



SPA  
Future  
Thinking

Transport for London



# TfL Driver Distraction

## Research debrief

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# Background, research objectives and methodology

innovation

intelligence

inspiration



# → Project background

- Transport for London (TfL) works with freight operators to reduce the risks posed to cyclists, pedestrians and other road users through various measures
- The market for vehicle safety equipment has been developing over several years. Anecdotal evidence suggests that products have developed from a variety of origins, and that the way freight operators have implemented the introduction of vehicle safety equipment has varied considerably between companies
- TfL is therefore seeking to gain a more detailed understanding of the advantages and potential drawbacks of vehicle safety equipment to inform its strategy on increasing vehicle safety





# → Research objectives

We spoke to depot managers, drivers, manufacturers and went on accompanied journeys with drivers to understand the following key objectives

- Whether driver distraction is an issue within the freight industry (and if so, to what extent)
  - What distracts drivers when they are working, including in-cab and external factors
  - What measures could be implemented to mitigate the risk of driver distraction
- Drivers' views and experiences of using safety equipment
- The potential perceived / real safety benefits of different types of safety equipment
- The market for safety equipment including what products are available and how they have been developed

# → Sample and methodology

We spoke to depot managers, drivers and manufacturers in order to get a fully rounded view on the issue of driver distraction

Managers	Drivers	Manufacturers*
<b>7 x 20 min tele-depths with depot managers</b> <b>5 x Gold companies</b> <b>2 x Bronze companies</b>	<b>3 site visits consisting of 4 hour breakout sessions with drivers (we spoke to between 5-10 drivers per break out session depending on availability)</b> <b>4 x accompanied journeys and 2 cab tours, across 5 depots</b>  <b>83 completed paper surveys from 9 depots</b>	<b>6 x 15-20 min manufacturer tele-depths. In addition thorough desk research was carried out looking at the range and breadth of manufacturers in the market</b>

**\*This audience is covered in a separate report, but overall findings are referenced in this presentation**

Fieldwork took place between the 14<sup>th</sup> of October and the 22<sup>nd</sup> of November 2013, and was conducted by [REDACTED]  
[REDACTED] of SPA Future Thinking



# Key findings

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# Overview of response

There was an overwhelming sense that safety equipment is of benefit to both drivers and other road users

**Necessity:** Managers and drivers largely recognise the importance and value of safety equipment

**Protection:** London roads are at capacity and safety equipment provides an extra layer of protection for drivers and other road users

**Potential to distract:** The majority felt that equipment was not distracting and the benefits far outweigh any potential issues

**The future:** Manufacturers hope that integrated, 'intelligent' systems will increase safety whilst reducing the individual pieces of equipment drivers are required to monitor

**At its limit:** A sense that the level of equipment has now reached a point where any more could result in overloading drivers

**Only what is needed is fitted:** If safety equipment is deemed a distraction or not adding value then it is discussed with the depot and potentially removed

**Limitations:** However, drivers believe other road users need to take responsibility too – road safety is the responsibility of all road users





# Help or hindrance

Safety equipment is most definitely considered a help rather than a hindrance

There was an overwhelming sense that safety equipment is of benefit to both drivers and other road users ✓

There was no real perception that it distracts drivers or prevents them from concentrating when on the road ✓

This was the case for the depots of both Gold and non-Gold companies, and views were similar amongst both drivers and managers ✓

*"Operating lorries is a dirty and dangerous game and so it's vital that safety is a part of the culture of our business. We need to protect both our workforce and the public"*  
Manager, Gold

*"I do everything I can to not be distracted, when I am in my cab I am just driving, nothing else, and the safety equipment adds a level of security, for example all round vision"*  
Driver





# Safety equipment in context

Drivers are constantly bombarded by stimulus. Safety equipment is another thing for them to manage and be aware of but it is not felt to impact negatively on their driving

A word cloud of various driving stimuli. The words are arranged in a circular pattern around the central text 'Safety Equipment'. The words include: Music, Taxis, Sat Nav, Timings, Rotating billboards, Pedestrians, Cyclists, Buses, Radio, and Cars. The words are in different colors (purple, brown, orange) and orientations (vertical, horizontal, diagonal).

- Drivers are professionals and take their work very seriously
- They are very focussed and fully aware of the power and potential damage their vehicles can cause
- They learn to manage stimulus, and filter out distractions, focussing solely on the road ahead of them and potential hazards in their path
- Safety equipment can help them in this task (even if sometimes it can constitute a minor distraction in itself!)



