CLOCS Guide
Vehicle safety equipment

Looking out for vulnerable road users
Construction Logistics and Cyclist Safety (CLOCS) - looking out for vulnerable road users (VRU).

CLOCS aims to achieve a visionary change in the way the construction industry manages work related road risk. This is being achieved through three industry led workstreams:

- Improving vehicle safety through design and manufacture of safer new vehicles and fitment of appropriate safety equipment to existing vehicles.
- Addressing the safety imbalance in the construction industry through ensuring road safety is considered as important as health and safety on site.
- Encouraging wider adoption of best practice across the construction logistics industry through taking best in class examples, developing a common national standard and embedding a new cultural norm.

CLOCS has developed the CLOCS Standard for construction logistics: Managing work related road risk (WRRR), a common standard for use by the construction logistics industry.

Implemented by construction clients through contracts, it provides a framework that enables ownership in managing WRRR which can be adhered to in a constant way by fleet operators.

Representatives from different organisations- vehicle manufacturers, construction logistics clients, operators, regulatory and enforcement bodies are actively engaged with CLOCS.

The CLOCS programme represents a united response to road safety across the industry and greater social responsibility which will save lives.

Visit www.clocs.org.uk for further information.

Acknowledgements

The CLOCS Guide - Vehicle safety equipment has been developed in collaboration with industry stakeholders.

The expert contributions made by organisations and individuals consulted in the development of this guide are gratefully acknowledged.

The supplementary guide will be reviewed at intervals not exceeding two years, and any amendments arising from its review will be published in an amended version. Users are responsible for the correct application of the information provided in this guide.
## Contents

**CLOCS Standard for construction logistics: Managing work related road risk**

### Terminology

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>How to comply with the CLOCS vehicle safety equipment requirements (3.2.1 to 3.2.4)</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Assessing your vehicle safety equipment options</td>
<td>27</td>
</tr>
<tr>
<td>4</td>
<td>How to develop and implement your vehicle safety equipment usage policy</td>
<td>31</td>
</tr>
<tr>
<td>5</td>
<td>Further information</td>
<td>34</td>
</tr>
</tbody>
</table>

### Appendixes

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CLOCS, FORS and TfL Work Related Road Risk Compliance</td>
<td>36</td>
</tr>
<tr>
<td>2</td>
<td>Goods vehicle accidents due to blind-spots on right hand drive vehicles</td>
<td>38</td>
</tr>
<tr>
<td>3</td>
<td>Sample vehicle safety equipment policy</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>Example driver daily walk around check sheet</td>
<td>41</td>
</tr>
</tbody>
</table>
The *CLOCS Standard for construction logistics* sets out a series of individual requirements for logistic operators and construction clients. Each requirement is designed to help you manage WRRR particularly in relation to the safety of vulnerable road users (VRUs).

This supplementary guide is designed to assist you in implementing and adhering to the requirements of the *CLOCS Standard*.

Section 3.2 of the *CLOCS Standard* sets out the following requirements for vehicle safety equipment to be fitted to vehicles over 3.5 tonnes gross vehicle weight:

**Requirement 3.2.1**
**Warning signage**

**Requirement**
Fleet operators shall ensure that prominent signage is fitted to all vehicles over 3.5 tonnes gross vehicle weight that visually warns other road users not to get too close to the vehicle.

**Purpose**
To reduce the risk of close proximity incidents and increase road safety.

**Demonstration**
All vehicles over 3.5 tonnes gross vehicle weight shall display external pictorial stickers and markings to warn vulnerable roads users not to get too close to the vehicle.

**Requirement 3.2.2**
**Side under-run protection**

**Requirement**
Fleet operators shall ensure fitment of side-guards to all rigid mixer, tipper and waste type vehicles over 3.5 tonnes gross vehicle weight that are currently exempt from fitment.

**Purpose**
To minimise the probability and severity of under-run collisions with vulnerable road users.

**Demonstration**
Fleet operators shall provide evidence that all rigid mixer, tipper and waste type vehicles over 3.5 tonnes gross vehicle weight are fitted with side-guards.

Fitment shall be on both sides of the vehicle unless this is proved impractical or impossible.
**Requirement 3.2.3**  
**Blind-spot minimisation**

**Requirement**  
Fleet operators shall ensure all vehicles over 3.5 tonnes gross vehicle weight have front, side and rear blind-spots completely eliminated or minimised as far as is practical and possible through a combination of fully operational direct and indirect vision aids and driver audible alerts.

**Purpose**  
To improve visibility for drivers and reduce the risk of close proximity blind-spot collisions.

**Demonstration**  
A combination of appropriate vision aids and driver audible alerts shall be fitted to the front nearside of all vehicles over 3.5 tonnes gross vehicle weight.

In addition, appropriate indirect vision aids shall also be fitted to the rear of all rigid vehicles over 7.5 tonnes gross vehicle weight.

Class VI mirrors shall be fitted to all vehicles where they can be mounted, with no part of the mirror being less than two metres from the ground.

All indirect vision systems shall be fully operational.

Fleet operators shall make regular checks and take all reasonable measures to ensure all indirect vision systems remain fully operational.

Fleet operators shall take steps to ensure that drivers recognise that use of indirect vision systems is an integral part of their job.

---

**Requirement 3.2.4**  
**Vehicle manoeuvring warnings**

**Requirement**  
Fleet operators shall ensure all vehicles over 3.5 tonnes gross vehicle weight are equipped with enhanced audible means to warn other road users of a vehicle’s left manoeuvre.

**Purpose**  
To reduce the risk of close proximity collisions by audibly alerting vulnerable road users to vehicle hazards.

**Demonstration**  
Vehicles over 3.5 tonnes gross vehicle weight shall be fitted with equipment to audibly warn vulnerable road users when a vehicle is turning left.

All vehicle manoeuvring warning systems shall be fully operational.

Fleet operators shall make regular checks and take all reasonable measures to ensure audible warning devices remain fully operational.

