

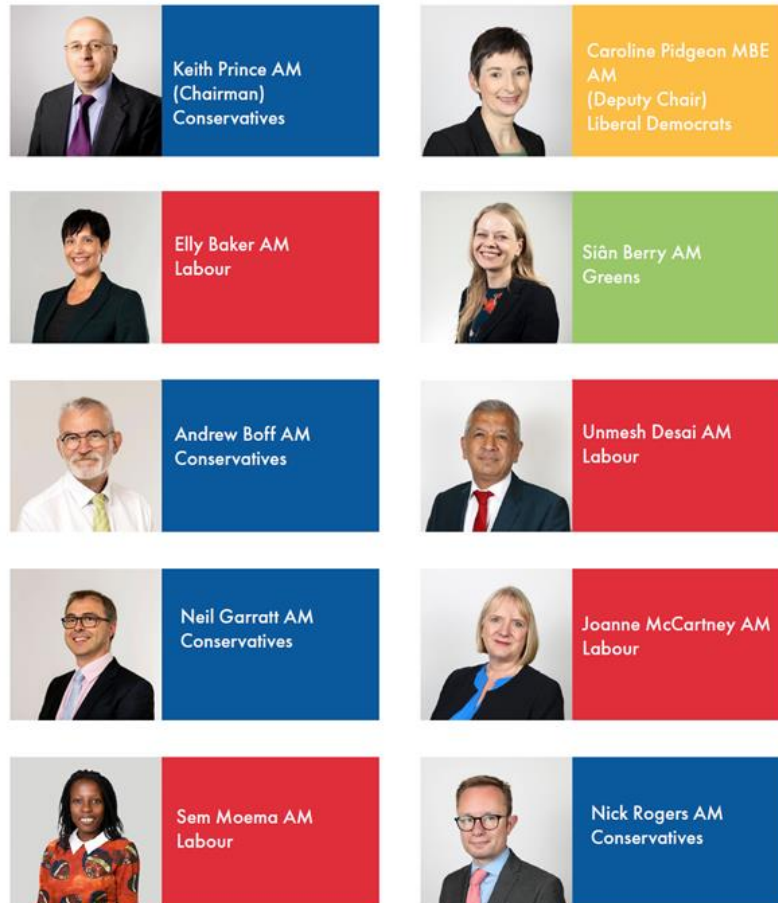
An aerial view of a city map, likely London, rendered in a vibrant green color. The map shows a dense network of streets and a winding river. Scattered across the map are several small, realistic figures of people walking, giving a sense of scale and movement. The figures are dressed in various casual and business-casual attire, including jackets, coats, and bags. The overall composition is clean and modern, with a strong focus on the urban environment.

Bus, tram and tube safety in London

Transport Committee

LONDONASSEMBLY

Transport Committee



This investigation was carried out by the Transport Committee in 2023-24, with Keith Prince AM as Chair, and the Assembly Members listed above.

The Transport Committee examines all aspects of the capital's transport system in order to press for improvements for Londoners. The Committee pays particular attention to how the Mayor's Transport Strategy is being implemented and looks closely at the work of Transport for London and other transport operators.

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Foreword



Keith Prince AM
Chair of the Transport Committee

It is a deeply regrettable fact that too many people are dying or being seriously injured on London's transport network.

In particular, the numbers of people being killed or seriously injured by buses in London remains excessively high. We should never allow raw numbers to blind us to the point that every death and serious injury on the transport network is a tragedy.

During this investigation, the Committee heard from a range of experts, including a survivor and bus drivers themselves. It remains clear that there is still a significant amount of work to do to ensure a safe and open culture is fostered and that the Vision Zero targets are achieved. Without a cultural step change those targets are currently set to be missed.

While the Committee welcomes any efforts by TfL to reduce injuries on buses, there is still much more to do. We heard that the conditions under which London bus drivers work are often extremely difficult. Fatigue is a widespread issue, with bus drivers working long shifts in uncomfortable bus cabins while under pressure to meet challenging schedules. Further work can and must be done to enhance the culture around the self-reporting of fatigue and to ensure that bus contracts do not focus on financial incentives at the cost of driver and passenger safety.

Passengers experiencing slips, trips and falls on the bus network remains a persistent issue. While TfL is undertaking analysis to understand and mitigate this issue, the large number of passenger injuries caused by slips, trips and falls requires more focused action. Working with government to establish an independent national Bus Safety and Standards Board would help share learning and focus action in this area.

This investigation builds on previous work by the Transport Committee, including the Committee's report in 2017 'Driven to Distraction: Making London's buses safer' and the 2020 report 'Tram and Bus Safety in London'. While technological advancements can help to address safety issues, the safety of drivers and passengers on London's transport network inherently involves a human factor that cannot be ignored.

Executive Summary

The Mayor's Transport Strategy includes a Vision Zero goal for London, setting an overall target of zero deaths and serious injuries on London's transport network by 2041. It also sets targets for nobody to be killed on or by a London bus by 2030, for no fatalities on the Underground by 2024, and an interim target for a 70 per cent reduction in people killed or seriously injured in, or by, London buses by 2022.

Transport for London (TfL) did not reach its interim bus target in 2022, and the 2024 targets for the tube appear to have been extended to 2030. In meeting these, the current focus seems to be primarily around ensuring existing safety levels are maintained and incrementally improved rather than making substantial investment in significant improvements.¹

The Transport Committee undertook a two-part investigation into safety on the transport network in autumn 2023 to assess progress against the Vision Zero targets, and wider safety concerns on the network.

The Committee's investigation found that while TfL has made good progress in implementing technical responses to bus safety issues, cultural and human factors continue to present key risks to bus safety. These are in part exacerbated by time pressures and financial incentives around bus punctuality. Drivers' wellbeing is still not given sufficient priority, despite a number of new initiatives, and the overall safety culture that TfL aspires to has not been adopted at all levels. More can be done to change this – including transparent reporting, better approaches to fatigue and rostering, and putting drivers at the centre of decisions.

On the tube and light rail network, financial constraints have led to a reduction in ambition, with TfL aiming to manage safety alongside the consequences of reduced investment in maintenance. This has resulted in a deterioration in asset condition and a backlog of renewals, which will take some time to clear. Whilst there is no indication that this has affected safety, it has meant that TfL's Vision Zero ambitions for the tube for proactive improvements have been significantly reduced in scope.

The report addresses the following areas:

- **Bus network**
 1. Pressure on bus drivers
 2. Working conditions
 3. Recording incidents and learning
- **Tube, tram and light rail network**
 4. Addressing risks around the platform/train interface
 5. Escalator falls
 6. Maintenance and safety challenges, and the impact of investment decisions on reliability

¹ [Vision Zero action plan progress report \(tfl.gov.uk\)](https://www.tfl.gov.uk/roadshow/articles/vision-zero-action-plan-progress-report)

Recommendations

Recommendation 1

The Mayor should require the TfL Commissioner to ensure that every report made to the Board includes detailed analysis of all serious injuries across transport modes in London, and ensure analysis of every incident is listed with links to further information.

Recommendation 2

In response to this report, TfL should provide a summary report detailing its performance against Vision Zero so far, and its plans for how it will meet future targets.

Recommendation 3

The Mayor should commission an Independent Safety Risk Assessment for TfL from a reputable independent authority which would investigate:

- The role and punctuality incentives in bus contracts, with emphasis on the stressful conditions these incentives might create for bus drivers, including those which cause fatigue.
 - The time pressures that Bus Drivers face.
 - Analysis of Speed Compliance Tool data.
-

Recommendation 4

TfL and bus operators should change the culture around self-reporting and ensure that fatigue is taken seriously. TfL should:

- Share the lessons learned from its pan-TfL Fatigue Working Group and Oversight Group.
 - Develop an action plan by September 2024 on how it will implement those lessons from trams (and other modes) systematically across bus operators.
 - Commission new research on shift lengths, patterns and rotas, including data on bus drivers' experiences of investment such as rest facilities and toilets.
-

Recommendation 5

TfL should convene relevant stakeholders, bus operating companies and unions urgently to develop proposals for TfL on timetabling, rostering, and drivers' hours and shifts to help deliver against the vision zero goal.

Recommendation 6

TfL and bus operators should identify changes that can be made to the ergonomics of the bus cab as part of updates ahead of the revised bus safety standard in 2027, and ensure further progress is made to improve driver conditions. In preparing the new bus safety standard, TfL should consult with bus drivers, and specifically ensure women drivers are represented in any such consultation.

Recommendation 7

TfL should address the issue of extreme temperatures in bus cabs through improved air conditioning and heating systems for the cab. It should monitor this by incorporating a digital thermometer in future cab designs, with data automatically recorded on iBus.

Recommendation 8

TfL should publish an action plan into how it intends to reduce slips, trips and falls on buses. This should include:

- Actions to reduce time pressure on drivers to prevent incidents caused by vehicles moving off before passengers have safely sat down.
- Analysis of the relationship between bus speeds and bus passengers being injured from slips, trips and falls, as captured by its Speed Compliance Tool Data on iBus.
- Clear actions that it plans to take, such as new signage and messaging, to encourage people to hold on.

