

**Date:** 14 September 2022

**Item:** Bus Safety Programme Update

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## **This paper will be considered in public**

### **1 Summary**

1.1 This paper provides an update on the progress of the delivery of the Bus Safety Programme.

### **2 Recommendation**

2.1 **The Panel is asked to note the paper.**

### **3 Background**

3.1 The Mayor and TfL have adopted Vision Zero for London, with a target of zero deaths and serious injuries from road collisions by 2041.

3.2 Within Bus Operations, we have even more ambitious targets:

- (a) 70 per cent reduction in the number of people killed or seriously injured in, or by, buses by 2022 (against 2005-09 baseline); and
- (b) No one killed in, or by, a bus by 2030.

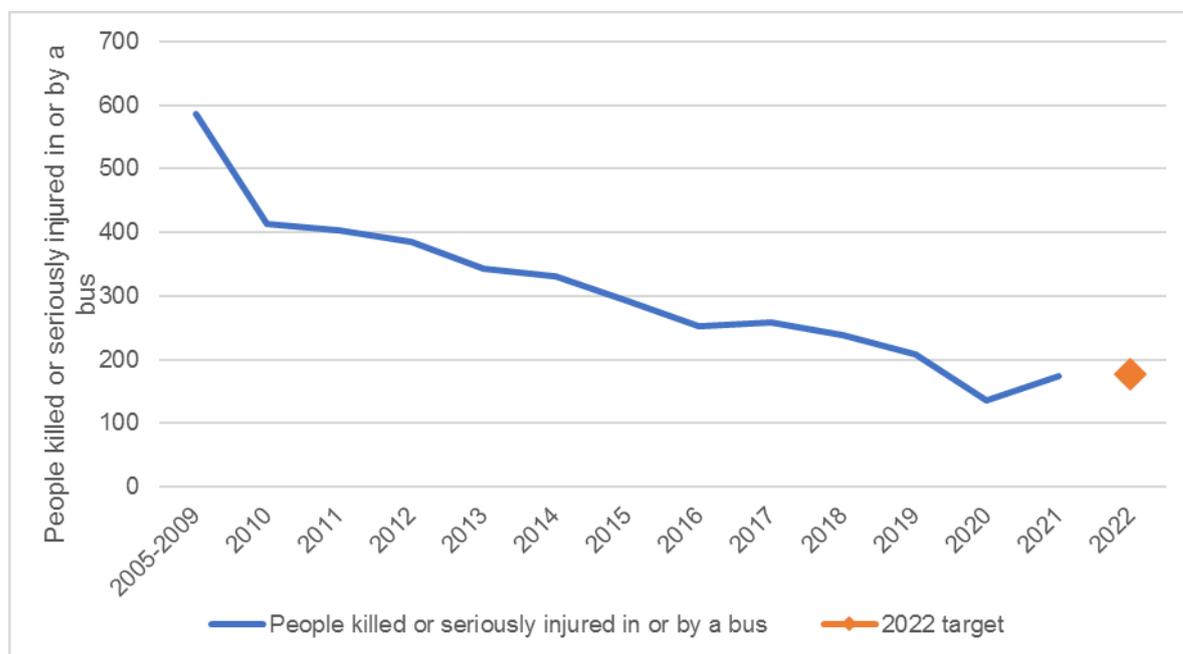
3.3 The Bus Safety Programme was launched in February 2016, with the aim of reducing the number of people killed or seriously injured (KSI) on the bus network.

3.4 The Bus Safety Programme is aligned with the Vision Zero ‘safe systems’ approach which aims to ensure safe speeds, safe streets, safe behaviours and safe vehicles alongside post-collision learning and justice. Funding pressures have impacted on the progress of implementation of the Bus Safety Programme since our last update in February 2022. This paper sets out the financial impact on the programme and provides key updates on our progress.

### **4 Safety Performance**

4.1 The number of people killed or seriously injured in or by a bus (bus involved KSIs) rose by 24 per cent to 174 people between 2020 and 2021. This increase was a result of the increasing number of people travelling again who continue to be concerned about Covid-19 while travelling on public transport, but still represents a 70 per cent reduction against the 2005-09 baseline. Figure 1 illustrates the continual downward trend in people being killed or seriously injured in or by a bus. We have now met our 2022 target of a 70 per cent reduction in KSIs two years early and for two years in a row. It is encouraging that we have maintained this

target achievement for a second year, despite the continued return to pre-pandemic collision rates, travel patterns, bus journeys and bus patronage. However, we continue to closely monitor this as our return to pre-pandemic levels is not yet complete. We also continue to monitor the emerging issues and risks that have developed during the pandemic and how these may continue to influence bus safety.