# Key beneficiaries of safety equipment

3 distinct audiences were identified as benefiting from safety equipment

## Drivers

- Safety equipment provides confidence and reassurance to drivers
- Having safety equipment fitted to vehicles has a positive impact on driver mind-set / awareness – the equipment constantly alerts drivers to any potential safety issues, thus acting as a regular reminder to check and double check their position in relation to other road users
- For the most part, equipment is felt to make driving easier not harder – it enhances their view of the road, and covers blind spots

## Other road users (including cyclists)

- Both drivers and managers understand the importance of safety equipment in helping to minimise risk, particularly when driving in central London
- Safety equipment makes drivers more aware, thus impacting on the safety of other road users
- In addition, some specific pieces of equipment are designed solely to alert the public to the presence of the vehicle, making them aware of potential dangers

## The company

- In commercial terms, companies install safety equipment in order to fulfil the terms of certain contracts – if they don't have this equipment they won't be allowed on site
- Having this equipment also demonstrates to potential clients that they are a reputable, safe and conscientious company
- Many managers feel strongly that it is their duty to protect drivers and other road users in any way they can, and safety equipment is a tangible expression of this ethos



# Cyclists as beneficiaries

- Cyclists in particular are at the forefront of drivers minds, particularly when driving in London
- In sharing the road with cyclists and other road users drivers adopt a careful and cautious approach to their work
- Constant vigilance is key, and safety equipment is considered to be a powerful asset in helping drivers to stay alert at all times

*"The most important thing is safety, for me and for others ... I would rather get there late and safe"*

*"These are 44 tonne killing machines, you have to drive carefully"*

*"All the time you are looking out for cyclists who think you can stop like a car"*

*"I try to remain courteous at all times and to plan ahead"*

*"Before I move anywhere I look at every angle"*

*"I don't do anything else, I just drive"*

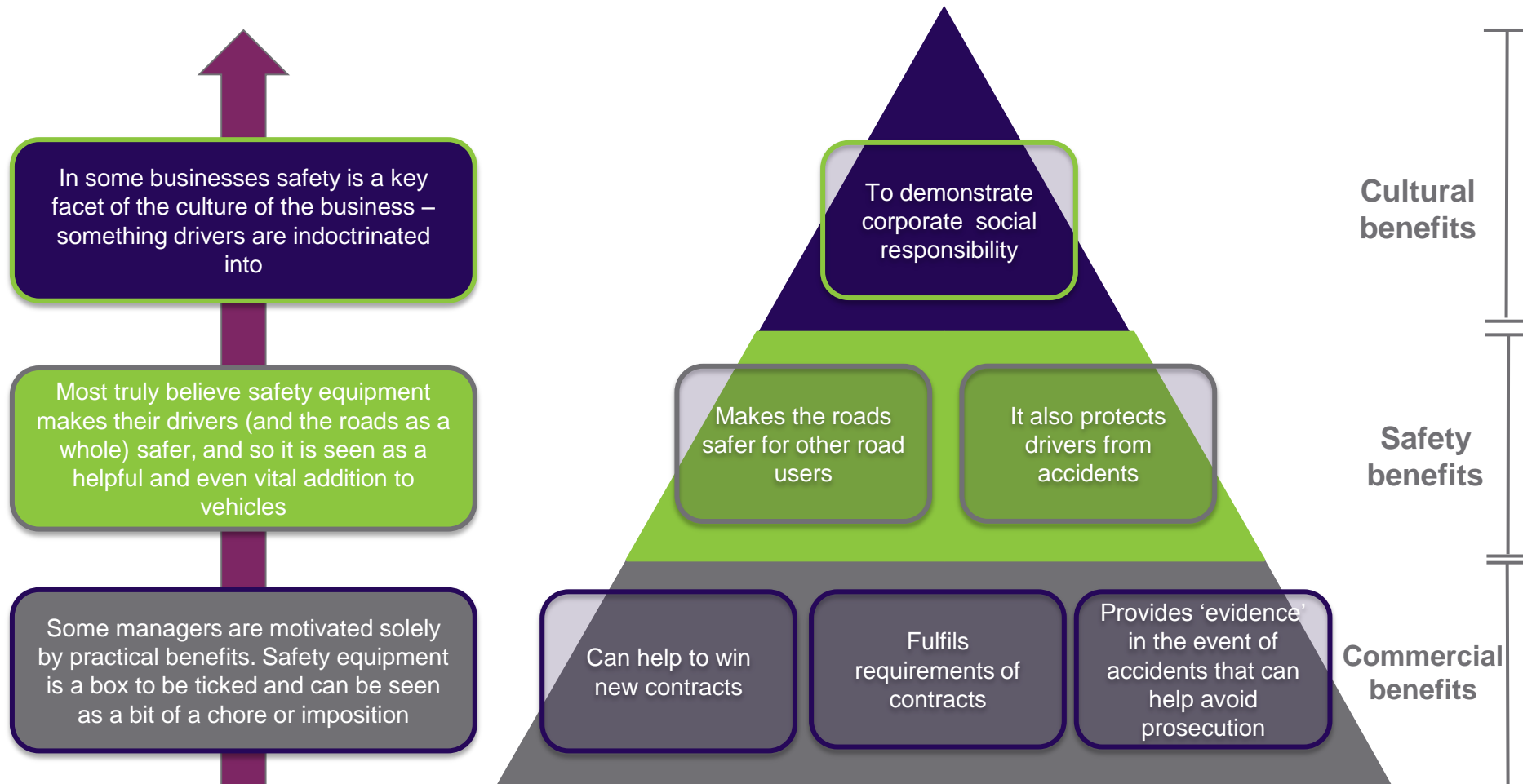
*"You can never have too much safety"*





# Manager attitudes

Manager attitudes towards safety equipment can inform the entire culture of a depot – if managers buy into it wholeheartedly then drivers will too...