Recommendation 9

Given the continuing high rates of injuries involving buses, TfL should explore the possibility of working with Government to set up a pilot scheme in London for an independent Bus Safety and Standards Board.

Recommendation 10

To enable learning, TfL should publish on its website an index of all transport related Prevention of Future Deaths (PFD) Reports that relate to London, including summary details of dates, locations, transport mode(s), transport operator and outcome. It should ensure all relevant information such as road safety audits and findings from the Met Police's own investigation teams are published for transparency.

Recommendation 11

The Mayor should undertake a new viability assessment with regard to implementing Platform Edge Doors across the tube network, determining how to prioritise such investment, as funding becomes available. TfL should provide an update to the Transport Committee once this has been completed. As part of this, TfL should provide the Committee with the results from the 2021 study on Platform Edge Doors, which was completed as part of the business case for driverless trains in London.

Recommendation 12

TfL should provide an annual update to the Transport Committee on progress in reducing escalator injuries across the transport network.

Recommendation 13

TfL should set out a plan by July 2024 for how it will address its maintenance backlog to reach a State of Good Repair, including the timing and investment required – including from Government.

This investigation

The Transport Committee undertook a two-part investigation into safety on the transport network in autumn 2023 to assess progress against the vision zero targets, and wider safety concerns on the network:

- Part One of our investigation examined TfL's initiatives to prevent deaths and injuries on its bus and tube networks. The findings and recommendations within this report are based on the evidence the Committee heard in this meeting, as well as separate meetings that the Committee held on trams and the Docklands Light Railway.²
- Part Two examined personal security on London's transport network, drawing on research by London TravelWatch.³ The findings and recommendations of Part 2 were covered by the Committee in a separate letter to the Mayor, published on 1 March 2024.⁴

The Committee held a meeting on 7 November 2023, with:

- **Tom Kearney**, Bus Safety Campaigner, #LondonBusWatch
- **John Murphy**, Regional Officer, Unite the Union
- **Professor Andrew Morris**, Professor of Human Factors in Transport Safety and Director of Internationalisation (Design School), Loughborough University
- **Jon Eardley**, Managing Director, Abellio
- **Richard Hines**, HM Deputy Chief Inspector of Railways, Railway Safety Directorate, Office of Rail and Road
- **Lilli Matson**, Chief Safety, Health and Environment Officer, TfL
- **Tom Cunnington**, Head of Bus Business Development, TfL
- **Richard Jones**, Director of Asset and Facilities, TfL

The Committee also held an online Bus Driver Roundtable on 29 November 2023. The Committee received written evidence from three bus drivers and Tom Kearney following the Roundtable.⁵

² London Assembly Transport Committee, [Transcript of Trams Meeting](#), 27 September 2023; London Assembly Transport Committee, [Transcript of Docklands Light Railway Meeting](#), 18 December 2023

³ London Assembly Transport Committee, [Agenda and minutes](#), November 2023

⁴ London Assembly Transport Committee, [Letter to the Mayor - Personal Security Investigation](#), 1 March 2024

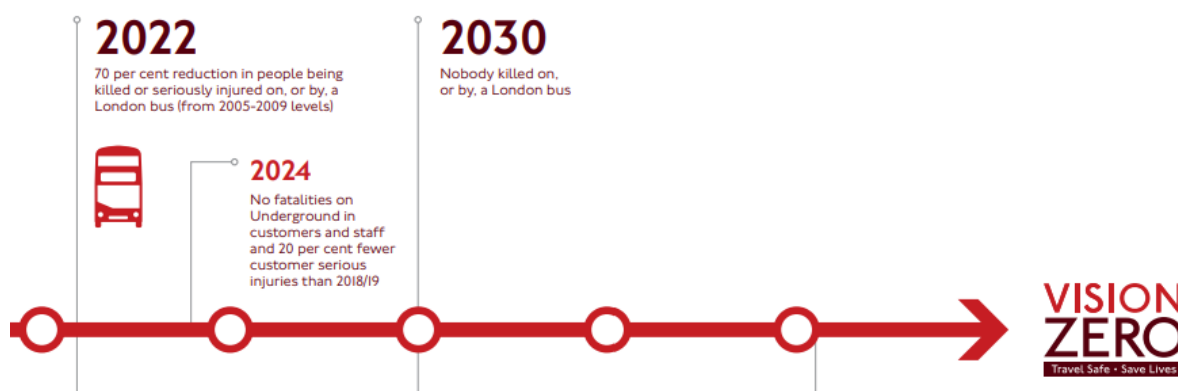
⁵ [Evidence Submission by Tom Kearney](#), 15 December 2023. Details of other evidence not included to maintain anonymity.

Vision Zero and the Transport network

The Mayor's Vision Zero targets

The Mayor's Transport Strategy set a Vision Zero goal for London that, by 2041, all deaths and serious injuries will be eliminated from London's transport network.⁶ The Mayor also set targets for nobody to be killed on or by a London bus by 2030, for no fatalities on the Underground by 2024, and an interim target for a 70 per cent reduction in people killed or seriously injured in, or by, London buses by 2022.⁷

TfL's Vision Zero Targets for Bus and Underground⁸



Progress on reducing injuries and deaths

Latest injury and fatalities figures

TfL's Safety, health and environment annual report for 2022/2023 states that there were 8,112 reported customer injuries on the transport network and four deaths over this period.⁹ There were also 214 serious injuries among customers.¹⁰ However, in February 2024, TfL reported that there had been seven fatalities on the public transport network in recent months, occurring at Walthamstow bus station, Piccadilly Circus, Stratford Underground station, on the bus network on A301 Waterloo Road, Hackney, Victoria bus station and Mile End station.¹¹ Every death and serious injury on the transport network is a tragedy, and reinforces the need to reach 'Vision Zero' as soon as possible.

⁶ Mayor of London, [Mayor's Transport Strategy](#), March 2018, p23

⁷ TfL, [Vision Zero action plan progress report \(tfl.gov.uk\)](#), p 7

⁸ TfL, [Bus Safety Strategy](#), Part of Figure 2, p9

⁹ TfL, <https://content.tfl.gov.uk/safety-health-and-environment-report-2023-acc.pdf>, July 2023

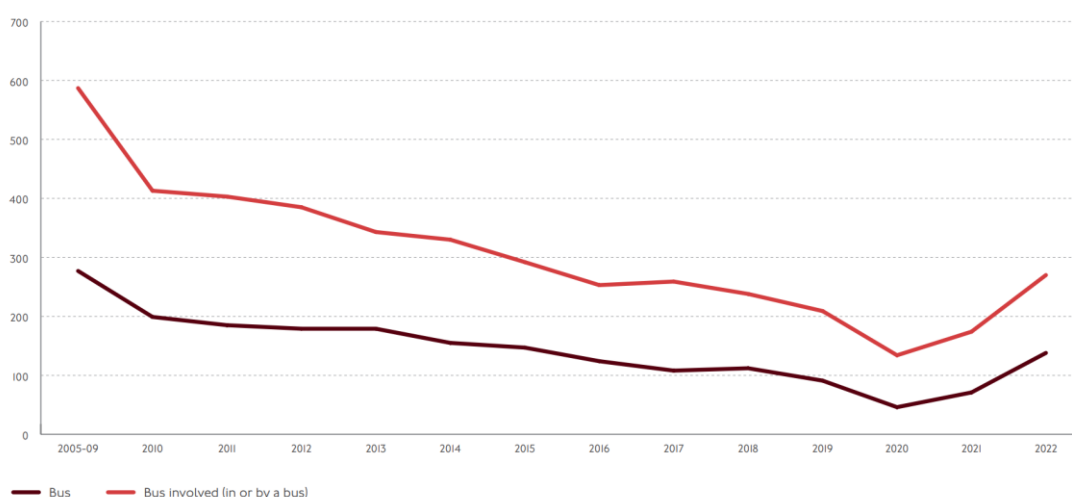
¹⁰ Clarification from TfL received 1 November 2023 as data in Annual Report incorrect (states 18)

¹¹ TfL, [Safety, Sustainability and Human Resources Panel](#), February 2024, p99

Progress on reducing injuries and fatalities on the bus network

By the end of 2022, the number of people killed or seriously injured in collisions involving London buses had reduced by 54 per cent against TfL’s 2005-09 baseline. While this is progress, it means that TfL did not reach its target set in 2018 under the Vision Zero Action Plan for reducing the number of people killed or seriously injured on, or by, a bus, by 70 per cent by 2022 compared with the 2005-2009 average.¹² TfL highlights that the reduction in deaths and serious injuries is greater than the overall reduction on London’s roads of 38 per cent.¹³ However, it did achieve the target in the previous two years, in part linked to lower travel demand due to COVID during that time.¹⁴

People killed or seriously injured on or by a bus¹⁵



In 2022, the number of people killed or seriously injured as a result of collisions involving buses increased by 15 per cent against the 2017-2019 pre-pandemic average. There was an increase in bus passenger risk from 1.3 fatalities and serious injuries per million boarding journeys (in 2019 and 2020) to 1.7 in 2021.¹⁶

Lilli Matson, Chief Safety, Health and Environment Officer at TfL, told the Committee that:
 “I think what that shows is it depends really whether your glass is half full or half empty. There has been progress. That progress is actually in advance of the

¹² London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 2 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Lilli Matson, p1

¹³ TfL, [Bus safety strategy \(tfl.gov.uk\)](#) p17

¹⁴ TfL, [Bus safety strategy \(tfl.gov.uk\)](#) p17

¹⁵ TfL, [Bus safety strategy \(tfl.gov.uk\)](#) p19. Note: the lower line [bus] refers to bus occupants only.

