

# Transport for London Health, Safety and Environment report

Quarter one (1 April 2018 – 23 June 2018)

MAYOR OF LONDON



**TRANSPORT  
FOR LONDON**  
EVERY JOURNEY MATTERS

# About Transport for London (TfL)

Part of the Greater London Authority family led by Mayor of London Sadiq Khan, we are the integrated transport authority responsible for delivering the Mayor's aims for transport.

We have a key role in shaping what life is like in London, helping to realise the Mayor's vision for a 'City for All Londoners'. We are committed to creating a fairer, greener, healthier and more prosperous city. The Mayor's Transport Strategy sets a target for 80 per cent of all journeys to be made on foot, by cycle or using public transport by 2041. To make this a reality, we prioritise health and the quality of people's experience in everything we do.

We manage the city's red route strategic roads and, through collaboration with the London boroughs, can help shape the character of all London's streets. These are the places where Londoners travel, work, shop and socialise. Making them places for people to walk, cycle and spend time will reduce car dependency and improve air quality, revitalise town centres, boost businesses and connect communities.

We run most of London's public transport services, including the London Underground (LU), London Buses, the DLR, London Overground (LO), TfL Rail, London Trams, London River Services (LRS), London Dial-a-Ride, Victoria Coach Station (VCS), Santander Cycles and the Emirates Air Line (EAL). The quality and accessibility of these services is fundamental to Londoners' quality of life. By improving and expanding public transport, we can make people's lives easier and increase the appeal of sustainable travel over private car use.

We are moving ahead with many of London's most significant infrastructure projects, using

transport to unlock growth. We are working with partners on major projects like Crossrail 2 and the Bakerloo line extension that will deliver the new homes and jobs London and the UK need. We are in the final phases of completing the Elizabeth line which, when it opens, will add 10 per cent to London's rail capacity.

Supporting the delivery of high-density, mixed-use developments that are planned around active and sustainable travel will ensure that London's growth is good growth. We also use our own land to provide thousands of new affordable homes and our own supply chain creates tens of thousands of jobs and apprenticeships across the country.

We are committed to being an employer that is fully representative of the community we serve, where everyone can realise their potential. Our aim is to be a fully inclusive employer, valuing and celebrating the diversity of our workforce to improve services for all Londoners.

We are constantly working to improve the city for everyone. This means freezing TfL fares so everyone can afford to use public transport, using data and technology to make services intuitive and easy to use, and doing all we can to make streets and transport services accessible to all. We reinvest every penny of our income to continually improve transport networks for the people who use them every day.

None of this would be possible without the support of boroughs, communities and other partners who we work with to improve our services. We all need to pull together to deliver the Mayor's Transport Strategy; by doing so we can create a better city as London grows.

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# Introduction

Our vision at Transport for London is that everyone will go home safe and healthy every day. Performance in the first quarter of this year shows improvements compared to last year. The most significant improvements were fewer injuries at London Underground stations following our focus on improving customer safety on escalators, a significant reduction in major injuries across our bus network and fewer injuries to our construction workforce following a strong focus on safety leadership and personal behaviour.

We have set ambitious long term goals to further improve safety for our customers, users and workforce. In quarter I, we published our Vision Zero Action Plan which sets out actions we will take, in partnership with the Mayor of London and the Metropolitan Police, to achieve these goals. This includes plans to reduce road speed limits, improve road junctions and create a new Bus Safety Standard. Testing has been completed on the potential components of the Bus Safety Standard, including emergency automatic braking and measures to make bus interiors safer if passengers slip or fall. The outcome will be a safety specification that will be incorporated into contracts from January 2019 to ensure compliance among new buses entering our fleet.

We have provided funding to six bus operators through the TfL Bus Safety Innovation Funds and their safety trials continued in quarter I. The trials include fatigue detection devices and new methods of training drivers in safety. The results will be shared with TfL and our bus operators in autumn.

As part of our commitment to make the tram network safer following the tragedy at Sandilands in 2016, we continue to implement the recommendations from the Rail Accident Investigation Branch investigation report. During the quarter, we completed our revision of the London

Trams Network Risk Model. This review incorporated learning from relevant incidents world-wide, to provide a more comprehensive understanding of risk on the tram network. The design of the iTram performance monitoring system is nearly complete and we have started the tender process for a system to physically prevent speeding. We continue to support those who were affected by the tragedy through The Sarah Hope line, which provides help with counselling and other support.

Our focus on encouraging and supporting our staff to stay physically and mentally healthy continued during the quarter. As part of Mental Health Awareness Week in May, we held workshops and drop in sessions across TfL. We have launched an initiative to encourage our staff to join 'parkrun'. We also launched a range of activities to encourage people across London to get active, including 40 free guided walks for National Walking Month.

Our plans to improve air quality in London progressed in quarter I with the announcement that the Ultra Low Emission Zone will be expanded to the North Circular and South Circular boundary in 2021. This will provide healthier environments for over 100,000 people in London. Our bus retrofit programme has upgraded more than 1,300 buses to date. Around one-third of the fleet is now bringing much lower emissions to large parts of London, directly benefiting the Mayor's programme to improve air quality.

During the quarter the The Office of Rail and Road (ORR) issued their authorisation for Rail for London Infrastructure (RFLI) to stand-up as Infrastructure Manager; a significant safety milestone for the new Elizabeth line.

Jill Collis  
Director of Health, Safety and Environment



# Performance at a glance

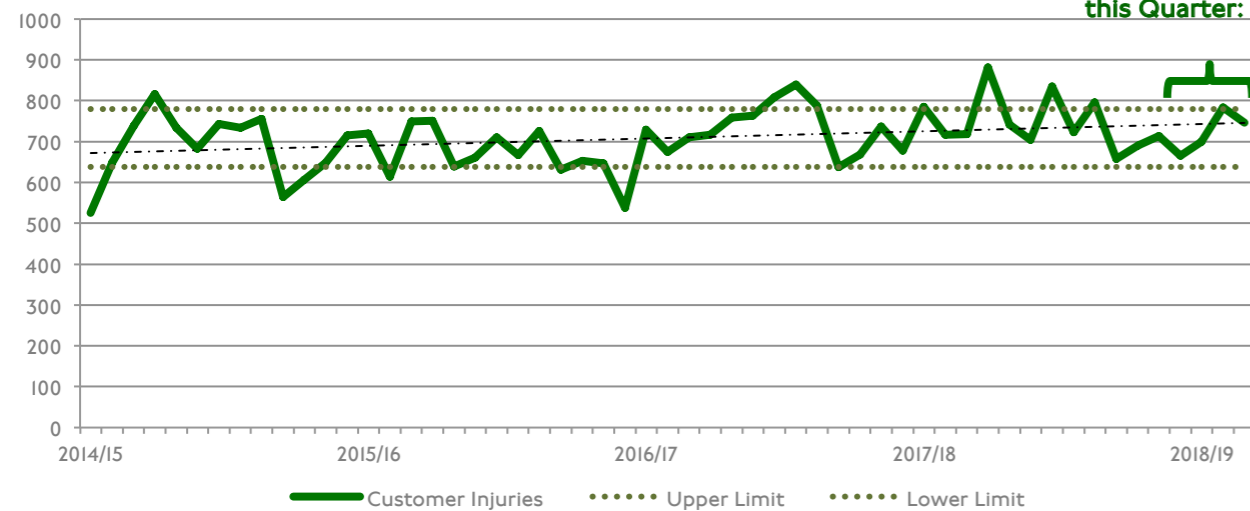
## 2018/19 TfL Scorecard

Long Term Objectives	2018/19 Scorecard	Year to date	
Outcome	Measure	Actual	Target
<b>Healthy Streets and Healthy people (18%)</b>			
London's transport system will be safe and secure.	Reduction in people killed or seriously injured on the roads from 2005-09 baseline (%)	39.3	38.1
	Reduction in people killed or seriously injured on the roads from 2005-09 baseline (incidents involving buses)(%)	72.6	51.8
	Injuries on the public transport network	2677	2719
London's streets will be clean and green.	Number of London's buses that are Euro VI compliant	4100	n/a

## Customer and workforce injuries

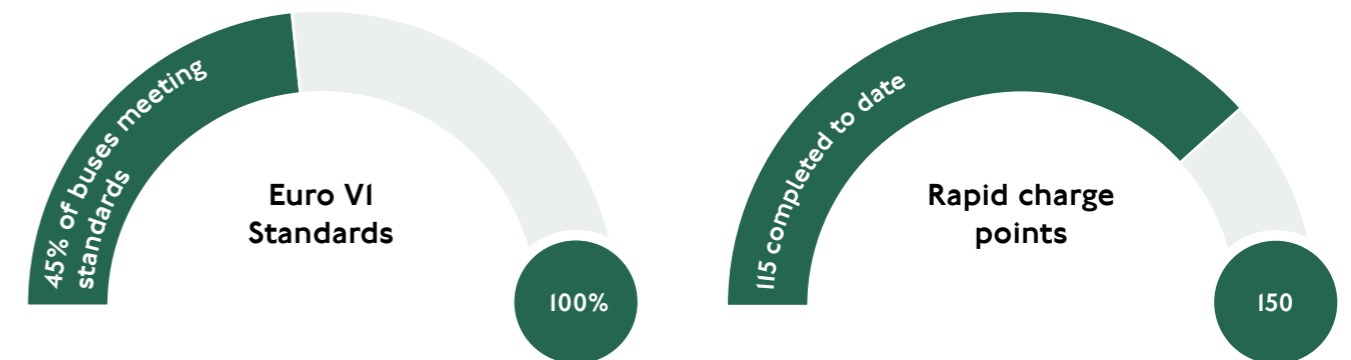
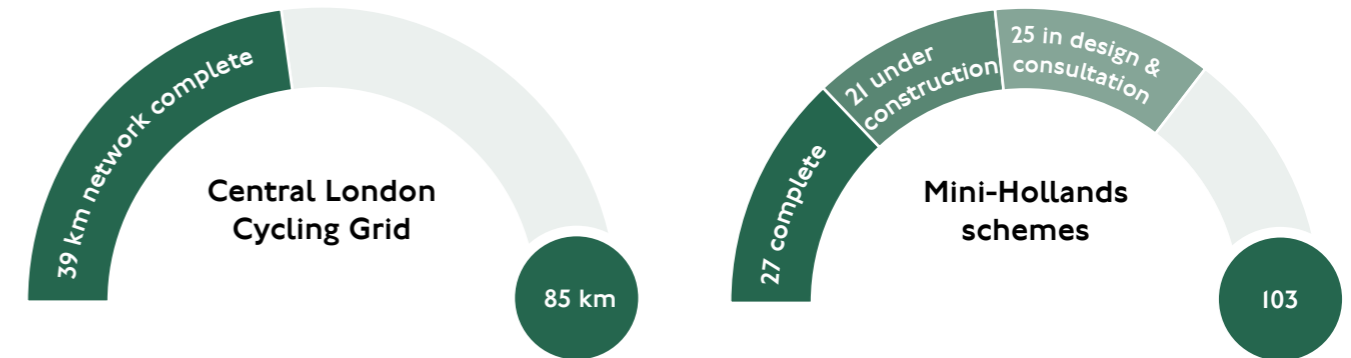
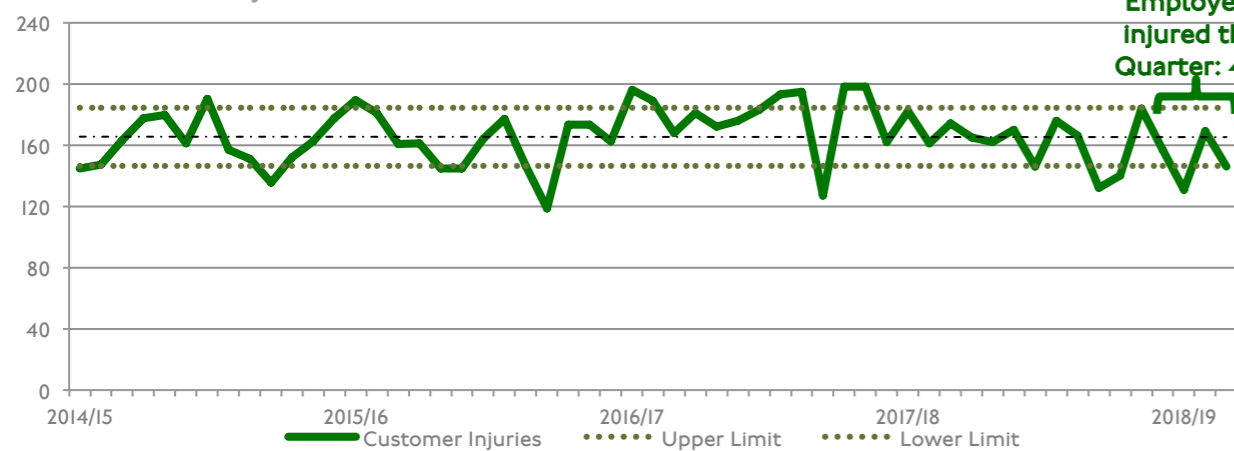
### Public transport customer injuries

Customers injured this Quarter: 2231



### Workforce injuries

Employees injured this Quarter: 446



**29%** reduction in injuries achieved at LU stations with "Escalator Excellence" status

**300** Number of Zero Emission Capable taxis licensed in London

**5** better junction schemes accelerated for delivery in 2020

# Mayor's Transport Strategy themes in this report



Our role is to deliver the Mayor's Transport Strategy in partnership with London's boroughs, businesses, local communities, consumer organisations and many others. The ambitious plan will increase the attractiveness of public transport and make cycling and walking easier and more convenient options.

We are providing more trains on our busiest services, and opening the Elizabeth line to connect our city. We are making local streets healthier and more pleasant places. Listening to, and acting on, the suggestions of our customers will enable us to make walking, cycling and public transport the first choice for the vast majority of trips. And we will continue to improve services to unlock the new jobs and housing our city needs.

**This report looks at our performance in relation to the following themes from the Mayor's Transport Strategy:**

## Healthy Streets and healthy people



### Scorecard measures

TfL uses a scorecard to measure its performance against the Mayor's Transport Strategy. In this report, the scorecard measures are marked like this.





# Healthy Streets and healthy people

# London's transport system will be safe

## Significant incidents

This section of the report covers the significant incidents that occurred on London's road and public transport networks in quarter I 2018/19.

Significant incidents are defined as any fatality, an incident resulting in 3 or more people requiring hospital treatment, or those resulting in a loss of more than £1 million.

### Significant incidents on London's Roads

Twenty-three people were killed on London's roads in quarter I, they include:

- eight pedestrians
- four cyclists
- nine motorcyclists
- one car occupant
- one dumper vehicle operative.

Police investigations are underway for these incidents.

### Significant incidents arising from our public transport activities

The significant incidents arising from our public transport activities were:

- A pedestrian was fatally injured in a collision with a route 25 bus. This incident is included among the 23 road-related fatalities above.
- Five bus passengers, the bus driver and two van occupants sustained injuries in a multi casualty collision involving a route 166 bus on 15 June. Three of the injured parties required hospital treatment for a wrist fracture, head injury and soft issue injuries.

# 23

Number of accidental fatalities

(8% ▼ against Q1 2017/18)

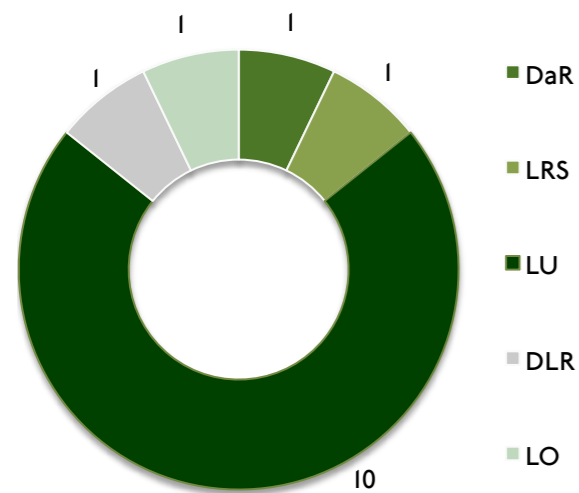


The Sarah Hope Line \* received 125 calls in quarter I, resulting in 18 new cases of people needing our help. These included cyclists (three), and those impacted by incidents involving London Underground (nine), buses (three) and London streets (three).

\*The Sarah Hope Line offers comprehensive help and support to anyone involved in, or affected by, a serious incident on our network. Our dedicated team, based within our Contact Centre Operations in North Greenwich, offers a range of services, from counselling to reimbursement of medical costs. We also work in partnership with organisations including Assist Trauma Care, The Samaritans and a range of private therapy clinics to provide further specialised support.