Fleet operators shall take steps to ensure that drivers recognise that activation of the device is an integral part of their job.
Certain terms are used within the CLOCS Standard and in this guide.

In the CLOCS Standard’s requirements:

- **Shall** - indicates something which is mandatory as part of the requirement, or in order to achieve the requirement
- **Should** - indicates something that is recommended as emerging practice
- **May** - indicates permission or an emerging practice option

**Blind-spot minimisation** - the complete elimination or reduction as far as practical and possible of blind-spots using a combination of direct and indirect vision aids

**Blind-spots** - areas around an HGV which are neither directly nor indirectly visible by the driver

**Devices for indirect vision** - devices to observe the traffic area adjacent to the vehicle which cannot be observed by direct vision. These can be conventional mirrors, camera-monitors or other devices able to present information about the indirect field of vision to the driver

**Direct vision** - directly visible to the driver through the cab windscreen and windows

**Fleet operator** - any organisation or part thereof which operates one or more vehicle(s)

**Indirect vision** - indirectly visible to the driver through the mandatory mirror set or camera monitoring system

**Side under-run protection** - lateral guards which can be fitted between vehicle axles to minimise the severity of side under-run collisions, also known as side-guards

**Vehicle manoeuvring warnings** - enhanced audible warnings to alert other road users to a left turning, right turning or reversing vehicle

**Vehicle nearside** - the side of the vehicle nearest to the kerb in the forward parked/driving condition. Also called the passenger side

**Vehicle offside** - the side of the vehicle furthest from the kerb in the forward parked/driving condition. Also called the driver side

**Vehicle safety equipment** - equipment which assists the driver in seeing or detecting other road users or obstacles and also reduces the incidence and severity of collisions, particularly with VRUs. This type of equipment can be fitted by vehicle manufacturers, dealers or retrofitted

**Vulnerable road user (VRU)** - primarily a cyclist, pedestrian, motorcyclist or person of reduced mobility

**Warning signage** - prominent signage used to warn VRUs not to get too close to vehicles when stationary (not parked) or in motion
Introduction

1.1 Purpose of this guide

This guide will help you to meet the vehicle safety equipment requirements of the CLOCS Standard. It will also help client organisations to check that vehicles are compliant with the vehicle requirements in the CLOCS Standard.

Both this guide and the CLOCS Standard are aligned with the Road Vehicles Construction and Use Regulations SI 1986 No. 1078 and the Road Vehicle Lighting Regulations SI 1989 No. 1796.

It provides guidance on vehicle safety equipment types, how to choose the most appropriate equipment for your fleet together with the primary and secondary benefits of the equipment to operators, VRUs and drivers.

The CLOCS Standard for construction logistics sets out a series of individual requirements for fleet operators. Each requirement is designed to reduce the risk of a collision with VRUs. Meeting the CLOCS requirements for vehicle safety equipment will help you to reduce the incidence and mitigate the severity of VRU collisions.

For further information:
• CLOCS Standard for construction logistics: Managing work related road risk

For further information:
• Copies of these Regulations can be obtained from http://www.selectregs.com/
1.2 Who should read this guide?

This guide is aimed at individuals within fleet operating companies who are directly involved in, or have a professional interest in the decision making process for vehicle safety equipment. The guide is also aimed at individuals in client organisations responsible for setting up and carrying out compliance checking processes.

- Senior management / leadership team
- Procurement and financial managers
- Health and safety managers
- Road risk compliance managers and teams
- Transport managers
- Fleet managers and engineers

1.3 How do I get started?

The first step is to read through this guide. It tells you what you must do to meet the requirements of the CLOCS Standard - these are the requirements identified as ‘shall’ and are mandatory. The flow chart in section 1.7 will assist you in navigating your way through the process.

Firstly, determine what vehicle safety equipment is fitted to your fleet at present and if it partly or wholly meets the CLOCS Standard. If your fleet already meets the mandatory requirements of the CLOCS Standard (‘shall’) you should review sections 3 and 4 of this guide.

If your fleet does not meet the requirements of the CLOCS Standard then you can use section 2.3 of this guide to help you develop a plan and a business case for procuring the equipment. Your plan must include all of the mandatory requirements of the CLOCS Standard plus any recommended and optional elements which you may wish to include.

The CLOCS Standard also makes reference to things that you ‘should’ or ‘may’ do. As new practice and new technology emerges, these ‘shoulds’ and ‘mays’ are likely to be incorporated into the ‘shall’ elements of the requirements in future editions of the CLOCS Standard. This will help ensure that the requirements keep up to date with emerging technology and good practice. It is recommended that you stay aware of developments in this field.

By complying with the requirements of the CLOCS Standard, you will also be complying with other safety standards and contractual requirements. For example, TfL’s work related road risk contractual requirements are aligned to both the FORS silver standard and the CLOCS Standard. Appendix 1 provides further information on compliance with different standards.
1.4 Vehicle safety equipment requirements at a glance

Table 1.1 will help you to identify the relevant sections of the guide to help you meet the vehicle safety equipment requirements.

Review the flowchart in section 1.7 to gain an overview of CLOCS vehicle safety equipment compliance.

Table 1.1: Document at a glance

<table>
<thead>
<tr>
<th>What can I do to help me comply?</th>
<th>When can I do it?</th>
<th>Where do I find the information in this guide?</th>
</tr>
</thead>
</table>
| Understand the benefits of vehicle safety equipment | Prior to selecting vehicle safety equipment and seeking board approval | Sections 2.2 to 2.5  
*Figure 2.1* |
| Seek internal approval and gain buy-in | Prior to purchasing and fitting equipment | Section 3.1 and 3.2 |
| Review options and purchase equipment | Prior to purchase and arranging fitment | Section 3.3 and 3.4 |
| Fit the required safety equipment to vehicles | Prior to starting work on any contract requiring compliance with the CLOCS Standard | Section 3.4  
*Figure 2.1* |
| Train drivers and update documentation | Before drivers use safety equipment on the road | Section 4.2 |

The flowchart in section 1.7 provides an overall summary of the processes and considerations involved in selecting, purchasing, using and reviewing vehicle safety equipment.
1.5 What are the benefits of fitting vehicle safety equipment?

