

# Update on Bus Safety Programme

*Transport for  
London response to  
London Assembly  
Transport  
Committee Report*



EVERY JOURNEY MATTERS

## Introduction

The London Assembly Transport Committee published their report 'Driven to Distraction – Making London's Buses Safer' on 17 July 2017. As part of that report, the committee made 11 recommendations including a request that Transport for London (TfL) should publish an update on the Bus Safety Programme in January 2018, drawing on learnings from the first two years of the programme. In October 2017 we published a full response to the other recommendations made by the committee<sup>1</sup>. This document builds on that response and provides the update requested.

The Bus Safety Programme was launched on 1 February 2016. Its aim was to reduce the number of people killed or seriously injured (KSI) on the bus network. The programme has a dedicated budget of just over £33m to fund specific interventions aimed at reducing collisions, as well as improvements to existing safety processes and data collection. The original programme had six main work-streams:

1. Bus Collision Data Analysis
2. Transparency
3. Contract and Performance Management
4. Vehicle Design
5. The Sarah Hope Line (Incident Support Service)
6. Bus Driver Training

The Bus Safety Programme is constantly evolving to better address the needs and best meet the requirements of bus safety in London. This document will articulate what we have done to date on each of the six work-streams, and what we plan to do in future to progress them further. We will also set out a number of additional activities and projects that we have initiated beyond the scope of the original Programme. These are:

7. Reducing Customer Injuries
8. Fatigue Management
9. Safety Innovation Fund
10. Working in Partnership

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<sup>1</sup> TfL Response to GLA Transport Committee Report on Bus Safety:  
[https://www.london.gov.uk/sites/default/files/tfl\\_response\\_to\\_bus\\_safety\\_report.pdf](https://www.london.gov.uk/sites/default/files/tfl_response_to_bus_safety_report.pdf)



# 1. Bus Collision Data Analysis

## Introduction

Bus operators carry out their own investigations of road collisions, focusing on the root causes of the incident. For major incidents, including fatalities and serious injuries, we gather information from operators, police agencies, boroughs, coroners, the Driver and Vehicle Standards Agency and others. We are committed to improving the quality, consistency and impact of bus collision investigations, and to using in depth analysis to learn from these. This section of the report sets out progress and future plans for collision investigation and data analysis, with the following section covering transparency around this.

## Progress

We currently have two main data sets for bus collision data: IRIS and STATS19. IRIS is used by bus operators under contract with TfL for reporting incidents relating to their operational activities. This includes collisions, but also slips, trips and fall and other safety incidents such as assault. Operators are required to report serious incidents within 48 hours, and all incidents within seven days. The system serves as the complete and reliable single source of information on all incidents involving or affecting London's buses.

STATS19 provides information on road traffic collisions that involve personal injury, occur on the public highway and that are reported to the police. Damage-only collisions are not included. Data is reported by the Metropolitan Police Service (MPS) and City of London police services. In 2017 the MPS launched a new collision data collection system, the Case Overview and Preparation Application (COPA), which is replacing STATS19. COPA will report similar data to STATS19, with the addition of improved identification of vehicle types. The system will also result in more accurate and timely information.

### Delivered

- Launch Surface Incident Review Group (June 2017, now embedded)
- A field has been added to IRIS for operators to confirm whether or not Police have been informed of each incident. This will help match the data to STATS19 and COPA.
- Publication of 10 Year Bus Safety Trends (STATS19) (August 16)
- In-depth analysis of police collision files to establish how and where collisions take place and identification of counter measures to inform development of Bus Safety Standard (October 2017).

## Future works

Work is being done to improve the compatibility of IRIS, STATS19 and COPA. A complex matching exercise is continuing to ensure better consistency and reliability of each data set. We are also developing a software system to improve the efficiency and accuracy of collecting IRIS data by enabling it to be automatically updated from bus operators own various databases.

The bus safety webpage will continue to be enhanced to make the data more accessible and provide graphs illustrating long-term trends for bus safety.

