Best practice guidance

Protecting vulnerable road users from vehicle blind spots

Produced by:

Brake
the road safety charity

fleetsafetyforum

Brake provides guidance for fleet managers to help them manage their road risk through its Fleet Safety Forum. This report contains guidance on protecting vulnerable road users from collisions caused by blind spots on cars, vans and larger vehicles. Brake thanks Aviva for sponsoring.

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Introduction

If someone in a vehicle is in a collision, they have the frame of the vehicle, and often other features like airbags and crumple zones, to help absorb the force of the crash and provide protection. If someone on foot, bicycle, motorcycle or horse is in a collision, they are exposed to the full force of the impact.

Vulnerable road users (people on foot, bicycle or motorbike) account for half (50%) of all road deaths worldwide.[1] In 2012, 866 vulnerable road users were killed and 13,781 were seriously injured on UK roads – that's 40 deaths and serious injuries per day, 60% of all UK road deaths and serious injuries.[2]

Because of the vulnerability of these road users, drivers have a responsibility to drive in a way that minimises the risks their vehicles pose. Employers have a legal duty of care to do everything they can to ensure that employees driving for work are not putting themselves or members of the public in danger. Employers can educate staff on the importance of this, and implement measures to ensure their vehicles are as safe as possible.

About blind spots

Blind spots are areas around a vehicle that a driver cannot see by looking through the windows or standard mirrors. They can result in a driver failing to notice hidden road users or hazards while manoeuvring, with potentially fatal consequences.

Blind spots can exist to the front, rear and sides of vehicles. All vehicles have blind spots, but on larger vehicles they are much bigger. Every year about 400 people are killed in EU countries when drivers fail to see people or objects in their blind spots while manoeuvring. Most of the victims are pedestrians, cyclists and motorcyclists.[3] 75% of cyclist collisions in Britain occur at or near junctions when vehicles are turning.[4]

Vehicle type	Cars	HGV	LGV	Bus or Coach
Number of casualties in which blind spot was a contributory factor	1,012	450	155	30

Vehicle blind spots was recorded as a contributory factor in 1,734 crashes in the UK in 2012, including 21 fatal crashes.[5] The table above shows these by type of vehicle.

Different blind spots cause different problems depending on the manoeuvre and the vehicle type. Manoeuvres that can be affected by blind spots include:

- reversing – blind spot immediately behind;
- changing lanes or overtaking – side blind spot, blind spots behind A-pillars on the rear window on cars and, for large vehicles, blind spot immediately behind;
- pulling away at a crossing – blind spot immediately in front;
- turning at junctions – blind spots behind A-pillars each side of the windscreen and side blind spot.

Raising awareness

It is vital that drivers of all vehicles are aware of their responsibility to protect and look out for vulnerable road users, and how to go about this. Your road risk policy should explain what steps your organisation is taking to prevent blind spot crashes and what is expected from drivers.

You should carry out ongoing awareness-raising, such as displaying posters, and including information and tips on safe driving and manoeuvring in staff briefings. The driver advice sheets accompanying this report can be provided to drivers to aid this.

Drivers should be educated on the importance of safe manoeuvring and checking blind spots, and trained on how to manoeuvre safely and use any blind spot devices fitted to vehicles. You must ensure that blind spot devices are never seen by drivers as a substitute for safe and careful driving.

Drivers should also be taught how to minimise the need for risky manoeuvres, and how to manoeuvre safely when necessary. These principles should be included in driver handbooks and covered in induction and refresher training, and should include:

- reverse into parking spaces, rather than out of them, to reduce the risk of hitting a person or another vehicle;
- avoid reversing whenever possible – for example by continuing on to the next roundabout rather than doing a three-point turn if you take a wrong turning;
- never overtake unless absolutely essential and you are certain it is safe;
- if you have to manoeuvre, do so extremely slowly and cautiously and keep checking around you;
- remember to check twice and look longer for other road users at junctions, especially cyclists and motorbikes;
- remain alert even in stationary traffic and be aware of vulnerable road users who may be weaving their way through traffic or position themselves in a blind spot;
- be mindful that obstacles such as puddles and pot holes, or high winds, may cause a cyclist to shift direction suddenly;
- wait for the right moment to pass cyclists and give them plenty of space when overtaking; and
- be aware of passing cyclists when opening doors.

