiarise themselves with a new machine, if appropriate;
- Caution should be exercised with drivers who may be unfamiliar with the hazards of construction sites, including trainees and new staff; and
- No one under the influence of alcohol or drugs should be permitted to drive any vehicle.
- Drivers should ensure that they are familiar with the use of all the additional attachments on the machinery that they are operating, such as lifting points and quick hitches on excavators, as these may vary.
- Drivers should be aware of their own responsibilities and avoid taking risks and shortcuts.

Driver's Safe Work Practices Checklist

- Only operate vehicles if you are competent and authorised to drive them.
- Do not drive when your abilities are impaired by ill health, poor vision, prescribed or illegal drugs or alcohol.
- Make sure you fully understand the operating procedures of the vehicles you control and all of the accessories you are using.
- Know the site emergency procedures.
- Understand the system of signals used on-site.

- Visiting drivers: seek appropriate authority to enter the site and operate vehicles.
- Know the safe operating limitations of your vehicle, particularly relating to safe maximum loads and gradients.
- Carry out daily checks on your vehicles and report all defects immediately to supervisors.
- Follow site procedures and comply with all site rules.
- Do not drive at excessive speeds.
- Follow established site traffic routes.
- Ensure that windows and mirrors are kept clean and clear.
- Keep the vehicle tidy and free from items that may hinder the operation of vehicle controls.
- Do not allow passengers to ride on vehicles unless safe seating is provided.
- Park vehicles on flat ground wherever possible with the engine switched off, the handbrake and trailer brake applied, and where necessary, use wheel chocks.
- Do not reverse without checking behind the vehicle for pedestrians, vehicles or obstructions.
- Where visibility from the driving position is restricted, use visibility aids or a signaller. Stop if you lose sight of the signaller or the visibility aid becomes defective.
- Do not remain on vehicles during loading operations, unless the driver's position is adequately protected.
- Ensure loads are safe to transport.
- Do not attempt to get on or off of moving vehicles.
- Do not make adjustments with the engine running and guards removed.
- Do not smoke during refuelling operations.

Signallers

Signallers used to direct pedestrian and vehicle movements need to be competent in the methods used to ensure everyone's safety. Safe systems of work need to be provided to prevent signallers being struck by vehicles. The provision of refuges, observation positions, control rooms, radio communications and CCTV systems can help remove signallers from areas of vehicle movement. Signallers should be authorised by site management and easily distinguished on-site by the use of colour-coded helmets, clearly labelled high-visibility jackets, etc.

Signallers' Safe Work Practices Checklist

- Ensure you know and understand relevant safety procedures and the correct signalling system.
- Ensure drivers understand the correct signalling systems.
- Signal instructions clearly.

- Ensure you are visible to the driver and the driver is visible to you; if not, stop the moving vehicle.
- Stand in a safe location at all times.
- Warn pedestrians, and make sure they are kept away from vehicle operations.
- Wear appropriate protective equipment, including high-visibility clothing.
- Report work hazards to supervisors.
- Make sure you can get to and from your work location safely.
- Do not ride on the vehicle you are directing unless you are in a designated safe position.
- Do not direct vehicles if your ability is affected by alcohol or drugs.

Safe Working Practices for Specific Vehicles

The following provides brief details of safe work practices for several types of common construction vehicles. Before using any vehicle for the first time, drivers should refer to the manufacturer's instructions for safe use.

Site Dumpers

Site dumpers are involved in many fatal and major accidents in the construction industry resulting from:

- Using site dumpers on gradients beyond their safe working capacity;
- Overturning;
- Inexperienced and untrained drivers operating site dumpers;
- Inadequate maintenance of braking systems;
- Carrying passengers in unsafe positions; and
- Failing to provide stop blocks at the edges of excavations and spoil heaps.

Safe Use of Site Dumpers Checklist:

- Do not drive on gradients in excess of those safe for the dumper (see manufacturer's instructions).
- Allow only competent people to drive site dumpers.
- Provide wheel stops at the edges of excavations, pits, spoil heaps, etc in order to prevent site dumpers falling when tipping. The blocks provided need to be positioned a sufficient distance away from any unsupported edges and slopes to prevent the weight of the vehicle causing collapse.
- Provide purpose-built platforms for regularly transported items—eg large drums.
- Implement safe systems of work at all times, and monitor their effectiveness.
- Do not operate the site dumper's controls unless seated on the driving seat.
- Do not carry passengers unless purpose-built seats are provided.

