

SAFE TRANSPORT AT WASTE AND RECYCLING SITES

This guidance has been developed by the Waste Industry Health and Safety (WISH) Forum to help control safety and health risks in the waste management industry associated with traffic management at waste and recycling sites.. The Health and Safety Executive (HSE) was consulted in the production of this publication. It endorses the sensible, proportionate, reasonable and balanced advice to owners on managing the risk from this guidance during the waste-related activities as set out in the guidance.

This guidance is about preventing transport-related accidents to people who work at or visit a range of waste management and recycling facilities where there is a potential to come into close proximity with moving vehicles. It is targeted at employers, managers and supervisors of a range of waste and recycling facilities such as landfill sites, recycling plants, waste transfer stations and waste treatment facilities. It provides advice on how to assess the main hazards associated with transport-related activities and practical examples of how to eliminate or reduce risk of serious injury or ill health. In particular, this guidance will help you plan and organise your site and concentrates on promoting:

- Site safety
- Pedestrian safety for workers and visitors
- Vehicle safety



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1. Introduction

This guidance applies to most types of fixed and temporary waste management facilities, such as landfill sites, recycling plants, waste transfer stations and waste treatment facilities. It can be used as a source of advice regarding transport risks and solutions at other types of undertaking (eg civic amenity sites). However, the special considerations to be applied to this type of site are largely outside the direct scope of this guidance.

This guidance is aimed at waste management and recycling facility managers, their supervisory staff and safety professionals in waste management companies. It can also be used as the basis for training operatives and the development or improvement of workplace transport systems. It aims to help eliminate or reduce the risk of injury that may arise from transport-related activities. In particular, those accidents to pedestrians who operate in close proximity to moving vehicles.

The overall number of transport-related incidents in the waste and recycling sector is comparatively small (about 4% of all reported accidents). However, the consequences are often serious and they are the most common causes of fatalities in the industry.

This guidance does not aim to be comprehensive but it does contain information and examples that will help you comply with the law and may help you in considering what you should to do.

2. Organisation and planning

2.1. Organising for traffic safety

The Workplace (Health, Safety and Welfare) Regulations require that every workplace is organised in such a way that pedestrians and vehicles can circulate safely. Operators of waste handling facilities should use the guidance to these regulations in conjunction with the information available in HSE's guidance *Workplace transport safety*.

2.2. Risk Assessment and traffic management plans

Traffic-related issues should be risk assessed for their potential risk and to ensure adequate systems, physical controls and procedures to control the risk are in place. The output of this risk assessment should be a formal traffic management plan. The depth into which such traffic management plans go should be proportionate to the complexity and size of site.

The traffic risk assessment should cover the following:

- Identify the hazards
- Decide who might be harmed and how
- Evaluate the risks and decide on precautions
- Record your findings and implement them
- Review your assessment and update as necessary

The key areas to areas to consider are:

- Pre-site entry issues
- Safe site
- Pedestrian safety for all workers and visitors
- Safe vehicles

Suitable control measures should include:

- Physical measures, such as road design and provision of signs, markings and barriers
- Procedures, such as a formal traffic management plan
- Training and induction - a robust traffic plan will be of no use unless all operatives, and others on site, are aware of it and those responsible for managing traffic are competent to do so

Traffic risk assessments should also consider other relevant legal standards, such as the Provision and Use of Work Equipment Regulations for the operation and maintenance of mobile plant.

For further information on risk assessment, visit www.hse.gov.uk/risk/index.htm. There is a list of other helpful workplace transport-related guidance at www.hse.gov.uk/workplacetransport/index.htm.

2.3. Pre-contract Issues for on-site contracted work

Selecting competent contractor companies to operate on your site is important. Before contracts are agreed, you should ensure that they are suitably resourced in terms of plant and personnel and they have the right level of technical and safety competence. See HSE publication '*Using contractors: A brief guide*' for more information about managing contractors safely.

On award of the contract, site rules should be provided to contractors in advance so that any company providing personnel or services can make their staff aware of site procedures and rules. You should ensure that contractors' employees have received and understand the site rules before starting.

Directions to the site should also be provided to minimise risks to drivers who may not know its precise location. Directions and maps should be clear and unambiguous to ensure drivers understand them.

2.4. Pre-site entry issues

A series of controls to ensure good traffic management should be in place before any customers, contractors or other vehicle users arrive at a site.

All contractors should be subject to an appropriate induction before they start work. This will include checks that they are all aware of any traffic issues and the risk control methods to be used.

The first point of contact on arrival at site should be made clear in the prior information you provide to visitors or contractors. Drivers should also be made aware of:

- Where to park
- Where to go to report in
- The member of staff to report to

2.5. Customer vehicles

The design and condition of customer vehicles is a valid safety concern for some site operators. There is more information on this for landfill sites in Appendix 1.

Safety specifications for contracted or leased vehicles, plant and personnel should be stipulated and formally agreed. These include requirements to fit safety devices such as reversing cameras, auto-sheeters and other safety-related provisions, as required.

2.6. Visiting drivers and other site users: Regular site users

Site operators should ensure adequate communication with site users and regular visitors before they start work on site, including the delivery and off-take of wastes and waste products:

- Provide site rules (including traffic) to customers in advance for issue to their drivers should not be wholly relied on, as site rules and other documents may not get passed to all drivers
- Site operators should ensure adequate site induction procedures are in place for regular customer drivers
- Establish clear feedback systems with regular customers on issues such as drivers breaching traffic rules
- Directions to site, maps, can be sent to regular customers and may be useful with new drivers

2.7. Visiting drivers and other site users: Irregular visitors and site users

Pre-site entry planning for irregular or unexpected site users and visitors is more difficult. So, the principles as above should also apply to other visitors, such as school groups or customers auditing sites. These visitors may be at higher risk due their relative lack of site-related experience and risk assessments for this type of visitor should reflect this.

Wherever possible, it is recommended that clear directions are provided on where to park, where to report to and any other relevant information on other site hazards is provided before people arrive on site. You should also include general issues in the site induction, such as use of appropriate PPE and clothing. There is more information on the use of PPE below.

Inevitably, new drivers and non-routine customers (such as hire companies delivering equipment) will arrive at sites. In these cases pre-planning is limited, but all of them should receive an adequate site induction that covers traffic management issues and site rules.