## Statutory reporting of customer and workforce injuries

### Customer injuries

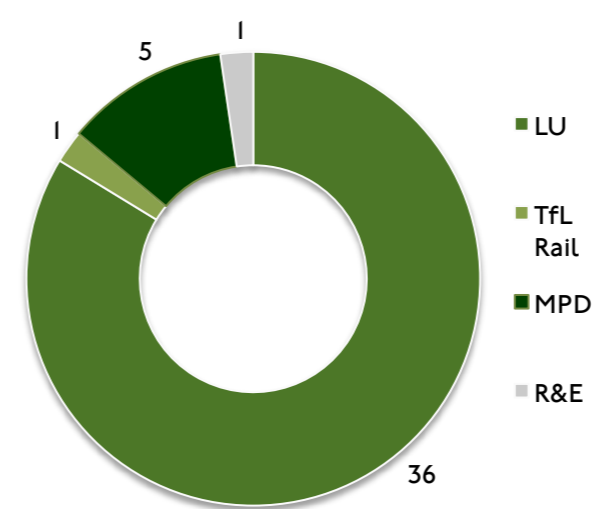


We are required to report certain categories of injuries to key statutory bodies. This includes certain serious workplace accidents, occupational diseases and specified dangerous occurrences (near misses).

Across our network, 57 incidents were reported to the Health and Safety Executive (HSE), the ORR and the Marine Accident Investigation Board (MAIB) in quarter 1. Of the incidents, 14 involved injuries to our customers and 43 involved injuries to our workforce. These figures do not include statutory reports made by our bus operators, which will be incorporated into future reports.

Slips, trips and falls accounted for 10 of the 14 customer incidents, nine within London Underground (LU) and one in Dial-a-Ride (DaR). On London Overground (LO), a passenger was struck by a train after falling into its path, sustaining serious injuries and on the Docklands Light Railway (DLR) and LU, passengers were injured when they were caught in the train's doors and a closing gate line respectively. The injury within London River Services (LRS) arose when a passenger's foot was caught between a boat and pier while disembarking resulting in significant leg injuries.

### Workforce injuries



The majority of workforce injuries reported to the HSE and ORR were minor. All but two injuries were triggered by the length of absence rather than the severity of the injury.

The two workforce major injuries were injuries to London Underground train operators. In April, a train operator on the Bakerloo line lost the tip of his finger when a train door shut on it and in May, a train operator fell between the train and the platform, fractured his collarbone and broke his arm. For both incidents, investigations were carried out and actions implemented. One of the train operators shared the story of his accident widely within LU to help prevent other similar incidents.



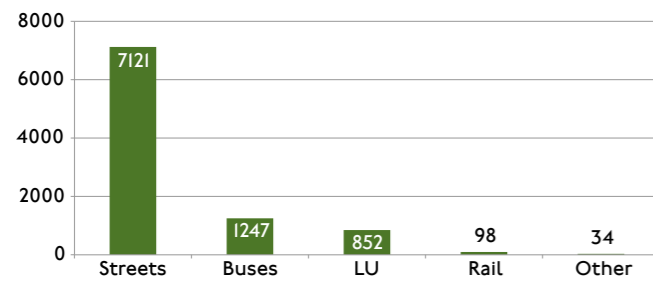


# London's transport system will be safe

## Injuries on London's road and public transport networks

There were 7,121 injuries on London's roads during the quarter, including 23 fatalities, compared with 25 for the same quarter in 2017. Across our public transport networks, a total of 2,231 customers were injured, up 0.5 per cent against the same quarter of 2017/18.

Number of customer injuries on the road and public transport networks (Quarter 1)



2.7

Number of injuries per million passenger journeys (1.5% ▼ against Q1 2017/18)



2.4

Number of injuries per million passenger journeys on the bus network this quarter\* (0.3% ▲ against Q1)



1.1

Number of injuries per million passenger journeys within our rail division this quarter (0% ▲ against Q1 2017/18)



5.5

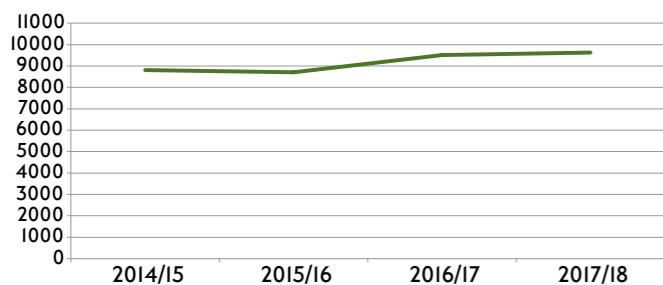
Number of injuries per million passenger journeys within our other operations this quarter (17.2% ▲ against Q1 2017/18)



\* Injuries to members of the public who are not bus customers are included in the Killed or Seriously Injured (KSI) figures within the streets section.

## Customer injuries

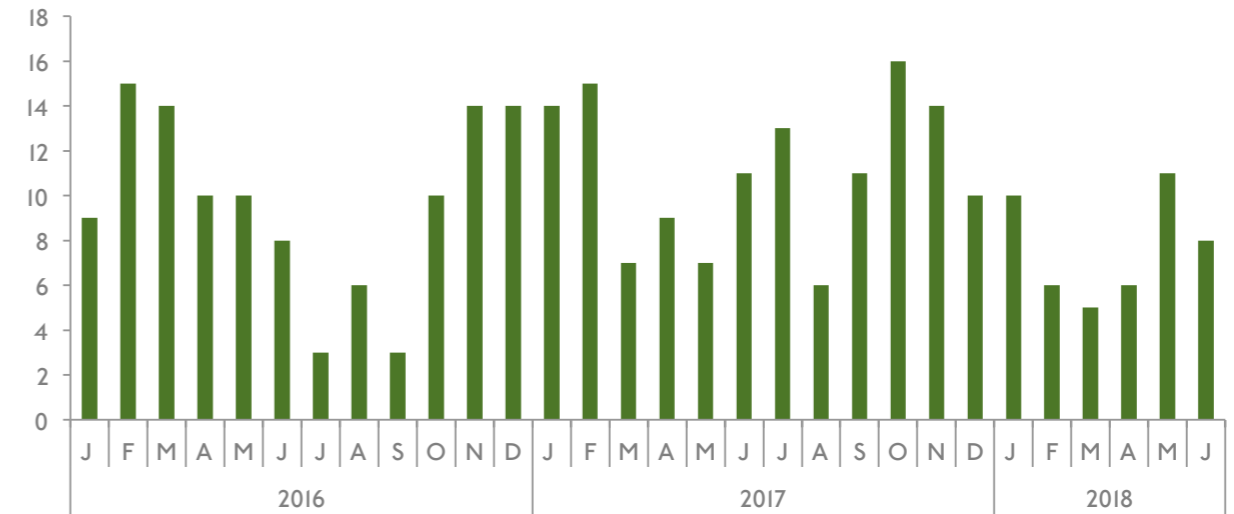
Annual totals



## Streets

### Fatalities on London's roads

(2017 and 2018 figures are provisional)

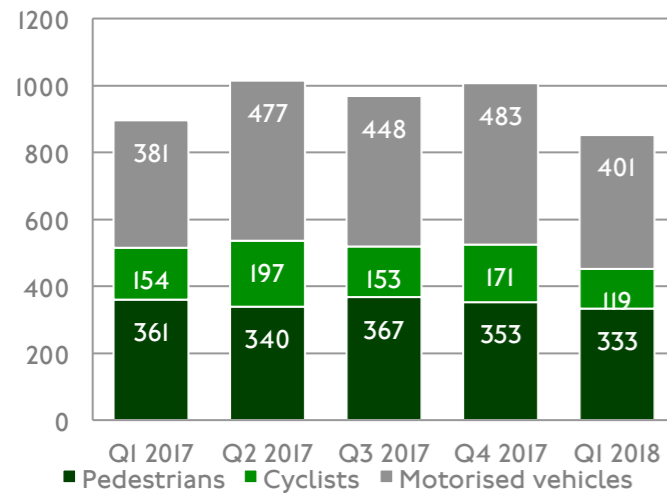


Road safety data is reported by calendar month. For the time period covered by this report, a total of 23 deaths were recorded on London's roads, compared with 25 for the same quarter in 2017. Seventeen of the 23 incidents were men. All incidents involved adults over the age of 18; four were 60 years of age or over. The individuals killed in these incidents included pedestrians (8), pedal cyclists (4), motorcyclists (9), a car occupant (1) and a dumper vehicle operative at a domestic property (1).

To ensure we understand the cases of fatalities and identify any actions we need to take on our network, we liaise regularly with collision investigators from the police to review the circumstances of each fatal collision. We work closely with Police Traffic Management Officers to ensure site visits carried out to identify any issues and instigate improvements to our network.

## People killed or seriously injured\*

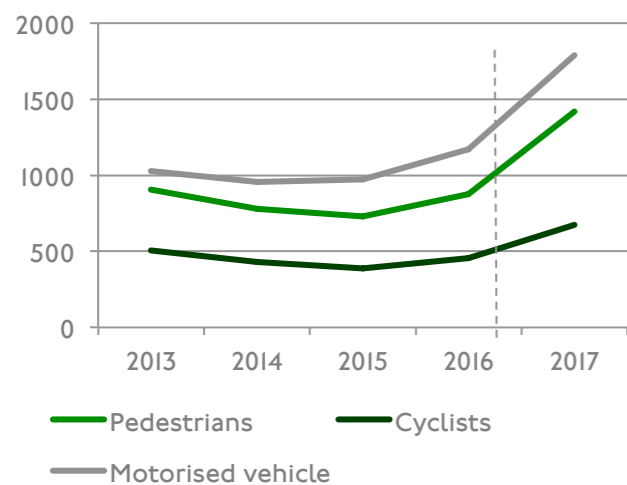
Past five quarters (type of user)



Total road casualty figures are reported using a calendar year, with quarter I covering January to March 2018. The provisional figures indicate that the number of people killed or seriously injured (KSIs) fell by 5 percent in quarter I of 2018 compared to the same quarter last year. Twenty-eight per cent of people killed or seriously injured were female and 72 per cent were male. The majority of people killed or seriously injured were aged 25-59 years, followed by those aged 16-24 years.

Fewer cyclists (23 per cent) and pedestrians (8 per cent) were killed or seriously injured in quarter I compared to quarter I last year. This improvement partly reflects exceptionally colder and wetter weather during quarter I of 2018, which results in changes to choice of transport mode.

Annual totals



\*Streets KSI data is based on calendar quarters rather than financial quarters ie. Q1 is January to March and is the latest available processed provisional data. This is subject to change as this information is reviewed and managed by the Metropolitan Police Service.  
 \*\*Figures from the end of 2016 have been reported using new systems and should not be compared with previous years. These systems are more accurate, with more injuries being classified as serious rather than slight. The figures are provisional and we are undertaking further 'back estimation analysis' with the Transport Research Laboratory.

## Road danger reduction

Changes to the road network, including segregated cycle lanes and improving dangerous junctions, have led to a 45 per cent reduction in the number of deaths on London's roads over the past eight years. However, people are still being killed or injured on our roads.

Therefore, in partnership with the Mayor of London and the Metropolitan Police, during quarter I, we finalised the Vision Zero Action Plan to deliver further improvement. The plan was launched by the Mayor, along with the Metropolitan Police, emergency services and other road safety partners on 24 July 2018.



## Vision Zero Action Plan

The Action Plan includes ambitious targets including the introduction of a new Lowering Speed Limits programme. The plan takes an internationally recognised approach to road danger reduction. The goal is to ensure that a collision doesn't happen in the first place, or, if it does occur, it is sufficiently controlled to not cause death or serious injury.

*"Travelling enriches our life and enhances our health and wellbeing by being more active. This programme will complement the existing Safer Junctions and Liveable Neighbourhoods programmes to create safer, healthier and more accessible neighbourhoods for people, reducing danger from the road network for all users. Our Vision Zero Action Plan, aims to eliminate death and serious injury from London's roads and public transport systems by 2041."*

Gareth Powell MD Surface Transport.



### Safer Junctions

To further reduce incidents, during the quarter, construction started at two key locations on the Safer Junctions programme. At Charlie Brown's Roundabout in Redbridge the scheme will reduce road danger, and increase links for pedestrians and cyclists through the introduction of signalised crossings on all approaches to the roundabout. We also commenced works at Highbury Corner. A further five Safer Junction locations have been accelerated as part of the new cycle route between Camden and Tottenham Hale, which is planned to start construction in late 2019.

### Town Centres

In Mitcham, safety enhancements for pedestrians and cyclists have been made through the town centre near Fair Green. On the Local Improvement Plan Corridors, Southwark has completed walking and cycle junction safety improvements at two roundabouts in Crystal Palace Parade with Fountain Drive and Sydenham Hill. This included a segregated bypass, parallel crossings, geometric changes to reduce speeds and asset renewal. Feasibility design is now underway for improvements to Peckham town centre. This will include an integrated package of measures to improve safety for pedestrians.

### Central London Cycling Grid

Construction of the original 85km of Central London Grid network has continued with 39km of the network now complete. This includes strategically important routes such as Quietway 13 (Broadway Market to Old Street) and Quietway 15 (Earls Court to Belgravia). An additional 5km of network is currently under construction including a segregated cycle track at Finsbury Square. These routes are due for completion by the end of 2018/19. A further 65km of potential Quietway routes have been identified and we have been working with Boroughs to define more detailed plans. This includes important routes such as the link between Cycle Superhighway 2 and 3 in Tower Hamlets, a link between Dalston and Bethnal Green via Queensbridge Road in Hackney and Kensington High Street to Notting Hill in Kensington and Chelsea.

### Cycling Quietways

Construction of the original 85km of Central London Grid network has continued with 39km of the network now complete. This includes strategically important routes such as Quietway 13 (Broadway Market to Old Street) and Quietway 15 (Earls Court to Belgravia). An additional 5km of network is currently under construction including a segregated cycle track at Finsbury Square. These routes are due for completion by the end of 2018/19.

Construction is complete or under way on 112km of a potential 250km network of routes. To date, we have launched Quietway 1 (Waterloo to Greenwich and Greenwich to Bexleyheath), Quietway 3 (Kilburn to Gladstone Park) and Quietway 5 (Oval to Clapham Old Town). Works are underway on a further 13 routes.

### Mini-Hollands

Twenty-seven of the 103 Mini-Hollands schemes (98 infrastructure and five supporting measures) are complete. Twenty-one further schemes are currently under construction, including the Kingston Station scheme, the Lea Bridge Road scheme in Waltham Forest and the A1010 South scheme in Enfield. Twenty-five schemes are currently going through design and consultation, including a number of Quietway Links and Quieter Neighbourhoods in Enfield.

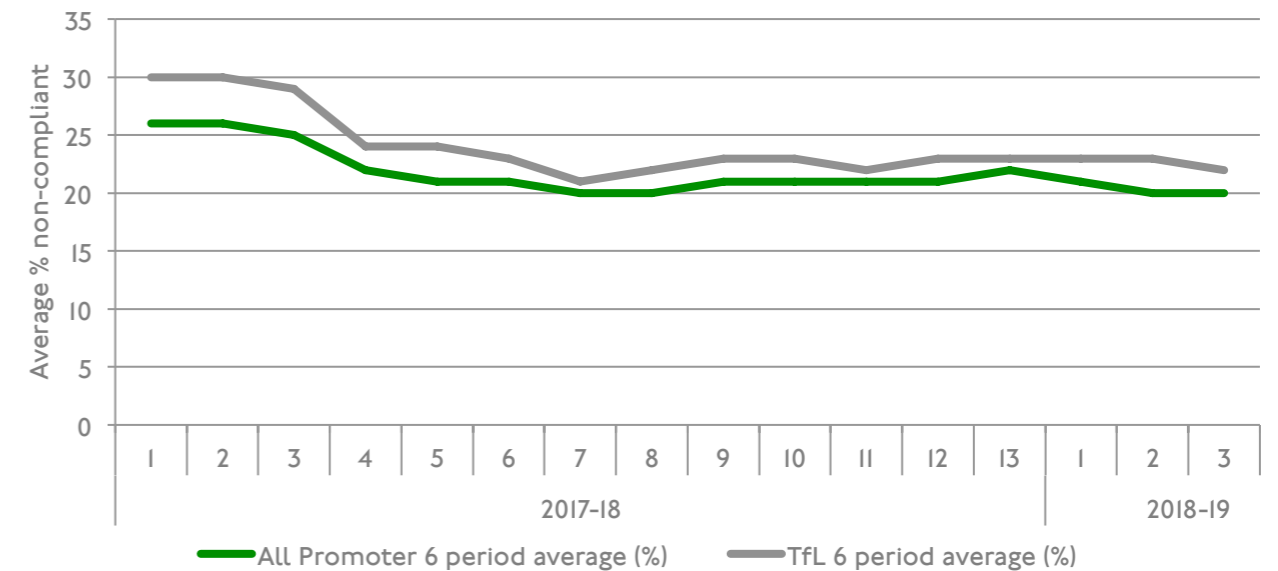
## Cycle Superhighways

With the core route of the East-West Cycle Superhighway (CS3) opened in full mid-December 2017, work on remaining parts of the route has continued. Re-surfacing works have been completed at Lancaster Gate and within St. James's Park and Green Park. Delivery of the North-South Cycle Superhighway (CS6) Phase 2 is nearing completion and will provide a continuous cycle route between Elephant & Castle and King's Cross, segregated from traffic on main roads.