Following the publication of analysis of police collision files, we have commissioned a 'deep dive analysis' of customer injuries and vulnerable road user casualties. We expect this analysis to be completed by the end of February 2018.

### Milestones

- Data matching exercise to consolidate IRIS, STATS19 and COPA (to be embedded)
- Developing a software solution to automatically 'upload' data from bus operators' own incident databases into IRIS, reducing opportunities for error.
- 'Deep dive analysis' of customer injuries and vulnerable road user casualties completed (February 2018)
- Bus Safety Webpage updated (quarterly)

## 2. Transparency

### Introduction

Following improvements in collision investigation and data analysis we have committed to publishing this data and outcomes of investigations where possible. This will enable Londoners to see how fatal and serious injury collisions on the bus network are investigated, the processes that are followed by TfL, the bus operators and the police and how learnings are shared.

### Progress

As part of our internal governance process, the Surface Incident Review Group meets every six weeks to peer review the investigation of all fatalities and other significant incidents. This ensures that immediate and root causes are identified, and the right action taken. We share key findings with our partners, including bus operators, and make sure any actions required by us, the bus operator or other groups are allocated and completed.

The Notification and Investigation of Major Incidents (NIMI) process has recently been improved to require operators to provide more information about an incident and work with TfL to establish all root causes. We have provided operators with new guidance and a consistent template for reporting such incidents. We now have a closer role in overseeing operators carrying out their own investigations, including TfL senior staff carrying out site visits.

We publish an annual overview of the investigation and outcome of all fatal incidents, continue to promote a culture of transparency internally and across operators, and publish additional data where possible.

#### Delivered

- Publication of IRIS data in a dashboard format to improve transparency  
<http://content.tfl.gov.uk/q3-17-london-bus-safety-dashboard.pdf> (November 16)
- Publication of summary findings from fatal collision investigations (November 16)
- Improved quality and consistency of major incident reviews. (New process rolled out during 2017)
- Improved understanding of the importance of transparency among TfL and operators (embedded)

### 3. Contract and Performance Management

#### Introduction

We use a range of data as part of the assessment of an operator's ability to provide a safe service. As part of the Bus Safety Programme we are considering methods to improve this process and to increase the emphasis on safety in the award and management of contracts.

#### Progress

Having considered a range of methods to best monitor operator safety, we are developing an Operator Safety Performance Index (SPI). The SPI is based on the same principle as the Consumer Price Index, that is, a composite measure, using basket of indicators to generate a single performance index. The Operator SPI builds on the success of the TfL bus Network-wide SPI which was introduced in 2017 to better monitor safety performance across 81 safety-related indicators. The operator SPI will include 41 indicators, a mix of incident-generated data and behavioural observations, covering: staff and customer safety, network safety, risk management, driving standards and engineering. Each operator's performance will be tracked against their own baseline, to encourage continuous improvement.

We feel this is more comprehensive than other methods (for example, safety scorecards).

#### Delivered

- Introduced a network-wide SPI providing a comprehensive and detailed measure of network safety performance (April 2017).

#### Future

The SPI will form part of an existing suite of performance indicators which we use to manage all aspects of the bus network. These are discussed with individual bus operators every four weeks. The Operator SPI will sit alongside the Bus Safety Assurance programme already in place. Whereas the SPI tracks improvement the assurance programme is a measure of the safety management maturity, or established safety culture, of each operator.

Our safety staff track each SPI and validate action plans submitted by bus operators to ensure that the steps outlined will bring required changes. This will be a continuing activity. In cases where poor performance does not improve in line with agreed action plans, both the performance and safety teams will engage with the operator. The assurance programme results will be evaluated alongside the results of the Safety Performance Index to provide a position statement as to where we believe the operators' safety performance lies (see below).



While we use a number of criteria to assess route tender bids including Driver Quality Monitoring and Engineering Quality Monitoring, we are now looking at introducing the SPI and Safety maturity measure into our contract evaluation process to further incentivise operators to improve safety.