3. Site safety

3.1 Signage

Place signs at the site entrance to indicate key site rules. Additional signs may be required throughout operational areas. Where possible, use pictograms and avoid confusing forests of signs. Signs should:

- Be clear
- Be maintained
- Conform to recognised standards such as road traffic signs (use road type signs wherever possible to avoid confusion) and the Health and Safety (Safety Signs and Signals) Regulations
- Indicate: speed limits, directions and routes, PPE, one-way systems, overtaking prohibitions, traffic priorities, traffic and pedestrian crossings, areas pedestrians are banned from and zones where reversing cannot be eliminated and additional precautions need to be taken

3.2 Entering onto the site: Reception and site entrance areas

Issues relating to entry (and exit) from the public highway should be assessed. Visiting vehicles crossing lanes of traffic or making sharp turns should be avoided, especially when entry is from a road with fast-moving traffic. Reasonably practicable examples of how to overcome such problems include the installation of dedicated slip roads from the highway and for drivers re-joining the public road and stipulating that exit should be 'left turn only' to prevent vehicles crossing opposing traffic lanes.

Segregation of lorries, plant and light vehicles should occur as soon as reasonably practicable. Where possible, heavy and light traffic should use separate vehicle routes and dedicated parking areas.

Pedestrian routes from visitor car parking to the reception/offices should be clear and obvious to visitors. Their design and layout should separate pedestrians from vehicle movements and avoid the need for crossing vehicle routes wherever possible. See paragraph 37 for more information on pedestrian crossings.

Effective control measures should be provided at points where drivers may need to queue. This could involve the use of vehicle holding points, traffic lights or other clear signage to ensure that entry is prohibited until it can be achieved safely.

Additionally, when on hold, drivers should be instructed to remain in their vehicles to ensure they do not stray into vehicle routes.

3.3 Driver checks and induction

The system adopted for the admission of waste vehicles to your site should confirm that drivers have:

- Received appropriate induction information and training
- Been made aware of emergency procedures
- Been made aware of your enforcement procedures for non-compliance with site rules

3.4 Multiple sites and common site rules

Many larger companies have common booklets containing site rules that apply to all sites in their ownership. Such booklets are useful in ensuring good consistent standards are in place across all sites. However, individual sites should still ensure that common site rules booklets have been adapted to account for site-specific circumstances.

3.5 Communication

It is common practice to use two-way 'fixed-band' radios for contact between parties. Their use is recommended rather than CB radios, as there is better signal control and quality. Sites should stipulate who should have access to radios and training will be required in their use.

Communications between drivers and pedestrians using two-way radios and/or hand signals should be clear and unambiguous.

See Appendix 2 for further information on examples of standard signs and hand signals.

3.6 Pedestrian segregation within the site

All vehicles (including mobile plant) and pedestrians should be segregated from each other, so far as is reasonably practicable.

- Provide separate routes or pavements for pedestrians wherever possible. Where defined pedestrian routes are not available (eg landfill sites), specific controls should be implemented to assure the safety of pedestrians
- Provide physical barriers to segregate pedestrians and vehicles. If pedestrians and vehicles share the same route, it should be wide enough to allow vehicles to pass pedestrians safely. Suitable warning signs should be displayed
- Provide barriers at buildings' pedestrian exits to prevent pedestrians walking unexpectedly onto roads
- Provide suitable road crossing points for pedestrians. These should have good visibility on either side for both pedestrians and drivers, and can be marked with conventional black and white stripes. Avoid locating them on blind corners
- Consider providing adequate lighting (particularly at times of bad weather and in winter months), vehicle speed retarders and maintenance of any high visibility paintwork
- Where there are high volumes of pedestrian traffic, consider installing subways, bridges and traffic lights, or a combination of these
- Ensure pedestrians are a safe distance from, and excluded from, areas where vehicle loading/unloading, tipping, sheeting and reversing take place

3.7 Site layout

A well-designed site not only improves safety, but contributes to ease of use and productivity.

Produce a traffic management plan, which shows the routes to be followed – a map in addition to a written explanation is appropriate. This should be reviewed (along with the transport risk assessment), periodically at intervals to be determined by site management, to take account of any changes in work activities, traffic type, traffic volume and circulation.

Monitoring, maintenance and enforcement regimes should be in place to ensure that the hardware and systems you originally provided still do their job, and are used as intended.

3.8 Weighbridges

The location of the weighbridge should be such that access is as simple and straightforward as possible. On entering the site, signage should clearly indicate where the weighbridge is, and provide instructions on what a visiting driver should do.

Weighbridge and reception area design should eliminate or minimise the driver's time out of the cab. Where possible, a driver should talk to the weighbridge staff and exchange documentation without leaving the cab.

Safe access and egress should be provided if drivers are required to leave their vehicle cabs and enter the weighbridge building.

If the driver leaves the cab, the vehicle should not be kept running and the ignition keys removed.

Suitable barriers, or equally effective means, should be provided to prevent other traffic encroaching over any pedestrian route between lorry and weighbridge door/window. Traffic should be controlled at this point to ensure correct queuing.

Systems should be in place to restrict vehicle access to the weighbridge when maintenance and repair work is being undertaken.

3.9 Roads: All sites

Design and construction should include the following factors:

- Roadways should be constructed to an appropriate standard and width and this should reflect the type of traffic that will use the road and anticipated adverse weather conditions
- Ensure the marking of routes is clear and unambiguous. To prevent confusion, all signs and markings should be to highway standard
- Use one-way systems wherever possible
- Routes should segregate heavy and light vehicles, and working plant
- Avoid sharp bends
- Avoid blind corners. Where these are unavoidable, provide mirrors to improve vision or consider traffic control, eg traffic lights
- Ensure good visibility for drivers along the road line

3.10 Roads: Landfill sites

In addition to the above, there are other considerations specific to landfill sites:

- Road edge limits may need to be defined clearly, eg in open areas, by use of clearly visible (eg fluorescent) markers, cones, bunting etc
- Use of bunded/barriered areas where there are open edges/faces/ditches/steep inclines etc
- Sites should use edge protection bunds or barriers, where appropriate, such as on the edge of steep inclines, drops and bends on downhill sections. For design requirements and specifications refer to *Health and Safety at Quarries. Quarries Regulations 1999. Approved Code of Practice*⁷ which states that they should be 1.5 m high or the radius of the largest vehicle wheel/tyre, whichever is the greater
- Avoid excessive inclines. They can affect vehicle braking performance, particularly in poor weather conditions. You should aim for haul road gradients of no more than 1:10
- Only use construction materials appropriate for roads
- Ensure adequate compaction and drainage
- For exceptional circumstances, safe systems of work should be devised in advance (with appropriate advice and guidance from others if necessary) to ensure safe towing of vehicles requiring assistance. Further information on dealing with such incidents is available in Appendix 1
- Separate procedures should be developed for the retrieval of vehicles where the routine towing procedure cannot be followed (see Appendix 1 for further information)
- Regular maintenance is required to ensure that the surface used for vehicular access to the tipping face is level and adequately compacted. Tipping faces at landfill sites need to be well maintained as excessive gradients, potholes and other defects can affect vehicle stability

3.11 Reversing

Reversing is a high-risk activity. The site should be designed to eliminate or minimise the need to reverse wherever possible. Where reversing cannot be eliminated the following mitigation measures should be considered:

- Use designated reversing areas which are segregated from other work activity
- Remove all unnecessary vehicles, plant and pedestrians from the immediate vicinity
- Good all-round vision is essential. For plant operators 360o visibility can be achieved by the use of appropriately fitted mirrors and, more commonly, a combination of mirrors and closed circuit TV cameras (CCTV). Mirrors and CCTV cameras should be inspected regularly (at least daily) to ensure they are properly maintained and remain in good working order

- Audible warnings should be used in combination with mirrors and CCTV cameras. However, care should be exercised in their use and they should not be relied upon in isolation. Reversing alarms may be a useful additional safeguard when risks cannot be adequately controlled by segregating pedestrians from vehicle movements or by eliminating unnecessary reversing, but they may not be heard by everyone. On a busy, noisy site, they can become part of the background noise or cause confusion if too many vehicles are reversing

The environmental impact of the noise and site operating times may have to be considered to reflect planning restrictions. Alternatives to the standard 'bleepers', such as 'warbling' or 'white noise' reversing alarms, may be used.

3.12 Use of reversing assistants and banksmen (signallers)

Guiding vehicles with a reversing assistant or banksman (signaller) is a high-risk activity and this option should only be used when it is not possible to implement other reasonably practicable measures such as improved site layout. These are two distinct roles with different responsibilities and training requirements.

A reversing assistant is defined as a trained employee who plays an active part in reversing manoeuvres by giving prearranged hand signals to drivers. Their role is to stop collisions by preventing the vehicle colliding with people and other road users. More information on the use of reversing assistants can be found in *Waste and recycling vehicles in street collection*.

Alternatively, a trained banksman (signaller) should be considered as they can be used both to keep the reversing area free from pedestrians and to guide drivers, particularly where lifting operations are also involved. More information on the use of a banksman (signaller) is available at www.hse.gov.uk/workplacetransport/information/reversing.htm.

Where a reversing assistant or banksman is deemed to be essential for the safe running of a site:

- They should be adequately trained
- They should wear appropriate, high visibility clothing
- They should be in the driver's sight at all times during vehicle movements
- They should be at a safe distance when vehicles are moving or tipping
- Signalling conventions or radio control procedures should be understood by drivers before vehicle movements under the controller's directions begin
- Drivers should be instructed that if, at any time, the reversing assistant or banksman (signaller) cannot be seen – they should stop!

3.13 Maintenance and repair activities

During plant shutdowns, it is essential that the same level of control, particularly in segregating work activities, be maintained. For relatively short shutdowns, normal operating procedures should be suspended to allow maintenance personnel and vehicles to access areas of the site they would not normally enter. It is important that there are appropriate risk assessments and method statements available to cover short and longer term shutdowns.

4. Worker instruction and training

4.1 Information, instruction and training

Workers must be given enough information and training to carry out their duties safely and effectively. It is important that those involved have received induction and training on safe systems of work. It is particularly important to consider the training needs and supervision of:

- New recruits and trainees
- Young people who are particularly vulnerable to accidents
- People changing jobs, or taking on new responsibilities
- Workers for whom English is not their first language

For all sites, traffic management is a highly significant issue and as such should be a routine feature of training, instruction and information systems, such as toolbox talks and staff briefings.

Initial training and induction of all site staff should include traffic management, pedestrian segregation and site rules. This training provision should include non-operational staff, such as weighbridge operators and reception staff.

Specialist training for staff specifically involved in traffic management may also be required, such as traffic controller or reversing assistant training. In this high-risk area, the competence of staff is vital. All training provision should be recorded and the records retained.

It is essential to assess the effectiveness of all training provided to ensure it is fit for purpose. Refresher training and induction to maintain safe working should be given for all staff to reflect changes in the traffic plan or where there is evidence of non-compliance. This may include re-induction or the use of toolbox talks on revisions to site rules and traffic management plans.

For additional advice, see HSE leaflet *Health and safety training: A brief guide*.

4.2 Exiting vehicle cabs

Jumping out of the cab can cause injuries such as twisted ankles and even broken ankles or legs. In addition, it could put the driver off-balance and place them in the path of other moving vehicles nearby.

Employers should ensure drivers and operators are trained and instructed to adopt the 'three points of contact' procedure, when exiting from vehicles, ie one hand and both feet or both hands and one foot should remain in contact with either the vehicle or ground. Any handholds and steps provided should be used to ensure that exiting the cab is done in a controlled manner.

Drivers and operators should wear footwear with good ankle support.

4.3 Sheeting and un-sheeting

Many workers have been seriously injured or killed falling off vehicles. No-one should work at a height where they are likely to fall a distance liable to cause personal injury. If working at height is required, a suitable safe system of work should be in place, including a safe means of access and egress, to all areas of the vehicle that require frequent access.