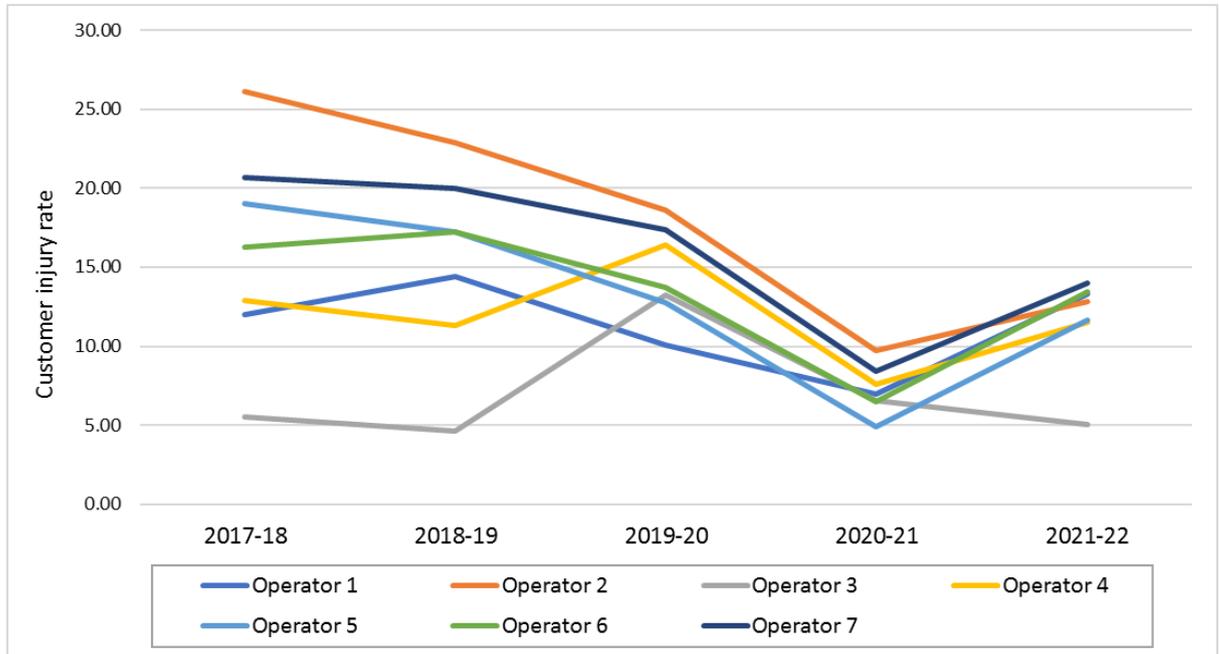


**Figure 1: People killed or seriously injured in or by a bus: progress against baseline**

- 4.2 Separating bus involved casualties into those injured on, and those injured by, the bus gives a slightly different perspective on who is being injured, that means we can target our safety interventions where they are most needed. It is important to note that whether a person was injured as a passenger, while walking or other road user, this does not mean that the bus driver was at fault, for example where someone may be injured ‘by a bus’, it could mean that a bus was involved in the collision simply as a stationary or third party. During 2021, one person died after falling down the stairs on a bus, and 66 people were seriously injured (passengers or bus drivers) on the bus, while four<sup>1</sup> people died and 103 people were seriously injured by the bus as a result of a collision involving the bus. Of those people who were killed or seriously injured ‘by a bus’, 49 were people walking, 30 were cycling and 16 were riding motorcycles.
- 4.3 Critical to our further progress in bus safety is the safety culture within TfL and London’s bus operators. Ensuring that there is consistent safety performance is a key responsibility of our Safety, Health and Environment (SHE) team. Analysis can be complex when trying to normalise the data and taking into account safety risk exposure. However, when scrutinising passenger injuries, normalising the rate of injury occurring by annual mileage operated, gives an indication of safety performance across the London bus operators. Figure 2 shows that the

<sup>1</sup> This excludes a fatality in Victoria Bus Station in 2021 as deaths occurring on private land are excluded from STATS19

passenger injury rate follows a broadly similar downward trend of improvement until after the pandemic. The range of risk rate values between operators has reduced over time too which may suggest that the focus on safety, greater collaboration and transparency since the launch of the Bus Safety Programme has helped to improve the consistency of performance amongst operators. Monitoring safety performance will continue to be a priority for us.