The main benefits of fitting vehicle safety equipment include:

- Improving drivers’ ability to see or detect VRUs, other road users and obstacles
- Warning VRUs of dangers of being in close proximity to vehicles
- Warning VRUs and other road users of a vehicle’s manoeuvre
- Reducing the incidence and potential severity of collisions
- Potential to assist accident investigations and counter fraudulent insurance claims
- Potential to reduce theft (fuel and load)

These are detailed, together with an indication of the level of cost of the equipment (low / medium / high) in Table 1.2.

Please note that cost and benefits will vary depending on the type and capabilities of specific equipment.

Table 1.2: Summary of the benefits of each type of vehicle safety equipment

<table>
<thead>
<tr>
<th>Equipment type</th>
<th>Benefits of vehicle safety equipment</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warning Signage</td>
<td>Improves drivers’ ability to see or detect VRUs, other road users and obstacles</td>
<td>Low</td>
</tr>
<tr>
<td>Side under-run protection</td>
<td>Warnings VRUs of dangers of being in close proximity to vehicles</td>
<td>Med</td>
</tr>
<tr>
<td>Blind-spot minimisation</td>
<td>Warns VRUs and other road users of a vehicle’s manoeuvre</td>
<td>Med / High</td>
</tr>
<tr>
<td>Vehicle manoeuvring warnings</td>
<td>Reduces the incidence of collisions</td>
<td>Low / Med</td>
</tr>
<tr>
<td></td>
<td>Reduces the severity of collisions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potential to assist accident investigations and counter fraudulent insurance claims</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potential to reduce theft (fuel and load)</td>
<td></td>
</tr>
</tbody>
</table>
1.6 HGV blind-spots and areas of greatest risk

Front and nearside blind-spots in existing vehicles are caused by a number of factors such as:

- Vehicle ride height
- Vehicle structure
- Mirror mounts
- A-pillars and vehicle body

There is a blind-spot which is not covered by Class V and VI mirrors or the cab window view (Figure 1.1).

Transport Research Laboratory (TRL) research has been carried out to identify the area of greatest risk on an HGV. Figure 1.2 shows the area of greatest risk for VRUs together with the size of the area around the vehicle where the driver would have nil or limited direct vision.

---

1 Applies to the nearside on right-hand drive vehicles and the offside on left-hand drive vehicles
Some vehicles are exempt from using Class V and VI mirrors which further impacts the extent of the blind-spots.

Achievable reductions in driving seat height combined with a reduced dashboard obscuration, and additional window apertures can greatly reduce blind-spots.

Appendix 2 shows the percentage of goods vehicle collisions that are caused through blind-spots on right-hand drive vehicles.

**Ask your manufacturer**

When procuring a vehicle there are some key questions to ask your vehicle manufacturer. These include:

- Are the blind-spots due to vehicle structure, ride height, chassis configuration or body structure?
- What is your cab type that offers the best direct vision, and suits the required vehicle chassis/body configuration?
- What options can the vehicle manufacturer fit to improve direct vision? e.g.
  - Additional window in the nearside cab door (lower)
  - Vehicles with a lower ride height (achieved with axle/suspension types and wheel/tyre selection)
1.7 Navigating vehicle safety equipment

**Understanding the CLOCS requirements**
Read and review the CLOCS Standard and supporting supplementary guidance.

**Review contract clauses**
Assess any contractual requirements regarding vehicle safety equipment.

**Gap analysis**
Assess your current situation against the requirements of the CLOCS Standard.
What Safety equipment do vehicles in your fleet have fitted currently?
What additional equipment is needed?

**Research and identify options for purchase**
Which equipment will be most suitable for your vehicles?
Has the equipment been independently evaluated?

**Business Case**
Develop a solid business case and consider the impact on your operation.

**Benefits**
- Reduced risk of collisions
- Contract awards
- Corporate social responsibility
- Benefit to the organisation
- Quantifiable savings

**Considerations**
- How much will it cost to purchase?
- What will vehicle downtime be for fitment?
- How much will it cost to fit?
- How much will it cost to maintain?
- Consequences of not fitting the equipment?

**Consultation**
Consult with your drivers, contractors and affected other stakeholders.

**Consideration**
- Vehicle age?
- Lease/hire agreements?
- Contractual obligations?

**Select specific equipment options**
Specify the correct configurations and options for your organisation.

**Fitment**
- Manufacturer/dealer fit?
- Approved supplier fit?
- Self fit?

**Policy**
Develop and communicate your vehicle safety equipment usage policy.

**Driver training**
Train your drivers on the use of vehicle safety equipment (see CLOCS Guide - Managing driver training and licensing).

**Driver and contractor opinion?**
- Fuel efficiency?
- Instances of theft?

**Key performance indicators**

**Review and Feedback**
Once the equipment has been trialled or utilised in everyday operations, ask drivers, contractors and other affected stakeholders for their feedback to assess the success of the product.

**Prominent pictorial warning signage**

**Side under-run protection**

**Vehicle manoeuvring warnings**

**Class V and Class VI mirrors**

**Rear-view camera**

**Close proximity sensors and blind-spot cameras**
How to comply with the vehicle safety equipment requirements (3.2.1 to 3.2.4)

2.1 What vehicle safety equipment must I fit?

The CLOCS Standard sets out the requirements for vehicle safety equipment. This includes:

- Warning signage
- Side under-run protection
- Blind-spot minimisation
- Vehicle manoeuvring warnings

2.2 Warning signage

The CLOCS Standard requires that ‘Fleet operators shall ensure that prominent signage is fitted to all vehicles over 3.5 tonnes gross vehicle weight that visually warns other road users not to get too close to the vehicle’.

Warning signage needs to be visible to a VRU before they enter the area of risk on approach to the vehicle. The most appropriate place is for one sticker to be placed on the rear of the vehicle at eye level for a cyclist.