You can prevent falls from vehicles by the following a hierarchy of control measures:

- Leave the load un-sheeted (if road traffic and environmental law allows it)
- Automated sheeting systems (auto-sheeters): These systems can allow the driver to sheet the load from ground level and remove the need to access the vehicle at height. They protect workers both on site and out on collection, where other safety facilities may not be provided
- Sheeting platforms are a commonly used solution. These platforms should be fully enclosed by guardrails to reduce the risk of a worker falling between the platform and the side of the vehicle or stepping off the end of the platform
- Gantries and harness systems: If the worker needs to leave the platform to carry out further tasks associated with sheeting, overhead gantries and harness systems should be used. These do not prevent a fall from occurring, but should reduce the risk of serious injury from the effects of a fall. If harnesses and lanyards are to be used, drivers must be trained in pre-use checks and how to use the personal protective equipment (PPE)

Sheeting and un-sheeting should only take place in a designated area that ensures segregation from other site activity. Further information is available at www.hse.gov.uk/workplacetransport/information/sheeting.htm.

4.4 Hand picking ('totting')

Totting refers to the manual 'hand' sorting or removal of materials direct from stockpiles of waste or recyclates. Typically, this takes place out of doors with vehicle assistance (eg use of mechanical shovels or other plant).

Further detailed information on 'totting' is available in *Hand sorting of recyclables ('totting') with vehicle assistance*. This specific WISH guidance aims to help eliminate or reduce the risk of injury or ill health that may arise from totting activities. In particular, it will help prevent accidents to pedestrians who have to operate close to moving vehicles.

4.5 Working inside buildings: Pedestrian and vehicle segregation

All buildings can be categorised as high-risk areas with the potential for vehicle to vehicle or vehicle to pedestrian collisions. Robust systems that control vehicle entry, manoeuvring and exit are required to prevent such incidents. Operators should consider the following reasonably practicable options:

- Provide separate doorways for pedestrians and vehicles to ensure segregation
- Site barriers or bollards sited near entrances to allow pedestrians to assess vehicles' movements before walking into or out of the building and to deter pedestrians from walking directly into vehicle movement areas
- Ensure audible warnings are used. All vehicles should sound their horn and slow down when entering and leaving buildings. To ensure that such a warning is always given, systems such as 'alarm strips' can be installed to activate a bell when approaching vehicles drive over them
- Design in traffic light entry systems controlled by the indoor plant driver or traffic controller which have been used by some sites to good effect. Traffic controllers in these areas are at significant risk and procedures should be designed so that they can work from a place of safety, eg within personnel protected zones protected by impact-resistant bollards
- Not to allow pedestrians entry during plant movement unless there are safe systems that ensure segregation from the work activity in place
- Put safe systems in place to ensure pedestrian and vehicle segregation during short and long-term shutdowns for maintenance and repair activities

There is additional guidance in the Workplace (Health, Safety and Welfare) Regulations 1992, *Workplace transport safety* and *Hand sorting of recyclables (totting)* WISH guidance.

4.6 Operator protection

Rollover protection should be provided to protect the driver if there is mobile plant rollover. This protection may also be required for other vehicles used on site (eg dump trucks, tractors, four-by-fours etc). Retrofitting of rollover structures should be considered if it is consistent with vehicles' use.

Falling object protection (FOPs) for mobile plant should be consistent with the site-based risks, paying particular attention to loading/unloading activities.

Under no circumstances should anyone work or walk under un-propped vehicle parts or interfere with interlocks or safety equipment. Body props should be provided and used on tipper vehicles (see www.hse.gov.uk/workplacetransport/information/tipping.htm for more information), tailgates, trailer doors and any other raised part where risk of crushing is present. Stipulating the use of body and door props should be part of site rules and their use should be monitored and enforced.

4.7 PPE, respiratory protective equipment and its use

PPE is the least acceptable control measure and should be considered a last resort. However, at a waste management site high-visibility clothing is essential, as at all times it has a positive role to play in enhancing safety for site operatives, drivers and visitors. Wearing PPE to the designated standard should be strictly enforced.

Suitable PPE (and respiratory protective equipment (RPE) where stipulated) should be provided to protect against hazards as identified in your risk assessment.

All PPE (and RPE) should be suitable and appropriate for the work environment and associated risks. PPE and RPE should be maintained (including replaced or cleaned as appropriate) to ensure it remains in good order.

5. Vehicle safety (including mobile plant)

5.1 Selection and fitness for purpose

The correct safety specifications for vehicles and plant used on site is essential. Vehicle capabilities and site conditions have to be consistent with the tasks performed. A full risk assessment is required to ensure that the vehicle specification is appropriate and the work activity can be undertaken safely. The stability and ground clearance of vehicles should be adequate for site conditions and tasks. For more guidance on vehicle specification and safety on landfill sites, see Appendix 1.

5.2 Light vans

Smaller vehicles such as light vans and site vehicles (eg four-by-fours) are at a significantly greater risk of being struck or crushed by larger vehicles, especially on landfill sites. Site operators should consider carefully whether these types of vehicle should be allowed access to the site.

Where their use is allowed, careful consideration and management control is required to ensure they are properly segregated from other vehicle movements. These vehicles may also require modifications to ensure they are suitable for the terrain and meet the site's safety requirements, eg fitting of warning beacons, reversing alarms and suitable markings.

5.3 Parking trailers

On sites where vehicles with traditional braking systems are used, the vehicles should be monitored:

- They are parked in dedicated areas and not on haul roads etc
- Mechanical brakes are always be used whenever trailers are uncoupled from tractor units
- Runaways are prevented – drivers who are picking up a trailer unit should check that mechanical braking systems are engaged before docking

Further guidance is available on the HSE website on coupling and uncoupling (www.hse.gov.uk/workplacetransport/information/coupling.htm) and on ways to stop vehicles moving (www.hse.gov.uk/workplacetransport/vehicles/waystostop.htm).

5.4 In-cab air quality

RPE and/or in-cab filtration (HEPA) systems may be required for plant involved in some site activity, eg at composting facilities where there is a potential for exposure to bio-aerosols and on sites where high levels of dust may be generated.

5.5 Loading and unloading

Loading (see www.hse.gov.uk/workplacetransport/factsheets/loading.htm) and unloading are high-risk activities and invariably involve the driver leaving the cab.

Badly loaded or overloaded vehicles present obvious hazards, eg waste falling onto the public highway or tipping problems at a receiving site. Site operators should have procedures in place to ensure vehicles do not become overfilled and leave the site in such a condition.

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Where drivers may need to leave their cabs to perform essential tasks (such as opening container doors, operating discharge controls etc), adequate safeguards should be in place to protect them.