¹⁶ TfL, [Bus safety strategy \(tfl.gov.uk\)](#) p23

reductions we have seen more generally. There was a 52 percent reduction in all fatalities compared to the 61 percent reduction in terms of bus-related fatalities.”¹⁷

In September 2023, TfL launched a new 80-page Bus Safety Strategy,¹⁸ which drew on its previous work on bus safety (its ‘bus safety programme’) expanding and updating commitments made in its 2022 Bus action plan and the July 2018 Vision Zero action plan. It included a focus on reducing slight injuries as well as serious ones, highlighting that this is particularly important for vulnerable passengers “where a slight injury may have a greater effect on confidence and willingness to travel by bus in the future”.¹⁹

Progress towards the London Underground targets

As part of his 2021 Vision Zero action plan progress report, the Mayor set a target of no fatalities on the London Underground for both customers or staff by 2024, and 20 per cent fewer serious injuries compared with 2018/19.²⁰

The 2024 targets for the tube in the 2021 Vision Zero Action Plan progress have not been referenced since. The focus appears to be primarily around ensuring current safety levels are maintained and incrementally improved rather than investment in significant improvements.²¹

In the Committee meeting, Lilli Matson did not refer to the target for 2024, only to a 2030 target for no colleague killed or seriously injured by 2030, and to halve the number of customers killed or serious injured on TfL’s transport network, from a baseline of 2022/23.²²

Putting data at the centre for accountability and transparency

The scale and the extent of these incidents is currently not reported in detail in TfL board papers. Lilli Matson from TfL told the Committee that the Board is not shown every single incident:

“Every Commissioner’s Report starts with safety. Usually, the first paragraph heading will be about safety. It will talk, obviously, about our performance, and if there have been notable incidents – whether that is on the Underground network or on the bus

¹⁷ London Assembly Transport Committee ([Public Pack](#))[Draft Transport Committee Transcript - 7 November 2023 - Panel 2 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Lilli Matson, p1

¹⁸ TfL, [Bus safety strategy \(tfl.gov.uk\)](#)

¹⁹ TfL, [Bus safety strategy \(tfl.gov.uk\)](#), p9

²⁰ TfL, [Vision Zero action plan progress report](#), p7

²¹ A 2017 Safety, Sustainability and Human Resources Panel identified that Rail and Sponsored Services, River Services and London Underground would lead on Vision Zero for rail, underground and river journeys.

<https://content.tfl.gov.uk/sshrp-20171122-item12-vision-zero.pdf>

²² London Assembly Transport Committee, ([Public Pack](#))[Draft Transport Committee Transcript - 7 November 2023 - Panel 3 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), 7 November 2023, p1

network – it will highlight those for the Board. It does not necessarily list every single one.”²³

Tom Kearney, a prominent bus safety campaigner who in his professional role sits on the board of mining companies, told the Committee that in the mining industry, fatigue incidents are recorded and reported to the board at every meeting. He noted the importance of preventive measures for fatigue related incidents,²⁴ stating:

“Preventive means looking very, very granularly at the working conditions bus drivers face because, from my perspective as a company director, we would not allow them, because we would be in jail for creating conditions that are guaranteed to kill and injure.”²⁵

The Committee is concerned that the TfL Board is not being shown detailed enough data to get an accurate picture of the extent of incidents occurring on London’s network.²⁶

TfL was due to provide a Vision Zero Road Risk Annual Update to the Safety, Sustainability and Human Resources Panel on 15 November 2023.²⁷ However, this does not appear to have been published.²⁸

Recommendation 1

The Mayor should require the TfL Commissioner to ensure that every report made to the Board includes detailed analysis of all serious injuries across transport modes in London, and ensure analysis of every incident is listed with links to further information.

Recommendation 2

In response to this report, TfL should provide a summary report detailing its performance against Vision Zero so far, and its plans for how it will meet future targets.

²³ London Assembly Transport Committee, ([Public Pack](#))[Draft Transport Committee Transcript - 7 November 2023 - Panel 2 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), 7 November 2023, Lilli Matson, p19

²⁴ London Assembly Transport Committee, ([Public Pack](#))[Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), 7 November 2023, Tom Kearney, p 1-2

²⁵ London Assembly Transport Committee, ([Public Pack](#))[Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Tom Kearney, p 2

²⁶ London Assembly Transport Committee, ([Public Pack](#))[Draft Transport Committee Transcript - 7 November 2023 - Panel 2 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Lilli Matson, p20

²⁷ TfL, <https://board.tfl.gov.uk/mgConvert2PDF.aspx?ID=20032&ISATT=1#search=%22vision%20zero%22>

²⁸ TfL, [Board/committee/panel meeting template \(tfl.gov.uk\)](#) ; TfL, <https://board.tfl.gov.uk/ieSearchResults2.aspx?SS=vision%20zero%20action%20plan&DT=1&CI=174&ADV=1&CA=false&SB=true&CX=500155182&PG=1>

Bus safety

Over half of all bus journeys in England are made in London.²⁹ 1.8 billion passenger journeys were made by local buses in the year ending March 2023.³⁰ In total, these buses travelled 282 million miles.³¹ As of February 2024, the London Bus fleet consists of around 9,000 buses, including 1,300 zero-emission buses.³²

The Committee's investigation sought to understand the reasons why the number of people killed or seriously injured on or by a bus has been increasing recently and is not on track to meet the Mayor's 2030 targets. While there has been good progress on technical solutions, such as speed limits and bus technology, there are also some underlying factors that affect safety. Many of these are due to human factors, and addressing these is a key part of the safe systems approach.

Pressure on bus drivers

Fatigue

Evidence over many years suggests that fatigue among London bus drivers is a chronic and widespread issue.³³ Research by Loughborough University and the Swedish National Road and Transport Institute in May 2019 found that one-in-six London bus drivers reported falling asleep at the wheel within the previous year.³⁴ The report's authors proposed solutions focused on education, working conditions, schedules and rostering, open culture and health, including sleep health.³⁵

During the Committee's investigation, it heard from Professor Andrew Morris who was involved in this research. Professor Morris told the Committee "we did find that fatigue was a problem for bus drivers. In fact, we found 21 percent of drivers are fighting sleep at least three times per week and insufficient sleep before shifts and changing shift patterns."³⁶

²⁹ [Annual bus statistics: year ending March 2023 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/annual-bus-statistics-year-ending-march-2023)

³⁰ [Annual bus statistics: year ending March 2023 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/annual-bus-statistics-year-ending-march-2023)

³¹ [Annual bus statistics: year ending March 2023 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/annual-bus-statistics-year-ending-march-2023)

³² TfL, [Commissioner's report February 2024](#), p19

³³ Fitness et al (2019) Bus Driver Fatigue Report by Loughborough University for TfL: <https://content.tfl.gov.uk/bus-driver-fatigue-report.pdf>

³⁴ Fitness et al (2019) Bus Driver Fatigue Report by Loughborough University for TfL: <https://content.tfl.gov.uk/bus-driver-fatigue-report.pdf>

³⁵ Fitness et al (2019) Bus Driver Fatigue Report by Loughborough University for TfL: [Bus Driver Fatigue \(tfl.gov.uk\)](https://www.tfl.gov.uk/road-users/bus-driver-fatigue)

³⁶ London Assembly Transport Committee ([Public Pack](#)) [Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Andrew Morris, p10

Professor Morris indicated that cultural changes within organisations could assist in managing fatigue among drivers. He told the Committee: “What we found was that some of the behavioural factors within the organisation or the cultural factors could address the problem in some ways.” He added that a key element in reducing risk was “improving the relationship between the drivers and the traffic controllers.”³⁷

TfL states that it is already working to deliver fatigue detection technology in its buses, and working with operators to deliver the Fatigue Management Plan, as well as delivering the Bus Safety Standard.³⁸ However, John Murphy, Regional Officer at Unite the Union indicated that efforts to tackle fatigue have so far only had a limited impact. He told the Committee: “Over the last couple of years, since 2016, I would not say fatigue has improved and it has an impact as we move forward. The reluctance, as I said before, to accept the responsibility helps to grow the risk there.”³⁹ John Murphy went on to say that there is a lack of accountability by TfL and the issues are caused by problems with the shifts, the shift patterns, and the length of the shifts:

“There is an issue with fatigue and fatigue is not caused by bus drivers staying up late at night watching television or arguing with their family, but the perception of TfL, certainly what they promote, is this sort of belief that the responsibility for fatigue solely rests with the driver. It really does not.”⁴⁰

