

Date: 24 May 2023

Item: Bus Safety Programme Update

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.
- 1.2 Despite an increase in serious injuries during 2022, resulting in not achieving our 2022 target, buses are still the safest form of road transport in London. We will continue to monitor the emerging issues and risks that have developed during and since the pandemic and how these may continue to influence bus safety and passenger behaviour.
- 1.3 TfL has committed significant funding to improving bus safety through both research and development, and extensive safety technology retrofit programmes. We will continue to deliver safety improvements on our buses, and particularly to roll out the Bus Safety Standard.
- 1.4 TfL will shortly publish our new Bus Safety Strategy and will continue to lead the positive culture change in bus safety throughout the bus industry in London and more widely.

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. This paper sets out our recent safety performance together with an introduction to our new Bus Safety Strategy which will help us maintain the right focus going forwards and in achieving our Vision Zero targets for the bus network.

4 Safety Performance

- 4.1 The absolute numbers of people killed or seriously injured in or by a bus (bus involved KSIs) dropped to the lowest on record in 2020 (135) as patronage and road use were significantly reduced at the height of the pandemic. This figure rose to 174 bus involved KSIs in 2021, which represented a 70 per cent reduction against the 2005-09 baseline. For 2022, this figure is expected to have increased to 270 people killed or seriously injured (some of the injury severity data remains provisional), equivalent to a 54 per cent reduction against the 2005-09 baseline.
- 4.2 Figure 1 illustrates the sustained downward trend from 2010 to 2020 in people being killed or seriously injured in or by a bus. While we met our 2022 target of a 70 per cent reduction in KSIs two years early and for two years in a row, recent incidents have highlighted a shift in the number of serious injuries being sustained by passengers on board the bus. We continue to monitor the emerging issues and risks that have developed during and since the pandemic and how these may continue to influence bus safety and passenger behaviour.

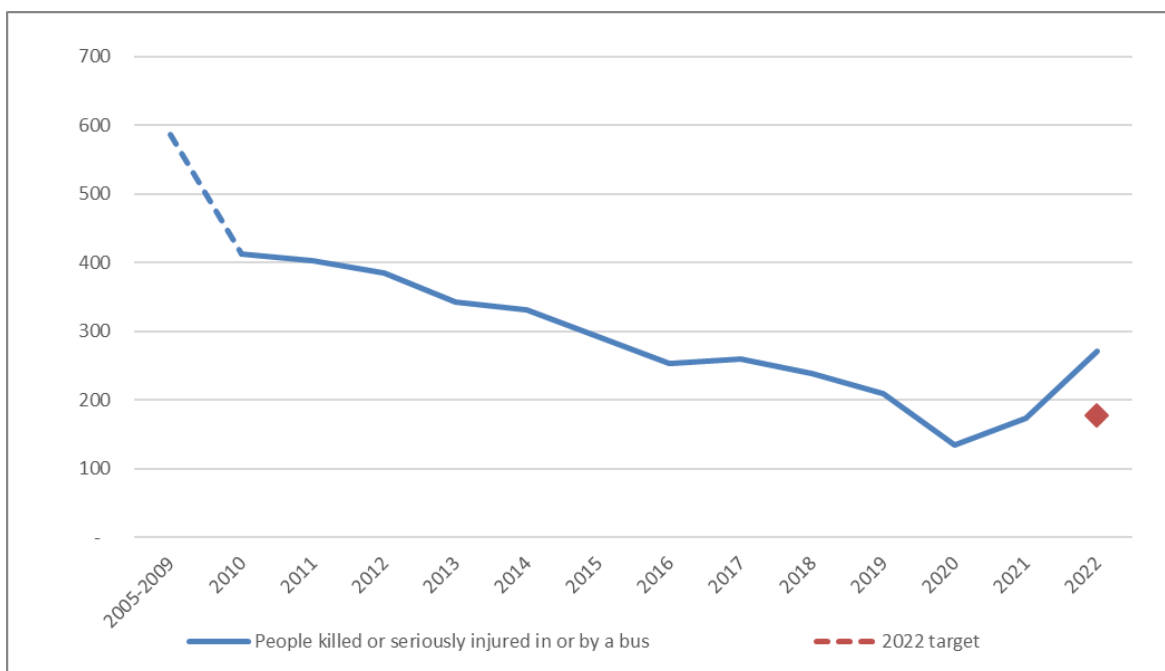


Figure 1: People killed or seriously injured in or by a bus: progress against baseline

- 4.3 Separating out the bus involved casualties – into those injured on the bus and those injured by the bus, helps to give a clearer perspective on who is being injured, and means that we can ensure our safety interventions are targeted towards where they are most needed. Where a person was injured as a passenger or as a pedestrian 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 2022, one person was killed and approximately 136 people were seriously injured (passengers or bus drivers) on the bus – 70 more than in 2021, while seven people were killed and 125 people were seriously injured by the bus (including a number of cases where the bus was stationary at the time). Of those people who were killed or seriously injured ‘by a bus’, 67 were pedestrians, 25 were cyclists and 14 were motorcyclists.