Measures may include:

- Adequate separation distance between the vehicle and other vehicles or plant in the area. The recommended industry standard is that no moving plant or vehicle should be within 5 m of any pedestrian
- Limits placed on the number of vehicles allowed into an area to preserve separation
- A requirement for any plant in the immediate vicinity to cease moving or operating when a vehicle is discharging
- Only the driver to be allowed out of any multi-person vehicle cab to perform essential duties
- Stipulating drivers remain as close to their vehicle as possible (even when performing duties)

Where drivers are not required to be part of the loading or unloading process, they should:

- Remain in the safety of their cab at all times, except where loads are moved over the cab (sometimes FOPs and cab protection can be insufficient when unloading heavy items, or when using grabs/buckets in close proximity to the cab), OR
- Leave their cab and go to a safe area (eg a driver rest room), via a safe pedestrian route

'Jogging' of vehicles to free blocked material (shunting, or driving the vehicle and braking hard) in an attempt to shock or jog the load free to remove blocked material from containers is a high-risk activity and should be actively discouraged. Jogging is not safe and should be eliminated (many operators prohibit this activity) as it affects vehicle stability and can lead to bogging down and a stuck vehicle. It is preferable to dig out loads that are jammed than try to release them by jogging:

- Jogging can cause uncontrolled release of the load
- Repeated jogging places undue wear on the hydraulic cylinders, load hook and bale bar
- Repeated wear may result in the cylinder seals or shaft components failing

5.6 Skip unloading

Skip unloading presents its own hazards and requires a robust level of control:

- Work on stable ground – avoid sloping, uneven or soft ground
- To avoid runaways, apply the handbrake and use chocks on slopes where necessary (it is better to select vehicles with four wheel braking, or fitted with rear stabiliser pads, where slopes are anticipated) – see www.hse.gov.uk/waste/skiploaders.htm

- Use stabilisers to keep braked rear wheels on the ground when on slopes
- Avoid trapping between the skip and vehicles/walls and keep a clear space all around the vehicle

5.7 Entry to the tipping area on landfill sites

Entry to the tipping zone should be controlled and risks from traffic and plant movements at, or adjacent to, the tipping face should be assessed and properly managed.

Marshalling may be necessary when multiple vehicles are present.

The decision to allow entry should lie with a single individual (a 'traffic controller') and should be controlled by a single person to avoid confusion. This may be a plant driver at a small tipping zone, or a separate dedicated individual at larger sites.

In situations where the role of traffic controller is separate from that of plant operator (that is outside of the protection of a plant cab), traffic controllers should:

- Be located in a safe area (eg an impact protected 'sentry box'). Their task is to control access to the tipping area, not to be on the tipping area
- Have sole and absolute control of vehicle movements
- Wear high visibility clothing

All drivers should be aware of and understand:

- The role of the traffic controller
- Their duty to obey instructions from the traffic controller
- What signals will be used and what these mean (see Appendix 2 for further information)

5.8 Hazards during tipping

Tipping methods need careful consideration to avoid accidents such as turn-over (see www.hse.gov.uk/workplacetransport/information/tipping.htm). Such incidents generally result from a combination of poor ground conditions and vehicle-related issues. A safe system of work should be adopted that includes ensuring safe distances are maintained between vehicles when tipping/discharging.

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The distances required will depend on the type of vehicle, but the following risks should be included in any assessment:

- Vehicle rollover
- Swinging container and vehicle doors
- Ejection of wastes
- Operation of door/container opening mechanisms
- The nature of the ground in the tipping area

It is recommended that a minimum distance is maintained between vehicles of 1.5 x the largest vehicles' maximum height (eg with body raised). Accordingly, on landfill sites, the following industry guidance on minimum distances is generally considered appropriate:

- 5 m between push-out vehicles (eg Refuse Collection Vehicles (RCVs) or vehicles without opening tail doors)
- 7 m between other, non-articulated vehicles

The use of articulated tippers on landfill sites is not recommended due to the increased risk of overturning presented by soft ground conditions and high winds. On those sites where they are allowed, their use should be subject to a specific risk assessment and the adoption of an appropriate safe system of work.

Overloaded or badly loaded vehicles may need special handling or have to be 'dug out' by plant rather than being allowed to tip. Site operators need to have appropriate procedures to cover this activity (for further information see Appendix 1).

To prevent vehicles falling rearwards, tipping should not be carried out at sharply graded tip faces. Where there are exposed edges, edge appropriate protection/bunds or barriers should be in place.

Site operators need to have safe methods in place for dealing with foreseeable problems, such as bridged loads. Drivers should not be allowed to devise their own methods.

Vehicles should not travel with vehicle bodies, hoppers, tailgates etc in an elevated position. They should be lowered as soon as practicably possible after the tipping action.

As part of their site induction, drivers should be instructed to abort tipping if problems occur and seek the advice of site staff.

5.9 Doors and tailgates etc

Loads can move or settle and 'pressurise' the door. Violent door release has caused amputations and other serious injuries. Damage to containers, trailers and other vehicle bodies with opening doors can result in doors being 'sprung'.

Door-locking mechanisms on containers should meet appropriate Container Handling Equipment Manufacturers Association (CHEM) (see <http://chem.uk.com/>) standards and should be selected to be appropriate for the task.

Use of ratchet and remote door opening devices can reduce the risks associated with sprung and/or pressurised doors. Safe systems of work to deal with sprung and pressurised doors need to be in place. Containers should be of good construction, free from patent defect and constructed to appropriate CHEM standards. Personnel should stand outside the arc of the door and away from the discharge path. Where this is not possible, the driver should use the door as a 'shield' to protect against falling waste. Once it is partially open, the driver should move outside the arc of the door.

The general integrity and condition of containers, their doors, hinges, opening mechanisms, lifting lugs and other points are safety critical issues. Drivers should visually inspect containers regularly and put a formal defect reporting system in place. Damaged containers should be stored in 'quarantine' areas to ensure they are not mistakenly used.

6. Monitoring and review

6.1 Management and supervision

Traffic management arrangements should form part of routine site inspections and any breaches of rules and systems should be targeted for remedial action.