#### Milestones

- Development of an operator SPI and improved assurance programme to be used as the basis for regular safety performance meetings and discussions between TfL HSE Managers, Performance Managers and operating companies (summer 2018).
- Consider options to introduce the SPI and Safety maturity measure into our contract evaluation process. (summer 2018)

## 4. Vehicle Design

### Introduction

As part of the wider Bus Safety Programme, we have introduced a vehicle design and technology work-stream which includes the development of a new Bus Safety Standard. This will identify a package of safety measures, including: measures to prevent collisions and measures to mitigate the impact of collisions.

### Progress

We have carried out an analysis of police collision investigation files for fatalities involving buses. This identified a range of problems and potential countermeasures including Autonomous Emergency Braking, reducing the incidents of pedal confusion, improving wing mirror design, windscreen glazing and front of bus re-design to reduce the impact of any collision. Following this, a workshop with bus operators and manufacturers was conducted to finalise the list of countermeasures.

A series of work packages are now underway to test feasibility, and evaluate potential benefits of the proposed countermeasures to improving safety on London buses. Outputs of this work include:

- a vehicle design and technology roadmap for Buses in London;
- detailed evaluation and testing of each of the proposed countermeasures;
- detailed business cases for each of the proposed countermeasures;
- peer reviewed Bus Safety Standard text for inclusion in the London Bus Vehicle Specification.

We completed a road map for the Bus Safety Standard in November 2017, and we will update this throughout the project. This road map shows which technologies and design features are suitable for inclusion in the first phase of the Bus Safety Standard, and which of these are not quite ready for market yet but will be suitable to fit to new buses in future years .

#### **Delivered**

- Workshop for bus operators and manufacturers to discuss the initial findings from the TRL report and finalise the list of countermeasures to be tested (December 2016)
- Analysis of police collision investigation files for fatalities involving buses completed (September 17)
- Initial road map for the Bus Safety Standard completed (November 2017).
- Roll out of ISA on new vehicles (December 2017)



## Future works

We will be testing the vehicle design countermeasures until summer 2018. A business case will be produced for each countermeasure, including a cost/benefit analysis. This will help us decide whether a countermeasure should be included in the Bus Safety Standard, now or in the future. Along with feasibility studies this will also allow us to determine whether individual countermeasures are suitable for retrofit.

Specifically we are looking at:

- Vulnerable Road User (VRU) protection
  - Autonomous Emergency Braking (AEB) or other collision avoidance systems - to prevent collisions with pedestrians, cyclists and motorcyclists.
  - Visual and acoustic conspicuity – to help ensure VRUs are aware of approaching buses.
  - Front of bus design – to be more forgiving in a collision with a VRU.
  - Improved vision – to address driver blind spots.
  - Enhanced visual inspections – to ensure that unintended hazards can be identified before vehicles are entered into service (also relevant to bus occupant protection).
- Bus occupant protection
  - Occupant friendly interiors – including redesigning grab poles and head restraints to be more forgiving if a passenger falls, or if a collision occurs.
  - Slip resistant flooring.
- Cross-cutting casualty protection
  - Intelligent Speed Assistance (ISA) – Restricting the speed of the bus so that it cannot travel above the posted limit to reduce speed related collisions.
- Mitigating high risk events
  - Pedal confusion prevention – minimising the risk of drivers confusing the accelerator for the brake.
  - Runaway bus prevention – to prevent serious incidents when a driver forgets to apply the parking brake.

These technologies and design features are currently being identified and tested by our manufacturer delivery partners to be incorporated into new route contracts from the end of 2018.

### Milestones

- Bus Safety Standard specification written into the London Bus Vehicle Specification, which forms part of our route contracts with bus operators (December 2018).

## 5. The Sarah Hope Line (Incident Support Service)

### Introduction

Following a serious collision, victims and their families can find it difficult to quickly access vital information and support. In March 2016 TfL created an Incident Support Team, dedicated to assisting people affected by fatal or serious incidents across the TfL network, known as the Sarah Hope Line. Immediately after an incident has taken place, the service is available to offer emotional and practical support and provide a single, named point of contact at TfL.