- 4.4 In response to this recent unexpected uplift in the number of serious injuries involving bus passengers, we’ve instigated a collaborative project with the bus operating companies to conduct an in-depth review of onboard incidents utilising bus CCTV footage. We know that around two-thirds of bus passenger injuries involve slips, trips, and falls, and this review is aimed to further inform the underlying circumstances and causes surrounding these incidents using a structured questionnaire. Factors such as the manoeuvres and actions taking place at the time of an incident, the frequency and potential reasons for sudden braking events, whether passengers were able to hold on at the time of the incident, and many others are being considered. Findings from this study will be used to help inform the next iteration of the Bus Safety Innovation Challenge, to be launched over the summer, which will be focused on solutions to reduce or mitigate bus passenger injuries.
- 4.5 Now that we have passed the 2022 interim target of a 70 per cent reduction in people killed or seriously injured on or by a bus, measured against the 2005-09 baseline, the next key milestone is the 2030 target of no one killed on or by a bus. This remains some way into the future, so to track interim progress, in accordance with the approach set out in the Mayor’s Transport Strategy, and how we will be measuring the changes in safety performance on London’s roads more holistically, from now on we will be measuring bus KSI performance against the 2010-2014 baseline. Compared to the 587 bus involved KSIs that occurred on average each year between 2005-09, from 2010-14 there were on average 375 bus involved KSIs each year. For 2023 our overall bus involved KSI target is 228. This stretching target will ensure we remain completely focused on delivering the best possible improvements with the limited funding available, as outlined in further sections of this paper.

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 April 2023, we achieved a significant milestone of 1,000 new buses meeting the standard (1,009), which is approximately 11 per cent of London’s bus fleet.
- 5.2 Over the last few months, we have retrofitted 1,204 buses with Intelligent Speed Assistance (ISA) technology. This means that, together with the Volvo ISA buses and all our new buses with ISA, approximately one-third of London’s bus fleet now has ISA.
- 5.3 Acoustic Vehicle Alerting Systems (AVAS) have been a requirement on new buses since the launch of the Bus Safety Standard. AVAS is only required on quiet-running buses, so there are fewer buses (869 as at end April 2023) with this technology.

- 5.4 Camera Monitoring Systems (CMS) have been very popular with London bus operators and bus drivers, as they eliminate blindspots and provide superior vision in adverse lighting and weather conditions. Currently 915 buses (as at end April 2023) have CMS.
- 5.5 We are continuing to develop our Bus Safety Standard beyond 2024 and we are actively looking at other technologies that may be suitable for retrofitting. These plans will mature over the next six months, and we look forward to updating you on our progress later in the year.

6 Overcoming the Funding Uncertainties

- 6.1 The funding uncertainties at TfL over the last three years have impacted the Bus Safety Programme. However, we have successfully agreed significant funding investment in bus safety through the new Business Plan, which will enable us to deliver more to help us achieve our Vision Zero targets for the bus network. This includes:
- 6.1.1 **ISA Retrofit:** We are currently planning the next tranche of ISA retrofit with up to a further 1,800 buses still in scope. Funding is in place to deliver this retrofit; discussions are underway with operators and suppliers to implement this next stage. There continues to be a six-month lead in time for further ISA systems, due to global supply chain issues, which will impact on the swiftness of delivery. If these buses are fitted over the next 12-18 months this would mean that, together with the new build buses delivered over this period, around 50 per cent of the bus fleet will have ISA technology.
- 6.1.2 **AVAS Retrofit:** Funding is now in place to retrofit AVAS to around 200 electric buses that pre-dated the introduction of our Bus Safety Standard, which would mean that our entire electric bus fleet will have AVAS. Subject to confirmation from the bus manufacturer as to technical feasibility, we will prioritise retrofitting these buses over the next few months. Alongside this, we will be upgrading all our buses with AVAS to our improved 'Responsive AVAS', which enables a more effective deployment of the AVAS sound depending on the time of day and ambient noise conditions, geolocated through combining our ISA and AVAS technologies. This means that wherever the bus travels the volume of the AVAS will alter to suit the ambient noise conditions – becoming louder on noisier streets and quieter on quieter streets or at night. This is the only known acoustic vehicle alerting system with this capability. In addition to this, we are considering whether retrofitting to hydrogen-electric buses would be beneficial.
- 6.1.3 **CMS Retrofit:** Funding is also in place to retrofit buses with CMS, and discussions are taking place to determine which buses they will be fitted to. Buses in scope include the New Routemaster, following the successful completion of a trial fitment to these buses.
- 6.1.4 **Fatigue Detection Technology project:** Funding is now in place to retrofit around 450 buses with Fatigue Detection Technology over the next year.