# Driver attitudes

For the most part, drivers are even more enthusiastic about safety equipment than their managers, given their first hand experience of the benefits they provide

## Enhances drivers view of the road

Cameras and sensors provide a view of large areas of the exterior of the vehicle that cannot be seen in mirrors

## Keeps driver aware

Safety equipment constantly alerts drivers to any potential safety issues which ensures that they drive as safely as possible

**77%** of drivers agree the equipment in their work vehicle makes them more aware of dangers

**82%** of drivers agree equipment contributes to the safety of themselves and others

## Peace of mind

Safety equipment gives drivers confidence that every precaution has been taken to ensure the safety of themselves and others. If the worst does happen there is a record of the incident

## It is simply part of the job

Most drivers are so used to driving with safety equipment that it has become fully integrated into the way they drive and the checks they make





# Driver attitudes

Age / length of time driving can impact on initial response to safety equipment, but all come to accept it in the end...

New Drivers have never known any different and feel safety equipment is something they couldn't live without

*"I passed my test 18 months ago, so this is all I've ever known. There is no way I'd drive without the cameras now. In fact, if they're not working for whatever reason I'll pull over and wait for them to reboot"*

Driver

Those who have been driving for many years find it harder to adapt – the process of acceptance can be slightly more protracted than for new drivers

## Initial scepticism

- Some initial concern that features such as cameras were installed to spy on drivers, rather than for safety reasons
- Others were cynical of the benefits, arguing that they had been driving for many years without the need for safety equipment
- In some cases managers have had to adopt a 'softly softly' approach to placate drivers
- N.B. Driver distraction is not an issue raised by drivers as an objection to the installation of safety equipment

## Eventual acceptance

- Once equipment is installed drivers quickly realise the benefits and come to accept (and even appreciate) its presence

**80% of drivers agree that all freight vehicles should be fitted with safety equipment**

*"I kicked up a bit of a fuss – I thought safety was being used as an excuse to spy on me! Now I can't imagine driving without the cameras"* Driver



# Preventing accidents

Whilst managers were reticent to state that safety equipment had 'prevented' accidents, drivers were able to recall examples of when they were alerted to something that might otherwise have resulted in an incident

## Managers

- There was a strong feeling among managers that safety equipment helped 'minimise risk' to both their own drivers and other road users, and that because of this, having equipment on board is important
- Although there was a sense that equipment had had a positive impact on safety managers were yet to see statistically evidence of this

## Drivers

**41%** of drivers admitted to having avoided a near collision due to the safety equipment in their vehicle

*"I've seen cyclists in my camera and had to brake suddenly. They don't realise the blind spots we have, and there would be even more without the cameras"*

Driver

*"I missed a cyclist in my mirror and was alerted by the side sensors as I turned left. Who knows what could have happened...!"*