The sign shall be pictorial to visually warn other road users not to get too close to the vehicle. If any text is included on the signage, it must be legible by a cyclist at a reasonable distance from the vehicle.

Signage should not be offensive and should not give instructional advice e.g. ‘Stay back’ or ‘No Entry’ to the vulnerable road user.

For further information:

- ‘Blind spot – take care’ warning signage is available to FORS companies and can be ordered from www.fors-online.org.uk

  This warning signage has been produced in consultation with cycling and road safety groups.
Additional warning signage should be applied to side-guards on both sides of the vehicle. See 2.3 for the corresponding side-guard design requirement.

Illuminated panels or LED warning signs may also be fitted at the rear of the vehicle to alert cyclists to the blind-spot on a heavy goods vehicle. Panels can flash in conjunction with the directional indicators, and only operate when the vehicle is stationary (not parked) or manoeuvring below 15 mph.

As LED warning signs are illuminated they can be read at night. Some types of LED warning signage are re-programmable and will allow you to change the warning message as required.

### 2.3 Side under-run protection

The *CLOCS Standard* requires that ‘Fleet operators shall ensure the fitment of side-guards to all rigid mixer, tipper and waste type vehicles over 3.5 tonnes gross vehicle weight that are currently exempt from fitment’.

Some vehicles are exempt from side-guards under the Road Vehicles (Construction and Use) Regulations 1986. However the *CLOCS Standard* requires side-guards to be fitted to all exempt vehicles. Side-guards need to be specified when procuring a vehicle and are commonly fitted during the bodybuilding stage. On new vehicles that are exempt this update shall only apply after registration.
Side-guards shall also be retrofitted to some existing vehicles where they are not fitted. Commercial vehicle bodybuilders are able to supply and install side-guards to new, existing and exempt vehicles. Alternatively, some bodybuilders will supply the side-guard components along with the instructions for fitment enabling an appropriately skilled person in your organisation to fit the side-guards.

Once fitted, you need to ensure that side-guards are kept in a serviceable condition. A vehicle exempt from side-guards under the Construction and Use Regulations but which has them fitted, can still fail its annual test if the side-guard or bracket is insecure; has exposed surfaces which are not smooth (e.g. it has jagged edges or bolt heads that are not domed shape); or increases the overall width of the vehicle.

Side-guards that are lower than the regulated height from the road and/or are fitted with a covering panel are recommended to further reduce the risk of under run collisions. Warning signage should be displayed on the panel. These side-guards will warn vulnerable road users when adjacent to the vehicle nearside and offer greater protection than the minimum legal requirement in the event of a collision.

**For further information:**

- The Road Vehicles (Construction and Use) Regulations 1986: Regulation 51, side-guards

---

**Safer Lorry Scheme**

From 1 September, all roads in Greater London (except motorways) will be covered by the Safer Lorry Scheme. The scheme will prohibit HGVs over 3.5 tonnes gross vehicle weight that are not fitted with the following safety equipment from driving in London:

- Side-guards
- Class V mirror
- Class VI mirror

The scheme will operate 24 hours a day, 7 days a week and will be enforced by the police, DVSA and the Industrial HGV Taskforce. Meeting the CLOCS requirements on fitment of side-guards and mirrors will also ensure you are compliant with the Safer Lorry Scheme.
2.4 Blind-spot minimisation

The CLOCS Standard requires that ‘Fleet operators shall ensure all vehicles over 3.5 tonnes gross vehicle weight have front, side and rear blind-spots completely eliminated or minimised as far as is practicable through a combination of fully operational indirect vision aids and driver audible alerts’.

To meet the CLOCS requirement on blind-spot minimisation you need to decide which combination of equipment is best for your fleet and your drivers.

Vehicle blind-spots shall be minimised through use of:

- Indirect vision aids such as Class V and VI mirrors, close proximity sensors and camera systems
- Direct vision aids such as additional windows in passenger doors

**Benefit!**

In addition to reducing the incidence of collisions, camera systems can also reduce fuel and load theft, fraudulent insurance claims and assist collision investigation.

**Class V mirrors**

Class V mirrors help to minimise the blind-spot immediately to the side and front corner of the vehicle passenger door. Class V mirrors are a legal requirement on non-exempt vehicles\(^2\) and shall be retrofitted, when required, on existing vehicles over 3.5 tonnes gross vehicle weight in order to meet the CLOCS requirement. A Class V mirror may also be retrofitted to the driver’s side.

Class V mirrors shall be fitted, with no part of the mirror and its mounting bracket being less than 2 metres from the ground.

Note: On 30 June 2013 a Class V mirror was introduced which extends the driver’s field of view to 2 metres forward by 2.5 metres outwards. As from 30 June 2015 all new HGVs over 12 tonnes gross vehicle weight will be fitted with these enhanced field of view mirrors.

---

\(^2\) As required by Regulation 33 of C&U on N category vehicles from 1 January 2000
Some vehicles are / will be exempt from this requirement where the 2 metre height from the ground requirement cannot be achieved, for example on low cabs.

Blind-spot cameras may be used instead of a Class V mirror, but the image shall cover the same field of view.

For further information:

- DVSA Heavy Goods Vehicle Inspection Manual
  
Class VI mirrors

Class VI mirrors help to minimise the blind-spot immediately in front of the drivers cab. Class VI mirrors are a legal requirement on all new vehicles over 7.5 tonnes gross vehicle weight and shall be retrofitted on existing vehicles in order to meet the CLOCS requirement.

Class VI mirrors shall be fitted, with no part of the mirror and its mounting bracket being less than 2 metres from the ground.

Some vehicles are/will be exempt from this requirement where the 2 metre height from the ground requirement cannot be achieved, for example on low cabs.

The improved drivers’ field of view achieved with fitment of Class V and Class VI mirrors shall conform to DVSA MOT test requirements and the relevant UK regulation³.