Formal education and training should be given, as a minimum: on recruitment; when an employee changes the vehicle they drive; and if an employee is involved in a collision or incurs points on their licence. See Brake's fleet service directory for some training providers.

Driver training should cover the importance of slower speeds when driving or manoeuvring. Brake has produced several resources on managing at-work driver speed, available for free to Fleet Safety Forum subscribers.

For further guidance, see Brake publication 'Driver assessment and monitoring', 2006.

Risk assessments

You should analyse the types of journeys and manoeuvres your drivers make. For example, a truck making town centre or home deliveries will carry out different manoeuvres in different environments (and therefore pose different risks) than one making long distance journeys between depots designed for commercial vehicle use. Analyse where and when blind spot crashes are likely to happen, and with which vehicle types, to help decide what measures should be taken.

Recording and analysing crash data

Analysing the extent and causes of previous company incidents will help you make informed decisions about the most effective measures to manage risk, including blind spots. Even minor bumps and scrapes should be recorded and investigated. For example, scraping a wall may seem minor, but it could indicate a lack of training or inadequate blind spot aids, which in the future could lead to a serious incident.

For further guidance, see Brake's publication 'Reporting and recording crash data', 2006.

Journey planning

Journeys and routes should be planned to avoid town centres, residential areas and schools, as there are likely to be lots of vulnerable road users in these areas, especially children. Routes should be planned to stick to motorways and other major roads wherever possible: this is not only safer for drivers as these roads have a lower crash risk, but will also greatly lessen the risk to people on foot or bike as they are less likely to be sharing the same roads.

It can also create a more pleasant environment in local towns if your vehicles avoid driving through them – with less pollution, noise, congestion and danger – helping to benefit local communities and enhance your reputation. Many communities report being concerned about the volume and risk of traffic, especially commercial vehicle traffic, passing through their area.

If a driver must go through an area where vulnerable road users are likely, they should be instructed to slow down to 20mph or below, even where the speed limit is higher, and manoeuvre safely, as set out above under raising awareness.

Blind spot devices

Operators of vehicles of any size should consider buying or hiring vehicles with devices to reduce blind spot risk. Some devices can also be retrofitted.

Wide-angle and blind spot mirrors are available for all vehicle types and sizes and should be used in conjunction with existing mirrors. In Europe they are a legal requirement for vehicles weighing more than 3.5 tonnes – see below for details.

CCTV provides drivers with a view of the area behind or to the sides of the vehicle. The rear view system is activated when reverse gear is used, and the side view activated when the indicator is used. CCTV is most commonly used on trucks and buses, although some vans and larger cars (such as 4x4s) may also use CCTV for reversing.

Rear, front and side sensors detect objects in a certain area around the vehicle and use an audio or visual warning to alert the driver. Some models increase the rate of the beeping or flashing LEDs if the vehicle moves closer to the object detected. Rear sensors are automatically activated when reverse gear is used, side sensors are activated when the indicator is used and front sensors are activated at low speeds (1-7mph), or can be activated manually. Sensors can be used on all vehicle types.

Automatic side mirrors automatically move outward when the vehicle turns to provide the driver with a view of side blind spots, and are suitable for all vehicle types.

Reversing alarms are activated when vehicles are put into reverse. They can automatically adjust in volume in accordance with background noise. Some alarms use directional sound only audible by a person standing behind the vehicle, to minimise noise pollution in residential areas. Reversing alarms are recommended for commercial vehicles by the health and safety authorities in several countries, including the UK[6] and USA.[7] However, alarms alone should not be relied upon by drivers – they should be aware of what is behind them and not assume people will move out of the way. A person with impaired hearing might not hear the alarm and a child might not know what the sound means.

Fresnel lenses, made of thin, clear plastic, can be fitted to a window to enhance the visibility of blind spots directly below and behind the cab on commercial vehicles.