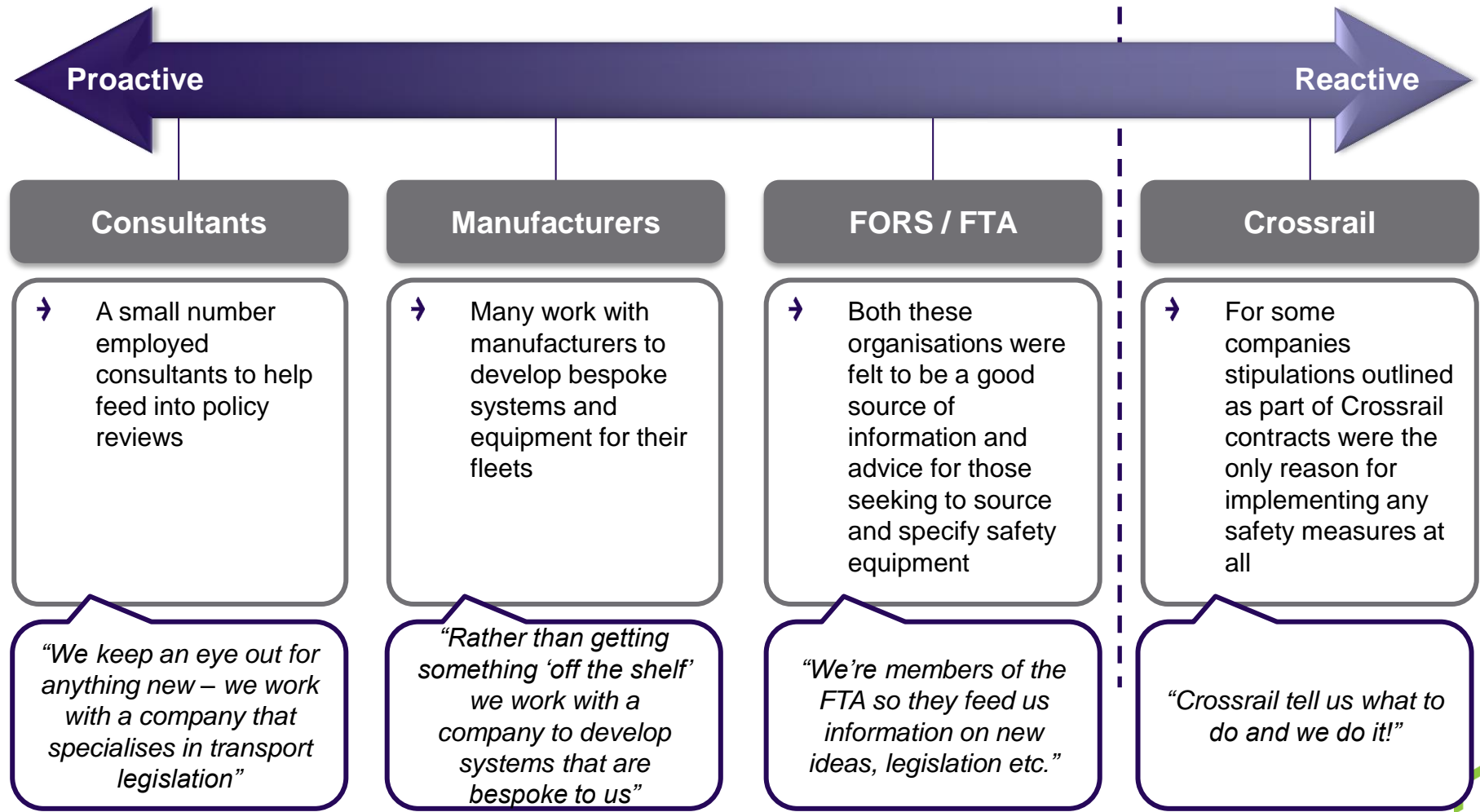
Driver





# Staying up to date

Given the numerous benefits (in terms of perceived safety and company reputation) it is not surprising that many (not all) managers are keen to stay 'ahead of the game' when it comes to safety equipment





# Issues with safety equipment

Safety equipment is continually assessed and re-assessed – for the most part it works really well, but if it doesn't, depots aren't afraid to take it off

There is a constant dialogue between managers and drivers, regarding the usefulness of individual pieces of equipment

If any piece of equipment is found to be distracting, or is thought to be surplus to requirements, it is simply removed

This doesn't happen very often, but there were a couple of examples in the depots we visited



*"We had Fresnel Lenses, but once we had side cameras installed our drivers were saying the lenses weren't needed anymore and that they actually blocked the window view, so we took them out"*

Manager



# Safety equipment training

Training is an important way of educating drivers and managers on the benefits of safety equipment. Many felt that although they'd already received training more would be valuable

Managers and drivers attend a lot of training already as part of their FORS membership but they are open to attending more

**86%** of drivers have received safety equipment training

**20%** think there is not enough information/ training provided



*"The safest thing is a well trained driver, we take training very seriously"*  
Depot Manager

However, they are also keen to see TfL and the government enforce cyclists and other road users to attend training so that the onus isn't simply on drivers



*"Other road users also need educating about how much room HGV's need to manoeuvre and blind spots that they have."*  
Driver



# The distraction ‘tipping point’

Most managers and drivers were certain that equipment had no negative impact on driver concentration or ability. However, there is a ‘tipping point’ that is fast being reached

*“At the moment it helps them [drivers], but there are only so many monitors, mirrors and buzzers you can pay attention to before it must start getting in the way of your driving”*

Manager, Bronze

**69%** of drivers have more than 5 pieces of safety equipment in/on their vehicle



There was a sense amongst some companies that vehicles may have reached the point at which if it was increased any further it could potentially begin to impact on drivers

**10%** agree that there are too many different pieces of safety equipment to monitor, which they find overwhelming





# The future

Manufacturers seem to be responding to this fast approaching 'tipping point', with developments focussed on one of two areas

## Augmentation of existing product categories

Increasing sensitivity and scope of current systems



- Side sensors designed specifically to recognise cyclists (currently, some systems are a little over sensitive and activate as vehicles drive past lamp posts or under bridges) eg Proximity Sensors from Backwatch
- Enhanced cameras that provide a wider field of vision than standard systems eg MotionEye from Vision Techniques

## Integrating systems



Reducing the number of checks the driver is required to make

- Systems that link side sensors to cameras, so that the driver display shifts to the correct view as the alert is activated eg Turn Safe from Vision Techniques
- Enhanced systems that stream data from all cameras on the vehicle to produce one 360 degree image. This allows the driver to see the surroundings of the vehicle more clearly and quickly than 4 separate camera views eg 360 Omnivue from Trailer Vision