Devices for indirect vision such as blind-spot cameras can be used instead of a Class VI mirror, but the image shall cover the same field of view.

For further information:

- DVSA Heavy Goods Vehicle Inspection Manual

³ Directive 2003/97
Close proximity sensors and detection systems

Close proximity sensors attract the driver’s attention by way of an audible or visual alert in the cab when a vulnerable road user is either stationary in the vehicle’s blind-spot or passing through it. Some systems have been designed to alert the driver when it has assessed the vehicle to be on a collision path with another road user.

Sensors should be placed around the front nearside of right hand drive vehicles (front offside of left hand drive vehicles), with consideration of the area of greatest risk at an appropriate height to pick up cyclists and pedestrians. Sensors should be kept clean at all times in order to keep them in good operational order.

Types of sensor or detection systems include:

- Ultrasonic detection system (side and front)
- Radar detection system (side and front)

There are a wide range of suppliers of this technology.

When deciding which system to use, be aware that the following features can vary:

- The rate of false alarms
- The size of the detection zone
- Maintenance regime for the system
- Whether the system is standalone or relies on additional equipment over which the operator does not have control (e.g. tags fitted to bicycles)

Camera and monitor systems

Camera and monitor systems are widely available from a range of suppliers. Systems differ in complexity depending on quality of image and recording and monitoring options. In order to minimise the nearside blind-spot, cameras should be placed so as to cover the blind-spots and area of greatest risk and as a minimum covering the front nearside of vehicles over 3.5 tonnes gross vehicle weight.

Vehicles over 7.5 tonnes gross vehicle weight shall also be fitted with a rear view camera to assist the driver when reversing. Select a complete camera system which utilises either one monitor and switches view to the rear of the vehicle when reverse gear is engaged or one which shows a split display.

The classes of product which are currently on the market fall into three broad categories:

- **Visualisation systems** which use externally fitted cameras and an in-cab monitor to provide more visual information than conventional mirrors can. These can cover blind-spots and in some cases, full 360° view around the vehicle which aids slow speed manoeuvring in enclosed spaces

- **Detection systems** with an audible and/or visual alert to the driver of the presence of one or more objects in the area where the latter would be a most risk. Simpler systems cannot discriminate between VRUs and street furniture but newer designs have this capability
• **Collision avoidance systems** with an audible and/or visual alert to the driver of an imminent collision between a VRU and the vehicle

When deciding which system to use, be aware that the following features can vary:

- Quality of the image
- Performance in situations with limited lighting
- Performance during hours of darkness
- Performance in various weather conditions
- Maintenance regime for the system
- Driver capability to safely view the images in the urban traffic environment

---

**Other systems**

HGV safety technology is an emerging market and new products continue to be developed which use a range of different technologies.

Ask your suppliers to fully explain the systems and their capabilities and work with your drivers to ensure the systems are fit for purpose and suitable for your type of operation.

The majority of systems only require equipment to be fitted to the vehicle. Others rely on equipment to also be fitted to bicycles in order to provide a warning, known as a ‘tag and beacon’ system. While it is possible to fit whole fleets with a beacon, this system relies on every cycle to also be fitted with a tag for it to work. Even with prolonged marketing campaigns, a 100 per cent uptake by cyclists could not be ensured.

CLOCS does not recognise tag and beacon systems as fulfilling the requirements of the blind-spot minimisation requirements.

---

For further information:

- Visit [www.fors-online.org.uk](http://www.fors-online.org.uk) where you will find a list of vehicle safety equipment suppliers. FORS accredited companies will be eligible for a range of discounts
2.5 Vehicle manoeuvring warnings

The CLOCS Standard requires that ‘Fleet operators shall ensure that all vehicles over 3.5 tonnes gross vehicle weight are equipped with enhanced audible means to warn other road users of a vehicle’s left manoeuvre’.

Vehicle manoeuvring warnings alert VRUs and other road users to a vehicle’s intended manoeuvre. Warnings for a vehicle’s left turn are particularly important as the near side blind-spot on right hand drive vehicles presents one of the greatest areas of risk to cyclists. For left hand drive vehicles this blind-spot is on the offside and affects these vehicles when turning right.

Vehicle manoeuvring warnings:

- Shall include external audible warnings that comply with UK Road Vehicles Construction & Use - 96/1078
- May include additional directional indicators that comply with UNECE Regulation 48

Drivers shall be trained in the correct use of this equipment and you shall ensure that drivers recognise that activation and deactivation of the system and correct use of the device is an integral part of their job. Audible warning devices should be fitted with a manual on/off switch or reset button for circumstances, such as working between 23.30 and 07.00, where it may be appropriate for the device to be deactivated. Section 4.2 of this document provides details for training drivers to use vehicle safety equipment.

It is recommended that you choose vehicle safety equipment which has been independently evaluated to determine its effectiveness where practical. See section 3.3 for further information.

Figure 2.1 gives a pictorial representation of a vehicle which complies with the CLOCS vehicle safety equipment requirements.
Figure 2.1: Vehicle which complies with the CLOCS vehicle safety equipment requirements

Vehicle Compliance

1. Class V and VI mirrors
   - Class V and Class VI mirrors Class V and Class VI mirrors on all vehicles over 3.5 tonnes gross vehicle weight where they can be mounted, with no part of the mirror being less than 2m from the ground.
   - From June 2015 all new HGVs over 1.2 tonnes gross vehicle weight will be fitted with Class V mirrors with increased field of view.

2. Close-proximity sensors and blind-spot camera
   - A method of minimising the vehicle blind-spots eg camera system and/or sensor system and/or Fresnel lens (the system must be working).

3. Side under-run protection (on both sides)
   - Side-guards on all rigid, mixer, tipper and waste type vehicles over 3.5 tonnes gross vehicle weight that are currently exempt from fitment.
   - From early 2015, the Safer Lorry Scheme will require the fitment of side guards on these vehicles travelling into London.