Choosing safer fleet vehicles

As well as using cameras, mirrors and other technology to eliminate blind spots, fleet managers should, when choosing vehicles, look for models designed to minimise blind spots. For example, some cars and vans have smaller A-pillars than others. Sports utility vehicles (most 4x4s) tend to have larger blind spots on all sides than cars, due to their height. This should be considered when purchasing or leasing fleet vehicles, and communicated to drivers using their own vehicles for work. Some buses, coaches and trucks may have lower windscreens than others, minimising the blind spot immediately to the front. Fleet buyers should also look for vehicles with blind spot-minimising technology fitted, such as the devices listed above.

As well as considering vehicle blind spots, fleet buyers should consider how well vehicles protect vulnerable road users. Some vehicles have features like soft bumpers, which are less likely to cause death or serious injury in a collision. Safety testing body Global NCAP recommends that fleet managers commit to buying cars and vans with the highest safety rating, which includes rating for pedestrian protection.[8] For commercial vehicles, check with the manufacturer what features are available.

Engaging the community

If there are roads local to your organisation's sites where you think vulnerable road users may be particularly at risk (such as due to a lack of safe paths/pavements, fast traffic, or risky junctions), or where local people have expressed concerns, you could take an active role in improving these. You could lend your support to local community campaigns as part of your corporate social responsibility programme, or write to your local authority yourself to express your concern and suggest improvements.

You could even take a direct role in improving sites, in conjunction with local authorities. For example, London construction project Crossrail funded, installed and maintains road safety mirrors at more than 50 junctions near its sites that it had assessed as high-risk for cyclists.

Your organisation could also get involved in awareness-raising schemes within the community, such as Exchanging Places (see below) or by taking part in Road Safety Week annually. See www.roadsafetyweek.org.

For further guidance, see Brake publication 'Protecting vulnerable road users', 2007.

Case study: Exchanging Places

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The Metropolitan Police Cycle Task Force runs a programme called 'Exchanging Places', which offers cyclists the opportunity to see the view from a lorry driver's perspective, and vice versa. As of May 2013, almost 4,000 cyclists have taken part in the programme.

The programme involves inviting cyclists into a truck with a high cab to see the blind spots for themselves. They discuss how drivers can miss seeing cyclists move into their blind spots: either by checking all mirrors too quickly, or checking thoroughly but looking in the mirrors on one side when the cyclist appears on the other. They advise cyclists to stay back and out of blind spot areas wherever possible and, if waiting by or in front of a vehicle at traffic lights, to make eye contact with the driver so they know he or she has seen them.

The Met Police also actively supports several training programmes for commercial vehicle drivers that include cycling on London roads. It works with several large vehicle fleets to run Exchanging Places events. Some companies who run the programme also encourage their drivers to go out on bikes, to experience first-hand the dangers cyclists face.

Feedback from cyclists has been incredibly positive: 95% say that they'll change their riding as a result. A video demonstrating the programme can be viewed at http://youtu.be/UN7mJR64tvs.

Tackling blind spots on large vehicles

Site planning and risk assessments

The best way for large vehicles to avoid collisions while manoeuvring is to avoid high-risk manoeuvres such as reversing whenever possible. Your road risk policy should state that the drivers of large vehicles should not reverse in areas where there are likely to be people nearby unless absolutely necessary and carried out with the utmost care. Drivers should be trained in how to minimise the need for high-risk manoeuvres.

Site assessments of areas where vehicles may need to reverse or manoeuvre, such as loading areas or bus stations, will identify possible improvements to reduce the need for high-risk manoeuvres. For example, you could introduce one-way systems, 'drive-through' loading and unloading positions, and large turning circles. These should be clearly marked and signposted. You could also use wall-mounted mirrors to reduce blind spots, and should review site furniture (such as posts and pillars) to ensure your site is free of dangerous obstructions that could make manoeuvring difficult.

You should ensure people on foot are kept out of areas where vehicles are manoeuvring. Reversing areas should be clearly marked with warning signs and road markings, and cordoned off with barriers if possible.