### Progress

The incident support service is the first point of contact for those affected, helping to solve practical problems resulting from the incident. The Incident Support Team also provides continuing support for the duration and aftermath of an investigation into the incident. This includes signposting victims to relevant organisations concerned with road/rail/transport safety and what information/support each of them provides, as well as providing contacts for business partners and charities who provide professional specialist services. In addition they can provide:

- short-term counselling services and transport (whether by air, road or rail) for family members of affected individuals
- short-term financial assistance in the aftermath of incidents such as paying for travel and accommodation for family members who may live outside London and need to stay near a hospital, or replacing damaged items
- assistance for bereaved families in completing funeral arrangements

#### **Delivered**

- Launch of Sarah Hope Line for Incident Support (March 2016).

## 6. Bus Driver Training

### Introduction

As part of the Bus Safety Programme, we committed to delivering improved safety training to all bus drivers, focused particularly on protecting pedestrians, cyclists and motorcyclists. Bus operators are the direct employers of all 25,000 bus drivers and 200 bus driving instructors in London and are responsible for ensuring that their staff receive appropriate safety training. Our role is to ensure that all drivers receive the same high standard of safety training.

### Progress

New bus drivers receive basic training which covers safety and legal requirements. We also require them to obtain a bespoke City and Guilds qualification during their first year of service. In addition, existing drivers must keep their Certificate of Professional Competence (CPC) up to date by completing 35 hours of structured continuous development every five years. We work closely with bus companies to develop content for bus driver CPC courses to support key priorities.

We are now commissioning a new CPC accredited Safety Training course for drivers and driving instructors. This will focus on safer urban driving (SUD) principles and on awareness of Vulnerable Road Users (VRUs). The training, which will be developed with the input bus operators and bus driving instructors, will include hazard perception skills and innovative training methods. The course will build on the success of 'Hello London', a customer-service focused training course that is highly engaging and interactive.

#### Delivered

- New driver safety training course out for tender (Dec 2017)

### Future works

We have just completed evaluation of the tender submissions for the safety development training, and unfortunately none of the potential suppliers has a proposal which we believe will provide the level of engagement to deliver the transformational behaviour change that we and the bus operators are looking for to help us achieve the Vision Zero outcomes. We will therefore need to reassess and approach this procurement in a different way, starting with a conference for potential suppliers in March. This will delay the start of the training by a few months, however it is important that we get the right supplier and allow sufficient time for them to develop an innovative course.

We are also working with an operator to explore pre-qualification psychometric testing for potential drivers, to help ensure recruitment of candidates with an appropriate attitude toward risk.

#### Milestones

- Supplier Conference (March 2018)
- Driver recruitment screening trial (funded by the Safety Innovation Fund) (summer 2018)

## Going Further: 2018 onwards

The Bus Safety Programme it has continued to evolve since it was launched. This section introduces new workstreams, which will become part of the programme. By widening the scope of the Bus Safety Programme, we have improved the focus on reducing customer injuries as well as KSIs. These new focus areas have been identified through continuing engagement with operators and partners, additional data analysis and through applying lessons from other transport sectors.

### 7. Reducing Customer Injuries

The greatest numbers of on-board customer injuries occur without a collision having taken place. Slips trips and falls cause the majority of customer injuries on buses, including while boarding and alighting, while the bus is moving, and on the staircase.

We have analysed customer injuries and vulnerable road user casualties to better understand the causes and possible countermeasures. The initial results of this stage of the research and implications were discussed at a stakeholder workshop in January focusing specifically on the Vision Zero for London categories of: safe speeds, streets, behaviours and post-collision response. Safe vehicles are already covered under the vehicle design work-stream). The workshop attendees included TfL staff specialised in bus operations, road safety strategy and delivery, health and safety and engineering, as well as representatives from the Metropolitan Police Service (MPS), bus operators and bus drivers. During the workshop attendees prioritised the potential measures. We will provide an update on the final results to the GLA Transport Committee in spring 2018.