This funding will enable TfL to belatedly achieve its target in the Bus Action Plan for 500 buses to be fitted with Fatigue Detection Technology, to collect quantitative data to ensure the effective development of the bus driver fatigue programme into the future. This will also enable TfL to introduce a performance specification for this technology for new buses through the Bus Safety Standard. Subject to the outcome of this project, it may prove suitable to develop a further retrofit programme of this technology.

6.1.5 Advanced Emergency Braking (AEB) implementation support:

Funding is now available to continue to support the implementation of AEB into the fleet as set out in our Bus Safety Standard roadmap. Inevitably there is some impact from both lack of funding as well as the technical complexity of the technology, however TfL will encourage and support bus manufacturers to introduce AEB into the London fleet as closely aligned to our 2024 roadmap as possible.

6.1.6 Bus Safety Standard Phase 2: Funding for further development of the Bus Safety Standard beyond 2024 is now confirmed. The Bus Safety Standard is a live document and work is underway to evolve our bus safety requirements beyond the current roadmap to take advantage of changes in international regulations, improvements in technology and the continuing innovation and investment across vehicle industries. As set out in the next section, the Bus Safety Standard will be developed to take account of new technological advances and to respond to changes in risk to achieving TfL's bus safety Vision Zero targets. We look forward to updating you of our progress later in the year.

7 Bus Safety Strategy

- 7.1 A Bus Safety Strategy has been developed to ensure the safety improvements and other activities contained within the Bus Safety Programme are focused on continuing to drive changes that will help us to achieve a safe bus network and our Vision Zero targets of no one to be killed on or by a bus by 2030, and for no one to be killed or seriously injured on or by a bus by 2041.
- 7.2 The Strategy draws together our vision for a safe bus network, already set out in the Bus Action Plan and the Vision Zero Action Plan and builds upon them to enhance our Bus Safety Programme. It sets out that:
- (a) delivering a safe bus network is essential to ensuring bus travel in London is inclusive and attractive;
 - (b) we work closely with the bus industry, including bus operators, manufacturers, and suppliers, in the development and delivery of our Bus Safety Programme;
 - (c) significant progress has been made in reducing deaths and serious injuries on, or by, a bus in London over the past decade. Buses are the safest way to travel on the roads and carry more people than any other public transport mode;

- (d) while significant progress has been made in improving bus safety, existing and emerging challenges mean that consistent investment and commitment are necessary to achieve Vision Zero for buses in London;
 - (e) we seek to strengthen all components of the system through our Bus Safety Programme, which encompasses safe vehicles, safe speeds, safe streets, safe behaviours and post-collision support and investigation;
 - (f) greater visibility of what we are achieving, and how or where we can make improvements, will help inform how we work together in the future; and
 - (g) we will seek to achieve Vision Zero for the bus network through activities already committed to, and new actions that are set out in our action plan.
- 7.3 The Bus Safety Strategy focuses on what is primarily being delivered under the Bus Safety Programme. It also acknowledges that the wider Vision Zero programme across TfL in reducing road danger contributes toward achieving a safe bus network. We will continue to work with colleagues towards our common goal.
- 7.4 We have taken this opportunity to bring together into one place the breadth of activities and initiatives that have been delivered or are in progress now, and the bus operators and other organisations who are working with us. This highlights just how collaborative the Bus Safety Programme is; consistent support and engagement with the wider bus industry is really helping to both drive safety improvements as well as delivering a positive culture change.
- 7.5 One of the most significant successes of the Bus Safety Programme is the continued drive for innovation in what had been a rather safety-stagnant industry. We have dedicated research and development funding that has enabled us to lead many technology trials and safety initiatives, including the three Bus Safety Innovation Challenges.
- 7.6 The Bus Safety Programme is a clear and systematic programme to realise our ambition of a safe bus network. At the forefront is our world-leading Bus Safety Standard, which is being adopted in part or whole by other public transport authorities or offered to bus operators as optional extras on new buses throughout the UK and Europe. We have been able to forecast the contribution towards reducing casualties that our Bus Safety Standard will deliver in London and identify how it should be developed beyond 2024 to strengthen risk reduction across all our customers and road users.
- 7.7 The Strategy also identifies and discusses emerging risks to the achievement of our Vision Zero targets. It sets out the challenges but also identifies new opportunities that will enable us to meet these challenges robustly.
- 7.8 An Action Plan brings together existing actions committed in the Bus Action Plan and the Vision Zero Action Plan, and clearly sets out the new actions that have been identified throughout this Strategy that will help us to ensure that we keep on track and demonstrates our commitment to do our utmost to reach our Vision Zero targets for a safe bus network.

7.9 The Bus Safety Strategy will be published on TfL's website in the next few weeks and will be circulated for your attention.

List of appendices to this report:

None

List of Background Papers:

Bus Safety Programme, Safety Sustainability and Human Resource Panel, 22 September 2022

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

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

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

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

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

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

Bus Safety Programme, Safety, Sustainability and Human Resource 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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