Legal requirements for commercial vehicles

Under European rules,[9] vehicles weighing more than 3.5 tonnes must have the following mirrors or "devices for indirect vision" (such as CCTV cameras) fitted:

- Class IV wide-angle mirror – these must cover 95% of the field of vision indicated in Area A of Figure 1
- Class V close proximity mirror (usually fitted above the passenger door) – these must cover 85% of the field of vision indicated in Area B of Figure 1.

Vehicles weighing more than 7.5 tonnes and manufactured after 2007 must also be fitted with Class VI front-mounted wide view mirrors, to help drivers see the blind spot directly in front of the vehicle. This is not a legal requirement for older vehicles, but it is good practice to retrofit them.

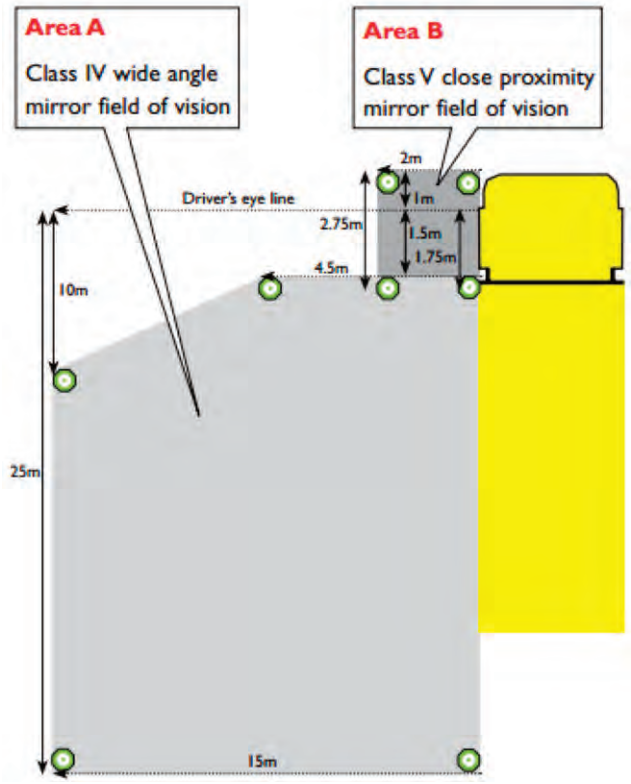

Figure 1: required field of vision complying with European Directive 2003/97/EC for class IV and class V mirrors. Source: Retrofitting mirrors to HGVs, Freight Transport Association, 2009 (reproduced with permission).

Fleet operators can read the relevant directives online by visiting the European Commission website ec.europa.eu and searching for Directive 2003/97/EC. Similar regulations are in place in some countries outside of the EU, such as Australia and New Zealand. Check with your local regulatory body to find out what regulations will affect vehicles in your country. You can also obtain technical advice from blind spot device manufacturers, like those listed in Brake's fleet service directory.

Under draft legislation approved by the European Parliament in April 2014, new trucks will have to comply with a new cab design including bigger windows and a more rounded front, to reduce the blind spot to the front and side of the cab. If approved by member state governments, these requirements will become compulsory for manufacturers seven years after the directive takes effect.

Using a banksman

As well as fitting devices to improve a driver's field of vision, it is advisable for truck, bus and coach drivers to use a banksman when reversing. The banksman should be properly trained to keep any reversing areas free of pedestrians and direct the driver to carry out manoeuvres safely, using an agreed system of signals.

Banksmen should be visible to drivers at all times and should stand in a safe position. They should wear high visibility clothing and ensure their signals can be seen clearly. Drivers should be trained to stop immediately if the banksman disappears from view.

Under-run guards

If a crash does occur, under-run guards at the rear and sides of large vehicles can help prevent serious injury or death by preventing pedestrians, motorbikes and cyclists from being dragged under the vehicle.

Under-run guards are a legal requirement in Europe for most trucks weighing more than 3.5 tonnes.[10] They are also a commercial requirement for all large vehicles, including those exempt from regulations, on some large construction projects such as London Crossrail.

Case study: CEMEX's review of large vehicle blind spots

Julie Welch, health and safety manager, CEMEX UK Operations Ltd
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CEMEX is a global building solutions company and supplier of cement, ready-mixed concrete and aggregates with a UK fleet of more than 300 heavy goods vehicles. It employs about 430 drivers in the UK.