- Manoeuvre carefully on sloping ground.
- Drive at appropriate speeds for site conditions.
- Load on flat ground with brakes applied.
- Get off the dumper when it is being loaded.
- Ensure loads are distributed evenly and do not let them obscure your vision.
- Securely fix loads which may cause danger if they move.
- Stop the vehicle, take it out of gear and apply the handbrake before tipping loads.
- Do not drive around with the skip in the vertical discharge position.
- Use the appropriate towing pins (not bent pieces of reinforcement bar).
- Do not leave the engine running when you leave the vehicle.
- Be aware of the differences in performance of site dumpers when loaded and unloaded, particularly speed, braking and stability on slopes.
- Be aware of the different handling and braking characteristics of the vehicle in wet or icy conditions.
- Do not alter tyre pressures outside the manufacturer's specifications.
- When using a starting handle ensure:
    - Neutral gear is selected, the handbrake is firmly applied and the area is clear of obstructions.
    - The starting-handle is the correct type and in good condition with a handle grip that rotates freely.
    - Your thumb is kept on top of the grip of the handle to prevent injury in case of kickback.

Lift Trucks and Telescopic Handlers

Material handling vehicles are at risk of overturning when:

- Overloaded;
- Working on sloping, uneven or unstable ground;
- Driving with raised loads; and
- Driving at excessive speed around corners.

Telehandler visibility to the rear may present a significant hazard. This may be remedied by fitting additional visibility aids. Similarly, when in operation with the boom raised and other configurations, there may be a significant 'blind spot' to the front right-hand side of the vehicle. Both of these hazards should be identified within a risk assessment and suitable control measures should be put in place.

These types of vehicle normally require prepared, flat, graded surfaces to operate safely. Even rough-terrain lift trucks have strict operational limits that need to be observed. Contractors should limit the use of these machines to competent drivers in safe environments.

Excavators

Excavators are involved in many accidents. They commonly occur when excavators slew around, reverse and move around site. To prevent such accidents:

- Excavators should be equipped with adequate visibility aids to ensure drivers can see areas where people may be at risk from the operation of the machine;
- People should be kept away from the areas of excavator operation by the provision of suitable barriers;
- A signaller should be provided and in a safe position to direct the excavator's operation and any pedestrian movements; and
- A clearance of over 0.5 metres needs to be maintained between any part of the machine, particularly the ballast weight, and the nearest obstruction.

Accidents commonly occur during reversing and digging operations. If pedestrians are liable to approach temporary work areas, bunting or fencing or other appropriate means need to be used to create and maintain a pedestrian exclusion area. Plan work to include the appropriate use of competent signallers to control third-party risks and to help the driver to accurately position the machine. At sites where space is limited—eg the loading of muck-away vehicles near the public motorway, sufficient room and appropriate traffic management systems should be provided to allow excavators to operate safely.

To prevent excavators overturning on sloping ground, create level work areas and carefully control the swing of the bucket downhill. All earth-moving vehicles should be parked with their buckets, blades, etc lowered to the ground.

Tipper Lorries and Lorry Loaders

Rear-tipping lorries can overturn during tipping operations. On unmade or uneven ground, tipper-trucks of Stability Category A or equivalent should be used. To prevent overturning:

- Always tip on firm, level ground;
- Never tip on a slope;
- Never tip during high winds;
- Ensure the load is evenly distributed in the body of the truck;
- For articulated vehicles, ensure that the tractor is in line with the trailer body;
- Ensure a competent signaller is on hand to supervise tipping operations;
- Tip the load gradually so that it is discharged in a controlled manner; and
- Watch out for loads sticking, which could cause instability during tipping.

Visibility from the driving position during reversing operations can be improved by fitting visibility aids such as convex mirrors and CCTV. Warning devices—eg alarms and lights, should operate when lorries and lorry loaders are reversing.

During maintenance operations under tipper-lorry bodies or cabs, proprietary props designed to withstand the lowering forces should be used to secure them in the raised position and prevent their collapse.

Lorry loaders should be operated on firm, level ground with their stabilisers fully extended and the parking brake applied when loading and unloading.

Delivery Lorries and Goods Vehicles

A large proportion of accidents that occur on construction sites involve the delivery of plant and material to the site. Statistics show that the most common causes of accidents involving goods vehicles are:

- Being struck by a moving vehicle;
- Falls from vehicles while getting in and out of the truck or during loading/unloading operations; and
- Materials falling from vehicles during the unloading process, due to load movement during transit to site.

To control the risks caused by these hazards, the following steps should be taken:

- The site should be designed and laid out, so far as is reasonably practicable, to ensure that people and vehicles cannot come into contact with each other through physical segregation. Physical segregation involves using barriers to keep pedestrians away from manoeuvring vehicles;
- Adequate means of access and egress to the vehicle should be provided. This is not only important for the driver getting in and out of the cab, but also to anyone accessing the vehicle bed to load/unload goods;
- Refuse to accept uneven loads or loads that have moved significantly: competent logistics operators will only send appropriately strapped loads.