Following the consultation for Cycle Superhighway 9 (Kensington Olympia to Brentford) and Cycle Superhighway 4 (Tower Bridge to Greenwich), designs are being updated in light of comments received during consultation. A response to issues raised is planned to be published in autumn for both routes. Designs are also being developed for a number of other routes, including Camden to Tottenham Hale, Hackney to Isle of Dogs and Acton to Hyde Park. Proposals are planned to be consulted on in early 2019. Construction of Cycle Superhighway 11 at Swiss Cottage was originally due to start in summer 2018 but was delayed due to submission of a Judicial Review by Westminster City Council (WCC). Following the Court's ruling in favour of WCC, we are currently exploring all options available to us to move forward with the scheme which will help to protect all road users and particularly those walking and cycling, whilst also significantly improving the area for residents.



## Safety at roadworks (Inspection failure rate)



Our Safety at Roadworks measure monitors the number of Signing, Lighting and Guarding (SLG) inadequacies at roadworks from safety inspections undertaken across six periods, (measured as an average over six preceding periods).

Through our active intervention the average work promoter non-compliance rate has fallen from a high of 27 per cent in October 2016 to 20 per cent at the end of quarter I, 2018/19. This has been achieved through the introduction of safety performance indicators for our highways contractors and an associated target of reducing the inspection failure rate to 20 per cent. Other measures introduced at this time include the use of tailored Action Plans for the poorest performing promoters and a safety focused prosecution campaign. An example of success is Openreach; their poor performance peaked at 27% in P8 2017/18, however following a

successful prosecution in March 2018 for safety offences and the implementation of an agreed action plan, safety failure rates have dropped to 14% in P3. TfL's performance has plateaued, so a new action plan is currently being agreed with the LoHAC contractors post contract changes, and Safety at Roadworks is the first agenda item at the next LoHAC Delivery Board meeting.

During quarter I we commenced work on a new Temporary Traffic Management Handbook, which we will publish in early 2019. This handbook will help those who work on our roads by providing detailed good practice guidance on how to manage roadworks such that they provide a safe environment for cyclists and pedestrians, suitable guarding and segregation of the works and the safe set-up and use of temporary traffic signals and signage.

## Plans for next quarter

During quarter 2 we will:

- Launch the Vision Zero Action Plan
- Start public consultation on proposals for Tooting town centre from September. The proposals will include improvements to pedestrian and cycling facilities and a reduction in vehicle speed limits
- Complete the concept designs for the construction work packages for Old Street. The works will transform the roundabout into a more pedestrian and cycle friendly environment
- Open Phase 2 of Cycle Superhighway 6 in September
- Publish full consultation reports for Cycle Superhighways 4 and 9 in autumn
- Continue work on the Temporary Traffic Management Handbook to promote good practice in managing roadworks.



# Customer Safety: Buses

## Overview: customer injuries in Q1

Accidental Fatalities	Major Injuries*	All Injuries	Near Misses**
1	236	1247	5534

\* Injuries requiring hospital attendance

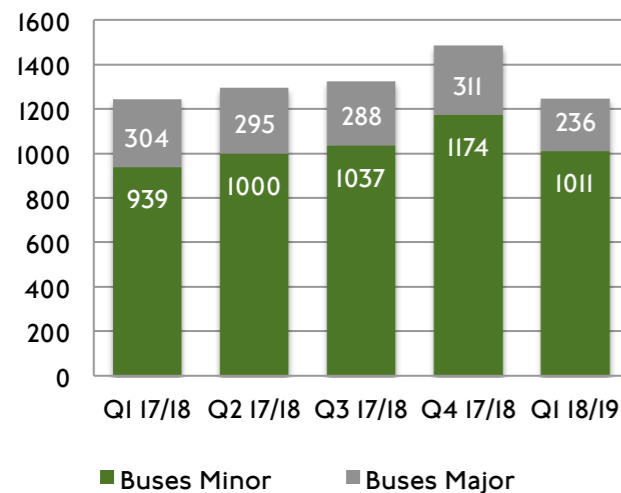
\*\* All incidents where no injury or damage arose

Over 71 million miles were operated by London's buses and over 521 million bus passenger journeys were completed in the quarter. There were 1,247 injuries in quarter 1, equating to 2.4 injuries per million passenger journeys. 19 per cent of these required hospital treatment and a pedestrian was fatally injured in a collision with a route 25 bus.

## Customer injuries five rolling quarters

### Customer injuries

Past five quarters



Customer injuries in the quarter represent a marginal rise of 0.3 per cent on quarter 1 2017/18. However, the number of major injuries has shown a significant improvement; falling by 22 per cent. We have encouraged greater collaboration on safety matters both with and between bus operators and improvements have been made in the capture and sharing of learning from significant incidents across all bus operators.

An improving trend is observed for injuries sustained while boarding buses, while the trend for injuries while alighting remains static. Injuries while seated have also seen an improving trend. Injuries sustained while using stairs, falls within the aisle and injuries sustained by customers when struck by or against objects within buses, show a worsening trend. The predominant reason given for these incidents is sudden movement of the bus, including evasive actions such as hard braking to avoid collisions and deceleration (34 per cent).

## Top 4 causes of all bus customer injuries

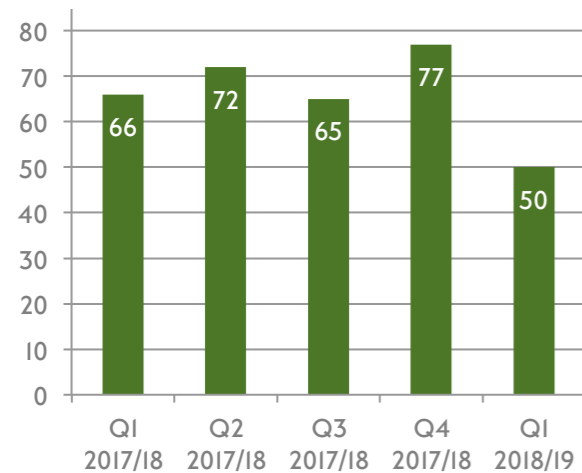
Slip Trip Fall	Struck by/ against object	Trapped fingers/ limbs	Collision
56%	22%	10%	6%

Slips, trips and falls on buses were the predominant cause of injuries accounting for 56 per cent during the quarter, followed by passengers striking objects within buses (22 per cent) and entrapment of fingers and limbs, such as between doors (10 per cent). In respect of major injuries, slips, trips and falls on buses account for 62 per cent of major injuries. Of these, 39 per cent were elderly passengers. For this group of passengers, the proportion of their major injuries attributable to slips, trips and falls was much higher than other causes, at 75 per cent.

Bus operators have been coordinating large-scale safety campaigns at locations on the bus network where we have higher rates of collisions or near misses, to see if more can be done to reduce risk on busy highways and junctions. They have agreed a programme of quarterly campaigns with a different operator leading each one. On 29 May 2018 RATPDev held a safety blitz event in and around Oxford Street to enable officers from bus operators and TfL to engage with drivers on safety messages and to view the behaviour of bus drivers, cyclists, pedestrians and other vehicle users who entered this area.

## Killed or seriously injured in or by London buses (STATS 19)

### Past five quarters

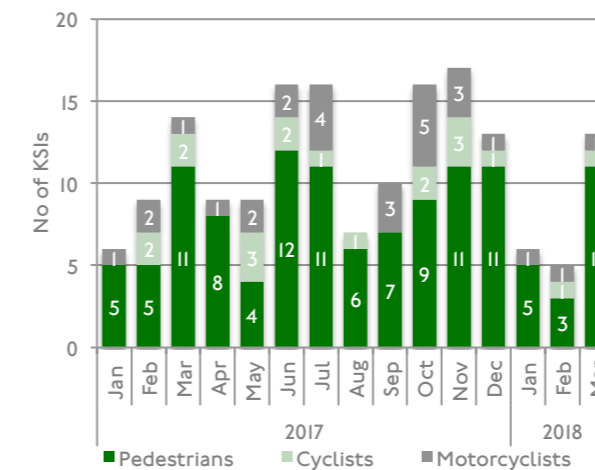


\*Buses KSI data is based on calendar quarters rather than financial quarters Q1 is January to March and is the latest available processed provisional data. This is subject to change as this information is reviewed and managed by the Metropolitan Police Service. Pre-2017 data includes coaches as well as buses.

In line with the overall reduction seen in all bus-related major injuries reported to TfL, the number of KSIs reported by, or to the police has reduced by 16.4 per cent in quarter 1 2018, compared to the same period in 2017. Of the total for quarter 1 2018, 25 (49 per cent) of the KSIs involved bus passengers, which is slightly better than the 29 in quarter 1 2017.

Twenty four (47 per cent) of those killed or seriously injured by a bus were Vulnerable Road Users (VRUs), including one pedestrian who was fatally injured in a collision with a route 25 bus. Pedestrians continue to make up the largest proportion of VRU's killed or seriously injured by a bus, accounting for 80 per cent of all VRUs killed or seriously injured by a bus during quarter 1.

## Vulnerable road user KSIs from collisions involving buses\*



\*Buses KSI data is based on calendar quarters rather than financial quarters Q1 is January to March and is the latest available processed provisional data. This is subject to change as this information is reviewed and managed by the Metropolitan Police Service. Pre-2017 data includes coaches as well as buses.

We are taking action to keep VRUs safe through our work on the new Bus Safety Standard, which includes the evaluation of autonomous emergency braking and ways to make it easier for other road users to see and hear buses. All tests have been completed and results are being evaluated to ensure we are prioritising the right measures.

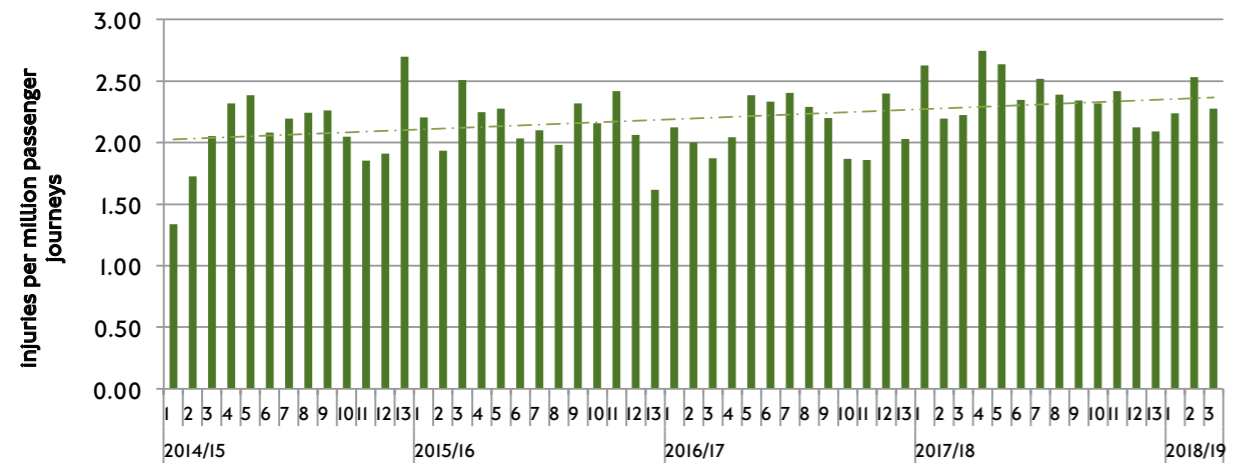
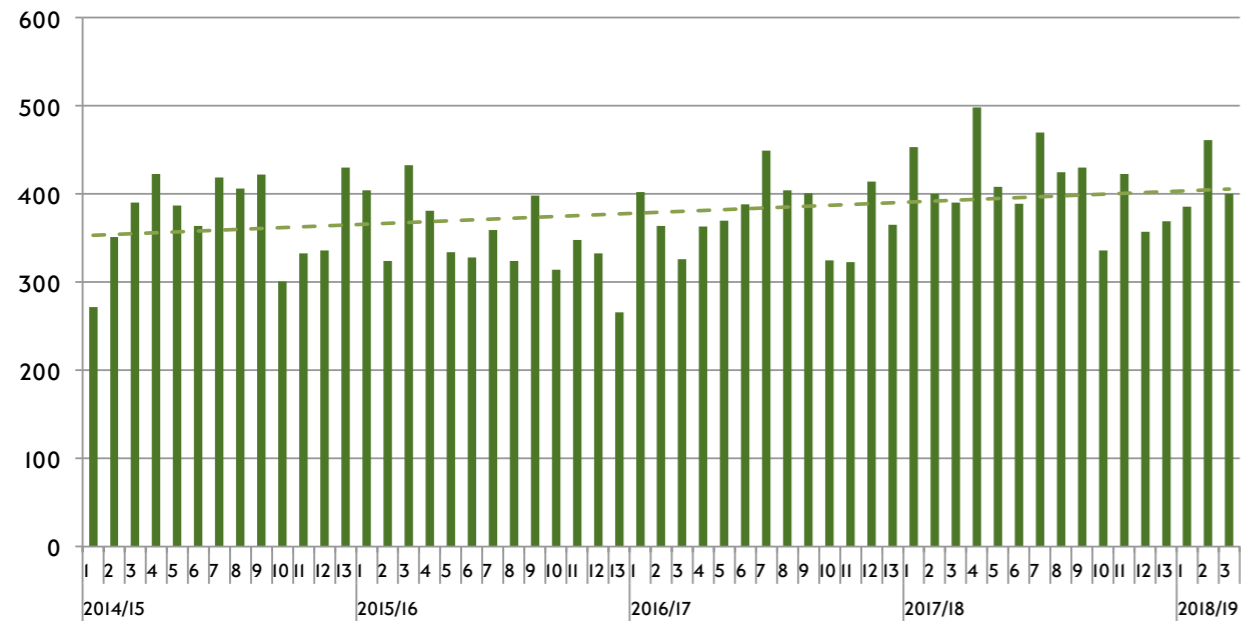
During quarter 1 we also continued to develop the specification for a new bus driver safety training course which will focus specifically on drivers' awareness of more vulnerable passengers and road users, as well as looking at how to reduce the number and severity of injuries that occur on board. Alertness is also key to drivers being responsive to hazards. For this reason, we have appointed Loughborough University, in partnership with the Swedish Road Safety Institute (VTI), to conduct independent research into bus driver fatigue. The research will enable us to understand the extent and nature of fatigue in London bus drivers and put forward evidence-based solutions to reduce fatigue. The research will conclude in spring 2019 but interim findings will be available in autumn 2018.

In parallel with the Bus Safety Standard, our bus operators are progressing trials of innovative safety equipment through our Bus Safety Innovation Fund. Eight innovation fund projects are underway, including trials of fatigue detection devices, acceleration limiters and new training apps.

These actions will help achieve our target to reduce the number of people killed, or seriously injured in, or by, London buses by 70 per cent by 2022 (against 2005-09 levels).