CEMEX's cyclist awareness campaign started in July 2000 when one of its contractor's trucks was involved in a fatal collision with a cyclist. The cyclist's mother, Cynthia Barlow, campaigned for action to eliminate these types of incidents, and a review of driver blind spots around large goods vehicles (LGVs) was initiated.

Safety equipment

Recommended safety equipment was identified in consultation with drivers and experts. By 2004, additional signage, mirrors and proximity sensors were fitted retrospectively on existing vehicles operating within the M25. These items are now mandatory on all new CEMEX vehicles. Additional equipment is evaluated to ensure it complements driver skills and increases safety, without causing distraction.

In 2012 CEMEX launched a trial of in-vehicle safety cameras. The cameras record around the outside of the vehicle and in the cab, and the system records vehicle speed, g-force to identify hard acceleration or braking, and GPS location. The cameras were introduced to: reduce incidents; use camera footage for driver coaching; reduce insurance costs through improved post-incident information; and improve reputation through promotion of safety investments. Collisions reduced from 45 in 2011, before the trial, to 10 in 2012.

Education and awareness

CEMEX has introduced safe and fuel efficient driving (SAFED) training, with the message about protecting vulnerable road users reinforced regularly. All drivers are required to hold the MPQC driver skills card, an industry standard that endorses safe behaviour, and complete an additional vulnerable road user training module.

Since 2009 CEMEX has attended numerous Exchanging Places events, run by the Metropolitan Police and other organisations (see below). CEMEX has also initiated similar events and demonstrations independently.

Results

The most common incident involving cyclists and LGVs in London is where the vehicle is turning left and the cyclist is alongside the vehicle in a blind spot.[11] In the five years from 1999-2004, CEMEX vehicles were involved in several of these types of incidents, causing two deaths and four serious injuries. From 2004 to 2012, following the initial awareness campaign and safety improvements, CEMEX achieved a significant reduction in collisions with vulnerable road users.

Case study: Future developments: intelligent transport systems

Philippa Oldham, head of transport and manufacturing, IMechE

Intelligent Transport Systems (ITS) use information and communication technologies to make journeys safer and more cost effective. Some ITS technologies, such as satellite navigation in cars and traffic control systems on motorways and railways, are already in mainstream use.

ITS can be active, passive, or combined.[12] Active systems are crash avoidance technologies that monitor the user, vehicle, environment, and transport network and can intervene as necessary. Passive systems mitigate or minimise the effects of a crash to enhance safety, e.g. an airbag.

LATERAL SAFE, a sub-project of the PREVENT Integrated Project (2004-2008), was co-funded by the European Commission and run by the Institution of Mechanical Engineers (IMechE). The aim was to introduce safety applications to be implemented by motor manufacturers into their vehicles. LATERAL SAFE's objective was to prevent collisions to the side or rear of vehicles, assisting the drivers' vision in adverse or low visibility conditions and blind spot areas. LATERAL SAFE applications include a lateral (side) and rear monitoring system (LRM), a lane change assistant (LCA) and a lateral collision warning (LCW). Figure 2 shows the information a vehicle with LATERAL SAFE applications will be interpreting.