Time pressures

Guests told us that pressure on bus drivers to meet time schedules adds stress and potentially increases the risk of collisions. Tom Kearney said that there is a systemic issue around targets being based around punctuality, saying “If you incentivise time and pay for time, safety will suffer.”⁴¹

Tom Kearney also wrote to the Committee and indicated that the targets in TfL bus contracts lead to pressure being put on bus drivers to make up time. He stated that “TfL’s sole measurement of Contract Performance has been “Excess Waiting Time (EWT)” or “Headway” Targets”.⁴²

Excess Waiting Time is a performance indicator showing the average waiting time minus the scheduled waiting time and provides an indication of the time passengers wait above the

³⁷ London Assembly Transport Committee ([Public Pack](#)) [Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Andrew Morris, p10

³⁸ [Letter from TfL to London Assembly Transport Committee](#), 29 January 2024

³⁹ London Assembly Transport Committee, ([Public Pack](#)) [Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), John Murphy, p2

⁴⁰ London Assembly Transport Committee, ([Public Pack](#)) [Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#) p11

⁴¹ London Assembly Transport Committee, ([Public Pack](#)) [Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Tom Kearney, p7

⁴² [Evidence Submission by Tom Kearney](#), 15 December 2023, p5

time TfL expected them to wait.⁴³ Headway Targets are defined as the 'time between the arrivals of two public transport services with the same stopping pattern. A service with a frequency of 6 vehicles per hour will have headway of 10 minutes.'⁴⁴

Jon Eardley, Managing Director of the bus company Abellio said that they always consult with drivers around route timetabling.⁴⁵ Further, TfL provided the Committee with a letter stating ways that TfL ensures pressure to run buses on time does not come at the expense of safety:

"We are in constant discussion with bus operators on matters such as schedules to ensure they are safe and reliable, meet the needs of customers, and adapt to changing journey times... Bus performance is reviewed in conjunction with the operators. A variety of both quantitative and qualitative data is used to ensure that the correct amount of schedule resource is in place along with a 'buffer' for resilience to match the current road conditions, address delays and ensure driver hours compliance. When we review schedules and run-time with operators, we ensure that a granular end to end review of performance has taken place. The operators also engage with the driver union representatives as appropriate to ensure that their concerns are heard and addressed by the operator when adapting and amending schedules. Routes are reviewed on a regular basis as part of the contracting cycle, but also in response to performance to capture reliability concerns. Operators also raise safety matters that need to be addressed as part of these discussions."⁴⁶

However, the Committee heard from guests that pressure to run buses on time has the risk of being at the expense of safety overall, even if measures are designed to improve safety. Professor Andrew Morris, Professor of Human Factors in Transport Safety, Loughborough University, stated that:

"There is a big move to reduce speed limits to 20 miles per hour, but part of the Bus Strategy is to increase journey speeds, therefore those sort of things are a little bit contradictory and they also impose stress on drivers who are already stressed quite a bit by what is going on in the bus cabin anyway, being the customer interface and having to meet very, very busy schedules, which in turn has an effect on perhaps the comfort and safety of the drivers."⁴⁷

In his evidence, Tom Kearney highlighted data from TfL's iBus Speed Compliance Tool system which he said indicates that a large number of speeding incidents are taking place.⁴⁸

⁴³ TfL, [Bus routes & borough reports - Transport for London \(tfl.gov.uk\)](https://www.tfl.gov.uk/road-users/bus-routes-and-borough-reports)

⁴⁴ TfL, [Glossary - Transport for London \(tfl.gov.uk\)](https://www.tfl.gov.uk/road-users/glossary)

⁴⁵ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 2 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](https://www.london.gov.uk/committees/transport-committee/draft-transport-committee-transcript-7-november-2023-panel-2-minutes-supplement-for-transport-committee-07-11-2023-10-00) Jon Eardley, p18

⁴⁶ [Letter from TfL to London Assembly Transport Committee](https://www.london.gov.uk/committees/transport-committee/letter-from-tfl-to-london-assembly-transport-committee), 29 January 2024

⁴⁷ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](https://www.london.gov.uk/committees/transport-committee/draft-transport-committee-transcript-7-november-2023-panel-1-minutes-supplement-for-transport-committee-07-11-2023-10-00), Professor Andrew Morris, p5

⁴⁸ [Evidence Submission by Tom Kearney](https://www.london.gov.uk/committees/transport-committee/evidence-submission-by-tom-kearney), 15 December 2023, p14

He drew attention to the fact that in response to a Mayor's Question, the Mayor said that TfL does not use the Speed Compliance Tool in crash investigations, citing "limitations and inaccuracies in the dataset".⁴⁹ However, given the importance of speed in the safe system approach to reducing injuries, the Committee consider that being able to accurately monitor the speed of buses should be a high priority.

Bus company culture

The Committee also heard that there is still a blame culture in bus companies which impacts many aspects of drivers' wellbeing, rather than an open safety culture where drivers can report any concerns and be supported. Drivers have access to a confidential reporting system, known as the Confidential Incident Reporting and Analysis Service (CIRAS), which bus drivers can use to report health, wellbeing and safety concerns.⁵⁰

Loughborough University's report for TfL on bus driver fatigue stated there should be a shift from a discipline-based culture, in which bus drivers do not report fatigue incidents due to fear of disciplinary action, towards an open culture, which will encourage bus drivers to report and discuss fatigue incidents with their employers.⁵¹

John Murphy from Unite the Union told the Committee:

"There is a reluctance to accept what the cause is. There is a reluctance to take responsibility in TfL and it is still driven by a willingness to blame. The problem with blame as opposed to taking responsibility, unless you understand what is going wrong, unless we all take our part in responsibility, we cannot seriously start to address things. Fatigue is a classic example. We now have TfL introducing different sorts of artificial intelligence machinery and stuff to recognise fatigue after it has happened. But there are no measures been put in place yet to prevent it, therefore we tend to be reactive rather than proactive."⁵²

The Committee heard from guests about the importance of engaging all stakeholders to create an open culture in addressing challenges. Professor Andrew Morris told the Committee that:

"If you are looking at a safe system, which TfL would claim to implement, then the safe -system does encourage buy-in from all stakeholders to make sure that everybody is working towards the same end goal."⁵³

⁴⁹ [Vision Zero: Speed Compliance Tool Data and KSI Incidents \(2\) | London City Hall](#)

⁵⁰ TfL, <https://content.tfl.gov.uk/bus-safety-strategy.pdf>, September 2023, p67

⁵¹ Loughborough University, [Bus Driver Fatigue \(tfl.gov.uk\), May 2019](#), p77

⁵² London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), John Murphy, p1

⁵³ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Professor Andrew Morris, p10

With regards to promoting a positive safety culture, Lilli Matson, TfL, told the Committee: “this is genuinely our top priority and is something that is at the heart of our strategy, it is something that, at a leadership level, from the [TfL] Commissioner, myself, and others, we will talk about very frequently. We will also be putting in place active and open conversations to encourage that.”⁵⁴ Following the Committee meeting, TfL wrote to the Committee to set out how it is promoting and working to improve safety culture:

“Improving safety culture is a key part of the Bus Safety Programme and there are a number of ways in which we aim to promote a safety culture. This includes sharing information and research across the bus industry to stimulate the development of measures to improve safety, extensive engagement and work with bus operators including collaboration on trials, research, and training. For example, as part of the fatigue, health and wellbeing workstream we delivered Fatigue Management Awareness training for bus operators to encourage an open culture on managing fatigue.”⁵⁵

Bus drivers’ contracts and performance

However, the Committee also heard that although there may be some efforts to change the culture, the underlying system means that the driver is put under financial pressure, which is likely to affect their wellbeing. Tom Kearney told the Committee that “60 percent of the cost of a bus is the driver. Anything that claims that the system is getting more efficient, it is returning money outside the system, is disproportionately affecting the pay packet of the bus driver.”⁵⁶

In 2016 at the launch of TfL’s original bus safety programme, TfL announced plans to update TfL’s bus contracts to include new safety incentives. In July 2017, the Transport Committee published its report on bus safety, ‘Driven to distraction – tackling safety on London’s buses’.⁵⁷ TfL accepted several of the recommendations set out in the report. For example, the Committee recommended that TfL should introduce a direct link between senior staff bonus payments and bus safety performance. TfL responded that senior staff bonuses were linked to its new scorecard which includes a target for reduction in Killed or Seriously Injured (KSI) casualties.⁵⁸

TfL uses a Safety Performance Index (SPI) to monitor the safety performance of their bus operators, using five “baskets” (‘Staff and Customer Safety’, ‘Network safety’, ‘Driving

⁵⁴ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 2 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#) Jon Eardley, p178

⁵⁵ [Letter from TfL to the London Assembly Transport Committee, 29 January 2024](#)

⁵⁶ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Tom Kearney, p7

⁵⁷ London Assembly Transport Committee, [‘Driven to distraction Making London’s buses safer’](#), July 2017

⁵⁸ https://www.london.gov.uk/sites/default/files/tfl_response_to_bus_safety_report.pdf

Standards', 'Engineering', and 'Issue and Risk Management') and Performance components within each of these baskets (e.g. engine fires, CCTV failure in the "engineering basket").⁵⁹

However, not meeting all safety targets on the scorecard has a fairly minimal impact on performance awards for senior managers and directors. For example, TfL told us that the scorecard for 2022/23 financial year "did not meet the stretching full-year, target, however it was higher than the floor target, and therefore a part-score was applied for Scorecard and performance award purposes".⁶⁰ The impact of this was just 0.12 per cent and 0.24 per cent respectively, as only 40 per cent of senior management performance awards are determined by the divisional scorecard result.⁶¹

⁵⁹ [Strategic analysis of current bus safety issues \(urbantransportgroup.org\)](https://www.urbantransportgroup.org); <https://www.london.gov.uk/who-we-are/what-london-assembly-does/questions-mayor/find-an-answer/vision-zero-2-2>

⁶⁰ [Letter from TfL to London Assembly Transport Committee](#), 29 January 2024, p 8

⁶¹ [Letter from TfL to London Assembly Transport Committee](#), 29 January 2024, p 8

Trams: Safety and learnings around culture

In a separate investigation, the Committee examined current tram operations in London. It also explored tram safety and lessons that have been learnt after the Sandilands Crash.⁶² Some of the experience and learning from tram operations appear directly relevant to bus safety challenges.