## Customer injuries five rolling years

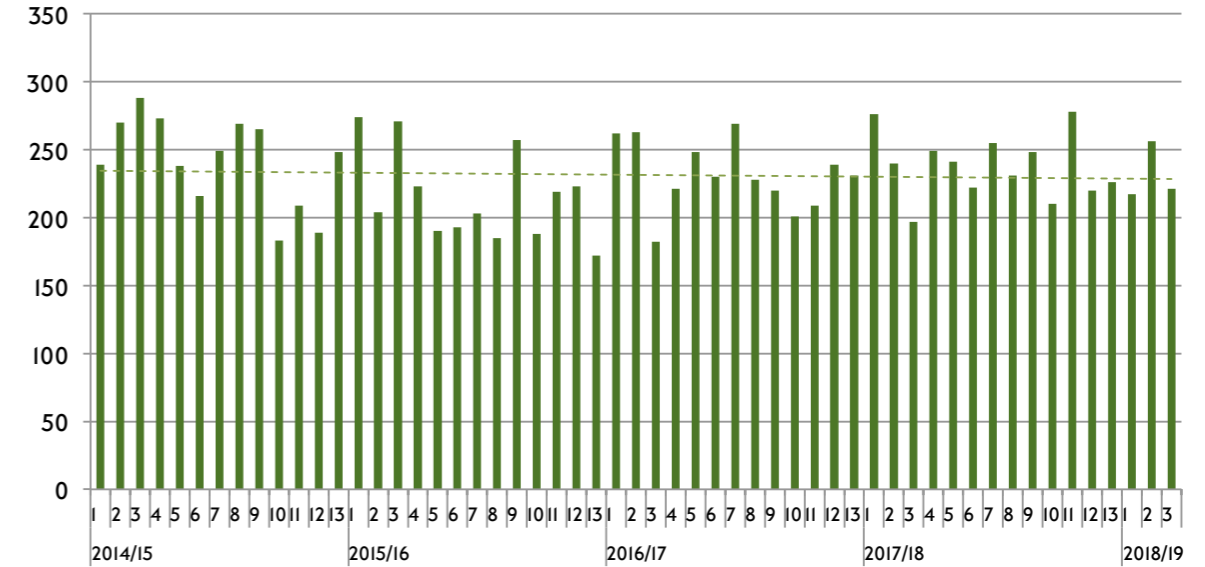


Over a five year period bus customer injuries have shown a rising trend; but there are signs of this slowing down over the last year and an improving trend is observed for major injuries over the last five years. This has been driven by a stronger focus on the investigation and sharing of learning from significant incidents by our bus operators. In the past two years, we have made a greater contribution to these investigations to ensure that contributory factors beyond the control of the bus operator are fully considered.

The more structured approach to the monitoring of bus operator performance and safety management introduced in 2017, including evaluating how they share learning and work with others to improve safety, is enabling better targeting of improvement activities at an operator and network level that will help drive further improvement.

Two key areas of focus have been falls on buses and collisions.

## Customer safety - slips, trips and falls on buses

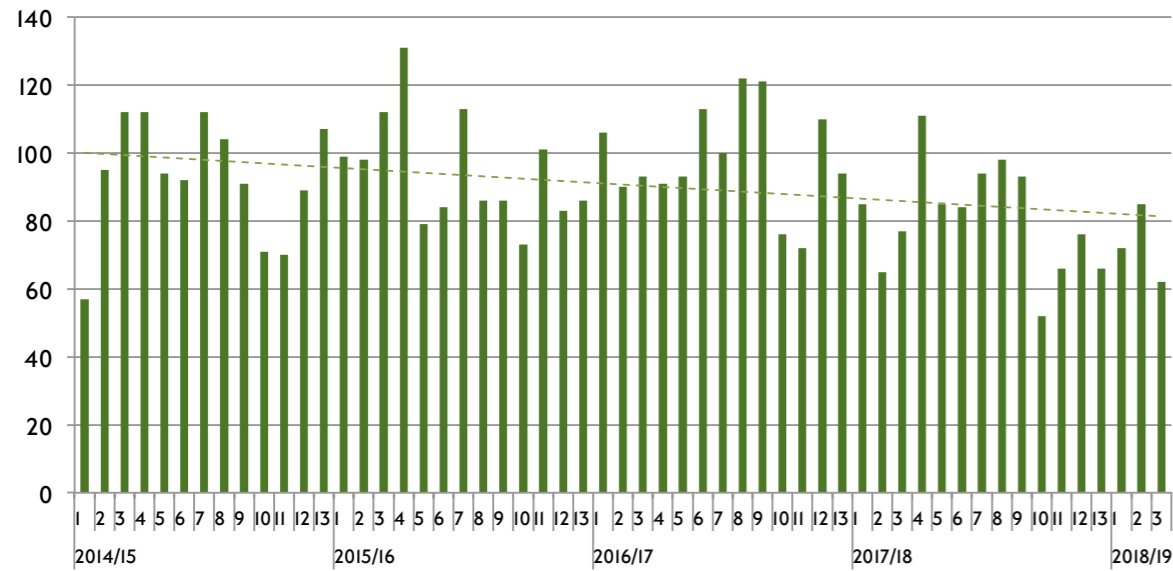


There were 694 injuries to customers this quarter, from the 1,143 slips trips or falls that occurred on our buses. This equates to 1.33 slip, trip and fall injuries per million journeys (an improvement on 1.35 in quarter 1 2017/18). The long term trend for injuries due to falls on buses is static.

The majority of slips, trips and falls were on a level surface. Twenty per cent occurred during boarding or alighting and 14 per cent of falls occurred within the stairs areas. Of the falls in the quarter, 141 (12 per cent) involved buggies/pushchairs and 17 involved wheelchair users (1 per cent), resulting in a total of 74 injuries to these vulnerable customers.



## Customer safety - bus collisions



There were 219 injuries sustained in 5,976 collisions involving buses. This equates to 3.1 collision-related injuries for every million miles operated this quarter. The number of injuries has reduced by 4 per cent and the total volume of collisions has reduced 8 per cent compared to the same quarter last year. Of the total collisions, just over 3 per cent caused injuries in the quarter. Customer injuries due to collisions have been steadily falling over the last five years.

To further reduce incidents, we are in the process of rolling out Intelligent Speed Assistance (ISA) to the bus fleet. Bus routes 222 and 183 are currently using ISA in operations. Following the initial road trials for autonomous emergency braking in March, the Bus Safety Standard work is testing a range of other vehicle design and technology features for their ability to improve safety, which will be peer reviewed by international industry experts.

## Plans for next quarter

During quarter 2 we will:

- Carry out policy reviews and gather data from focus groups and interviews with drivers and managers across bus operators to understand the issues associated with bus driver fatigue.
- Add ISA to a third route in September.
- Conclude our work to inform our Bus Vehicle Specification.
- Receive interim findings from the Safety Innovation Fund trials.
- Support the bus operator safety campaign at Elephant and Castle in September 2018, led by Go-Ahead.
- Award the bus driver training contract in September.



# Customer Safety: London Underground

## Overview: customer accidental injuries in Q1

Accidental Fatalities	Major Injuries	All Injuries	Near Misses
0	19	852	350

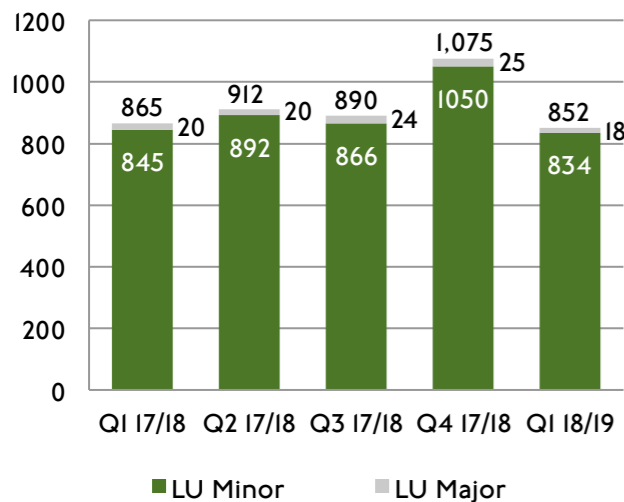
In quarter I 314 million passenger journeys were made and 852 customers were hurt when travelling on London Underground. Nineteen of those customer injuries (2.2 percent) were major injuries. This equates to 2.71 injuries per million passenger journeys, an improvement on the same quarter last year (2.77)

There were four cases where a passenger was fatally injured following a collision with a train. These await the outcome of the coroner's inquest.

## Customer injuries five rolling quarters

### Customer injuries

Past five quarters



We recognised there was an increase in the number of accidental injuries to our customers in 2017 and took action towards the end of 2017. Our actions focused on the key locations where accidents happen - on escalators (47 per cent), at the platform train interface (18 per cent) or on stairs (17 per cent). The majority of these accidents are when customers slip, trip or fall in these areas. The number of customer accidents on our stations in quarter I this year was the lowest for the past five quarters.

To improve safety on escalators, we introduced an 'Escalator Excellence Award' programme for the 10 stations which have the most accidents. This programme set the standard for good escalator safety practices on LU stations, including new 'Hold the Handrail' signs on escalators, better local announcements, a new safety poster campaign. Our station staff are involving their families in communicating safety

## Top three causes LU customer injuries

Slip Trip Fall	Hit by doors, gates or other objects	Other
84%	14%	2%

messages, including getting their children to record safety messages at our stations. This has had positive feedback from our customers. Our analysis of the "Escalator Excellence Award" showed that the number of accidents on escalators at these stations dropped by 29 per cent. We are now making these improvements in all LU stations which have escalators.

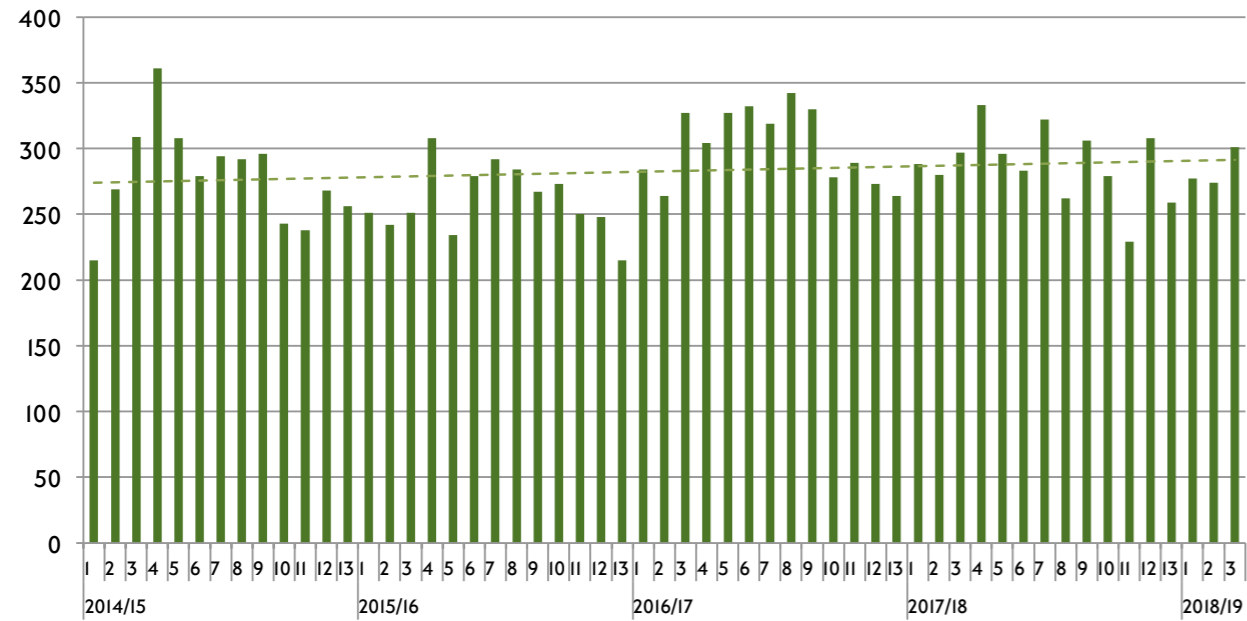
In quarter I, we also published our new LU Platform Train Interface (PTI) Plan. During this time, we produced, with input from our front line staff, a short film focused on reducing accidents at the PTI for train operators and station staff. We launched our new monthly PTI Day programmes - where senior and local managers talk to station staff and train operators about any issues or concerns.

We made a number of infrastructure improvements in quarter I. We have moved the platform edge on 86 platforms on the Underground to reduce the gap between the train and the platform. We also improved the cameras on a number of platforms which will improve the view the train operator has of the platform when they are despatching a train. We plan to make improvements on 95 platforms between now and April 2021.

*"Managing safety is about more than hitting targets, it is about protecting real people – our customers and our workforce. Over the past six months, our escalators safety plans have had a real impact in improving customer safety on the Underground. Many of the ideas in the plan came from our front line teams and we are encouraging them to come to us with more ideas for improving safety in other areas – at the Platform Train Interface, on stairs and in their own working environment."*

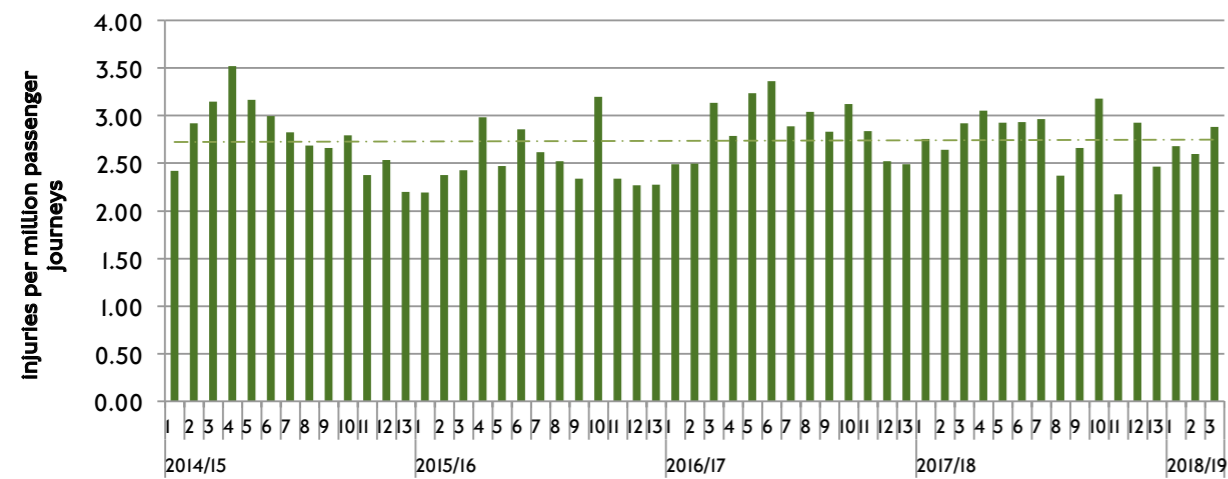
Mark Wild – MD London Underground

## Customer injuries five rolling years



Reviewing the longer term trend for London Underground customer injuries, these increased by around 15 per cent between 2015/16 and 2016/17. The renewed focus on injury prevention, with a specific focus on slips, trips and falls in

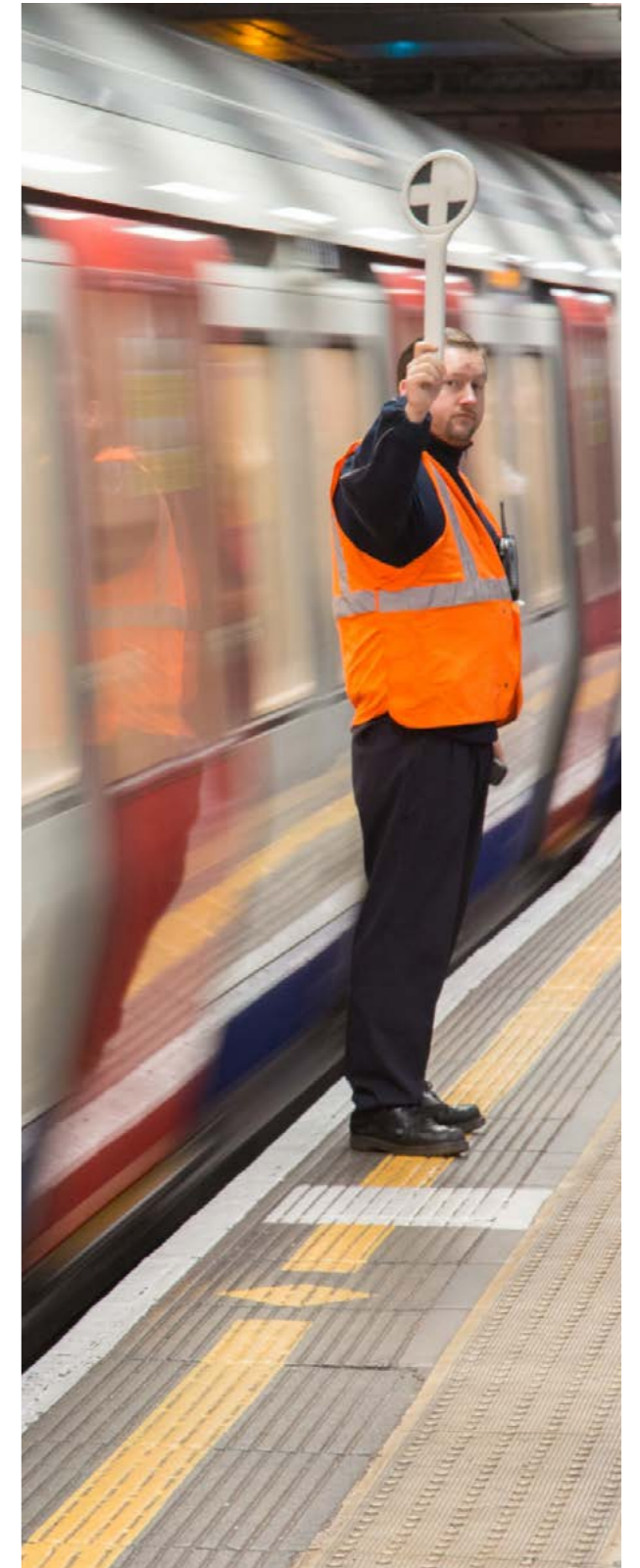
2017/18 halted and reversed that increase and the current quarter shows a further decrease from 2017/18. The five year trend when normalised by passenger numbers shows a stable trend.