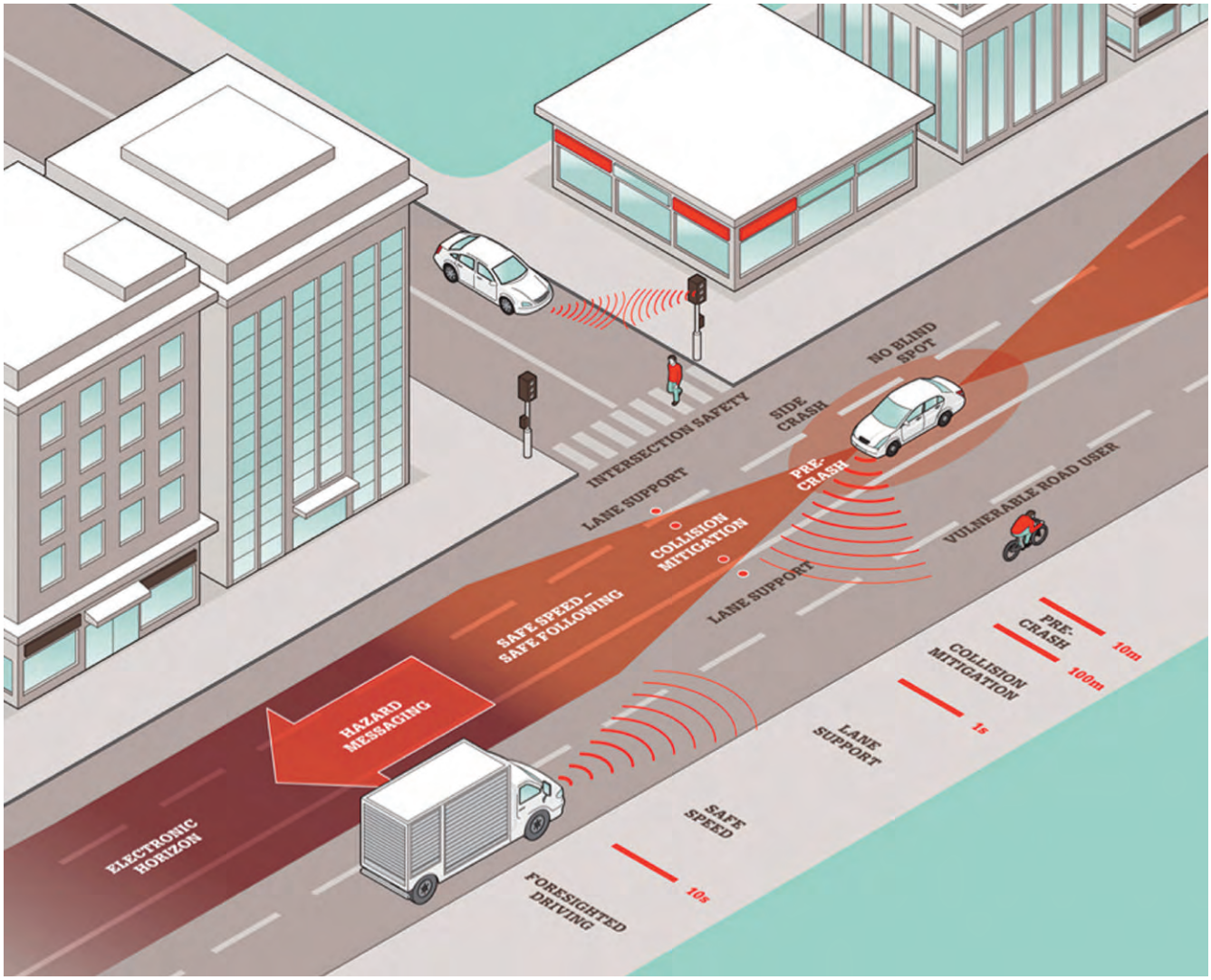

Figure 2: LATERAL SAFE coverage. Source: Intelligent Transport: Intelligent Society, Institution of Mechanical Engineers, 2012 – reproduced with permission.

Since the LATERAL SAFE project was completed in 2007 some systems have begun to emerge as add-on products or systems in new vehicles.[13] For example, the BMW 3 Series Touring has wing-mirrors that flash when the vehicle is changing lane or turning and there is a hazard in its blind spot. A US company, PreView Radar Systems, sells side object detection systems to large distribution customers to help minimise similar incidents.