The Sandilands tram crash

On 9 November 2016, a tram was overturned whilst travelling at a speed of over three times the 20 km/hour limit when approaching a sharp curve around Sandilands junction, a stop in a residential area east of Croydon.⁶³ This crash resulted in seven deaths and 61 passengers injured, 19 of which were serious.⁶⁴ In 2017, the Rail Accident Investigation Branch (RAIB) concluded an inquest which attributed the main cause of the crash as the speed at which the tram was travelling as it approached the curve of the tram stop, in addition to several other factors.⁶⁵

In this investigation, TfL told the Committee that the Sandilands court case was an important learning experience for TfL and that it has taken on board the sentencing remarks. TfL stated that “the whole light rail sector has changed considerably since 2016.”⁶⁶ In regard to risk management, the Committee heard that there have been improvements across the light rail sector. These include the implementation of a comprehensive risk model by the Light Rail Safety and Standards Board (LRSSB), which provides a centralised point for gathering data on precursors and hazardous events to evaluate risk,⁶⁷ and the introduction of a Fatigue Risk Management Group by the tram operator TOL, that meets quarterly.⁶⁸

Mark Davis, General Manager for Trams at TfL also told the Committee that “we constantly ensure our staff feel enabled and able to report incidents when they see them.”⁶⁹ These

⁶² London Assembly Transport Committee Transcript, [Transcript of Meeting](#), 27 September 2023, Mark Davis (General Manager for Trams, TfL)

⁶³ Rail Accident Investigation Branch, [Report 18/2017: Overturning of a tram at Sandilands junction, Croydon - GOV.UK \(www.gov.uk\), 7 December 2017](#)

⁶⁴ Rail Accident Investigation Branch, [Report 18/2017: Overturning of a tram at Sandilands junction, Croydon - GOV.UK \(www.gov.uk\), 7 December 2017](#)

⁶⁵ Rail Accident Investigation Branch, 18/2017, Overturning of a tram at Sandilands junction, Croydon, 9 November 2016, v2.2, October 2020.

⁶⁶ London Assembly Transport Committee Transcript, [Transcript of Meeting](#), 27 September 2023, Mark Davis (General Manager for Trams, TfL), p20

⁶⁷ London Assembly Transport Committee Transcript, [Transcript of Meeting](#), 27 September 2023, Carl Williams (Chief Executive, Light Rail Safety and Standards Board), p17

⁶⁸ London Assembly Transport Committee Transcript, [Transcript of Meeting](#), 27 September 2023, Ben Groome (Operations Director, Tram Operations Limited), p31

⁶⁹ London Assembly Transport Committee Transcript, [Transcript of Meeting](#), 27 September 2023, Mark Davis (General Manager for Trams, TfL), p21

changes also include improvements to rostering, allocation, fatigue management and drivers' now self-reporting fatigue. The tram operator TOL stated that they now have:

“A self-report fatigue system, which is non-punitive, and you can call in if you are before work and say you feel fatigued. You can call in. You then get adequate rest before coming into work and you will have a fatigue conversation with your manager to ask, “Look, what happened? Why is that happening?” Invariably, those are one-off events where something happened, a screaming baby next door or there is a party, those kind of things.”⁷⁰

TfL told the Committee about the existing pan-TfL group which learns from all TfL transport modes with respect to fatigue, as well as using the learning from bodies such as the Rail Safety and Standards Board (RSSB) and the Light Rail Safety and Standards Board (LRSSB). Lilli Matson from TfL told the Committee that:

“I would not like you to have the impression that we do not take the learnings from, for example, what we are doing on trams and apply it directly to buses, because we do. That is exactly what we have been doing. When I talk about having a pan-TfL Fatigue Working Group and Oversight Group, that brings the people who run the different modes together to share their learning. We are trying to create a culture where we are learning across different modal operations.”⁷¹

In the absence of a national bus safety regulator, additional steps are required to assure safety. An Independent Safety Assessment (ISA) is a service undertaken by a third party to confirm that a product, or transport system meets recognised industry, legal and regulatory standards that relate to safety.⁷² Undertaking an Independent Safety Risk Assessment would provide greater transparency and an objective view of the risks.

Recommendation 3

The Mayor should commission an Independent Safety Risk Assessment for TfL from a reputable independent authority which would investigate:

- The role of punctuality incentives in bus contracts, with emphasis on the stressful conditions these incentives might create for Bus Drivers, including those which cause fatigue.
- The time pressures that bus drivers face.
- Analysis of Speed Compliance Tool data.

⁷⁰ London Assembly Transport Committee Transcript, [Transcript of Meeting](#), 27 September 2023, Ben Groome (Operations Director, Tram Operations Limited), p30

⁷¹ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 3 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Lilli Matson, p9

⁷² Ricardo, [Independent Safety Assessment | Independent assurance | Assurance and testing | Services | Ricardo](#)

Recommendation 4

TfL and bus operators should change the culture around self-reporting of fatigue and ensure that fatigue is taken more seriously. TfL should:

- Share the lessons learned from its pan-TfL Fatigue Working Group and Oversight Group.
- Develop an action plan by September 2024 on how it will implement those lessons from trams (and other modes) systematically across bus operators.
- Commission new research urgently on shift lengths, patterns and rotas, including data on bus drivers' experiences of investment such as rest facilities and toilets.

Recommendation 5

TfL should convene relevant stakeholders, bus operating companies and unions urgently to develop proposals for TfL on timetabling, rostering, and drivers' hours and shifts to help deliver against the vision zero goal.

Working conditions

Cabin design

The Committee heard the working conditions in the bus cabin (the cab) negatively impact bus drivers and their performance. Professor Andrew Morris said that the ergonomics of a bus cab are "ad hoc at best and wilfully obstructive at worst".⁷³ He added:

"From a human factor and an ergonomic point of view, there is still a lot that might cause confusion, and this is not a good situation for the driver. If you are overloading them with things to remember or things to learn within the driver cockpit, then that will impact on their driving style ultimately. That reflects on passenger safety of course."⁷⁴

Tom Cunnington from TfL told the Committee that only ten percent of the driving workforce are female, which he stated:

"Is partly down to the ergonomics of the cab that they have maybe been designed for men rather than for women. How can we make sure that we design the cabs to encourage as many people as we can into the industry that are able to do that job and, within that, really set the cab up in a way that it is their office, perhaps, and so that far more human factors are built into that as well."⁷⁵

⁷³ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#) Professor Andrew Morris, p8

⁷⁴ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#) Professor Andrew Morris, p8

⁷⁵ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 2 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#) p16

TfL commissioned the Transport Research Laboratory (TRL) to develop the bus safety standard, which was first published in 2018.⁷⁶ The Bus Safety Standard requirements for new buses were first specified in 2019, with subsequent requirements in 2021, grouped into four categories: driver assist, partner assist, partner protection and occupant protection. The next set of measures are due to be introduced in 2024 – which include Advanced Emergency Braking and a new bus front-end design to reduce the impact in the event of collisions.⁷⁷

TfL also told the Committee that the 2027 version of the Bus Safety Standard will likely cover the conditions inside the cab as they can “improve or affect a driver’s performance”,⁷⁸ including looking to make these conditions more ergonomic for women, and “making sure that we design a cab in a way that does not cause fatigue”.⁷⁹

Pedal confusion is a safety concern

Pedal confusion is defined as “an occurrence of a driver accidentally selecting the brake pedal instead of the accelerator pedal or the other way around.”⁸⁰ Pedal confusion has been associated with recent tragic bus collisions.⁸¹

TfL commissioned research by the infrastructure consulting firm AECOM on pedal confusion which was published in 2022.⁸² This report attributed possible causation of pedal confusion incidents to be the pedal configuration, including the pedal sizing and spacing, on electric and hybrid buses.⁸³ The report also identified factors such as fatigue, human error, driver concentration, passenger interaction and driver pressure to meet time pressures as contributing to this issue.⁸⁴