# The limitations of safety equipment

It is clear that safety equipment is considered helpful; however, there was a strong feeling that safety equipment on freight vehicles can only do so much to improve safety on the roads

Managers

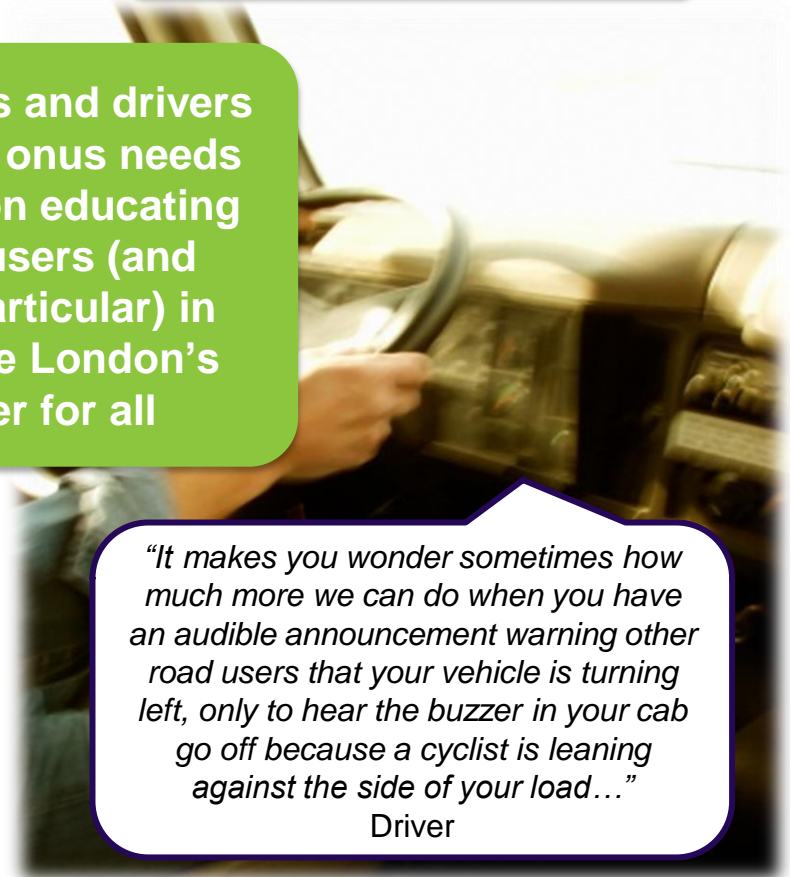


Both managers and drivers feel that more onus needs to be placed on educating other road users (and cyclists in particular) in order to make London's roads safer for all

*"There is far too much emphasis put on the haulier, rather than other road users. I have spent thousand of pounds kitting out my lorries and training my drivers, yet cyclists ride around London without any sort of licence or training"*

Manager

Drivers



*"It makes you wonder sometimes how much more we can do when you have an audible announcement warning other road users that your vehicle is turning left, only to hear the buzzer in your cab go off because a cyclist is leaning against the side of your load..."*

Driver



# Safety equipment in detail

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# Reviews of safety equipment

The majority of drivers surveyed find each piece of safety equipment useful and essential with very few considering anything to be distracting

	Have fitted to vehicle	Considered useful	Considered essential	Considered distracting
Side guards/skirts	✓ 94%	✓ 75%	✓ 82%	✗ 1%
Reversing beepers/alarms	✓ 94%	✓ 83%	✓ 80%	✗ 6%
Blind spot elimination mirrors/fresnel lens	✓ 89%	✓ 80%	✓ 77%	✗ 8%
Side sensors/side scanning system	✓ 71%	✓ 64%	✓ 53%	✗ 12%
Near side turning warning/side chat	✓ 71%	✓ 59%	✓ 59%	✗ 13%
Side marker lights	✓ 67%	✓ 75%	✓ 83%	✗ 2%
Cameras:				
Forward facing/recording	✓ 55%	✓ 59%	✓ 55%	✗ 5%
Near side blind spot	✓ 47%	✓ 51%	✓ 54%	✗ 7%
All round	✓ 51%	✓ 51%	✓ 54%	✗ 4%
Reversing	✓ 75%	✓ 77%	✓ 73%	✗ 2%