## Plans for next quarter

During quarter 2 we will:

- Complete the roll out of the Escalator Excellence programme to all LU stations which have escalators.
- Roll out “Stair Excellence” programme to the 10 stations which have the most accidents.
- Use feedback from our monthly frontline PTI days to develop focused messages for staff and customers.
- Move nosing stones on the final six platforms to reduce the gap between the train and platform as part of our plan to reduce injuries when customers are boarding and alighting.
- Continue delivery of our Platform Camera Improvement project which will improve the train operators’ view of the platform and make it safer for customers boarding and alighting our trains.



# Customer Safety: Rail

## Customer injuries

Overview: customer accidental injuries in Q1

Accidental Fatalities	Major Injuries	All Injuries	Near Misses*
0	5	98	n/a

\*This data will be collated across our rail division and included in future reports

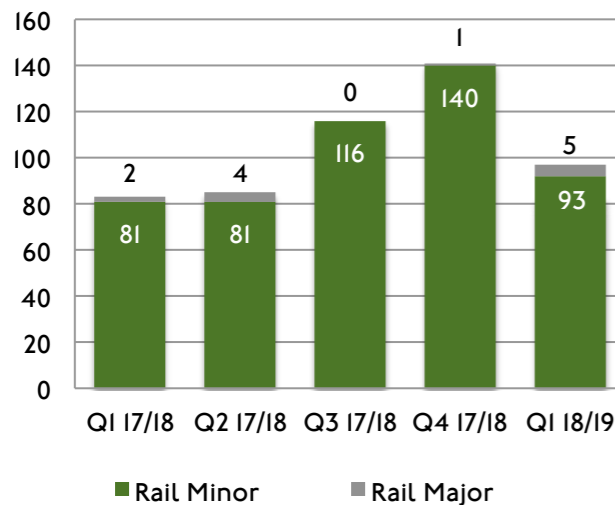
There were 89.8 million passenger journeys made across our rail networks during the quarter. A total of 98 customers were injured on our rail network. This equates to 1.1 customer injuries per million passenger journeys; an increase from 0.9 at the same time last year.

Two customers were hit by trains at Crouch Hill Station (LO) and Stratford Station (TfL Rail). These are awaiting the outcome of Coroner inquests. Just under 5 per cent of the injuries were classified as major injuries. They occurred within TfL Rail (3), Docklands Light Railway (DLR) (1) and London Overground (LO) (1).

## Customer injuries five rolling quarters

### Customer injuries

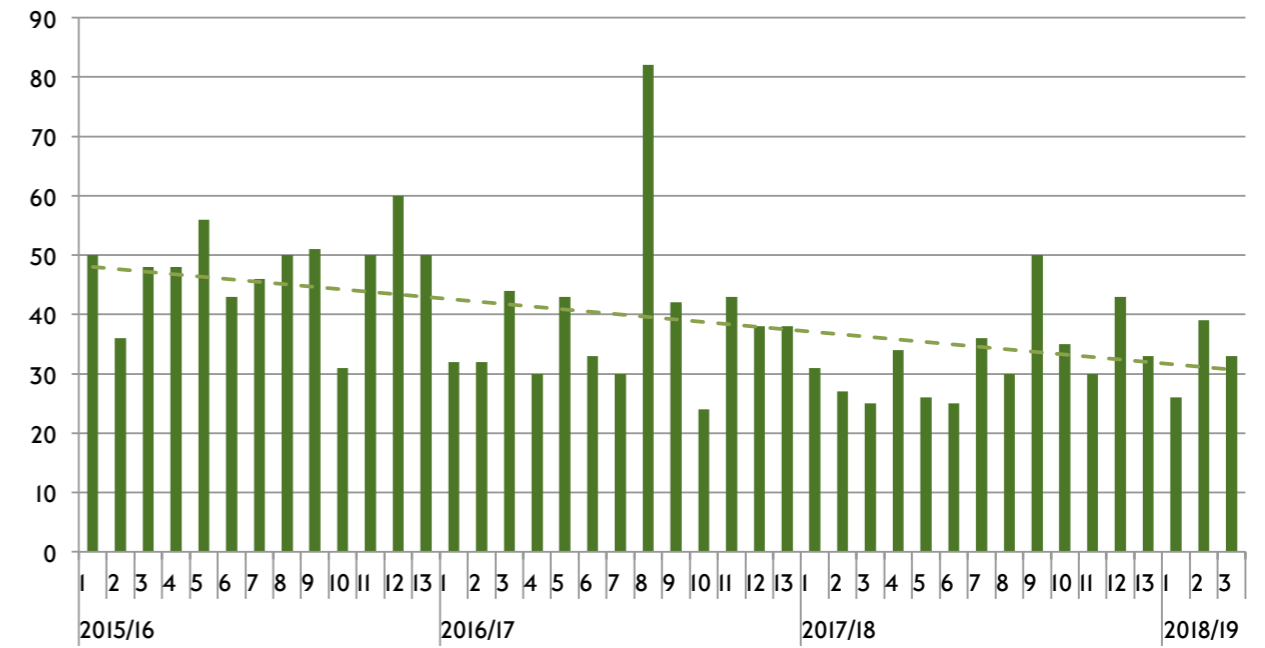
Past five quarters



The number of customer injuries increased by 18 per cent when compared with quarter 1 of 2017/18. A significant proportion of the increase in total injuries occurred within TfL Rail, where the number of injuries increased 57 per cent (23 up to 36) compared with quarter 1 2017/18. Although statistically significant, the TfL Rail performance is against the backdrop of the takeover of 11 Great Western stations from quarter 3 of 2017/18.

Analysis of causes of customer injuries across the individual rail modes is being undertaken for inclusion in future reports.

## Customer injuries long term trend



Despite the rise in the quarter, the 13 period trend shows an improvement. Although we're seeing a steady improvement in the long term trend for injuries, the tragic event at Sandilands junction on the tram network in November 2016 continues to drive our efforts to improve our understanding and control of risk across all our networks. Details of the actions being taken across our public transport networks are included in Appendix I.

## Rail Customer Safety

During the quarter, we completed our revision of the London Trams Network Risk Model. This review incorporated learning from relevant incidents world-wide, to provide a more comprehensive understanding of risk. We will now use the model to guide monitoring activities to confirm that the controls we have in place to keep our customers safe are working effectively. We also revised driver training following a review of our Route Risk Assessments. Our tram crossing risk assessments for Croydon town centre were updated and we are trialling additional mitigation to protect pedestrians, in the form of improved signage, crossing design and layout, and clearer segregation between authorised walking routes.

In May, we began the process to introduce an automatic braking system for the tram network which automatically brings a tram to a controlled stop; alerting the control centre if the speed limited at a location is exceeded. Potential suppliers will be asked to bid for the contract at the end of July. We are also assessing options for improving tunnel lighting and strengthening tram windows. The design of the ITram performance monitoring system is nearing completion and bids are being evaluated for improvements to tram emergency lighting.

To promote wider industry learning, we continue to work with the ORR, UK Tram, Department for Transport, and tram operators, owners and infrastructure managers, to establish and embed a new industry body to develop common standards and address risk review and identification. In June we also shared lessons learned and



actions we have taken after the Sandilands tragedy with the safety and risk professionals from across the railway and broader transport industry, at the Rail Safety and Standards Board's Risk Management Forum.

Full details of actions taken in response to the RAIB and our own recommendations following the incident at Sandilands in November 2016 are in Appendix I.

On our LO network, we introduced a new cutting edge simulator representing the driving cab and route that will be used by our new LO trains. The simulator allows drivers to experience and prepare for driving through all operational conditions including severe weather and trespassers on the track. We have also improved our standards for the management of fire precautions at stations where Rail for London is the Infrastructure Manager, and increased the frequency of inspections to ensure that controls remain effective.

In line with the approach taken to the management of the platform train interface across our other rail operations, 'Mind the Gap' announcements and platform signage have been introduced at DLR locations with larger stepping distances between the platform and train.

During the quarter the ORR issued their authorisation for Rail for London Infrastructure to stand-up as Infrastructure Manager; a significant safety milestone for the new Elizabeth line.

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## Plans for next quarter

During quarter 2 we will:

- Continue to support the development of the tram industry body for safety and a UK-wide trams safety risk model.
- Issue the Invitation to Tender for the automatic braking system for the tram network.
- Engage with Original Equipment Manufacturers on the installation of ITram.
- Establish whether similar remote monitoring capabilities can be introduced on the Stadler tram vehicles as is now used on the Bombardier vehicles.
- Revise tram crossing risk assessments for the segregated sections of the tram network.
- Support the development of a fatigue management strategy by our LO operator and the trial of a “Readiband” fatigue monitoring system by our DLR operator.
- Assess the impact of a 3 second door chime to warn of door closure on the DLR.



# Other operations

## Customer injuries

Overview: customer accidental injuries in Q1

Accidental Fatalities	Major Injuries*	All Injuries	Near Misses**
0	11	34	117

\*Injuries requiring hospital attendance

\*\* All incidents where no injury or damage arose

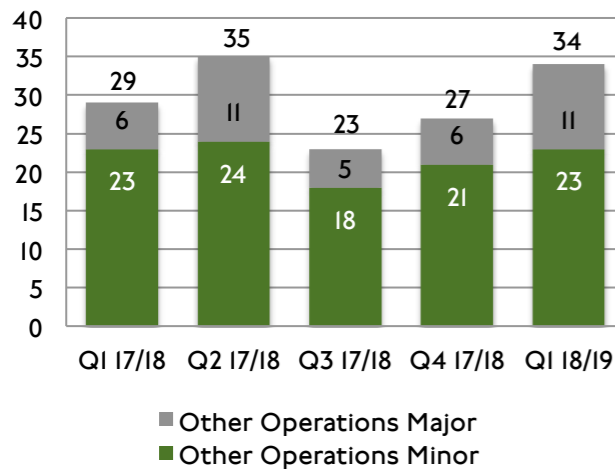
A total of 6.2 million passenger journeys were made across our other operations. Thirty four customers were injured. This equates to 5.4 customer injuries per million passenger journeys. This is worse than the same last year when it was 4.5 injuries per million passengers journeys.

Eleven of the injuries were classified as major within Santander Bikes (5), Dial-a-Ride (DaR) (3), Victoria Coach Station (VCS) (2) and London River Services (LRS) (1). A significant proportion of injuries occurred within DaR (35 per cent), unchanged compared with quarter I 2017/18. Santander Bikes and VCS each accounted for 21 per cent of the injuries with the remainder occurring within LRS and Emirates Air Line (EAL), both accounting for 12 per cent each.

## Customer injuries five rolling quarters

### Customer injuries

Past five quarters



The number of injuries rose by 17 per cent compared with quarter I 2017/18.

Slips, trips and falls were the predominant cause of injuries in all areas except Santander Bikes, where collisions caused most injuries. These two causes of injuries were responsible for all 11 major injuries in the quarter. In respect of those due to collisions, four out of the five incidents involved Santander Bikes users, and the other involved a DaR customer.

## Top 4 causes of injuries

Slip Trip Fall	Collision	Cut/abrasion	Trapped fingers/limbs
41%	18%	15%	6%



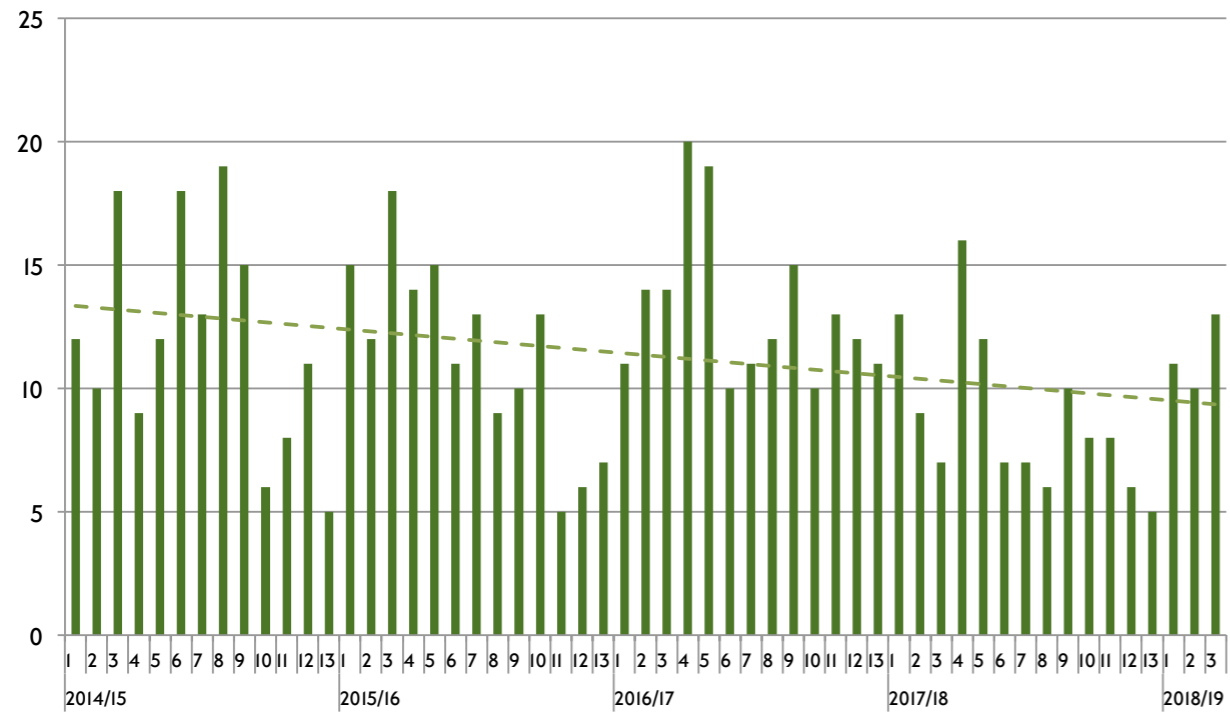
To reduce these incidents safety features are being built into the design of new assets and vehicles. This is key to achieving and sustaining risk reduction. The specification for new DaR vehicles issued during quarter I builds in safety features including low-floors, a reduced incline on ramps, as well as seats and aisles widths that ease movement.

To deliver improvements in safety on the river, we have gained support for the development of a River Safety Strategy from key stakeholders, including the Port of London Authority.

Our licensing and enforcement regimes also support risk reduction and the elimination of injury by ensuring that the assets used to provide services and the way in which they are operated remain safe. Our new powers to carry out road-side stops of taxi and private hire vehicles without police presence came into force, enhancing our ability to eliminate illegal and non-compliant activities.

Our 12 week consultation on a range of measures to improve safety and raise standards across the private hire industry through our licensing regime concluded at the end of quarter I. Responses are being evaluated.

## Customer injuries five rolling years



The overall trend for other operational services shows a positive trend. Our work to introduce new vehicles and vessels and develop a new strategy for safety on the river will help improve safety and reduce injuries in these operations.

## Plans for next quarter

During quarter 2 we will:

- Start work on the River Safety Strategy.
- Evaluate the response to the DaR vehicle specification.
- Evaluate the response to the private hire consultation.





## Customer marketing and behaviour change campaigns to improve health and safety

During the quarter the following campaigns were delivered to support safety and reduce injuries across our networks.

The Introduction of a Priority Seating Week campaign to make travelling easier for people who find it difficult to stand, included a campaign launched using our staff and public address systems to encourage people to look up and offer a seat to those who might need it. Local trials concluded on all modes of communication on public transport, focusing on communicating the key causes of slips, trips and more serious injuries, encouraging customers to take care when travelling.