Review of traffic management assessments (and associated transport management plan) should take place if any significant changes have been implemented or there is an accident or near miss history. Even if no significant changes have occurred, traffic risk assessments should be reviewed regularly (at intervals to be determined by site management).

The results of monitoring activities should be recorded and any required remedial actions carried out.

6.2 Maintenance, daily checks and defect reporting

All site plant should be maintained in accordance with manufacturers' recommendations. Daily and weekly vehicle and plant default checks should be carried out to ensure compliance with the Road Traffic Act (for road-going vehicles), other statutory requirements and the manufacturers' recommendations.

Former road-going (highway) vehicles that are used exclusively for site activity should still be maintained to road-going standards.

6.3 Enforcement of site rules and procedures

Traffic accidents are one of the most common causes of fatalities at work and site staff should be clear that it is their duty to ensure compliance with traffic management rules. There should be a clear management commitment to take responsibility for what takes place on their site. In addition, all operators should be made aware of their personal responsibilities and the consequences for breaches of site rules.

7. Worker consultation and engagement

Workers should be consulted and engaged regarding health and safety arrangements for the work they undertake as their support is essential. Safety representatives and workers can contribute positively in achieving the desired outcomes by:

- Identifying problems
- Indicating whether activities can be carried out safely
- Generating sound practical ideas and solutions

Further information on worker involvement is available at www.hse.gov.uk/involvement/.

8. Reporting and investigating accidents

There are requirements under the Reporting of Injuries and Dangerous Occurrences Regulations (RIDDOR) to report specific types of accidents/incidents to the relevant enforcing authority (usually HSE). Further information on the reporting of incidents at work can be found at www.hse.gov.uk/riddor/index.htm.

Because workplace transport accidents often have serious outcomes, it is recommended that all incidents, including non-reportable accidents, near-misses, or failures to adhere to site rules and procedures (whether an injury or incident occurred or not), should be reported to the site management for investigation. Investigations should aim to reveal the immediate and underlying causes; establish lessons to learn and ensure appropriate remedial action is taken.

9. National emergencies

On rare occasions, landfill sites are used for national emergencies, eg during foot and mouth disease outbreaks for disposal of animal carcasses. This may require a change to the normal site arrangements, eg specific tipping areas, running temporary haul roads and the inclusion of special conditions, such as additional vehicle sterilisation.

If such circumstances arise, a separate risk assessment will be required to ensure that all additional hazards and control measures have been addressed.

Further reading and information

HSE publications

Available from the HSE web site:

Workplace transport safety: An employers' guide HSG136

Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance L22

Using contractors: A brief guide Leaflet INDG368

Safety signs and signals. The Health and Safety (Safety Signs and Signals) Regulations 1996. Guidance on Regulations L64

Health and safety at quarries. Quarries Regulations 1999. Approved Code of Practice

Health and safety training: A brief guide Leaflet INDG345

Construction site transport safety: Safe use of compact dumpers Construction Information Sheet CIS52

Reporting accidents and incidents at work: A brief guide to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) Leaflet INDG453

Personal Protective Equipment at Work. Personal Protective Equipment at Work Regulations. Guidance on Regulations L25

Preventing slips and trips at work: A brief guide Leaflet INDG225

Reducing error and influencing behaviour HSG48

Workplace transport safety: A brief guide Leaflet INDG199

WISH guidance

Available from the WISH web site:

Managing health and safety in civic amenity sites WISH Waste 26

Waste and recycling vehicles in street collection WISH Waste 04

Hand sorting of recyclables ('totting') with vehicle assistance WISH Waste 18

Health and hazardous substances in waste and recycling WISH Waste 27

Health and safety training: Guidelines for the waste management and recycling sector WISH Waste 21

Other documents/guidance

Road Traffic Act 1991 (c.40) The Stationery Office 1991 ISBN 978 0 11551093

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The Waste Industry Safety and Health (WISH) Forum exists to communicate and consult with key stakeholders, including local and national government bodies, equipment manufacturers, trade associations, professional associations and trade unions. The aim of WISH is to identify, devise and promote activities that can improve industry health and safety performance.

Further information

This guidance is issued by the Waste Industry Health and Safety (WISH) Forum to help control safety and health risks. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance. Some parts of the guidance represent good practice and may go further than the minimum needed to comply with the law.

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Appendix 1 Towing and recovery of vehicles on landfill sites

Introduction

Over 46 million tonnes of waste goes to landfill each year. Most of the material is transported by road to sites in road-going goods vehicles. These range from rigid body 7.5 tonne vehicles to 44 tonne articulated vehicles. A relatively small volume of material is transported by container or by rough-terrain plant.

This appendix deals with specific towing or recovery procedures required for vehicles that have lost traction or get bogged down on landfill sites. However, important information is provided on plant and vehicle specification and ground condition as correct choices in these areas can significantly reduce the frequency of towing and/or recovery operations.

Bad weather (heavy rain or melting snow) is the most significant factor in causing adverse conditions, such as slippery and boggy ground.

Hazards

There is a long history of fatal accidents associated with plant and vehicles operating on landfill sites. The three main contributory factors are:

- Use of inappropriate plant and vehicles
- Unsuitability of ground conditions
- Towing and recovery operations defects

Vehicles or plant striking pedestrians or smaller vehicles (eg four-by-fours) is the common denominator in all serious accidents. So it is essential that transport management and pedestrian segregation issues are properly assessed and controlled.

Pushing a bogged down vehicle using mobile plant was traditionally a widespread practice and was seen as a quick and easy way of moving vehicles that had lost traction. This proved to be a particularly dangerous practice and fatal accidents did result. Plant operators were required to push their vehicle, either directly against the stuck vehicle, or into waste material used as a buffer at the rear of the vehicle. In these circumstances, a person standing in front of the vehicle can be crushed, as the plant operator is unable to see the front of the vehicle that is being pushed. Consequently, this practice is rarely or selectively used, and only under controlled conditions.

Plant and vehicles

Landfill sites have more in common with construction sites and quarries than they do with other waste sites. Roads on sites tend to be constructed in a way that is generally impractical or unachievable on some landfill sites, particularly in operational areas where 'live' tipping is taking place. As a result, this landfill-specific assessment is required to address the additional transport-related issues that arise.