- Regular checks should be made and all reasonable measures taken to ensure equipment and devices are fully operational.
- Steps shall be taken to ensure that drivers recognise the use and activation of devices as an integral part of their job.
- Any additional safety equipment fitted to the vehicle should include in driver daily walk around checks.
- Use vehicle safety equipment that has been independently evaluated.
4 Audible alert for vehicle turning left

Audible warning devices fitted to warn VRUs when a vehicle is turning left. Devices must be fitted with a manual on/off switch for circumstances, such as between the hours of 11pm and 7am, where it may be appropriate for the device to be de-activated.

5 Prominent pictorial warning signage

External pictorial stickers to warn vulnerable road users not to get too close to the vehicle to be fitted to all vehicles over 3.5 tonnes gross vehicle weight.

Appropriate blind-spot warning signage can be obtained from www.fors-online.org.uk

6 Rear-view camera

Vehicles over 7.5 tonnes gross vehicle weight to have rear blind-spots minimised for example by use of a rear view camera.
2.6 Ensuring equipment remains operational

Where additional indirect vision systems (mirrors, cameras and sensors) are fitted you shall ensure that they are properly maintained and fully operational at all times.

2.7 Driver training

Drivers shall be made aware of the importance of the equipment and the purpose for which it has been installed. They should be trained in the use of each piece of equipment prior to them taking out a vehicle with it fitted. Drivers shall also be aware of how to report any faults with equipment. These items should be included on your driver daily walk round check sheets.

Section 4.2 of this document provides details for training drivers to use vehicle safety equipment.

2.8 Improving direct vision

Additional windows in the cab and/or passenger door give drivers increased direct vision of VRUs and other road users. Where possible they should be specified for new vehicles, however it is possible to retro-fit additional glass panels to existing vehicles (see Figure 2.2).

Achievable reductions in driving seat height combined with reduced dashboard obscuration can also greatly reduce blind-spots.
Implementing vehicle safety equipment on your fleet

Fitting your fleet with vehicle safety equipment represents a change to the way your fleet is procured and equipped. It is important that you keep all stakeholders aware of what changes are taking place, why they are happening and what the benefits will be.

This section of the guide will take you through the four key stages in implementing this change programme. The four stages are shown below:

- **Stage 1** - Developing the business case and seeking approval for the purchase of vehicle safety equipment
- **Stage 2** - Consulting with drivers and getting driver buy-in
- **Stage 3** - Selecting specific options for vehicle safety equipment
- **Stage 4** - Review of vehicle safety equipment investment
3.1 Developing the business case and seeking approval

The first stage in implementing a change programme is to develop the business case for retrofitting vehicles with additional safety equipment or procuring new vehicles with improved design and additional safety equipment.

Depending on the structure of your organisation, the business case needs to be presented to your company’s board or the individual responsible for approving the change and authorising the budget.

When developing a business case you need to set out the answers to the following questions:

<table>
<thead>
<tr>
<th>Core questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>What safety equipment do vehicles in your fleet have fitted currently?</td>
</tr>
<tr>
<td>What additional equipment is needed to ensure compliance with the CLOCS Standard?</td>
</tr>
<tr>
<td>Which equipment will be most suitable for your vehicles?</td>
</tr>
<tr>
<td>How will investment in improved vehicle safety tie in with your corporate social responsibility policy?</td>
</tr>
<tr>
<td>What are the potential consequences of not fitting this equipment?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much will equipment cost to purchase?</td>
</tr>
<tr>
<td>How much will equipment cost to fit?</td>
</tr>
<tr>
<td>What will the equipment cost to maintain?</td>
</tr>
<tr>
<td>What will be the vehicle downtime for fitting? Can this be done at a time which will not affect operations?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>How will fitting additional vehicle safety equipment benefit your organisation? Think about the full range of potential benefits</td>
</tr>
<tr>
<td>Reducing risk of collisions</td>
</tr>
<tr>
<td>Time off the road</td>
</tr>
<tr>
<td>Contract award</td>
</tr>
<tr>
<td>Longer term quantifiable savings made as a result of fitment e.g. reduction in collisions and associated costs, reduced insurance premiums</td>
</tr>
</tbody>
</table>
3.2 Consulting and getting buy-in

Drivers
Once you have approval to procure the vehicle safety equipment, you need to engage drivers at this early stage in order to determine which equipment they may have preference to. Drivers are likely to be more supportive and proactive in using additional safety equipment if they are consulted early and are able to help test and evaluate the equipment.

Maintenance contractors
It is also recommended that you communicate with your vehicle maintenance staff or contractors at this stage in order to make them aware of your intention to comply with the CLOCS Standard and to retro-fit particular equipment to your fleet. Vehicle maintenance staff can provide assistance in equipment selection based on your specific fleet type.

3.3 Evaluating vehicle safety equipment

At the point of going to publication, the intention is to set up evaluation of vehicle safety equipment with test houses. Ideally, blind-spot minimisation technology will be selected once evaluated at an independent test house against relevant performance criteria in order to determine its effectiveness.

For further information:
- FORS provides links to vehicle safety equipment and training providers that help with compliance to the CLOCS Standard www.fors-online.org.uk

Evaluation of HGV Safety Technology
A methodology for the independent evaluation of HGV safety equipment has been developed by TRL.

It is intended that the methodology will be used by an independent test house(s) for the evaluation of current and future safety equipment.

The evaluation includes both stationary and dynamic testing of equipment while also allowing driver feedback to be considered.

Based on testing, safety equipment will be scored against a set of relevant criteria.

Testing of safety equipment will help fleet operators when making purchasing decisions. When established, further information will be provided on the CLOCS website and in future editions of this guide.

It is recommended that you choose vehicle safety equipment which has been independently evaluated to determine its effectiveness where practical e.g. blind-spot minimisation equipment.
3.4 Options for fitting vehicle safety equipment

When selecting options for your fleet, be aware that elements of the CLOCS Standard which are currently recommended or optional (the ‘shoulds’ and the ‘mays’) could become mandatory in the future.