Managing Construction Transport

This section examines different duty holders' roles in managing construction vehicle safety using the framework of the Construction (Design and Management) Regulations 2007 (CDM).

The earlier in the life of a project that health and safety issues are considered, the greater the potential for accident prevention. Successful health and safety management details the principal requirements for effective health and safety management that include setting policy, organising staff, planning and setting standards, measuring performance and learning from experience. Key elements of successful health and safety management include:

- Senior management's commitment;
- Clear objectives;
- Competent and trained personnel;
- Effective work planning, including risk assessment;
- Positive implementation in the workplace; and
- Checking and reviewing performance.

Clients

Clients need to ensure that those they appoint are competent to manage transport-related risks. Clients should consider, in particular, candidates':

- Previous experience and understanding of logistics, such as booking time slots for deliveries and off-site waiting areas where appropriate, and past performance in this area;
- Health and safety management systems; and
- Systems for assessing the competence of their appointees.

CDM requires the client to provide relevant health and safety information with the pre-construction information. When the project is notifiable, the client should provide the CDM coordinator with this information. Transport-related information could include:

- The extent of site occupation by those not involved in construction work;
- Anticipated vehicle and pedestrian traffic movements, including deliveries;
- Speed, height, width and parking restrictions;
- Requirements for safe public and emergency vehicle access;

- Exclusion zones, routes, crossings, traffic calming measures and designated car parks;
- Restrictions on working times or temporary diversions during peak traffic hours;
- Location of gas and electricity services, adjacent railways, etc; and
- Hazardous ground features—eg contaminated landfill areas, burial grounds, underground streams, surface watercourses, etc.

Designers

Designers need to examine, assess and reduce the risks associated with their designs. Considering the following measures at the design stage can assist with safe site vehicle operations:

- Allowing space around structures and site boundaries for safe traffic movement;
- Designing one-way systems and drive-through areas to reduce the need for reversing;
- Removing hazardous gradients and embankments;
- Specifying suitable profiles, surfaces and traffic management for site roads, and the early installation of permanent roads with safe site access to and from the public motorway;
- Considering how site traffic routes can avoid hazards such as overhead electricity lines, railway lines, etc, and how routes need to change as work progresses on-site;
- Indicating the maximum loading limits of floors used by vehicles, particularly during construction, demolition and refurbishment;
- Relocating or protecting vulnerable services such as gas pipes and electricity cables; and
- Passing on information about any features of the design presenting significant transport risks to other project team members as necessary, including significant risks during future construction work or maintenance.

Designers' responsibilities extend beyond the construction phase of the project. They also need to consider health and safety aspects for the users of the workplace in accordance with the Workplace (Health, Safety and Welfare) Regulations 1992 (1993 in Northern Ireland).

CDM Coordinators

CDM coordinators should ensure project designs take account of the issues facing clients and designers above, and that there is pre-construction information on specific transport risks. Pre-construction information may also include things such as:

- The need for crash decks for works over railways;
- Phasing works to minimise risk to the public; and
- Local or statutory authority restrictions—eg in relation to access on and off the public motorway.

Principal Contractors

Principal contractors should ensure the safe management of pedestrian and vehicle movements on-site. Key tasks for principal contractors include:

- Provide relevant information from the construction phase plan to contractors to allow them to adequately plan their work and identify safe systems of work and prepare method statements;
- Planning, managing and monitoring transport activities including establishing site rules and giving reasonable directions to contractors;
- Implementing systems of work which ensure that pedestrians and vehicles are kept as far apart as possible;
- Ensuring subcontractors make adequate provision for the selection and supervision of drivers and general vehicle safety;
- Making specific reference to vehicle safety in the construction phase plan, including traffic and pedestrian routes, vehicle access and site rules;
- Setting standards for driver competence, vehicle safety and maintenance, and maintaining a site register of authorised drivers;
- Ensuring coordination and cooperation between contractors;
- Coordinating the views of safety representatives and workers;
- Ensuring all workers receive site induction training covering safe traffic routes and site rules for operating vehicles;
- Establishing safety monitoring procedures for the use of vehicles on-site—eg checking vehicle maintenance, key custody and permit-to-work systems, drivers' work practices, and the use of high-visibility clothing; and
- Reviewing the health and safety performance of everyone on-site.

Compliance with site rules needs to be monitored and necessary action taken when they are breached. Appropriate disciplinary action may be necessary against contractors and individuals who ignore them.

Contractors

Contractors should assess and minimise the transport risks associated with their work, institute safe systems of work, follow the site rules as well as the guidance applicable to them above in the principal contractor section.

To prevent death and injury ensure that you have:

- A safe workplace;
- Safe vehicles; and
- Safe driving and work practices.