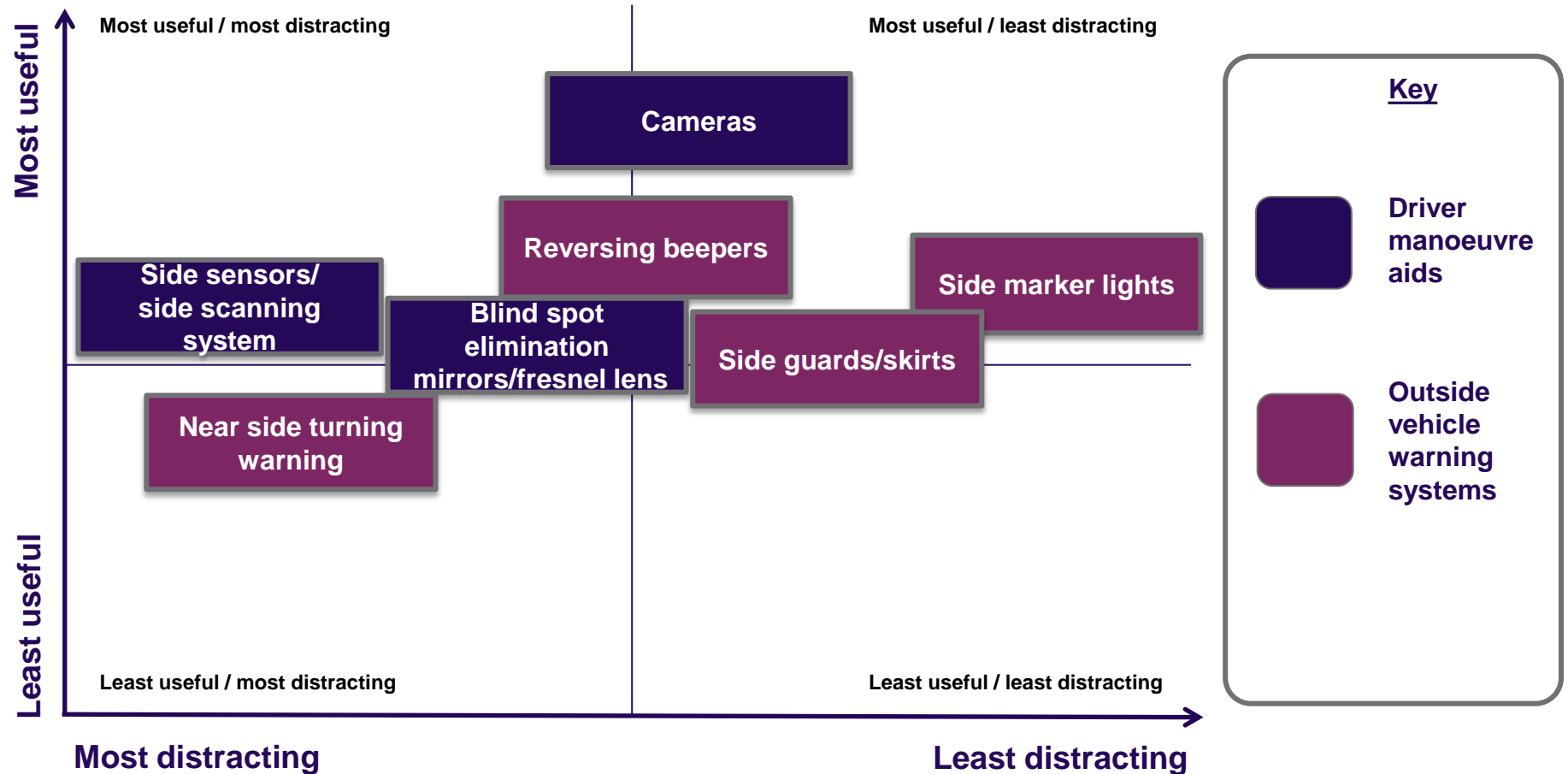
Almost all those who have cameras find them useful and essential





# Mapping safety equipment

Equipment can be categorised into one of two groups....





# Equipment categories

Driver manoeuvre aids are generally considered to be very useful, though they also have the potential to be more distracting



## Driver manoeuvre aids

- All pieces of equipment within this category were felt to be more useful than distracting
- For cameras and side sensors, we noted systems of varying degrees of sophistication. Generally, the more intelligent the system the more useful and less distracting it is deemed to be

## Outside Vehicle Warning Systems

- A strong sense that they are useful, and can heighten awareness, but that in many cases other road users ignore them
- There is no sense that this equipment in any way distracts drivers, given it is all external to the cab and is focussed on other road users rather than the driver



# Cameras

Of all the safety equipment researched, camera systems were possibly the most useful for drivers



- This picture clearly demonstrates the role the side camera plays in alerting drivers to potential hazards on the inside of the vehicle

**100%** of those with a forward facing camera, **97%** a near side camera, **93%** an all round camera and **95%** a reversing camera, find them to be useful

- Many drivers spoke enthusiastically about the benefits of cameras and how important they are for covering blind spots (see image on left)
- Forward/side/all round facing cameras are less common than other equipment however all but a few of those who have them find them useful
- Different drivers prefer different dashboard displays (some choose to display the side camera, and others the reversing camera)
- Generally split screen displays are felt to be too busy and cumbersome for drivers to pay attention to
- The concept of the display automatically altering as the vehicle changes direction was well-liked, particularly if this can be linked to sensor systems (so that the view changes as sensor systems are activated)
- A small minority felt displays on dashboards could potentially be distracting as drivers' eyes track from left hand to right hand mirrors. However, the benefits were felt to far outweigh any drawbacks