TfL has noted that although this is a rare event, the impacts are significant, and therefore active risk management is crucial.⁸⁵ It has also included a commitment in the Bus Safety Strategy to “implement the pedal application error workstream”, but also stated that “the development and implementation of new measures to address pedal application error also relies on bus manufacturers and suppliers.”⁸⁶ After our meeting TfL wrote to the Committee

⁷⁶ TfL and TRL, <https://trl.co.uk/Uploads/TRL/Documents/PPR872-Bus-Safety-Standard---Executive-Summary.pdf>, 2018

⁷⁷ TfL, [Bus safety strategy \(tfl.gov.uk\)](https://www.tfl.gov.uk/road-traffic/road-traffic-safety/bus-safety-strategy), September 2023, p34

⁷⁸ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 2 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](https://www.london.gov.uk/committees/transport-committee/public-pack-draft-transport-committee-transcript-7-november-2023-panel-2-minutes-supplement-for-transport-committee-07-11-2023-10-00), Tom Cunningham, p16

⁷⁹ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 2 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](https://www.london.gov.uk/committees/transport-committee/public-pack-draft-transport-committee-transcript-7-november-2023-panel-2-minutes-supplement-for-transport-committee-07-11-2023-10-00), Tom Cunningham, p16

⁸⁰ AECOM report for TfL, [Bus Safety Standard: Report - Pedal Confusion](https://www.aecom.com/~/media/Files/Bus-Safety-Standard-Report-Pedal-Confusion), August 2022, p14

⁸¹ [Pedal Confusion: Danger of Electric Buses | London City Hall](https://www.london.gov.uk/committees/transport-committee/public-pack-draft-transport-committee-transcript-7-november-2023-panel-2-minutes-supplement-for-transport-committee-07-11-2023-10-00)

⁸² AECOM report for TfL, [Bus Safety Standard: Report - Pedal Confusion](https://www.aecom.com/~/media/Files/Bus-Safety-Standard-Report-Pedal-Confusion), August 2022, p14

⁸³ AECOM report for TfL, [Bus Safety Standard: Report - Pedal Confusion](https://www.aecom.com/~/media/Files/Bus-Safety-Standard-Report-Pedal-Confusion), August 2022, p6

⁸⁴ AECOM report for TfL, [Bus Safety Standard: Report - Pedal Confusion](https://www.aecom.com/~/media/Files/Bus-Safety-Standard-Report-Pedal-Confusion), August 2022, p6

⁸⁵ [Letter from TfL to London Assembly Transport Committee](https://www.tfl.gov.uk/road-traffic/road-traffic-safety/bus-safety-strategy), 29 January 2024, pp 7-8

⁸⁶ <https://content.tfl.gov.uk/bus-safety-strategy.pdf> p41

to tell us that they “facilitate periodic Working Groups and quarterly Steering Groups with operators to discuss lessons learned from pedal application error incidents, share best practice on preventing and mitigating pedal application error incidents, and suggest ideas for new pedal application error research or trials.”⁸⁷

However, Professor Andrew Morris told the Committee that “Still there are issues with pedal confusion, ... improvements have been made and there are lots of very good safety innovations on the modern fleet of buses. But, from a human factor and an ergonomic point of view, there is still a lot that might cause confusion, and this is not a good situation for the driver.”⁸⁸

Extreme bus cabin temperatures

The Committee heard that the bus cabin temperatures can seriously impact bus drivers’ ability to perform their jobs safely. John Murphy from Unite the Union attributed some of the issues to air conditioning not being effective and windows not opening on some buses. He told the Committee “it starts at the cab where the driver is. You need a cool driver. That alleviates the risk that the other people travelling on the bus are exposed to.”⁸⁹

Tom Cunnington from TfL told the Committee of the challenges in updating air-conditioning units on London buses:

“We have had issues of air conditioning. All buses have an air conditioning unit fitted to the driver’s cab. A number of those are quite old and those systems were not designed for temperatures that we were not planning to see ten or 14 years ago, when those were installed. Obviously, the summer temperatures in London have gone up quite significantly in the last probably four or five years. There is probably a bit of a difference in the effectiveness of those older air conditioning units in the hotter temperatures.... Maintaining those systems has been an issue in some cases. We have been very focused in our discussion with operators to ensure that they do maintain their systems and they service their systems in a way that keeps them cool in the summer. On new vehicles we have upped the specification significantly to put a more powerful unit in. However, the challenge is that those new vehicles will take a number of years to go into the fleet. It is around maintaining that system in the short term to make sure the systems that are there work as effectively as they can in hot weather. That is one part. The other part is cold.”⁹⁰

⁸⁷ [Letter from TfL to London Assembly Transport Committee](#), 29 January 2024, p8

⁸⁸ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Professor Andrew Morris, p8

⁸⁹ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), John Murphy, p13

⁹⁰ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 2 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Tom Cunnington, p22

Recommendation 6

TfL and bus operators should identify changes that can be made to the ergonomics of the bus cab as part of updates ahead of the revised bus safety standard in 2027, and ensure further progress is made to improve driver conditions. In preparing the new bus safety standard, TfL should consult with bus drivers, and specifically ensure women drivers are represented in any such consultation.

Recommendation 7

TfL should address the issue of extreme temperatures in bus cabs through improved air conditioning and heating systems for the cab. It should monitor this by incorporating a digital thermometer in future cab designs, with data automatically recorded on iBus.

Recording incidents and learning

Slips, trips and falls on the bus network

TfL states that the recent increase in serious injury figures have been caused largely by bus passengers sustaining injuries often as a result of slips, trips and falls, as passengers were alighting or lost balance when brakes were applied.⁹¹

Tom Cunnington from TfL told the Committee that there has been “an increase in injuries on board the bus, linked to slips, trips and falls. Those are potentially linked to drivers responding to incidents outside the bus and braking to avoid a collision, leading to a slip, trip or fall inside the bus.”⁹²

Tom Cunnington further acknowledged that certain customers are more vulnerable than others:

“It is absolutely right to identify that different customers have different vulnerabilities and different propensities to different behaviours on board vehicles. That flows through to incidents and injuries that come from that. Buses tend to have a broadly representative usage from across London but with a slightly higher propensity amongst older population and we do have more older people using buses. Potentially, we are also seeing that people who are older may not be quite as mobile as younger people and therefore if there is a harsh braking incident on board the bus, they may be more likely to be injured as a result of that than perhaps a younger person might be as well.”⁹³

⁹¹ TfL, [Safety, Health and Environment Quarterly report Quarter 1 2023/24, September 2023, p8](#)

⁹² London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 2 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Tom Cunnington, p2

⁹³ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 2 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Tom Cunnington, p3

One explanation that TfL suggested is that people are holding on less due to concerns about germs. Tom Cunnington explained that:

“In a post-COVID world people do seem to be less happy to hold on to handrails across all of our modes, particularly on buses. The handrails and the handholds that are there are well placed across the vehicle, and, in fact, it is very well regulated as to how far apart those poles should be, particularly on the lower deck. It does mean that when the bus does move unexpectedly, perhaps with a harsh braking or a turn, therefore customers are more likely to injure themselves as a result of that.”⁹⁴

TfL told the Committee that it undertook a deep dive analysis into slips, trips and falls sustained by bus passengers. This analysis concluded that harsh braking or sudden movement of the bus are the main cause of slips, trips and falls, which can be in response to the road network environment, such as a vehicle pulling out in front of a bus, or passengers not being seated when the bus is moving.⁹⁵ TfL further stated: “We are also currently conducting research and testing on acceleration rates on buses; CCTV analysis on the causes of harsh braking; work on fatigue which can lead to harsh braking; work on pedal application error; and are beginning to roll out a new Equality, Diversity and Inclusion training to bus drivers which includes a focus on vulnerable passengers who may be at more risk of slips, trips and falls.”⁹⁶

There is £1,000,000 of funding available during the current round of the Bus Safety Innovation challenge, which has a focus on trialling solutions to reduced bus customer injuries as a result of slips, trips and falls. During these trials, a bell sound will be trialled as a warning to passengers for when the bus is departing, signalling them to find a seat or hold on. This trial will begin in early spring 2024. CCTV data will be used to evaluate this trial, and whether this will influence customer behaviour and improve safety.⁹⁷

Recommendation 8

TfL should publish an action plan into how it intends to reduce slips, trips and falls on buses. This should include:

- Actions to reduce time pressure on drivers to prevent incidents caused by vehicles moving off before passengers have safely sat down.
- Analysis of the relationship between bus deceleration, acceleration, speed and bus passengers being injured from slips, trips and falls, as captured by tools like the Speed Compliance Tool Data on iBus.
- Clear actions that it plans to take, such as new signage and messaging to encourage people to hold on.