Conclusions and recommendations for fleets

- All vehicles have blind spots, but they are larger and therefore may pose a particular risk to vulnerable road users on larger trucks and buses. Fleet managers should ensure appropriate safety kit is fitted to all vehicles.
- Awareness-raising, such as displaying posters and including safety information in staff briefings, can help to remind drivers of the importance of protecting vulnerable road users.
- Fleet managers should complete risk assessments to determine which of their vehicles are most affected by blind spot risk, based on vehicle size and types of routes they are driven on.
- All crashes, scrapes and near misses should be recorded, as even minor incidents such as scraped sides or clipped wing mirrors may indicate a need for driver training on safe manoeuvres or other interventions such as improved policies or site design improvements.
- Drivers should be educated on the importance of safe manoeuvring and checking blind spots, and trained on how to avoid risky manoeuvres, manoeuvre safely when necessary, and how to use any blind spot devices fitted to vehicles, with refresher training provided on a regular basis.
- As much as possible, journeys should be routed to avoid areas with more vulnerable road users, or where risky manoeuvres might be more likely, such as town centres and residential areas.
- Wide-angle and blind spot mirrors, CCTV, rear, front and side sensors, automatic side mirrors, and reversing alarms are available for various types of vehicle. Fleet operators should implement devices suitable to their vehicle types.
- Fleet operators should be aware of and comply with laws to help protect vulnerable road users. Under EU law, trucks weighing more than 3.5 tonnes are legally required to have some safety devices fitted, including extra mirrors and under-run guards. Similar requirements exist in many other jurisdictions worldwide.
- Where safety devices are not legally required, fleet managers should still consider fitting them to ensure their vehicles are as safe as possible.
- When selecting vehicles to lease or buy, or advising employees who use their own vehicles for work, fleet managers should select vehicles with smaller blind spots or blind spot-minimising technology fitted, and features designed to minimise the harm to vulnerable road users in a collision.
- Fleet managers should keep up-to-date with the latest technology in this fast-moving area, and implement new technologies where available and appropriate. Information on the latest research and developments is available through Brake's fortnightly Target Zero email newsletter to subscribers, and in Brake's research library.

Brake, the road safety charity, produces guidance, research and resources for fleet and road safety professionals through its Fleet Safety Forum and Brake Professional website. It runs a programme of events sharing best practice and research on a range of road risk topics. Find out more and subscribe at www.brakepro.org/join.

End notes

1 *Global status report on road safety, World Health Organisation, 2013*
2 *Reported road casualties Great Britain 2012, Department for Transport, 2014*
3 *Fitting Blind-Spot Mirrors on Existing Trucks: A Consultation Paper, European Commission, 2006*
4 *Reported road casualties Great Britain 2012, Department for Transport, 2014*
5 *Reported road casualties Great Britain 2012, Department for Transport, 2014*
6 *Vehicles at work: Reversing, Health and Safety Authority, http://www.hse.gov.uk/workplacetransport/factsheets/reversing.htm*
7 *Safety and Health Regulations for Construction, Occupational Safety and Health Authority https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10768*
8 *2003/97/EC, 2005/27/EC and 2006/96/EC*
9 *Vehicle Approval (NA) Manual for Categories 01, 02, 03 and 04, VOSA, 2013*
10 *Pedal cyclist collisions and casualties in Greater London, Transport for London Surface Transport factsheet 2011*
11 *Global NCAP fleet safety guide and safer car purchasing policy 2014-2015*
12 *TRACE Review of Crash Effectiveness of Intelligent Transport Systems sl. Information Society Technologies, 2007 Project No.027763-TRACE*
13 *Intelligent Transport: Intelligent Society, Institution of Mechanical Engineers, April 2012*

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Advice for truck, bus and coach drivers

Protecting vulnerable road users from blind spots

Pledge

An initiative by: Brake the road safety charity

All vehicles have blind spots, and it's vital you understand yours and how to minimise the risks they pose. Failing to see people and things in your blind spots can lead to costly damage or, worse, death or serious injury, and potentially you losing your job, licence or being prosecuted.

You have a responsibility to look out for other road users, particularly pedestrians, cyclists and motorcyclists, who are more vulnerable, and especially children, who can act unpredictably and may not understand how a vehicle will manoeuvre.

People on foot, bicycle or motorbike account for half (50%) of all road deaths worldwide.[1]

Before setting off

Familiarise yourself with your blind spots, especially in vehicles you are new to. Think about what manoeuvres might be affected by blind spots and how you could avoid these or reduce the risk. For example: the side blind spot can be a risk when changing lanes or turning at junctions and blind spots immediately in front of large vehicles can pose a danger when pulling away at crossings.