**Figure 2: Customer Injury Risk Rate by annual Operated Mileage**

Note: Three operators were excluded as their injury rate and/or mileage operated was low

- 4.4 In addition to statistical performance analysis, we also consider how well bus operators engage with our various safety initiatives. Examples include the fatigue management training rolled out to operators during 2021, where training was given to all bus operator managers and operational supervisors, engagement was high across all operators to deliver and receive this training; our most recent bus safety innovation challenge had bids submitted by nearly all the bus operators; engagement at our various safety working groups for pedal confusion, fatigue, and, health and wellbeing is well established and attendance is consistent across most operators.

## 5 Roll out of Bus Safety Standard into London’s bus fleet

- 5.1 The Bus Safety Standard is being rolled out against the published Roadmap. At the end of July 2022, 827 new buses met the standard, which is approximately nine per cent of London’s bus fleet. Based on the current 14-year lifecycle of buses within our fleet, it is estimated that it will take until 2033 for complete roll out of the 2019 Bus Safety Standard to be achieved. For safety features required from 2021, complete roll out is estimated by 2035, and for safety features required from 2024, complete roll out is estimated by 2038.

- 5.2 Intelligent Speed Assistance (ISA) technology has been a requirement for new buses since the launch of the Bus Safety Standard, but we have also worked to enable some existing Volvo buses in the fleet which have a similar version of ISA capability to be activated, and there is an active ISA retrofit programme. This means that the rate of ISA fitment in London's bus fleet is much higher than the rest of the Bus Safety Standard measures, as at the end of July 2022 it was around 25 per cent of the fleet.
- 5.3 Acoustic Vehicle Alerting Systems (AVAS) have also been a requirement on new buses since the launch of the Bus Safety Standard but are only required on quiet-running buses so there are slightly fewer buses (672 as at end July 2022) with this technology, representing around seven and a half per cent of our fleet.
- 5.4 Camera Monitoring Systems (CMS) were only required in the Bus Safety Standard from 2021, however several operators were keen to introduce these earlier, which has resulted in 718 buses as at the end July 2022 being fitted with CMS, representing around eight per cent of the London fleet.
- 5.5 The next milestone for the Bus Safety Standard is 2024, when a range of further safety measures will be required. We have also included two additional new safety measures for implementation in 2024 within our latest New Bus Vehicle Specification and will publish a revised Roadmap later this year to reflect these changes. These additional safety measures help to further align the Bus Safety Standard with the new European General Safety Regulations updated in early summer 2022, they are:
- (a) **Tyre Pressure Monitoring System:** a system that provides a warning to the driver if an unsafe change in air pressure in one or more tyres is identified; and
  - (b) **Alcohol Interlock Installation Facilitation:** requires bus manufacturers to make available a document with clear instructions for installation of alcohol interlocks without interfering with the performance or maintenance of the bus. This is a pre-cursor to any potential inclusion of Alcohol Interlocks within a future phase of the Bus Safety Standard.

## 6 Impacts of Funding Uncertainty

- 6.1 The funding uncertainties we face have impacted the Bus Safety Programme. With each short-term funding deal expected to lead to a longer-term settlement, deferring activity for 3-6 months has been an appropriate decision. The impact of the new Government funding deal on bus safety projects is not yet known, the following information is provided in the meantime and we will provide an update at a later meeting on any further changes. The aggregated effect of the pandemic and lack of clarity over future funding is now significant, and the following projects and activities were paused in March/April 2022 as a result of lack of funding availability:
- (a) **ISA Retrofit:** Funding for 1,800 buses to be retrofitted with ISA was paused. The total number of buses in scope for retrofit is 3,000, the 1,200 buses with funding had hardware fitment completed during August 2022. It was estimated that if all 3,000 buses were retrofitted with ISA as originally

planned, together with the new build buses, this would equate to around 50 per cent of the bus fleet.