In the meantime, we have also launched a pan-TfL safety campaign which aims to encourage our customers to think about their personal safety and take extra care when travelling on public transport. The campaign was launched in July 2017 to provide a reminder to all Londoners through both integrated communications and operational interventions. The campaign includes posters and a trial of iBus automated messaging 'Please hold on. The bus is about to move'. There were initial issues with the timing of the message which were resolved during the four week trial., TfL is reviewing the results of the trial to understand what effect it had on injuries during that period. Throughout 2018 this campaign will be further developed, to include safety messaging on other media, such as oyster card wallets, bus vinyls on stairs and additional on-board signage.

#### Milestones

- TfL to provide update to GLA Transport Committee on the prioritised counter measures (spring 2018).
- Customer Safety campaign to be expanded (throughout 2018).

## 8. Fatigue management

Fatigue is an issue faced by drivers across our services, but it is under-reported as a contributory factor in collisions. Despite the lack of reliable data, we know from working with operators and drivers that fatigue is a safety risk and we are therefore taking a proactive approach to addressing it.

In November 2017 we held the inaugural Bus Safety Summit, bringing together bus operators, industry experts and stakeholders to hear from other industries about how they manage safety and promote a safety culture throughout their organisations. A number of presentations were made looking at how other transport operators manage driver fatigue, for example in the aviation sector, and measures that can be used to manage it, such as fatigue detection devices. The Rail Safety and Standards Board (RSSB) are developing a fitness for duty tool and London Trams have implemented a driver protection device. The Office of Rail and Road (ORR) presented on staff fatigue in the rail industry and measures to mitigate against it. We will continue to monitor developments in fatigue management across the transport industry for applicability to buses.

In addition, two operators have been separately awarded funding from the Bus Safety Innovation Fund (see below) to develop sensors in driver cabs to detect eye and face movements, picking up on signs of fatigue and distraction. Their proposals use two different technology suppliers but both work by monitoring the driver's eye and face movements and providing an alert, via a vibration to the driver's chair, if drowsiness is detected. Both these studies are due to conclude in summer 2018.

### **Milestones**

- Bus Safety Summit to be held annually
- Trials of fatigue detection by two operators. Both funded by the Bus Safety Innovation Fund, with results in summer 2018.



## 9. Safety Innovation Fund

In August 2017 we launched the Bus Safety Innovation Fund and asked operators to consider how TfL funding could help them deliver innovative ideas to reduce the number of people seriously injured or killed on the network, including staff. It was open to all bus operators and we encouraged staff from management to bus drivers to share their ideas.

There were 14 bids in total, with the eight winners announced at the Bus Safety Summit in November 2017. Many operators have set up partnerships with universities, not-for profit organisations including cyclist groups and technology companies. They were awarded a total of £500,000 to develop new ideas that will improve safety across London's bus network. The majority of the results will be available in autumn 2018.

The initiatives that have been funded are listed below:

### **Bus Acceleration Rates**

An investigation into the effects of different acceleration rates when buses move off from a stationary position. The study aims to identify the optimum rate of acceleration and therefore, reduce the number of passenger injuries as a result of slips, trips and falls, particularly for older customers.

### **Audible and Flashing Alarms**

An external device to be trialled on buses which operate in the Oxford Street area, to alert vulnerable road users to buses approaching. This aims to reduce incidents caused by cyclists and pedestrians crossing into the path of the bus.

### **London Cycling Campaign Champions**

A joint project with the London Cycling Campaign, training vulnerable road user champions at bus garages. The project will also include development of a toolkit and a driver training module. This aims to encourage a cultural shift amongst bus drivers in order to improve safety for cyclists, by reducing the number of incidents caused by drivers overtaking or driving too close.

### **Collision Prevention Device**

Installing a forward facing vision sensor to provide the driver with advance collision warnings and a speed limit indicator. This aims to reduce collisions with pedestrians and cyclists, stationary or parked vehicles and collisions arising from side swipes and lane changes.

### **Psychometric Testing**

Developing a scientific psychometric test to be used during the bus driver recruitment process. The aim is to quickly identify potential candidates with risk-adverse attitudes, as well as those exhibiting high levels of risk taking behaviour, who would be unsuitable for the job.