Plant used on landfill sites should be selected based on its suitability for the terrain. Most problems at landfill sites generally arise when road-going vehicles drive on surfaces to which they are not suited, become bogged down and then need assistance to move off.

When plant and vehicles get bogged down, the most serious hazards arise when people leave the safety of the cab and enter an area where there are other plant and vehicle movements. Small vehicles or pedestrians in the vicinity of large plant may not be seen and collisions are foreseeable.

The 'manoeuvring area' (see Figure 1) is a particularly hazardous area for pedestrians. The only instance when drivers should be out of their cabs is when attaching towing equipment. All plant operations should cease when pedestrian activities, eg litter picking, are taking place.

On some landfills, despite all reasonable efforts to reduce the frequency, towing can tend to become a 'routine' activity, particularly for some vehicle types. The use of vehicles, such as single drive axle and walking floor lorries on the tipping face, should be discouraged/restricted where possible.

It must be emphasised that towing bogged down vehicles should not be regarded as a routine activity, and should be an exception rather than the rule. However, in certain conditions, eg during bad weather, it can become, by necessity, a more frequent occurrence. Even so, every effort should be made to reduce the frequency by ensuring that haul roads and access to the tipping area are fit for purpose and that the vehicles operating on site are suited to the working environment.

Vehicle specifications

Close cooperation and communication between site operators and customers on vehicle specification can reduce the risks associated with operating on a landfill site.

Waste companies who operate landfill sites should be aware of vehicle specifications best suited to landfill sites and should procure their vehicle fleet accordingly. Dedicated vehicles are able to tolerate poor surface conditions that less suitable vehicles cannot. These vehicles also include design elements to minimise damage from materials that get tangled in the vehicle's components.

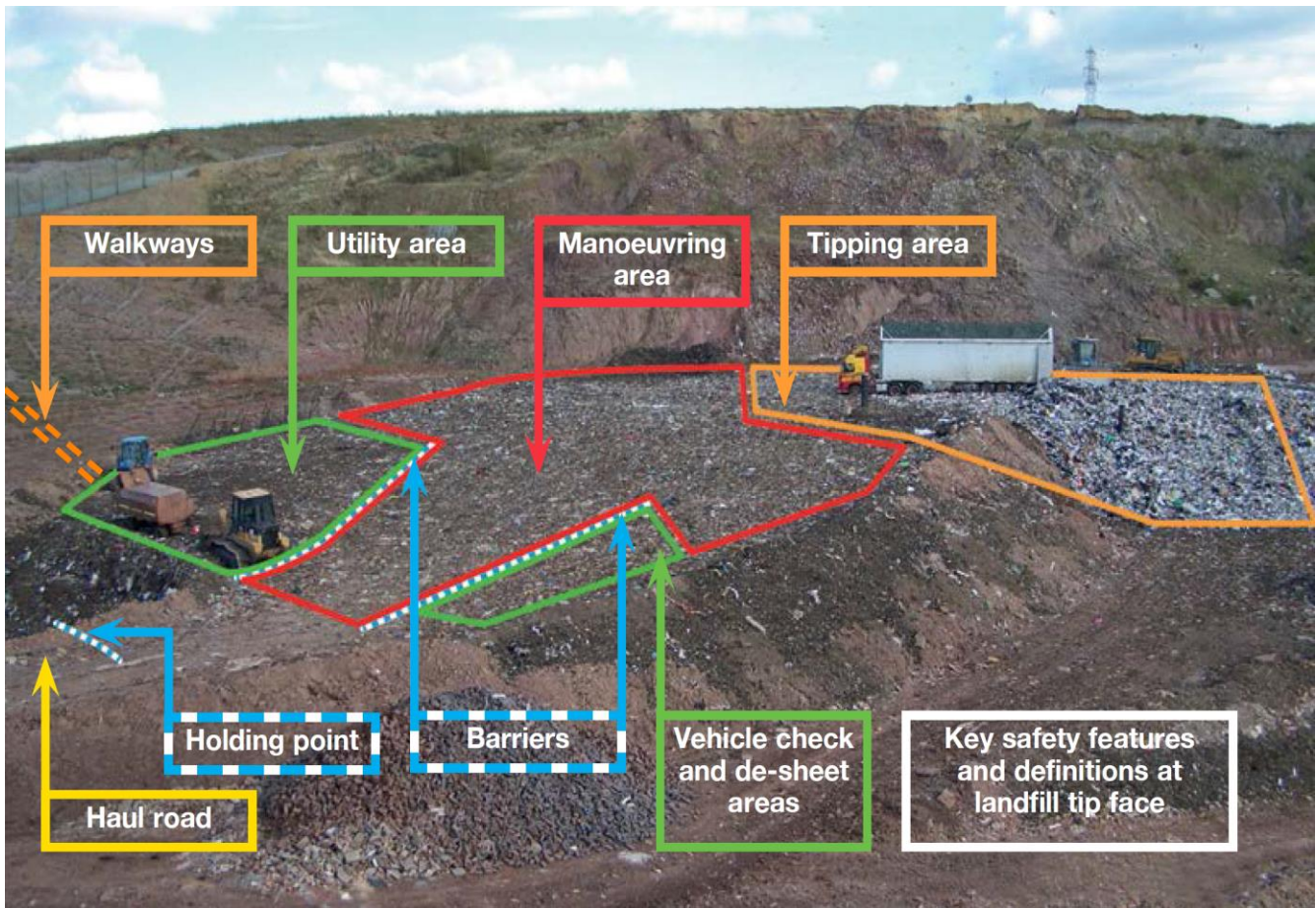
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Most towing incidents occur on areas of tipped waste rather than on the haul roads. A number of issues, such as the weather, driver competency (training and experience), suitability of the vehicle and the surface composition are common factors that can all contribute to the likelihood of vehicles getting bogged down.