**Importantly though, monitors can always be turned off if drivers don't want to use them**



# Cameras

Each camera view has a role to play – all round systems have the potential to simultaneously be the most useful and the most distracting



75%

Reversing Camera

- Enables drivers to see everything behind them and to manoeuvre in tight spaces (e.g. on site)
- Some more sophisticated systems provide outlines to illustrate the area the vehicle will cover when reversing (see image)



55%

Forward Facing Camera

- Initially, some drivers felt these cameras were being used to 'spy' on their driving
- However, once drivers began using the equipment it was quickly welcomed as evidence should an incident occur



51%

All around camera systems

- All angles / blind spots are covered
- Somewhat difficult for drivers to monitor multiple views
- Systems that display the most relevant view (e.g. reversing camera when moving backwards) felt to be most useful



47%

Side Camera

- Many have begun to use this as another mirror
- Particularly useful in built up areas when the driver is turning left, as the camera covers mirror blind spots



# Side sensors / side scanning system

Polarising, due to varying levels of accuracy across different systems

71%

*"If you're sitting in tight traffic in Central London it will just go off constantly, which is really annoying. It's too sensitive"*  
Driver

- **47%** find it to be very useful, as the in cab alert only sounds if a cyclist gets too close to the side of the vehicle
- However, some systems sound indiscriminately – for example, if the vehicle passes a bin or a lamp post
- This diminishes the usefulness of the system, and led some to describe it as 'irritating' (to the extent that one manager had had it removed from his vehicles)
- The sound the system makes was described as 'piercing' making it impossible to ignore - drivers always triple check their cameras if it sounds, regardless of any issues they may have experienced with regards its accuracy
- For those with sensors all around the vehicle, it would be beneficial if the system could alert the driver to exactly where the proximity alert has been triggered from (through an automatic camera display, for example)

**12%** of drivers surveyed found this to be distracting, making it one of the top two most distracting pieces of equipment





# Blind spot elimination mirrors

Drivers very much hold the view that the more mirrors the better



- Mirrors are regularly checked as part of drivers routine, regardless of whether they are surrounded by other road users or not – it is second nature
- They help to eliminate blind spots
- No moving images or flashing lights to cause distraction

**80%** of drivers consider these to be useful and **77%** consider them to be essential for safety

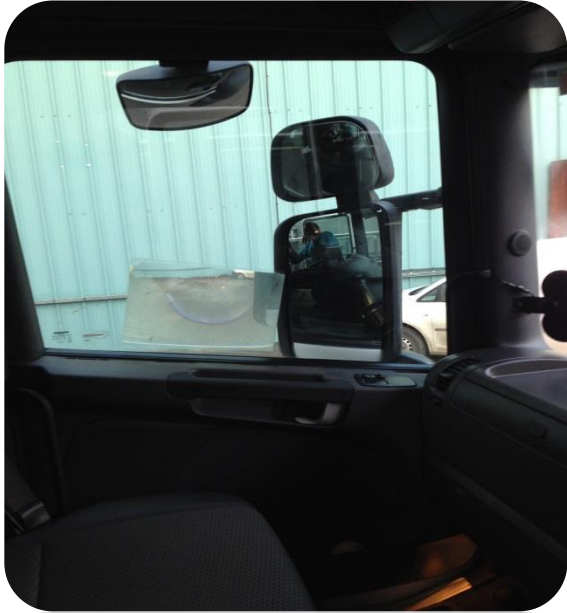
*"I do it [drive] the old school way, mirrors, mirrors, mirrors"*  
Driver

*"A mirror is never distracting – they are only ever a help"*  
Driver



# Fresnel lens

Valued by a minority, but generally felt to be of only limited use. The contorted image lacks clarity, but is not seen as a distraction as such



- Obscures window view and many drivers prefer to use the side camera instead

- A few drivers value the Fresnel lens, and find it useful for covering the blind spot down the side of the vehicle (particularly if they don't have cameras)
- However, the image is contorted and not particularly clear
- In addition, the lens partially covers the window obscuring the wider view of the driver
- For some drivers with cameras, the Fresnel lens had become redundant and so had been removed

*"I don't like them - they give you a blurred vision. I use the side camera instead"*  
Driver

*"Fresnel lenses spread the view, they are handy but you can't see too much through them, but at least you know something is there"*  
Driver



# Near-side turning / reversing warning

A very useful piece of equipment that should help other road users avoid an incident, but felt to be often ignored



- Considered important as it warns other road users what the vehicle is doing
- Generally felt to be less distracting than side sensors / side scanning systems as the sound can't be heard inside the cab very loudly
- Some complaints that other road users ignore the warning, thus rendering the equipment useless
- Vocal warnings felt to be more noticeable than a simple 'beeping'

The reverse beeping is considered more useful than the near side turning warning (by **83%** versus **59%** of drivers)