### **Driver Safety Videos and Phone App**

Producing a series of professional safety videos and developing a mobile phone based app to enable bus drivers to easily view them. Videos will focus on reducing incidents arising

from changing lanes, pulling in/out, VRUs and blind spots, trapping in doors, braking and driver assaults.

### **Distraction and Fatigue Monitors**

Two separately-run projects installing in-cab sensors that detect eye and face movement to monitor drivers' alertness. If signs of distraction or fatigue are recognised an immediate alert is sent to the driver via a vibration in their chair. This will aim to reduce collisions with other road users and provide invaluable data to better understand the issue of fatigue.

#### **Milestones**

- Eight innovative operator-led trials have been funded, and will report during 2018. Successful technologies may be incorporated into the Bus Safety Standard (report during 2018)
- Re-open the application process for the Safety Innovation fund in the next financial year (2018/19).

## 10. Working in Partnership

### With the Met Police Service (MPS)

TfL and the MPS work together on a day-to-day basis to improve safety in London. We part fund the MPS Roads and Transport Policing Command (RTPC). The RTPC is currently the largest police command in the UK; made up of over 2,300 officers who work to ensure all journeys across the road and surface transport network are safe, secure and reliable. The MPS Cycle safety team, within the RTPC, has launched two new initiatives in 2016, to specifically enhance the safety of pedestrians and cyclists around buses: Exchanging Places in bus garages, and the Close Pass initiative.

Exchanging Places is a well-established programme run by the MPS, whereby HGV drivers and cyclists are given the opportunity to 'swap' places. Cyclists get to experience the lower visibility of an HGV cab and drivers experience first-hand the relative vulnerability of being on a bike. The MPS have now introduced the programme to bus drivers, and the first event was held at Brixton Bus garage on 20 November 2017. A truck is taken into the bus garage so that drivers can better understand how cyclists and HGVs interact, which helps build their awareness of potential safety issues on London's streets. The feedback from the garage was very positive. The drivers that participated enjoyed it and appreciated the principle of seeing things from each others perspective. This will be rolled out to other garages.

'Space for Cyclists' the MPS Close Pass initiative was launched in July 2017. A plain clothed cyclist communicates with motorcycle support when they are close passed. The motorcycling officer then stops the vehicle, carries out checks and explains the danger of close passing. The initiative has now been integrated into regular MPS operations and is carried out on any road suitable for cycle patrols (i.e. not the very fastest roads). Currently, sites are chosen in response to suggestions on Twitter and emails. TfL and the Cycle Safety team are currently considering the best way of directly targeting bus drivers with the Close Pass message.

#### Milestones

- Roll out Exchanging Places across bus garages (embedded)
- Deliver the Space for Cyclists safety message at bus garages (embedded).

### With CIRAS

CIRAS is a national Confidential Incident Reporting Analysis System for Transport. CIRAS take calls from all staff, from front line to Managers in the strictest of confidence. CIRAS is independent of member organisations' safety management system, and functions as a back-up to complement health and safety arrangements at work.

Both TfL and CIRAS are clear that CIRAS should not be used as a first line reporting tool. CIRAS is an alternative independent confidential reporting line. It is intended to be used when a reporter has exhausted their internal reporting system and feels they are not achieving a satisfactory response, or when a reporter feels they cannot use their own internal systems for some reason. However, the CIRAS call centre will rightly always ask a reporter whether they have used their internal system and will direct them there first unless there is a good reason for not doing so.

TfL facilitated the initial promotion of CIRAS to drivers, and we will be reviewing whether it has been embedded in induction and other relevant training since its launch through our Safety Maturity measure. CIRAS hold a twice-yearly London bus operators working group meeting where operators share best practice and discuss learnings around a specific safety theme. CIRAS has also invited two bus operators to join the CIRAS Board to ensure that there is complete representation and increased collaboration so all parties are involved in ensuring bus drivers' concerns are addressed appropriately.

**Delivered**

- Promoted CIRAS to drivers (embedded)
- Facilitated bus operators joining CIRAS board (embedded)