Vehicle design is one significant factor that can affect the safety of tipping operations. In general, the industry recommended configuration for bulk haulage vehicles discharging on landfill sites is:

- Twin-drive axle
- Hydraulic ejector blade
- Construction to an 'off-road' specification that provides additional protection for vulnerable features under the vehicle, such as fuel tanks, air lines and brake pipes

Figure 1 A typical organised active tipping area



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Definitions to accompany the above graphic

Tipping area/face – active area of landfill where waste is discharged from vehicles

Check and de-sheeting area – defined safe area for vehicle checks, preparation before leaving site and for the un-sheeting of vehicles/containers

Manoeuvring area – area adjacent to tipping area where vehicles manoeuvre in preparation to discharge

Utility area – eg refuelling area, four-by-four parking, maintenance, etc

Haul road – main site road

Walkways – defined pedestrian routes

Holding point – vehicles held ready for access to manoeuvring area

Barriers – used to mark boundaries

Walking floor vehicles are more prone to bogging down due to the action of the walking floor. Ultimately, site operators should exercise their discretion and refuse access to vehicle types not suitable for the prevailing site conditions.

Some makes of RCVs may not be suitable for operating on landfill sites. RCVs with twin-drive axles tend to have adequate traction; however, low-riding vehicles (unless they are fitted with height adjustable running gear), are prone to becoming stuck as traction is lost as the vehicle chassis/body is grounded. Again, those responsible for procurement of vehicles for use on landfill sites should consider this issue.

Where reasonably practicable, the use of hard-standings should be considered. On some sites, hard-standings are used and the cost of this provision factored into contract negotiations. It is possible that the cost of installing hardstanding areas could be offset against increased turnaround times and reduced damage to RCVs and other vehicles. However, on some sites Environment Agency (or other environmental regulator such as SEPA) permitting conditions may be a limiting factor in their use.

Poor ground conditions and high winds can make tipping lorries unstable. If this type of vehicle is permitted on site, the site operator must assess the risks and implement control measures as appropriate.

Any serious vehicle defects that could potentially affect operation and use should be brought to the attention of the driver and their employer.

The use of flashing beacons and/or headlights should be considered as means of highlighting the presence of vehicles and plant. The use of flashing indicators in hazard mode is not recommended as these should be used only as part of the signal for towing or emergencies (see Appendix 2).

Ground conditions

Roads should be constructed to an appropriate standard and maintained to a good standard. Temporary haul roads and the landfill tipping areas, in particular, can be problematic and can result in lorries being towed on and off the tipping area and/or the immediate access road.

There are different types of ground cover material that can reduce the incidence of vehicles slipping and becoming bogged down. Selected waste material, typically 'frag' (fragmented vehicle components, eg shredded foam and rubber) that cannot be recycled is used.

The 'manoeuvring area' and 'tipping area' (see Figure 1) of the active cell are where most vehicles are likely to be bogged down. These are the areas where most benefit can be obtained by using materials that provide the greatest traction and surface stability. An adequate stock of suitable materials should be available on site to enable a quick response to unforeseen problems.

Contingency measures, to include the use of alternative areas to tip, should be available if difficult circumstances, such as very poor weather, arise.

Towing and recovery

These are high-risk activities and should only be carried out by specially trained operators. Recovery requires a higher level of competence due to the variability and complexity of the tasks. A clear distinction should be drawn between the towing and recovery of vehicles: recovery takes place only after the towing effort has failed or it is considered unsafe or impractical to do so.

Most towing and recovery activity takes place at the active landfill area (cell). However, as already stated, it is possible that towing or recovery will be required anywhere on site, eg on haul roads; if so, the same basic methodology will apply to these situations. A written safe system of work should be in place for towing and recovery procedures. This should be properly communicated to site staff and visiting drivers.

Equipment used for towing and recovery

Plant and equipment used for towing and recovery of bogged down vehicles tends to have been manufactured for that specific purpose. As a result, extremely powerful machines are used and they may not be compatible with the construction of bogged down vehicles manufactured to a less robust standard. Consequently, care should be taken to ensure that undue forces, in excess of design limits, are not imposed on the towing equipment and vehicle attachments.

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During the operation, cables, wire ropes and chains can break causing whiplash or recoil incidents which could kill or seriously injure people. Large forces can build up that exceed the capability of the steel chain/rope/wire and/or the vehicle connection. The use of kinetic stops is a recommended safety mechanism and their use should be carefully considered and the correct specification used, ie they must be correctly rated with weakened links installed that fail to safety before excessive loading.

Towing points and associated attachments, eg towing pins, must be of suitable construction and fit for purpose.

Towing with casualty vehicle under power

Collisions between the towing plant and the casualty vehicle have occurred when the casualty vehicle is in gear and under power when being towed. In these circumstances, the decision on whether or not to have the vehicle under tow in drive will require an individual assessment which takes into account the individual circumstance and site rules.

Reverse towing

The likelihood of collision is greater when the casualty vehicle is towed by reversing plant. This is not the preferred methodology as there is a reduced capability for the plant operator and casualty vehicle driver to communicate effectively.

The vehicle under tow should be in neutral gear and additional signalling protocols may be required to reflect the additional communication difficulties.

Pushing vehicles

This practice (see paragraphs 5 and 6) is extremely dangerous and it should be actively discouraged as a routine means of recovery. Pushing of vehicles should only take place in exceptional circumstances, and then only under strictly controlled conditions as part of a full recovery operation.

Monitoring and review

All risk assessments and systems of work that relate to towing or recovery of bogged down vehicles should be regularly monitored and reviewed to ensure they reflect any site-related changes that have taken place. For further information, see paragraphs 109–111 of the main guidance.

Appendix 2 Signs and signals that can be used for waste/site plant operations

An industry-wide review of its member companies by the Environmental Services Association in 2011 of the signs and signals used to control plant by a number of waste management operators showed generally very little difference and Table 1 was subsequently developed. This guidance is provided to help standardisation and avoid ambiguity that could affect safety.

Table 1

Item	Signal
Haulage driver requires assistance	Haulage driver engages hazard lights No separate signal required for reverse tow
Plant operator signals it is safe for haulage driver to exit cab and attach tow strop	'Thumbs-up' from plant operator For reverse tow – 3 x short horn blasts
Tow strop attached, haulage driver signals readiness for tow to commence to plant operator	Haulage driver switches off hazard lights No separate signal required for reverse tow
Haulage driver wants tow to stop	Driver re-engages hazard lights, also sounds horn repeatedly in event of emergency
Plant operator signals it is safe for haulage driver to exit cab and release tow	'Thumbs-up' from plant operator For reverse tow – 3 x short horn blasts
Haulage driver signals to plant operator it is safe for towing vehicle to move off	'Thumbs-up' from haulage driver