*"When I indicate it says 'attention ..' people tend to ignore it but it is not distracting for me" Driver*

*"It makes you wonder what more you can do when you have an audible announcement warning other road users that your vehicle is turning left only to hear the buzzer in your cab go off because a cyclist is leaning against the side of your load!" Driver*



# High visibility markings / signage

Of questionable usefulness, but certainly not distracting to drivers



- ➔ No potential for driver distraction as signage is on the exterior of the vehicle
- ➔ The extent to which the signage helps with regard to safety is questioned (apparently, some cyclists even hold on to the signs when stationary)
- ➔ But most are of the opinion that it's better to have it than not, 'just in case'

*"We have them at the back to warn cyclists about the dangers of coming up on the inside – whether they read them or not is another matter"*  
Manager

*"There are lots of signs on the back of a lorry – the manufacturer, our brand logo, info on the rear mud guard... we've taken all that off so all the cyclist sees is the safety signage"*  
Manager



# Side guards / side marker lights

Considered useful and certainly not distracting to drivers



94%

- Protects cyclists from getting caught under the wheels, and so considered a useful safety feature for the most part

The vast majority of drivers (**94%**) have this fitted to their vehicle and consider it essential for safety (**82%**)

*"They are there so no one can fall under the lorry, though a cyclist got a pedal stuck in one at Blackfriars and ended up breaking his leg" Driver*



67%

- Lights help cyclists to identify when the vehicle is turning
- Particularly useful if other road users are wearing headphones

**67%** of drivers have this fitted to their vehicle but more (**83%**) consider it an essential piece of safety equipment

*"I have no idea whether they work or not, I guess cyclists can see them in the dark, which could be handy" Driver*





# Conclusions and recommendations

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# Conclusions and recommendations

It is clear that safety equipment is appreciated by all, and considered 'essential' by most. There was no real sense from drivers or managers that safety equipment distracts the driver. The below developments could however ensure that this continues

## Conclusions

Cameras were deemed to be the most useful to drivers. Forward/side/all round facing cameras are the least likely of these to be fitted but are considered very useful

For managers, safety equipment also plays a role in terms of communicating to current and potential customers that the company is reputable and professional

Although most managers and drivers have received some form of safety equipment training they are open to receiving more

Some companies alluded to a 'tipping point' which is quickly being approached; there are only so many pieces of equipment drivers can manage before it becomes overwhelming

## Recommendations

Work towards educating freight companies about the benefits of the different cameras and make them more obtainable to encourage them as a standard on all HGV vehicles

Focus on improving visibility of FORS amongst commercial companies, to encourage FORS accreditation and in turn recognition of safety standards

Provide more training so managers realise the true benefits of equipment and drivers learn how to make the most of it

Future developments in safety should be focussed on integrating systems where possible. Intelligent systems will minimise the amount of 'checks' the driver is required to make, thus reducing distraction levels



# Appendix

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# Accompanied journeys

During the journeys nothing distracting was observed, the drivers were well trained and seemed to be able to drive and listen/use the safety equipment easily. The noise in the cab is minimal so any beeping simply alerts the driver to use more caution and to find out what is near him

## 1. Mirrors

Mirrors really help make safe manoeuvres  
They offer a 360 degree view

*"I am constantly checking my mirrors and the camera [visual display] when I am going slow enough"*

*"The mirrors are essential, most other safety equipment is a back up to these"*

## 2. Visual display

Visual display add extra visibility of the whole of the vehicle

*"It's [the visual display] just like another mirror"*

## 3. Rear camera

Not at all distracting and alerts the driver to what is approaching his vehicle

*"This [the rear camera] is the best thing since sliced bread"*

## 4. Proximity/side sensors

Alert the driver to other road users coming alongside the vehicle  
Whilst a potential distraction they do warn the driver of any dangers

*"It's nice to know they are there [the proximity sensors]"*



# Driver views

Drivers of HGV vehicles take their jobs incredibly seriously. They are aware that they are driving very dangerous vehicles and the last thing they want is to be involved in an accident, safety equipment is seen as preventative

*"The most important thing is safety, for me and for others ... I would rather get there late and safe"*

*"Before I move anywhere I look at every angle" Driver*

*"These are 44 tonne killing machines, you have to drive carefully"*

*"I try to remain courteous at all times and to plan ahead"*

*"All the time you are looking out for people who think you can stop like a car"*

*"I try not to force my way through traffic like other road users do"*

*"The safest thing is a well trained driver, we take training very seriously" Depot Manager*

*"I wouldn't drive for a company that doesn't have these [safety] systems"*

*"It's all about A1 driving, to be aware of everything and distracted by nothing"*

*"You can never have too much safety"*

*"I keep my 'eyes open', I plan ahead, the most unusual things can happen"*

*"We have to be constantly vigilant, we need to look out for Barclays bikes, pedestrians, black cabs, mini cabs, buses, cars and courier bikes"*