⁹⁴ London Assembly Transport Committee, ([Public Pack](#))[Draft Transport Committee Transcript - 7 November 2023 - Panel 2 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Tom Cunnington, p2

⁹⁵ [Letter from TfL to London Assembly Transport Committee](#), 29 January 2024, p11

⁹⁶ [Letter from TfL to London Assembly Transport Committee](#), 29 January 2024, p12

⁹⁷ [Letter from TfL to London Assembly Transport Committee](#), 29 January 2024

Collisions between buses and pedestrians

In the Committee's meeting with the TfL Commissioner and Deputy Mayor in February 2024, the Committee asked about a recent fatal collision at Victoria Station, and what action is being taken, for example in making the layout more legible for drivers or improving wayfinding for passengers. The Commissioner expressed his condolences around the tragic situation and said that a full investigation is being carried out. However, he also stated that there is currently a lack of national guidance around bus station layout:

"I have also asked the team to reach out to DfT and other industry colleagues because there does not appear to be a set standard of what bus station layout should be."⁹⁸

He further stated that there is a need for pedestrians to be more aware of their surroundings:

"We also need to work with bus users to think about how we raise the awareness of their actions when using bus stations. We have probably all been guilty of not necessarily sticking to walkways, sticking to crossings, these are busy places. Victoria Bus Station is a very big and busy bus station. There are many others across London, and we need to see what more we can do as TfL to raise awareness of that and work with bus passengers and the bus operators to ensure that safety around bus stations is an absolute priority."

In a similar way, at the Committee's meeting on trams in September 2023, Mark Davis from TfL told the Committee that influencing the behaviour of passengers and the public on and around the tramways is a significant challenge. He stated:

"One of our biggest hazards at the moment is members of the public who have big headphones on, watching Love Island on their phone or whatever the current programme is, wandering out into the path of a tram."⁹⁹

Therefore, he added, there is a need to implement an education programme "to make people understand that an argument between you and a 30-tonne tram normally only ends in one winner."¹⁰⁰

The need for a consistent approach to recording incidents

Given that injury rates are no longer falling, more consistent and detailed data from incidents would allow more research and action to prevent them from occurring. The Committee heard from Professor Andrew Morris that there are different approaches to reporting incidents, which makes it hard to learn from them:

⁹⁸ London Assembly Transport Committee Transcript, [Transcript of Meeting](#), 20 February 2023, p18

⁹⁹ London Assembly Transport Committee Transcript, [Transcript of Meeting](#), 27 September 2023, Mark Davis (General Manager for Trams, TfL), p24

¹⁰⁰ London Assembly Transport Committee Transcript, [Transcript of Meeting](#), 27 September 2023, Mark Davis (General Manager for Trams, TfL), p24

“There is quite an inconsistency of data across all of the bus operators, they all have the obligation to collect data when incidents occur on the roads, and even more so if there is a fatality or a serious injury. But there is a very inconsistent approach to that... Therefore, there is no consistency about what has been fed into the database that TfL ultimately manages.”¹⁰¹

John Murphy from Unite the Union told the Committee that:

“There is a willingness – and not just with TfL but with a lot of corporations – to interpret the data in the way that you perhaps want to be interpreting it. Therefore, I do not think it is necessarily a case that there is not enough information, it is about how we use the information.”¹⁰²

The Committee’s 2017 report recommended that TfL carry out a review into how bus incidents are investigated in London, and whether serious incidents should be investigated by an independent body, as occurs in the rail industry.¹⁰³ In response, TfL stated that they would be supportive of this, as it would create a “a consistent approach nationwide”. Additionally, under the Coroners and Justice Act 2009,¹⁰⁴ coroners have the duty to make reports to a person, organisation, local authority or government department or agency in cases where the coroner believes that action should be taken to prevent future deaths. These are referred to as Prevention of Future Death (PFD) reports. Currently, the Chief Coroner receives all reports and responses and will publish them on the Courts and Tribunal Judiciary website, in most cases.¹⁰⁵

The Mayor has noted there is no need for duplication of publication as the data is already available on the Judiciary website.¹⁰⁶ However, the Committee considers that publishing PFD reports alongside an accompanying set of TfL actions taken in response would provide a set of evidence in one place and enable lessons to be learned.

Recommendation 9

Given the continuing high rates of injuries involving buses, TfL should explore the possibility of working with Government to set up a pilot scheme in London for an independent Bus Safety and Standards Board.

¹⁰¹ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#) Professor Andrew Morris, p5

¹⁰² London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 1 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), John Murphy, p4

¹⁰³ London Assembly Transport Committee, [‘Driven to distraction Making London’s buses safer’](#), July 2017, Recommendation 10, p 11

¹⁰⁴ [Coroners and Justice Act 2009 \(legislation.gov.uk\)](#)

¹⁰⁵ Courts and Tribunals Judiciary, [Reports to Prevent Future Deaths](#)

¹⁰⁶ London Assembly, <https://www.london.gov.uk/who-we-are/what-london-assembly-does/questions-mayor/find-an-answer/vision-zero-refusal-publish-prevention-future-deaths-reports-issued-tfl-and-contractors-0>

Recommendation 10

To enable learning, TfL should publish on its website an index of all transport related Prevention of Future Deaths (PFD) Reports that relate to London, including summary details of dates, locations, transport mode(s), transport operator and outcome. It should ensure all relevant information such as road safety audits and findings from the Met Police's own investigation teams are published for transparency.

Safety on the tube, tram and light rail network

While a lot of effort has been made in reducing deaths and injuries on buses, there appeared to be less focus on the Vision Zero targets for the tube. TfL wrote to the Committee saying that “We will always ensure that the Tube meets its legally required safety standards. However, beyond existing contractual commitments and safety-critical activities, further investment will remain limited.”¹⁰⁷

Addressing risks around the platform-train-interface

The platform-train-interface (PTI) is a key risk in passenger journeys. This refers to the boundary between the edge of the platform and the train (or track if no train is present).¹⁰⁸ Some of the newer TfL lines have in-built infrastructure to reduce this risk. Platform Screen Doors (PSDs) and Platform Edge Doors (PEDs), protective glass barriers between the train and platform are in place on parts of the Jubilee Line and the Elizabeth Line, eliminating any risk of a passenger falling, or jumping, between the train and tracks.¹⁰⁹

Richard Jones, Director of Asset Performance and Facilities, TfL, told the Committee that:

“I have been to a number of coroner’s inquiries where coroners have concluded that PEDs [Platform Edge Doors] would be a solution to preventing people coming into contact with trains. It is a question of redesigning the whole platform. It is not simply a case of bolting them to the platform edges as they are at the moment. It would therefore be hugely intrusive, extremely expensive, and in certain places it would not benefit the level of investment. It is obviously something that we continue to look at. If you take, for example, the Northern Line Extension, those platforms are designed for future retrofitting but none of the other platforms across the network are.”¹¹⁰

In 2021, TfL undertook some work exploring the feasibility of adding Platform Edge Doors on two lines, as part of the business case for driverless trains in London.¹¹¹

In October 2023, in reference to a tube platform incident which left a woman seriously injured, the Financial Times reported that TfL had previously explored the potential of adding platform edge doors, but found that it was too expensive. It stated that the tube is

¹⁰⁷ [Letter from TfL to London Assembly Transport Committee](#), 29 January 2024, p10

¹⁰⁸ Rail Technology Magazine, <https://www.railtechnologymagazine.com/Comment/control-of-risk-at-the-platform-train-interface>, September 201

¹⁰⁹ [All aboard the transformational Elizabeth line - Transport for London \(tfl.gov.uk\); 'Installing more safety barriers on London Underground platforms should be a priority' - Lucy Skoulding - MyLondon](#)

¹¹⁰ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 3 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Richard Jones, p8

¹¹¹ [London Underground driverless train study seeks platform edge door alternatives | Rail Business UK | Railway Gazette International](#)

“arguably among the most complex and expensive systems to upgrade.”¹¹² It was reported that “Among colleagues, there was an informal “value to life” assessment when considering new safety initiatives... £5 million to save five lives was worth it, but £20 million to save five lives wasn’t.”¹¹³

There is evidence that lessons have been learned from an incident that occurred at Waterloo underground station in May 2020, including closing gaps between the platform edge and train: Lilli Matson told the Committee that:

“Those mitigation measures could be anything from physical interventions such as moving the nosing stones out from the platform to minimise that gap, because it is often the gap between the train and the platform that is the risk, to ensuring visibility for the driver with cameras on both the platform and the train that allow them to see the passengers getting on and off, proper processes that are followed, and basically making sure that we have the appropriate balance between manning the platform and the management of customer flows.”¹¹⁴

TfL states that it has been working with the Rail Standards Safety Board (RSSB) and the wider rail network to tackle this issue and has recently completed the Line Operations PTI plan for London Underground.¹¹⁵

However, the Committee considers that more could be done to ensure that all platforms are safe and where there are significant risks, platform edge doors should be considered as a potential way of addressing these in the longer term.

Recommendation 11

The Mayor should undertake a new viability assessment in regard to implementing Platform Edge Doors across the tube network, determining how to prioritise such investment, as funding becomes available. TfL should provide an update to the Transport Committee once this has been completed. As part of this, TfL should provide the Committee with the results from the 2021 study on Platform Edge Doors, which was completed as part of the business case for driverless trains in London.