The CLOCS Standard will be reviewed at least every two years in order to ensure that it is current and includes the latest and most effective safety equipment.

Other considerations will include:
- Are you specifying a new vehicle?
- Vehicle age/ useful life
- Length remaining on lease or hire agreement
- Contractual obligations

Where possible, have vehicle safety equipment fitted by the manufacturer or dealer. If this is not possible, we recommend approved supplier fit over self-fit. This will ensure that equipment which interacts with the vehicle’s electrical systems do so correctly. Incorrect connection can result in numerous electrical issues.

3.5 Review

Decide how you will review the return on investment from the vehicle safety equipment you have selected. It is recommended that you review the following against pre-fit figures where possible:
- Driver opinion
- Accident Key Performance Indicators (KPIs) such as incidence, cost of collision
- Fuel efficiency (for aerodynamic side-guards)
- Instances of theft (load and fuel)
How to develop and implement your vehicle safety equipment usage policy

This section provides you with step-by-step guidance for developing and implementing your vehicle safety equipment usage policy. This includes training for users, usage policy / work instructions and updating existing documentation and processes.

4.1 What should your vehicle safety equipment usage policy include?

Your policy for using vehicle safety equipment should include:

- A description of the equipment fitted
- Training for those using the equipment
- Responsibilities for the correct use, activation and deactivation of equipment
- Responsibilities for reporting defects to equipment
- Responsibilities for inspecting and maintaining equipment

Appendix 3 provides a sample vehicle safety equipment policy

4.2 Training drivers

You need to ensure that drivers recognise that the correct usage, activation/deactivation, inspection and maintenance of vehicle safety equipment is an integral part of their job.

Section 3.3.1 of the CLOCS Standard requires that ‘drivers shall undertake training in the use and limitations of supplementary vehicle safety equipment.’ It is recommended that you include a requirement to carry out safety equipment training in your policy.

Refer to CLOCS Guide - Managing driver training and licensing to assist you in developing driver training.
Training should cover the following:

<table>
<thead>
<tr>
<th>The objectives of the training are for drivers to:</th>
<th>Following the training the driver should be able to:</th>
<th>Timescale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Know the use and limitations of supplementary vehicle safety equipment and how to maintain its effectiveness</td>
<td>Explain the vehicle requirements of the CLOCS Standard and why they are important</td>
<td>To be completed before a driver first uses a vehicle with safety equipment fitted</td>
</tr>
<tr>
<td></td>
<td>• Describe the blind-spots on vehicles and how they can be minimised</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Explain the proper adjustment and use of close proximity mirrors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• List the types of vehicle safety technology</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Describe the daily inspection and use of audible turn alarms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Describe the daily inspection, functionality and use of close proximity sensors and camera monitoring systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Name the health and safety offence associated with tampering, removing, misusing safety equipment</td>
<td></td>
</tr>
</tbody>
</table>

4.3 Work instructions for equipment use

Providing drivers with written work instructions for using, inspecting, maintaining and reporting defects for vehicle safety equipment will help them to use the equipment correctly and safely. These instructions can form part of your drivers’ handbook with step by step instructions for:

• Activation of equipment when manoeuvring
• Keeping warning signage clean and legible
• Deactivation of external warnings between 11:30pm and 07:00am in built up areas
4.4 Update existing documentation

You should update existing documentation and forms to include your chosen vehicle safety equipment. Documentation can include:

- Driver daily walk around check-sheets
- Work instructions
- Defect report sheets
- Driver induction material
- Driver training material
- Drivers’ handbook

There is an example driver daily walk around check sheet and defect reporting form in Appendix 4. Some items might not be applicable to your vehicles and should be removed as appropriate. There could be other items you wish to add. Highlighted items refer to equipment which is mandatory under the CLOCS Standard.
Section 5

Further information

5.1 Further information

For further information visit www.clocs.org.uk

An electronic version of this document can be downloaded from the following link: http://www.clocs.org.uk/clocs-guides/

The CLOCS Standard for construction logistics: Managing work related road risk (WRRR) can be downloaded from the following link: http://www.clocs.org.uk/standard-for-clocs/

CLOCS Guides, Toolkits and associated forms can be downloaded from: http://www.clocs.org.uk/clocs-guides/

· CLOCS Guide - Managing driver training and licensing

· CLOCS Guide - Managing work related road risk in contracts

· CLOCS Guide - Managing supplier compliance

· CLOCS Toolkit - Managing collision reporting and analysis

· CLOCS Compliance Toolkit

Further information can be found in the following publications:

Work Related Road Risk requirements: Managing contract compliance http://www.tfl.gov.uk

Construction logistics and cyclist safety - summary report
Transport Research Laboratory
http://www.trl.co.uk/online_store/reports_publications/trl_reports/cat_road_user_safety/report_construction_logistics_and_cyclist_safety_summary_report.htm

Construction logistics and cyclist safety - full technical report
Transport Research Laboratory
http://www.trl.co.uk/online_store/reports_publications/trl_reports/cat_road_user_safety/report_construction_logistics_and_cyclist_safety_technical_report.htm

Driving at work: Managing work-related road safety
Department for Transport / Health and Safety Executive
Further information on the Fleet Operator Recognition Scheme (FORS) is available from www.fors-online.org.uk
Appendix 1

CLOCS, FORS and TfL WRRR Compliance

FORS
FLEET OPERATOR RECOGNITION SCHEME

Demonstrating road risk compliance through FORS
Progressive, three tiered accreditation scheme recognising safer, greener and more efficient fleet operations

FORS demonstrates operator compliance with these standards at these levels

GOLD
Fleet operators providing evidence of improvements in safety, environmental impact and efficiency

SILVER
Implemented through planning conditions and procurement contracts

BRONZE
Fleet operator that is lawful and following best practice

Fleet operators actively committing to improve safety, environmental impact and efficiency through a range of initiatives
VISION

Working together to revolutionise the management of work-related road safety and helping ensure a positive road safety culture is embedded in fleet operations.