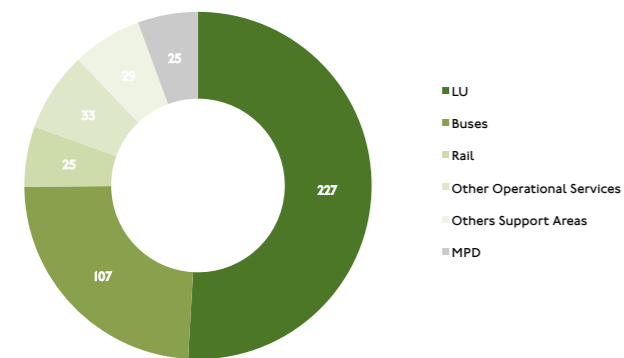
In addition to our focus on the health and wellbeing of our own staff, we launched a range of activities to encourage people across London to get active. These included pop-up cycle docking stations at new locations and the funding of over 40 free guided walks during May as part of National Walking Month. The walks included the exploration of our urban tree trail and a sensory and dementia-friendly walk.



# London's transport system will be safe

## Number of workforce injuries on the network (quarterly)

There were a total of 446 injuries to our workforce, a 14 per cent decrease on the same quarter in 2017/18.



## 227

Number of workforce injuries on the LU network this quarter (9% ▼ compared to Q1 2017/18)



## 107

Number of workforce injuries on the Bus network this quarter (14% ▼ compared to Q1 2017/18)



## 42

Number of total construction workforce injuries quarter (19% ▼ compared to Q1 2017/18)



## Workforce injuries

Overview: workforce accidental injuries in Q1

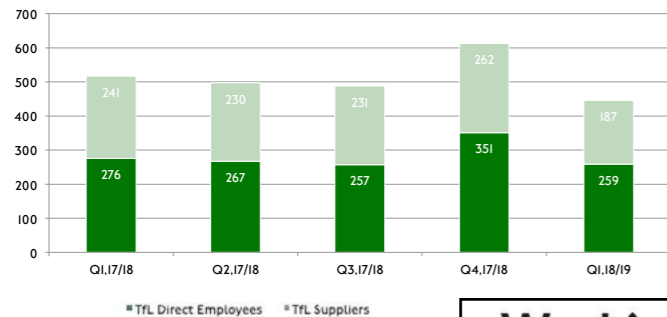
Fatalities	RIDDORs*	All Injuries
0	43	446

\*Reporting arrangements for our bus suppliers being developed

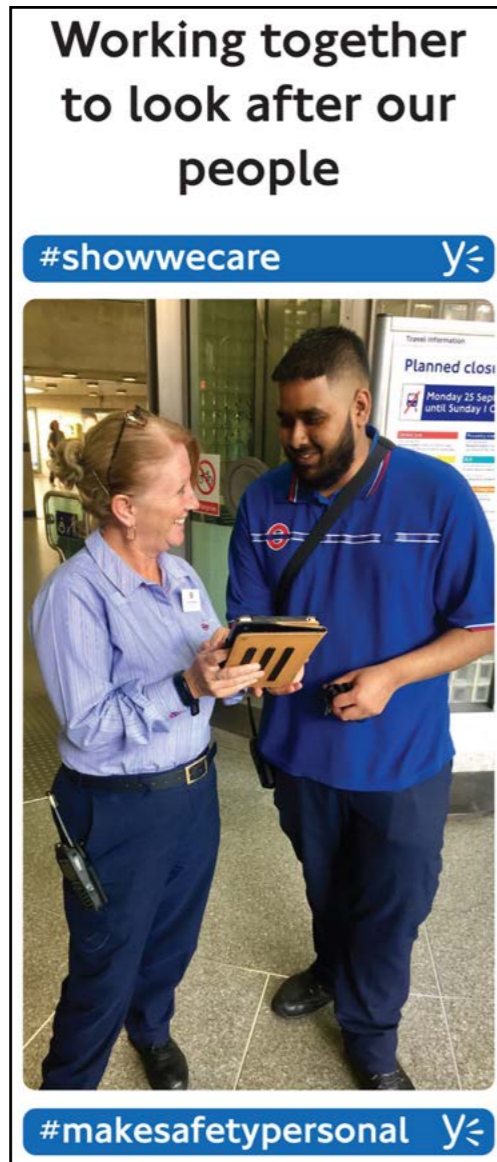
Fewer members of staff and contractors were injured in quarter 1 compared with the same quarter last year (6 per cent improvement compared to the same quarter in 2017/18).

Of the 446 workforce injuries during the period, 43 were reported to regulatory authorities (information on page 15) and a further 21 were classified major in connection with bus driving, as they required hospital attendance. We held our first HS&E “workforce stand down” of the year across our construction projects, in response to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) reportable injuries we experienced within our construction and project teams during the quarter. Whilst there was no common causation amongst these injuries, the stand down facilitated conversations with those on our sites and in our offices about what they can do to ensure the wellbeing, safety and health of themselves, their colleagues and our customers.

## Workforce injuries five rolling quarters



Our direct employees accounted for 58 per cent of workforce injuries, with 83 per cent of these incidents occurring within LU (which has the greatest number of direct employees in TfL). Injuries to our supplier staff accounted for 42 per cent of our workforce injuries. The number of injuries reduced by 22 per cent compared with quarter I of 2017/18. Bus drivers were the group most affected, accounting for 51 per cent of supplier staff injuries. This is followed by our major project teams where 25 injuries (13 per cent) were reported. Within our Rail modes, we recorded 24 injuries (12.8 per cent) and in other operational service we recorded 22 injuries (11.8 per cent). The remainder were reported within LU (12 - 6 per cent) and other support areas (2 - 1 per cent).

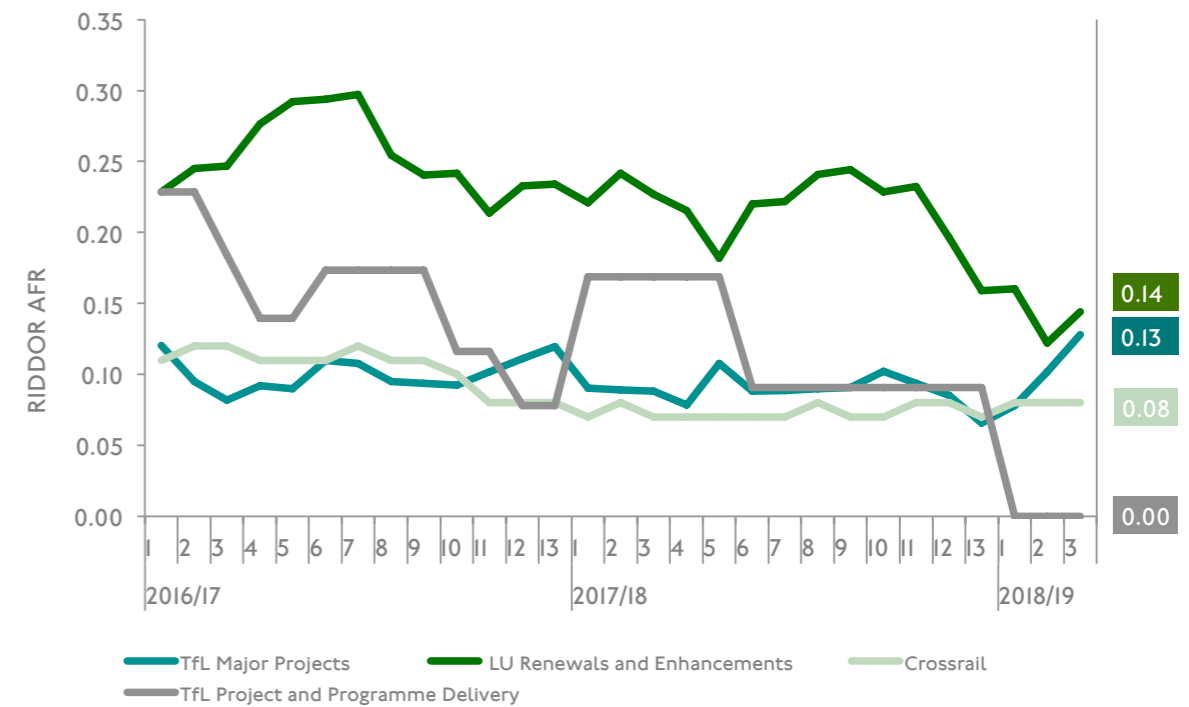


We took action to improve the safety of our staff and contractors in a number of other areas in quarter I. Our ongoing focus on improving safety leadership and culture in TfL continues through making safety personal to all. During the quarter, LU launched its first LU Safety Culture Plan. It includes

establishing safety charters for all Heads of Customer Services, sharing their commitment to improving health and safety in their areas, rolling out a Safety Conversation approach in the maintenance team, and creating open forums for discussing safety issues. We have also included encouraging more near-miss reporting to address issues before they cause injury.

During the quarter, there was a strong focus on improving our understanding and control of risk across the rail networks and strengthening our competence management arrangements. We also aim to improve learning between different parts of TfL, such as sharing of good practice between LU and London Trams on the safe use of the underfloor wheel lathe at our tram depot.

## Construction workforce Accident Frequency Rate (AFR)



Our total construction workforce accounted for 42 accidental injuries in the quarter. This is a 14 per cent decrease on quarter I 2017/18. Six of the injuries in the quarter were reported under RIDDOR, though none of them were major injuries. In response, within major projects the focus has been on our key incident trend; an increase in injuries leading up to and during the summer holiday season. Campaigns have been launched reminding employees to maintain their focus on safety when returning from work following a holiday using simple techniques to improve hazard awareness. Through our Zero Harm community (a forum for working with our suppliers to improve safety across TfL) we are working to embed "back to work" campaigns as a part of work induction.

Taking the lead for construction across TfL, our major projects teams identified that whilst safe systems of work and processes were of an acceptable standard, they were not consistently followed. This quarter we began trialling a Behavioural-Based Safety (BBS) programme in MPD with supporting short films that forms part of a consistent HS&E induction pack. The focus of the BBS programme is on workers' behaviours and we will share this programme with other parts of TfL in quarters 2 and 3.

The chart above shows the RIDDOR Accident Frequency Rate (AFR) for all our construction teams including Crossrail.

## Top 4 causes of injuries (all areas)

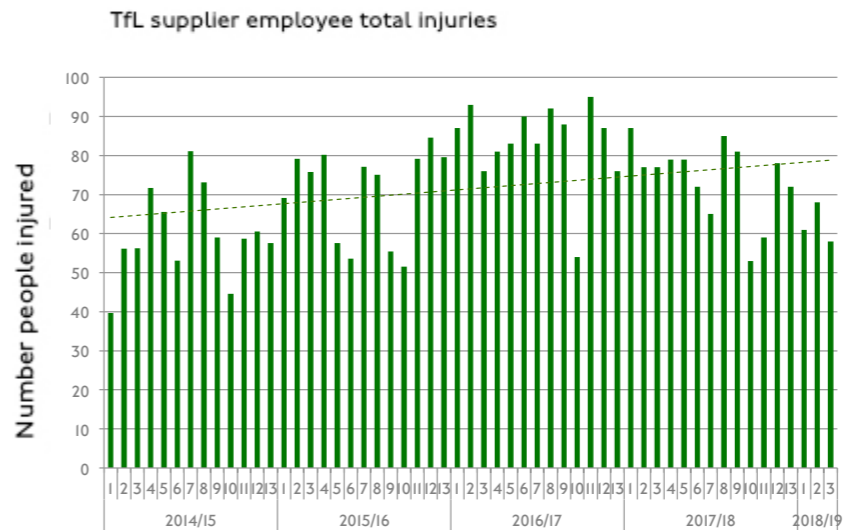
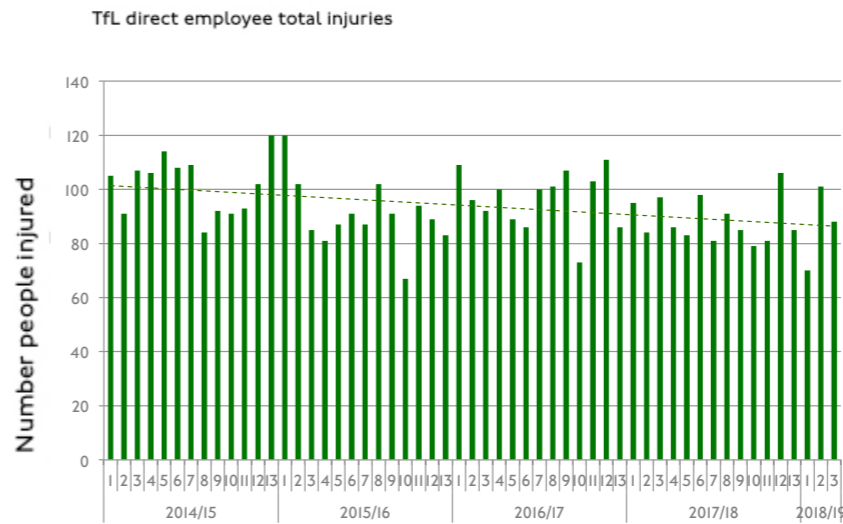
Slip Trip Fall	Machinery/ Equipment/ Powered Tools	Manual Handling	Collision
22	19	12	5

For our direct employees, slips, trips and falls were the main cause of injuries. Although the longer term trend for overall injuries is declining, within LU and Surface Transport, there has been an upwards trend for two years in respect of slips trips and falls. LU and Surface Transport have focused plans addressing slips, trips and falls. Actions include improving walkways and barriers where possible, clearing redundant material from track and working environments and ensuring that our staff remain alert and aware of their surroundings. Short films are

being produced which help staff understand the risk and the potential consequence of slip, trip and fall accidents.

Manual handling injuries are a key theme across different parts of TfL, particularly London Underground, our Major Projects Directorate and Dial-a Ride. Enhanced training is being delivered to staff, and we have a number of projects aimed to reduce the amount of manual handling required. This training has already begun to result in improvement within our construction teams. Capability assessments for those delivering services in DaR and VCS are being used to reduce manual handling injuries. Improved management of vehicle movements at VCS and introduction of a speed monitoring tool will target collision-related injuries.

## Workforce injuries five rolling years



The long term trend for total workforce injuries overall is stable. We are seeing an improving trend for injuries to TfL's own staff, but a worsening trend with our supplier staff within major projects and Santander Bikes.

Our Supplier Assessment Tool (SAT) provides our key leading measure for supplier performance within our major projects and other rail projects. This approach is being progressively rolled out across all construction and maintenance related supply chains. A similar approach has been introduced to provide a more holistic view of safety management maturity within our bus operators.

Taking the lead for construction across TfL, our major projects teams identified that whilst safe systems of work and processes were of an acceptable standard, they were not consistently followed. This quarter we began trialling a Behavioural-Based Safety (BBS) programme in MPD with supporting short films that forms part of a consistent HS&E induction pack. The focus of the BBS programme is on workers' behaviours and we will share this programme with other parts of TfL in quarters 2 and 3.

## Plans for next quarter

During quarter 2 we will:

- Introduce new measures to improve the management of fatigue for tram infrastructure maintenance workers.
- Strengthen the training and competence assurance of those who work on the tramway and at the LO fleet maintenance facility.
- Launch the new HSE improvement programme in our Major Project Directorate, which will run from August 2018 to August 2019.
- Roll-out a new reporting application to make it easier for our construction workforce to report incidents and near misses.
- Deliver the first round of Safety Leadership and Culture conversations with senior managers as part of the LU Safety Culture Plan.
- Launch a workforce safety video for all LU functions, including sharing injury/accident experiences.
- Extend the use of the Supplier Assessment Tool (SAT) across all TfL Capital Programmes, and revise our 'Beacon' HSE award scheme to apply across TfL.
- Launch HSE Roles and Responsibilities training for middle managers.
- Launch a new simplified risk assessment process across TfL.