¹¹² Financial Times, [Sarah de Lagarde fell on to the Tube tracks. Nobody helped. Why? \(ft.com\)](#)

¹¹³ Financial Times, [Sarah de Lagarde fell on to the Tube tracks. Nobody helped. Why? \(ft.com\)](#)

¹¹⁴ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 3 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#) p7

¹¹⁵ TfL [Safety, health and environment report Q2 2023/24v](#), 15 November 2023

Escalator falls

In 2021, TfL reported that escalator falls were the “biggest risk from a passenger injury perspective” on the London Underground.¹¹⁶ In 2022, there were two incidences of children getting their feet stuck in the escalators at South Kensington Tube stations. Five escalators were replaced during a 15-month overhaul, which was completed in June 2022.¹¹⁷

In December 2022, there was a fatality where an older female wheelchair user fell on the escalator sustaining fatal injuries at Tooting Broadway London Underground station.¹¹⁸ In response to these incidents, TfL commenced an urgent review of escalator safety, in which the Escalator Safety Steering Group was formed. It also increased staff briefings and enhanced customer information, such as posters and materials targeted to grab children’s attention and placed staff next to the escalators during busy periods.¹¹⁹ TfL also stated that it is ‘developing medium- and longer-term initiatives to take a strategic approach to this issue.’¹²⁰

Lilli Matson wrote to the Committee on 29 January 2024 providing information on TfL’s actions to improve escalator safety. She told the Committee that TfL has “an escalator safety steering group which meets every four weeks to ensure a holistic and strategic approach is taken to escalator safety and to ensure actions are addressed in a timely way.”¹²¹ She further noted that TfL is involved in Network Rail’s Escalator Safety Group, to share learnings with each other and ensure a consistent approach is taken industry wide.¹²²

Recommendation 12

TfL should provide an annual update to the Transport Committee on progress in reducing escalator injuries across the transport network.

Maintenance and safety challenges

The 2022 funding settlement with Government included the expectation that the Government’s support for TfL investment in major projects “must be combined with TfL showing prudence and identifying savings and efficiencies wherever possible.”¹²³ The Government also set out the expectation that TfL should realise efficiencies across its capital programme.¹²⁴ TfL has stated the objective to achieve £650 million of recurring operating savings by 2025/26 as part of its savings programme.¹²⁵

¹¹⁶ The Standard, [Falls on Tube escalators rise as users fear catching Covid if they hold onto hand rails | Evening Standard, 16 September 2021](#)

¹¹⁷ My London, [London Underground: 2 children hurt after getting their feet stuck in escalator at same Tube station - MyLondon, 22 March 2023](#)

¹¹⁸ TfL, [safety-health-environment-quarter-4-2022-23.docx \(live.com\), 24 May 2023](#), p7

¹¹⁹ TfL, [safety-health-environment-quarter-4-2022-23.docx \(live.com\), 24 May 2023](#), p7

¹²⁰ TfL, [safety-health-environment-quarter-4-2022-23.docx \(live.com\), 24 May 2023](#), p7

¹²¹ [Letter from TfL to London Assembly Transport Committee](#) 29 January 2024

¹²² [Letter from TfL to London Assembly Transport Committee](#), 29 January 2024

¹²³ DfT, [Transport for London: long-term funding settlement \(publishing.service.gov.uk\)](#), August 2022, p3

¹²⁴ DfT, [tfl-capital-funding-settlement-letter-dec-23.pdf \(publishing.service.gov.uk\)](#), December 2023, p2

¹²⁵ TfL, [2024 Business Plan](#) January 2024, p33

In a paper to its Programmes and Investment Committee in October 2023, TfL acknowledged challenges around budget and funding:

“Budget constraints during and after the coronavirus pandemic have reduced investment in all our renewals and we are beginning to see service impacts of the resultant degrading asset base... Overall, asset condition has deteriorated and the need to defer projects has led to a backlog of works which continues to build. We anticipate this position will challenge future maintenance budgets.”¹²⁶

Despite funding challenges, Lilli Matson from TfL assured the Committee that TfL does not run assets that are not safe: “If there is any question about the integrity, in safety terms, of an asset, we would take it out of service. That may have reliability issues that we also need to consider, but that is our bottom line. We will not run something that is not safe.”¹²⁷

Lilli Matson also stated:

“Track safety is an absolute priority for us, and we are investing in new technology to improve the safety of track access, for example, indicator devices which would help anyone accessing the track know whether the track was live at that point, and app mechanisms to allow them to more easily access that information.”¹²⁸

In her further written response to the Committee, Lilli Matson stated:

“However, beyond existing contractual commitments and safety-critical activities, further investment will remain limited. To best prioritise our limited resources, we have assessed investment options against our strategic outcomes and long-term commitments.”¹²⁹

On 18 December 2023, TfL announced that it had reached agreement with the Government on a new £250 million funding injection for 2024. The additional funding is being provided to enable continued delivery of TfL’s capital investment programme and its committed major capital projects, including the Piccadilly Line upgrade.¹³⁰ This is in the context of TfL’s overall renewals budget for 24/25 of £393 million for the London Underground, which makes up part of the £2.1 billion planned spend.¹³¹

Following the announcement, TfL Commissioner Andy Lord stated:

¹²⁶ TfL, [pic-20231005-item12-part1-LUL-Renewals.pdf \(tfl.gov.uk\)](#), 5 October 2023

¹²⁷ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 3 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#), Lilli Matson, p4

¹²⁸ London Assembly Transport Committee, [\(Public Pack\)Draft Transport Committee Transcript - 7 November 2023 - Panel 3 Minutes Supplement for Transport Committee, 07/11/2023 10:00 \(london.gov.uk\)](#) Lilli Matson, p5

¹²⁹ [Letter from TfL to London Assembly Transport Committee](#), 29 January 2024

¹³⁰ DfT, [Ministers and TfL agree £250 million government funding to upgrade London’s transport system](#), December 2023.

¹³¹ [2024 Business Plan \(tfl.gov.uk\)](#) p25

“We will now need to reassess our recent draft business plan and address the impact of the continuing shortfall in funding. That work is underway so that we can confirm as soon as possible what we will deliver for London.”¹³²

During the Committee’s Question and Answer session with the TfL Commissioner in February 2024, Andy Lord told the Committee that despite the lower capital funding, TfL had found a way to ensure that everything in the 2024/25 business plan will still be delivered. He stated that this was possible due to renegotiation of the commercial terms of the contract for delivering Piccadilly line trains, which had “made a significant contribution to filling the shortfall”.¹³³ However, he noted that this “will result in a higher overall cost to the programme over its lifespan” and that TfL does not have “any certainty beyond the end of the financial year March 2025.”¹³⁴

The Committee notes that savings must be made under the funding agreements TfL has with Government. Yet, TfL must also provide assurance that it can continue to fund and implement a comprehensive programme of safety renewals across the tube.

Recommendation 13

TfL should set out a plan by July 2024 for how it will address its maintenance backlog to reach a State of Good Repair, including the timing and investment required – including from Government.

¹³² DfT, [Ministers and TfL agree £250 million government funding to upgrade London’s transport system](#), December 2023.

¹³³ London Assembly Transport Committee Transcript, [Transcript of Meeting](#), 20 February 2023, Andy Lord, p3

¹³⁴ London Assembly Transport Committee Transcript, [Transcript of Meeting](#), 20 February 2023, Andy Lord, p3

Committee Activity

The Transport Committee conducted a two-part investigation into safety on the transport network. **Part 1** examined TfL's initiatives to **prevent deaths and injuries on its bus and tube networks**.¹³⁵

The Committee held a single meeting with two panels for part one of the investigation on 7 November 2023, with:¹³⁶

- **Tom Kearney**, Bus Safety Campaigner, #LondonBusWatch
- **John Murphy**, Regional Officer, Unite the Union
- **Professor Andrew Morris**, Professor of Human Factors in Transport Safety and Director of Internationalisation (Design School), Loughborough University
- **Lilli Matson**, Chief Safety, Health and Environment Officer, TfL
- **Tom Cunnington**, Head of Bus Business Development, TfL
- **Richard Jones**, Director of Asset and Facilities, TfL
- **Jon Eardley**, Managing Director, Abellio
- **Richard Hines**, HM Deputy Chief Inspector of Railways, Railway Safety Directorate, Office of Rail and Road

Part 2 examined **personal security on London's transport network**, drawing on research by London Travelwatch.

The Committee also held a meeting to investigate London's trams and what lessons have been learned from the Sandilands crash, on 27 September 2023, which also forms important evidence for this report.¹³⁷

The Committee also held a Question and Answer session with the TfL Commissioner, Andy Lord and Deputy Mayor for Transport, Seb Dance on 20 February 2023.¹³⁸

¹³⁵ London Assembly Transport Committee, [Agenda and minutes](#), 7 November 2023

¹³⁶ London Assembly Transport Committee, [Agenda and minutes](#), 30 November 2023

¹³⁷ London Assembly Transport Committee, [Transcript of Trams Meeting](#), 27 September 2023

¹³⁸ London Assembly Transport Committee Transcript, [Transcript of Meeting](#), 20 February 2023

Other formats and languages

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Greek

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Hindi

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Bengali

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Urdu

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Arabic

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العنوان البريدي العادي أو عنوان البريدي
الإلكتروني أعلاه.

Gujarati

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