CONSTRUCTION LOGISTICS AND CYCLIST SAFETY (CLOCS)

National common standard for managing work related road risk and raising awareness of cyclists and vulnerable road users across the construction industry

Target audience
Construction sector, Planning Authorities, Developers Contractors and Fleet Operators (Nationwide)

TFL WORK RELATED ROAD RISK (WRRR)

Road safety requirements for fleet operators included in all TFL contracts

Target audience
All TFL contractors who deliver, collect or service a TFL project, site or premises

SAFER LORRY SCHEME (SLS)

Road safety requirements for all HGVs in London. Including fitting sideguards and close proximity mirrors

Target audience
All operators with HGVs entering or operating in London
Appendix 2

Goods vehicle accidents due to blind-spots on right hand drive vehicles

[Diagram showing the percentages of accidents due to blind-spots on right hand drive vehicles, with a focus on the right side blind spot]
Appendix 2
Goods vehicle accidents due to blind-spots on right hand drive vehicles

Accidents due to Near-Side Blind spot
These account for 7% of all KSIs and 11% involve RHD vehicles, >75% evenly split between Rigid and Articulated vehicles. 4% involve VRUs.

Direct Vision
These areas are visible to the driver through the windows of the vehicle.

Indirect Vision
These areas are visible to the driver through mirrors. The views afforded to the driver will be distorted to a greater or lesser degree by the radius of curvature of the mirror.

Blind Spot
These areas are not visible to the driver; the occur due to obstruction from the structure of the vehicle. In some cases, the driver can look around the blind spot, such is that caused by the A Pillar. However, some blind spots such as the Near-side and Rear cannot be seen regardless of what the driver does.

Accidents due to Off-Side blind spot
These account for 9% of all KSIs and 11% involve LHD vehicles, >75% of which 90% are Articulated. 34% involve RHD vehicles >75% of which 64% are Articulated. VRUs are almost never involved.

Rear Blind Spot
This area is hidden to the driver from a combination of vehicle cab and body / trailer.

Accidents due to rear blind spot
These account for 8% of all KSIs and 14% involve RHD vehicles >75% of which 71% involve VRUs.

25% of all fatalities are from reversing
17% of all accidents are from reversing

Goods Vehicles
Accidents Due to Blind-Spots

Produced by Dr. Russell Marshall and Dr. Steve Summerskill, Loughborough Design School.

Data taken from the SWIS 19 UK Police Accident Data Base, 2008.
Data analysis by James Lenard, Loughborough Design School.
Appendix 3

Sample vehicle safety equipment policy

Sample vehicle safety equipment policy
<Insert company name> is committed to ensuring that our company fleet is as safe as possible.

This policy is to ensure that <Insert company name>’s vehicle safety equipment requirements are documented and managed in a consistent way in order to improve our WRRR safety record.

Ensuring the most appropriate safety equipment is fitted to our fleet is the joint responsibility of senior management, operations, fleet management and health and safety. Drivers also play a key role in providing feedback to ensure the most appropriate equipment is fitted and that any defects are reported as soon as they occur. This policy applies to all staff responsible for any aspect of the procurement, fitment, maintenance and use of our vehicles and their safety equipment.

<Insert company name> will ensure that each commercial vehicle over 3.5 tonnes gross vehicle weight that we operate is fitted with:

- Class V and Class VI mirrors (where they can be mounted with no part of the mirror less than 2 metres from the ground)
- Side-guards (on exempt vehicles)
- A combination of close proximity sensors, cameras and monitoring systems to ensure all blind-spots are minimise as far as possible
- Vehicle manoeuvring warnings to alert other, vulnerable road users to a vehicles left turn manoeuvre

In addition, <Insert company name> will ensure that each commercial vehicle over 7.5 tonnes gross vehicle weight that we operate is fitted with:

- Indirect vision aids such as reversing cameras to minimise the rear blind-spot

<Insert company name> will ensure that each of our drivers:

- Is trained in the use of the vehicle safety equipment PRIOR to first using a vehicle with it fitted
- Understands the process for checking the vehicle safety equipment as part of the daily walk round check process
- Understands the process for reporting defects to the equipment

This policy is a ‘living’ document and as such will be updated on an ongoing basis. <insert person name> is the person responsible for the maintenance of this policy, its communication and implementation.
## Example driver daily walk around check sheet

<table>
<thead>
<tr>
<th>Date:</th>
<th>Drivers Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Reg:</td>
<td>Trailer Fleet/ Serial No:</td>
</tr>
<tr>
<td>Odometer Reading:</td>
<td></td>
</tr>
<tr>
<td><strong>Daily check items</strong></td>
<td></td>
</tr>
<tr>
<td>Shift Check</td>
<td>*items apply to articulated vehicles</td>
</tr>
<tr>
<td>Fuel/oil leaks</td>
<td>Wipers</td>
</tr>
<tr>
<td>Battery security (condition)</td>
<td>Washers</td>
</tr>
<tr>
<td>Tyres and wheel fixings</td>
<td>Horn</td>
</tr>
<tr>
<td>Spray suppression</td>
<td>Excessive engine exhaust smoke</td>
</tr>
<tr>
<td>Steering</td>
<td>Brake hoses*</td>
</tr>
<tr>
<td>Load security</td>
<td>Coupling security*</td>
</tr>
<tr>
<td>Mirrors</td>
<td>Electrical connections*</td>
</tr>
<tr>
<td>Lights</td>
<td>Brakes</td>
</tr>
</tbody>
</table>

Report defects here: Rectified:

Write NIL here if no defects found: Driver Signature:

Defects rectified by: Date:

Signature:
Notes
Disclaimer

This guide is issued by the CLOCS working group. Following the guide is not compulsory and you are free to take other action. Regulators seek to secure compliance with the law and may refer to this guide as illustrating good practice.
About CLOCS Guides

This guide is part of a series of documents developed by the CLOCS working group. The guides are designed to help construction sector clients and logistic operators implement and comply with the CLOCS Standard for construction logistics: Managing work related road risk.