Larger vehicles may have extra devices such as wide-angle mirrors, under-run guards and reversing alarms fitted to comply with regulations and make them safer. Know what devices are fitted to your vehicle and how to use them. Let your manager know if you haven't received training on this. However, don't rely on these devices. You also need to avoid risky manoeuvres, drive and manoeuvre slowly and cautiously, and stay alert.

What you can do...

- ✔ know the vehicle, where its blind spots are and which manoeuvres are affected
- ✔ know how to use blind spot devices but don't be overly reliant

Manoeuvre safely

The biggest danger to vulnerable road users caused by blind spots is when you are manoeuvring, such as changing lanes, reversing, or turning. Three-quarters of cyclist crashes in Britain are at or near junctions.[2] Up to a dozen cyclists can be concealed in the side blind spot of a large truck.[3]

Some manoeuvres, such as reversing and changing lanes, should be avoided whenever possible. If they can't be avoided, proceed very slowly and carefully, checking all around and using mirrors and other devices.

Your company should provide a trained banksman to keep manoeuvring areas clear of pedestrians and direct you to carry out on-site manoeuvres safely. You should receive training on how to follow a banksman's directions – ask your manager if unsure.

It is up to you to check the space around your vehicle is clear before and during any manoeuvres. But you should also tell your manager if the design of a site is making manoeuvring difficult, or your route is causing unnecessary risky manoeuvring, or you feel you need extra training.

What you can do...

- ✔ avoid high-risk manoeuvres such as changing lanes or reversing whenever possible
- ✔ check around carefully before and during a manoeuvre, and take it very slowly
- ✔ check twice and look longer for other road users at junctions, especially cyclists and motorbikes
- ✔ keep windows and mirrors clean and clear
- ✔ use a banksman if provided
- ✔ tell your manager if you think you need further training, or if a site's layout or your routing is making manoeuvring risky, or causing you to make risky manoeuvres

Make the Brake Pledge

Everyone can make the Brake Pledge. It's a Pledge to do simple things to protect you and people around you, build happier communities, and help save the planet. Drivers pledge to follow six golden rules by driving:

slow – within speed limits, and slowing right down for built up areas, bends and bad weather

sober – free from alcohol and drugs

sharp – alert, awake and with good vision

silent – phone off and out of reach

secure – belted up in a safe vehicle

sustainable – only when you have to

Sign the Brake Pledge online at **www.brakepro.org/pledge** to show your commitment to road safety.

End notes

1 *Global status report on road safety, World Health Organisation, 2013*
2 *Reported road casualties Great Britain 2012, Department for Transport, 2014*
3 *Lorry blind spots, Transport for London, 2010. Video available at: http://www.youtube.com/watch?v=wzL0Kyk4m-8*

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If your vehicle has equipment to minimise blind spots, such as extra mirrors or parking sensors, know how to use them. Let your manager know if you haven't received training on this. However, don't rely on these devices. You also need to avoid risky manoeuvres, drive and manoeuvre slowly and cautiously, and stay alert.

What you can do...

- ✔ know the vehicle, where its blind spots are and which manoeuvres are affected
- ✔ know how to use blind spot devices but don't be overly reliant

Manoeuvre safely

The biggest danger to vulnerable road users caused by blind spots is when you are manoeuvring, such as changing lanes, reversing, or turning. Three-quarters of cyclist crashes in Britain are at or near junctions.[2] Cyclists and other small vehicles can travel several metres while hidden from view by the pillars on each side of your windscreen.

Some manoeuvres, such as reversing and changing lanes, should be avoided whenever possible. If they can't be avoided, proceed very slowly and carefully, checking all mirrors and other devices and looking over your shoulders.

When parking, it is safer to reverse into spaces: you are less likely to hit someone or something.

What you can do...

- ✔ avoid high-risk manoeuvres such as changing lanes or reversing whenever possible
- ✔ check around carefully before and during a manoeuvre, and take it very slowly
- ✔ check twice and look longer for other road users at junctions, especially cyclists and motorbikes
- ✔ reverse into parking spaces, not out
- ✔ keep windows and mirrors clean and clear
- ✔ remain alert for cyclists or motorbikes weaving through stationary traffic
- ✔ be aware of passing cyclists when opening doors

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