- (b) **AVAS Retrofit:** Funding to retrofit AVAS onto all quiet-running buses in the fleet was paused. The number of buses that could be retrofitted was flexible, from just fitting the buses that always run quietly (the electric and hydrogen buses) to a full roll out onto all diesel-hybrid buses that have shorter periods of silent running.
- (c) **CMS Retrofit:** Funding to retrofit buses in the fleet with CMS was paused. In particular, fitting CMS to all New Bus for London buses was planned.
- (d) **Fatigue Detection Technology project:** Funding to fit a further 450 buses with Fatigue Detection Technology was paused. This funding would have enabled us to achieve our target in the Bus Action Plan for 500 buses fitted with Fatigue Detection Technology. Furthermore, this funding would allow us to collect a more diverse and robust set of quantitative data to ensure the effective development of the bus driver fatigue programme, and to enable us to introduce a performance specification for this technology for new buses through the Bus Safety Standard.
- (e) **Bus Safety Standard Phase 2:** Funding for further development of the Bus Safety Standard beyond 2024 was paused. The Bus Safety Standard is a live document intended to evolve to take account of new technological advances and to respond to changes in risk to achieving TfL's bus safety Vision Zero targets. New safety initiatives such as reducing distraction and simplifying the driver's cabin, measures to further improve customer safety, and integrating the safety of e-scooter riders into the specification, are all now on hold.
- (f) **Advanced Emergency Braking (AEB) implementation support:** Funding to realise the recommendations of recent work into supporting the implementation of AEB into the fleet by 2024 has been paused. AEB for an urban environment is the most challenging safety measure being introduced because of the complexity of the fixed and moving vehicles and vulnerable road users alongside the multiple passengers that are seated and unbelted, or who might be standing when an AEB system brakes. However, if implemented correctly AEB has the potential for significant safety benefits and forms a critical part of our ability to meet our Vision Zero targets for buses. Owing to the complexity of the technology it requires a high level of investment from our suppliers to meet our requirements. TfL had a strategy in place to help reduce the barriers while ensuring AEB systems realise the forecasted benefits, however a strong pipeline of orders for new vehicles is necessary to support that investment by our supply chains (see 6.2 (a) below).

6.2 The effects of the funding uncertainties were not limited to the direct impact on current project funding. There are further effects on the delivery of the Bus Safety Standard:

- (a) The roll out of the Bus Safety Standard is directly linked to the rate of fleet renewal. Fleet renewal has been lower than average due to the natural

fleet renewal cycle over the last few years; however, it has also been affected by the pandemic through both supply chain delays and TfL's funding issues with a pause in letting new contracts implemented for a few months in late 2021. While this has now resumed, the effect on fleet renewal will remain. The proposed reduction in fleet size of around four per cent set out in our Financial Sustainability Plan (half of which is subject to a live public consultation) has had a direct impact on new vehicle orders for this year and next too.

- (b) If further funding does become available for ISA retrofit, there will be a 9–12-month delay before any further buses can be retrofitted as there is now a minimum 26-week lead in time for parts with suppliers and fitting takes time. Orders were being placed on a rolling basis, but these were stopped when no further funding was approved. The ISA retrofit project will end in September 2022 at which point the project resourcing and approvals will expire.
- (c) There are around 200 electric buses within our bus fleet which are going to be prioritised for AVAS retrofit alongside the ISA retrofit programme, in order for them to be fitted with our enhanced Responsive AVAS system which optimises safety and reduces extraneous noise nuisance. However, this is impacted by the lack of funding for ISA and compounded by the lack of funding for AVAS retrofit. These buses are the only electric buses without any form of AVAS currently in the fleet. Furthermore, lack of funding has meant that the successful outcome of the Responsive AVAS project has not been rolled out to the existing buses with AVAS.
- (d) Funding for future year retrofit programmes was also paused including those for vulnerable road user alerting systems (a requirement on new buses from 2024) and further fatigue detection technology.

## **7 Bus Driver Fatigue, Health and Wellbeing Innovation Challenge**

- 7.1 Ten projects selected from around 50 bids are being rolled out across eight bus operators as part of the Bus Driver Fatigue, Health and Wellbeing Innovation Challenge. Most of these projects were awarded funding in late February 2022 with work commencing at the end of March 2022. The last project had funding approved in July 2022. To manage the delivery of these ten projects which are of differing scope, value and timescale, we have put in place appropriate project controls and are actively engaging with bus operators.