# Workplace Violence

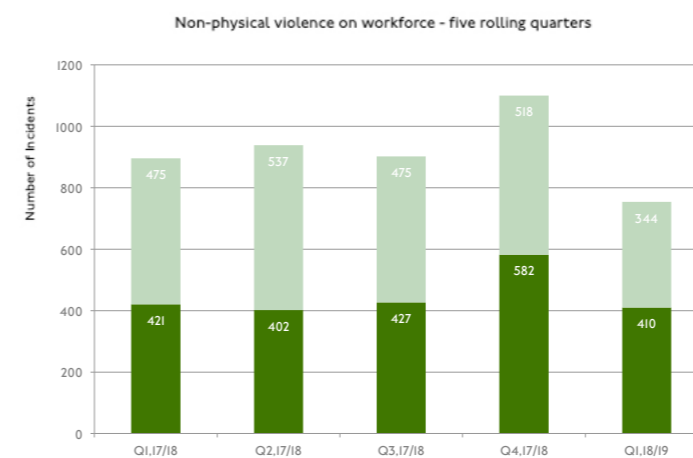
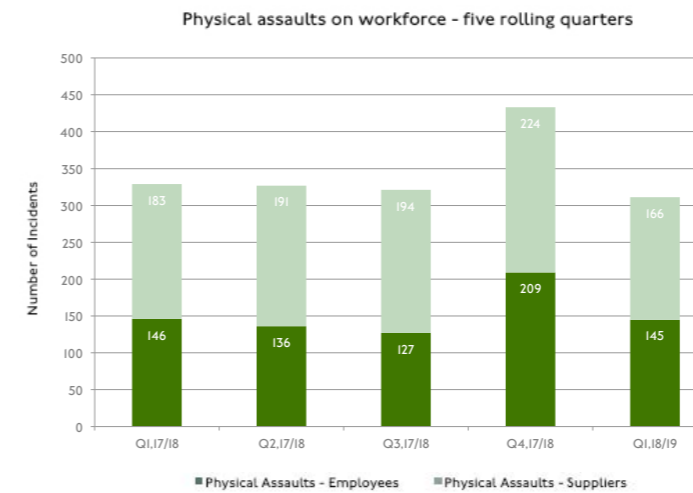
## Overview: workplace violence in Q1

Physical Assaults	Non-physical Assaults	Total Assaults
311	754	1065

In the quarter, there were a total of 1,065 acts of violence towards our workforce, 29 per cent of which were physical assaults. Incidents tend to be connected with revenue collection, and temporary LU station closures as part of our congestion control plans. These incidents mainly result in verbal abuse. Road-rage also features as a cause for our road-based operations.

For our direct employees, there were a total of 555 acts of violence in the quarter, 26 per cent of which were physical assaults. For our suppliers, a total of 510 staff were affected by workplace violence in the quarter, 32 per cent of which were physical assaults. Seventy-five per cent of all acts of violence against our supplier's workforce were recorded on the bus network (our largest customer-facing supplier workforce). LO and DLR recorded 12 per cent and 8 per cent respectively. During the quarter MTR, the operator of the TfL Rail network, refreshed their conflict management training to address an increase in the number of staff assaults.

## Workforce violence - five rolling quarters



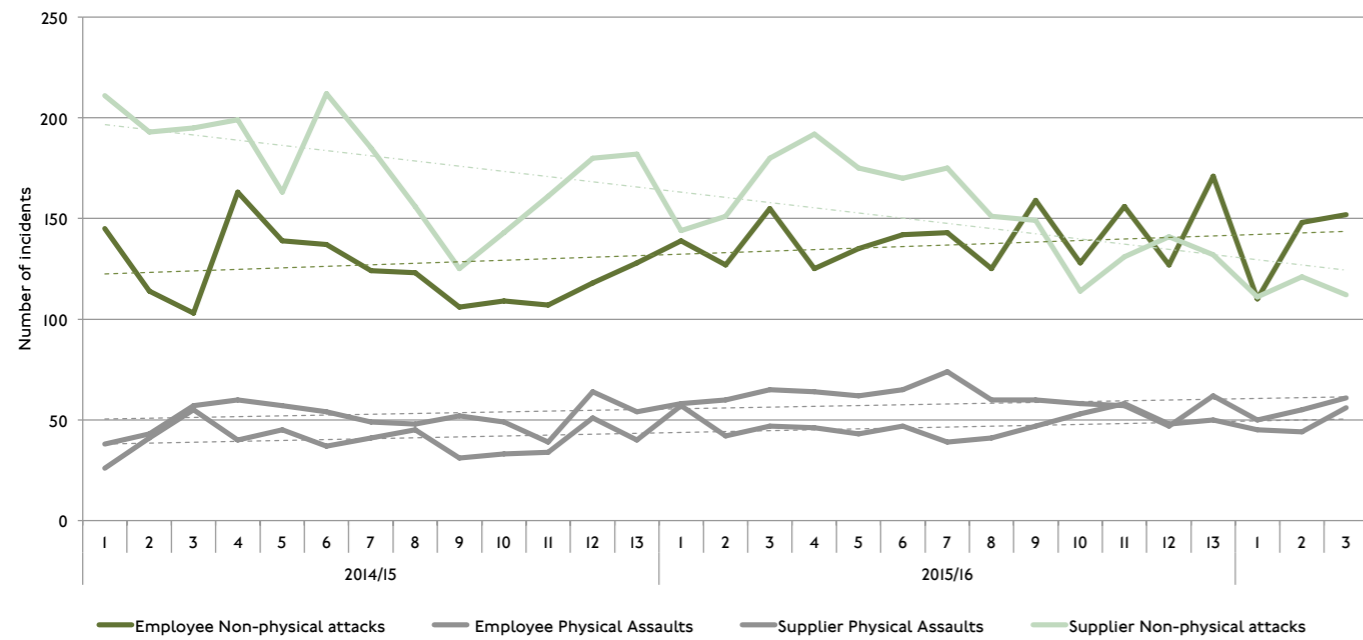
The total level of violence against our workforce in the quarter is a reduction of 13 per cent compared to quarter 1 2017/18, resulting from a two per cent reduction in assaults against direct employees and a 23 per cent reduction against our supplier workforce. There was a 6 per cent reduction in physical assaults and a 15 per cent reduction in non-physical aggression compared with quarter 1 of 2017/18.

Through dedicated teams in our operational businesses, we support our workforce to take formal action through the police, against those who commit acts of violence. A total of 465 incidents of workplace violence were reported for police investigation. The workplace violence support teams worked closely with the police to assist their investigations. The British Transport Police (BTP) created a Staff Assaults Unit (SAU) from the end of May 2018. The SAU will include up to six police constables and one sergeant by the end of quarter 2. We also run regular workplace violence Interactive Sessions (i-Sessions) to enhance the support available to managers and employees dealing with workplace violence. The focus on these was re-doubled in the quarter, and as a result over 300 staff have now undertaken sessions across the network.

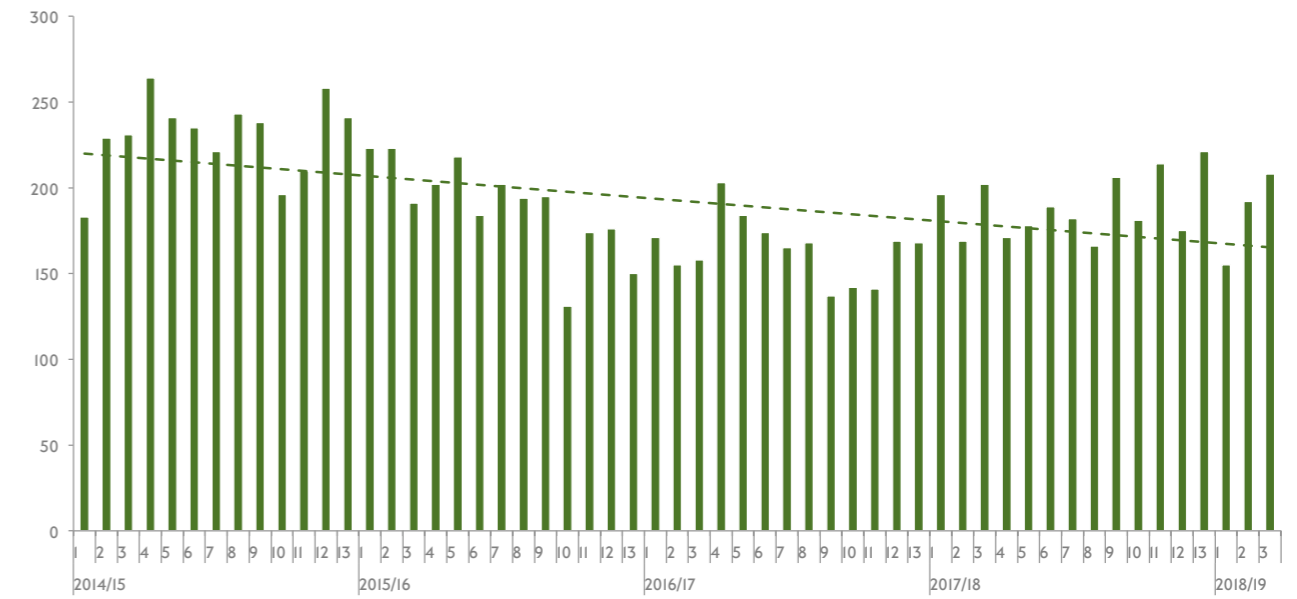
Incidences of workplace violence on Night Tube are very low. However, it was noted that the 26 incidents in quarter 1 was a reduction on the 41 reported at the same time last year. Of these 7 per cent were physical assaults. Alcohol is a common factor in these incidents. LU launched a new Workplace Violence reduction Plan in quarter 1, which has actions focused on managing customers under the influence of alcohol or drugs. Actions aimed at improving customer safety and reducing workplace violence to staff (from customers under the influence) were trialled, with the support of the BTP in May. Lessons learned from this trial have been incorporated in the LU Workplace Violence Reduction Plan.

## Workplace violence 5 rolling years

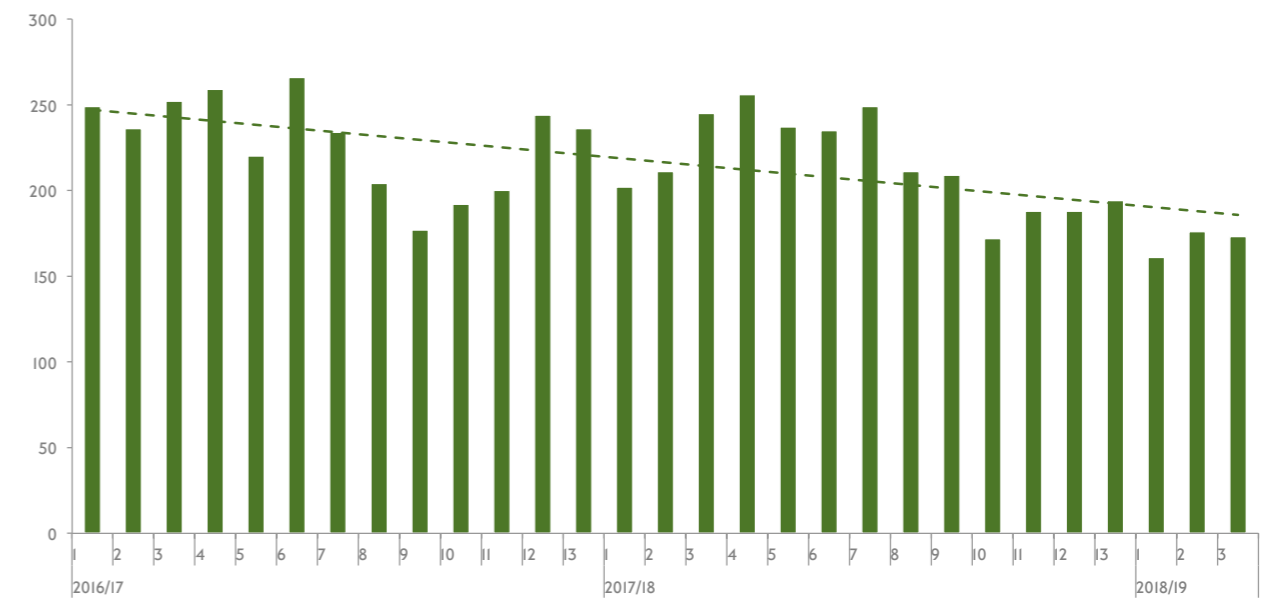
Workplace violence - trend



TfL direct employee work related violence incidents



TfL supplier work related violence incidents



The trend for physical assaults on our workforce has remained relatively steady since 2016/17. However, non-physical violence towards our workforce is declining on our bus network, which is in turn contributing to an overall decline within our supplier workforce.

Our staff are encouraged to report all acts of aggression towards them, it is therefore accepted that higher levels of reported non-physical violence is a sign of positive culture, and enables effective deployment of enforcement personnel.

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## Plans for next quarter

During quarter 2 we will:

- Continue to support staff experiencing violence in their workplace to take formal action through the police.
- Support the expansion of the BTP's Staff Assault Unit.
- Start to deliver the LU Workplace Violence Plan.





# Health & Wellbeing

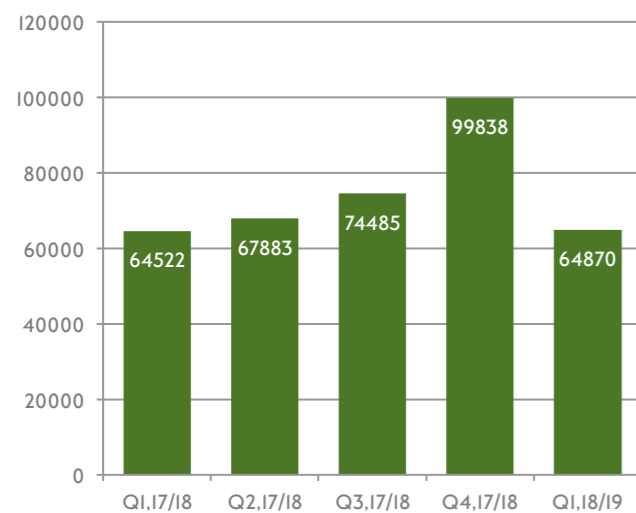
## Workforce sickness absence

Working days lost to sickness	% working days lost to sickness
64870	4.45%

We employ over 27,500 staff in TfL. Within our direct employee workforce, a total of 64,870 working days were lost due to sickness in quarter I. 82 per cent of the working days lost were within LU, and Surface Transport accounted for 11 per cent.

In respect of musculo-skeletal, mental health and accidents/assaults, the three causes of sickness absence where we currently implement work-related risk controls, 54 per cent of the days lost can be attributed to these causes.

## Days lost to sickness absence – rolling 5 quarters



The total number of working days lost to sickness shows a small improvement (0.5 per cent) on the same quarter last year. The performance follows a rise during quarter 4 of last year. The average number of working days lost to sickness absence remained static compared with quarter I of 2018/19.

A higher percentage of working days were lost to coughs and colds than in 2017/18 following a worse flu season than the previous year. We also observed increases in the percentage of working days lost to Mental Health, Musculo-Skeletal, Gastrointestinal and Neurological issues, compared to the previous quarter I. The slight decrease in overall working days lost to sickness absence can therefore be attributed to a decrease in the other types of sickness absence.

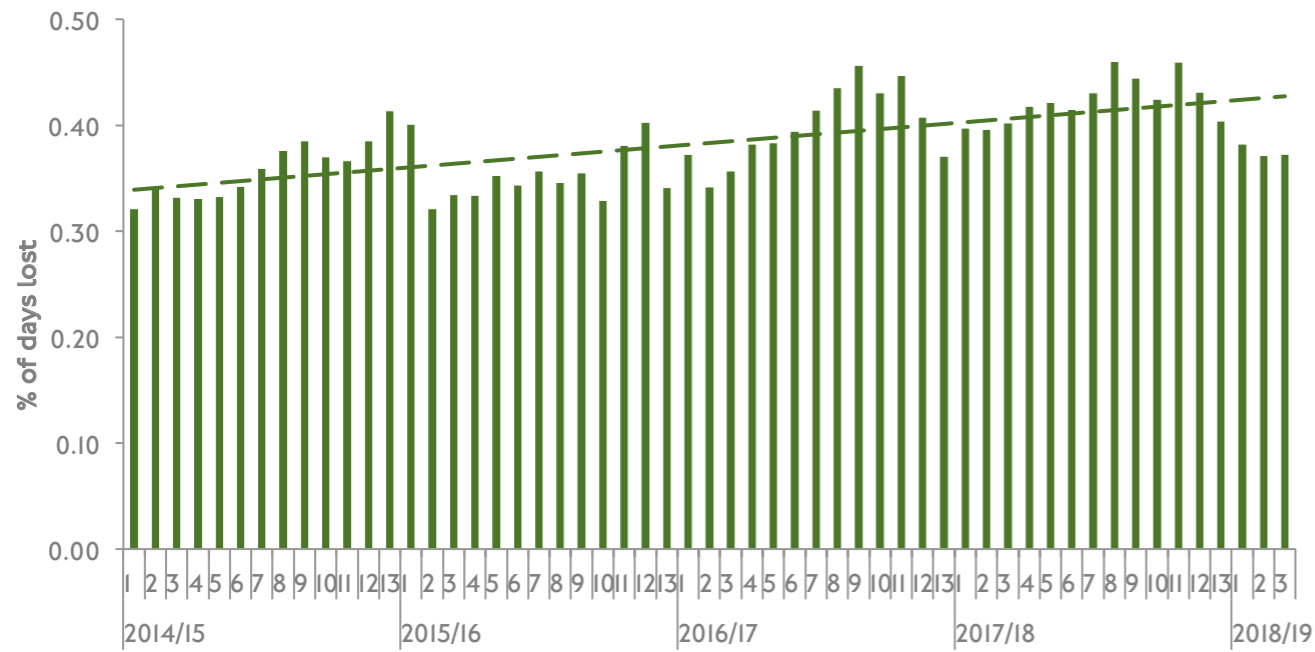


Our focus on encouraging and supporting our staff to stay physically and mentally healthy continued during the quarter. Mental Health Awareness Week, between 14-18 May, was packed with activities around the business, organised through our network of Time to Change Agents. The TfL parkrun initiative saw 96 staff join the new TfL Running Club for parkrun and over 170 participants in the TfL Yammer group. Interviews to expand the Supporting Colleagues Network by 150 were concluded and 5 out of 12 two day training sessions were completed.