## **8 Pedal Confusion**

- 8.1 The recent research we commissioned AECOM to undertake has now been completed and this study is published on TfL's website at:  
<https://content.tfl.gov.uk/bus-safety-standard-pedal-confusion.pdf>

- 8.2 The report (appended to this update) sets out several recommendations which are being incorporated into the work overseen by the joint TfL and bus operator Working Group for pedal confusion. The report states that its main recommendation is the need to gather evidence to validate the reports' recommendations and the impact they will each have to the reduction of pedal confusion incidents. Evidence is now being collected through the use of pedal/footwell cameras on new buses, however owing to funding restrictions it is not currently possible to retrofit these cameras which would rapidly improve our evidence base.

## **9 Emerging Issues**

### **Bus Safety Programme Strategy**

- 9.1 An independent programme assurance group recommended that an overarching strategy for achieving Bus Vision Zero is established. We have committed to producing a strategy document that will set out the approach to achieving Vision Zero for buses, the alignment with Vision Zero as a whole and the role played by the specific projects in TfL's investment programme.
- 9.2 The development of this strategy is at an advanced stage and will be shared with the Panel when it is available. Activity undertaken for the strategy to date includes:
- (a) holding five stakeholder engagement workshops to discuss and explore issues related to bus safety. Attendees included representatives from different transport modes, bus operators and manufacturers, lobby and safety campaign groups, the Independent Disability Advisory Group (IDAG), the London Fire Brigade, and internal TfL staff from a range of teams;
  - (b) holding several informal engagement sessions with bus drivers from different London bus operators at bus garages across London;
  - (c) developing a tool to carry out sensitivity testing of the Bus Safety Standard safety measures to understand how the estimated benefits of the Standard may be affected by changes in our business case assumptions such as fleet renewal, and to understand the potential safety impacts of new safety measures that we may wish to include in future phases of the Bus Safety Standard; and
  - (d) developing a new Power BI tool to better analyse the bus involved risk rates based on mode (e.g., person walking, cycling or travelling by bus) and known characteristics such as gender, age or ethnicity, to ensure that risk is being reduced for all people who may be killed or seriously injured in or by a bus.

### **Bus Fires**

- 9.3 On average there have been 17 bus fires per year over the last five years in London. This is significantly below the average rate for the rest of the UK. The roll out of more zero emission buses introduces different risks than those arising from diesel and diesel-hybrid buses..

9.4 We have therefore decided to incorporate a Bus Fires workstream into the Bus Safety Programme to ensure a systematic approach is taken to address the actual and potential risks of fire within our changing bus fleet as with the rest of the Bus Safety Programme. The new workstream has been developed to address key risks and prioritise activities within TfL and amongst our key stakeholders, such as working with bus manufacturers, operators and the London Fire Brigade to provide education on the different types of buses in our fleet.

## **10 Summary**

10.1 We have a good grasp of the safety issues facing the bus network, we have built robust relationships with the bus industry and work very closely with bus operators who are also strongly committed to improving safety.

10.2 We are committed to continual improvement of the safety of London's buses and bus network; however, the funding uncertainties are impacting upon our ability to deliver planned and future safety improvements, it can be seen that this is being compounded the longer these uncertainties persist. The impact of this is an increasing risk that we will be unable to achieve its Vision Zero targets for the bus network in the current timeframe.

10.3 However, we are ready to restart all the paused activity as soon as funding is available and subject to supply chain limitations, we will seek to catch up on lost time. The impact of the new Government funding deal on bus safety projects is not yet known, we will provide an update at a later meeting once the details have been confirmed.

10.4 We will continue to focus on improving and advocating for bus safety as a key outcome of both the Bus Action Plan and the Vision Zero Action Plan.

### **List of appendices to this report:**

Bus Safety Standard Pedal Confusion Report (AECOM, 2022)

### **List of Background Papers:**

Bus Safety Programme, Safety Sustainability and Human Resources Panel, 24 February 2022

Measuring and Improving Employee Health, Safety, Sustainability and Human Resources Panel, 14 September 2021

Bus Safety Programme and Driver Health and Well Being, Safety, Sustainability and Human Resources Panel, 10 February 2021

Bus Safety Programme, Safety, Sustainability and Human Resources Panel, 12 February 2020

Bus Safety Programme, Safety, Sustainability and Human Resources Panel, 4 September 2019

Bus Safety Programme, Safety, Sustainability and Human Resources Panel, 27  
September 2018

Bus Safety Programme, Safety, Sustainability and Human Resources Panel, 23 January  
2017

Bus Safety Programme, Safety, Accessibility and Sustainability Panel, 30 June 2016

Bus Safety Programme, Safety, Accessibility and Sustainability Panel, 10 March 2016

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