**96**

Number of staff joining the new TfL Running Club

Days lost due to sickness absence – rolling 5 years

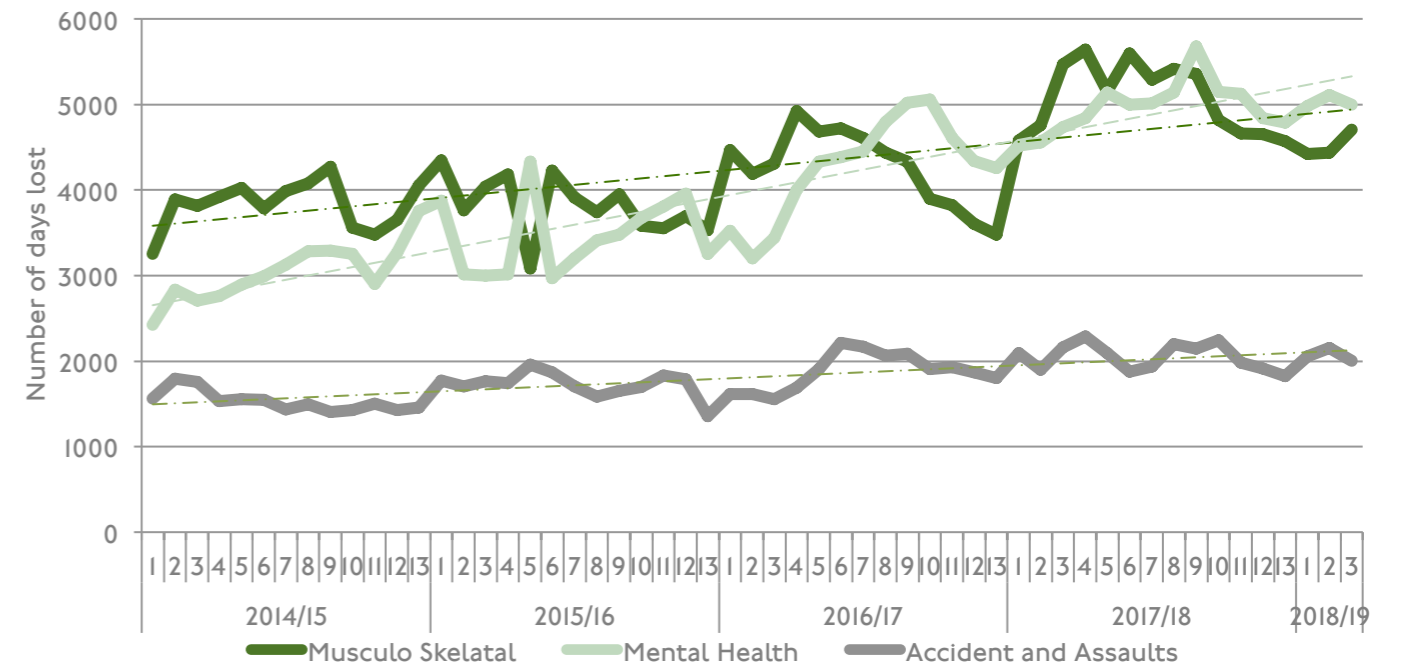


We observe a worsening trend in working days lost (when considered over 5 years), including when shown as a proportion of available working days.

The long term trend for the number of working days lost to musculo-skeletal, mental health and accidents/assaults causes is worsening.

and support for these three causes of sickness absence through our Occupational Health and workplace support teams, Employee Assistance Programme and Supporting Colleagues Network which provides peer support.

We currently implement specific work-related risk controls and interventions



# London's transport system will improve air quality and the environment



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## Environment – London’s streets will be clean and green

In support of the delivery of the Mayor’s environmental objectives outlined in the Mayor’s Transport Strategy and the London

Environment Strategy a number of key work programmes have been progressed during the quarter.



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### Ultra Low Emission Zone (ULEZ)

The Mayor announced the ULEZ will be expanded up to the North and South Circular boundary in 2021. The new ULEZ will cover an area 18 times larger than the Central London ULEZ and will affect large numbers of polluting vehicles that do not comply with strict emission standards. It is estimated that 100,000 cars, 35,000 vans and 3,000 lorries might be affected by the expanded zone and tighter standards every day.

Expanding the ULEZ beyond central London will result in more than 100,000 Londoners no longer living in areas exceeding legal air quality limits in 2021, a reduction of nearly 80 per cent. We estimate that expanding

the ULEZ will reduce road transport nitrous oxide emissions by a further 28 per cent across London.

Following extensive consultation, the Mayor will also tighten the standards for the most polluting heavy vehicles including buses, coaches and lorries across the whole of London, using the same boundary as the existing Low Emission Zone. From October 2020 all buses, coaches and Heavy Goods Vehicles (HGVs) in London will need to meet Euro VI emissions standards or pay up to £300 daily charge. From October 2021 the ULEZ will be expanded to the North and South Circular roads for all cars, vans and motorcycles.



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## Improving air quality on the tube

The Mayor is focused on reducing pollution from all London's transport network including the Tube, river transport and construction sites. We continue to monitor the air quality on the tube network and are trialing different cleaning regimes to minimise dust levels and ensure employees and passengers continue to breathe the cleanest air possible.

Previous independent scientific research funded by us in 2004, found that the composition of dust particles on the Tube was different from that above ground and concluded that the dust did not contain components at levels that are likely to pose a health risk. Last year we committed to reviewing this evidence and requested independent support and advice from the Department of Health's expert Committee on the Medical Effects of Air Pollutants. We expect to receive the outcome of this review next quarter, the findings of which will help inform actions to ensure that the Tube system remains as clean as possible.

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## Low Emission Buses

Around 45 per cent of our 9,000-strong bus fleet now meets the ultra-clean Euro VI standard following our programme to upgrade around half our vehicles and replace remaining vehicles. We are accelerating this transition through the introduction of Low Emission Bus Zones beyond the proposed ULEZ and are working with the Mayor's Office to launch further zones as soon as all routes along these corridors have been raised to the same ultra-clean level.

In the quarter, 71 per cent of the bus fleet entering London was compliant with ULEZ. There were 96 electric buses (same as last quarter). There were 4,100 buses London wide meeting Euro VI standards (ULEZ compliant).

Our bus retrofit programme has upgraded more than 1,300 buses to date. Around one-third of the fleet is now bringing much lower emissions to large parts of London, directly benefiting the Mayor's programme to improve air quality. With every vehicle retrofitted air quality benefits are immediately brought to London as its proportion of nitrous oxides and particulates falls by up to 95 and 85 per cent respectively.

In addition to this, most new vehicles entering the fleet are fitted with hybrid systems which reduce CO<sub>2</sub> by up to 30 per cent. A small but growing part of the fleet (around 100 vehicles) is made up of zero emission electric and hydrogen fuel-cell buses which emit no exhaust fumes at all.

To support the 3,000 hybrid and 95 electric bus milestones, a number of buses have been fully wrapped with advertising, supported by other communications to promote continued progress to improve the fleet.



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## Electric vehicles and charging infrastructure

To support the growing number of Zero Emission Capable taxis and the take-up of electric vehicles, we are building a network of rapid charge points across London. We have installed 115 to date, of which 58 are dedicated to taxis. This will increase to 150 by the end of December 2018, which is a major step towards our target of 300 rapid charge points by December 2020. At present, there are nearly 300 Zero Emission Capable taxis licensed in London – more than a 300 per cent increase since March 2018.

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## Electric Vehicle Infrastructure Task Force

The Mayor has launched a new taskforce dedicated to boosting the infrastructure needed to increase the take up of electric vehicles across the capital. Whilst the rapid charging infrastructure is leading the field internationally, it is currently delivered on land and roads managed by us. The taskforce has representatives from business, energy, infrastructure, government and London boroughs.



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## School Audits

On 24 May 2018, the Mayor released reports containing the findings of the Mayor's School Air Quality Audit Programme. The reports investigated how air pollution levels at 50 schools situated in some of the most polluted areas in London could be addressed. A dissemination session was held in the London

Living Room on 25 June 2018 which provided schools and borough officers with further information and support for implementing the audit recommendations. Together with the GLA we are continuing our support by arranging a series of meetings with boroughs and associated schools.

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## Green Infrastructure

We continue to review all schemes and delivery programmes to understand the opportunities for green infrastructure and sustainable drainage through our established processes such as environmental evaluation and healthy streets checks and early engagement with project sponsors. We have input from specialists in engineering such as arboriculture and drainage. As a result, our projects now building green roofs including Tottenham Hale station upgrade, Acton Trains Modification Unit and Four Lines Modernisation Signalling Equipment rooms.

We have commissioned a tool for measuring and delivering a biodiversity baseline and net gain to support the Mayor's Transport Strategy and London Environment Strategy goals. This is currently being trialled on development of cycling schemes and the design of DLR Beckton depot before rolling out fully later in the year through training and inclusion in our project management process.

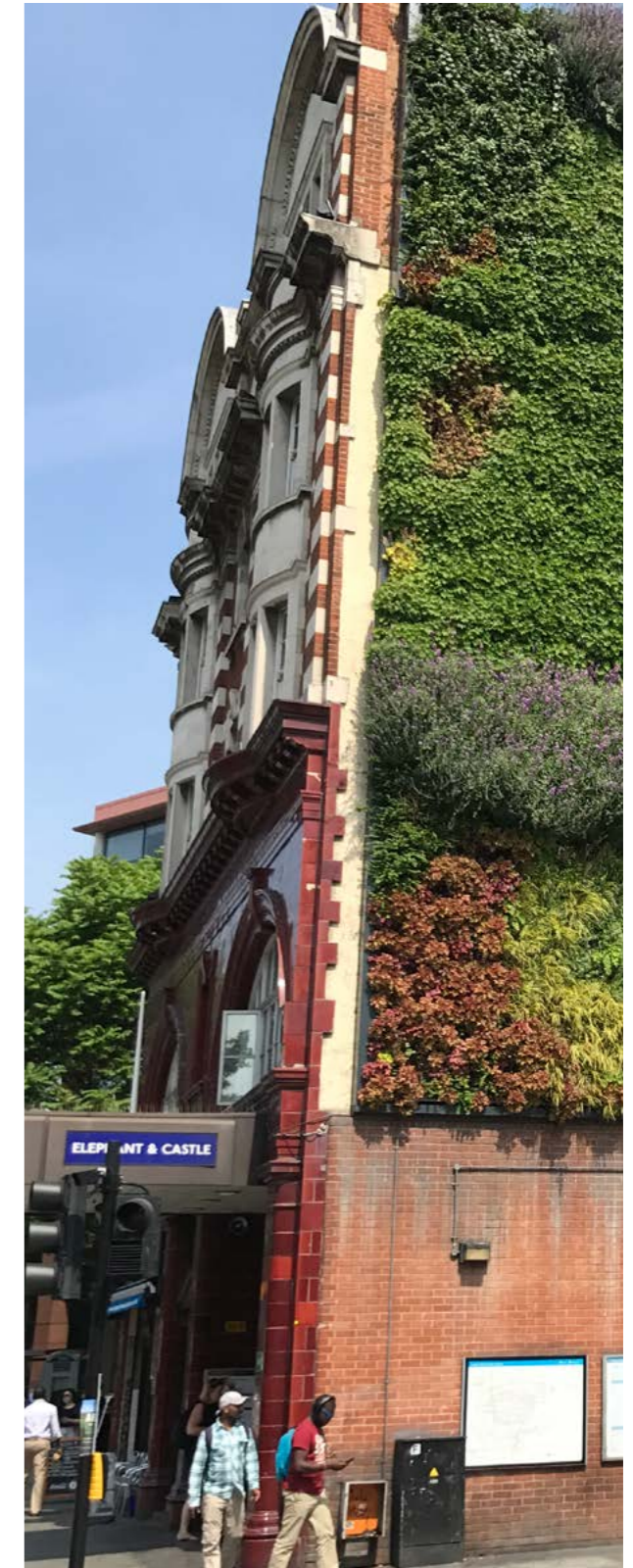


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## Plans for next quarter

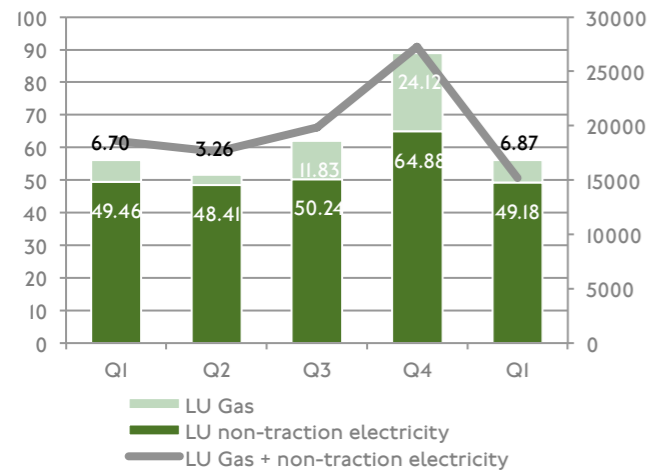
During quarter 2 we will:

- Meet with schools to support the implementation of the schools audit recommendations.
- Complete of the trials of the biodiversity base-lining tool.



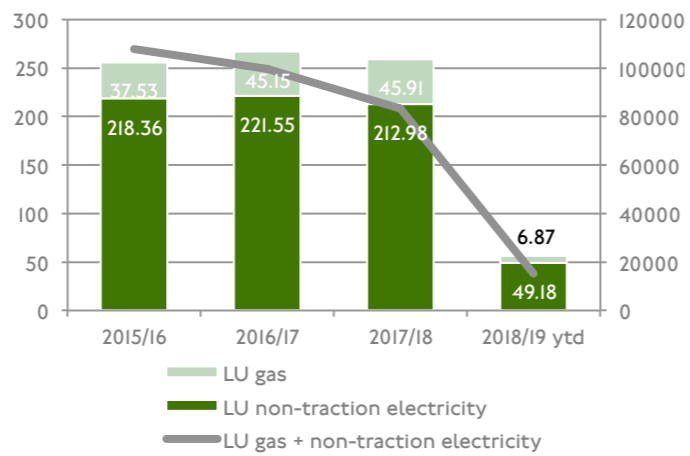
## Energy Usage and Emissions

Non-Traction Electricity Use rolling 5 quarters



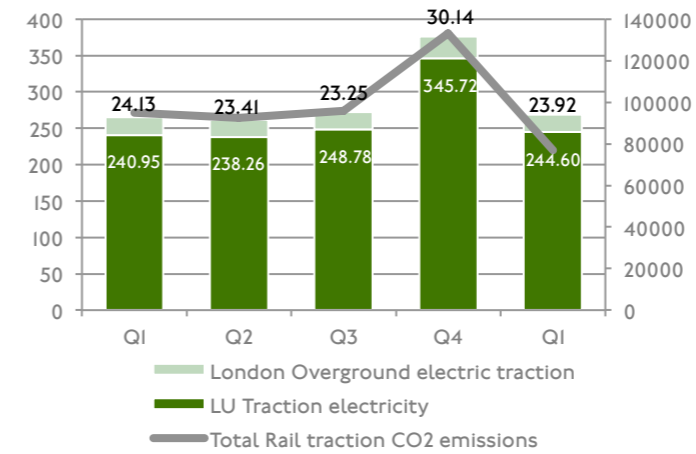
Within LU, we reduced our usage of non traction energy by 0.6 per cent with a total of 49.18 GWh used in the quarter. In respect of our gas usage, there was an increase of 2.5 per cent with 6.87 GWh used in the quarter.

Non-Traction Electricity Use rolling 5 years



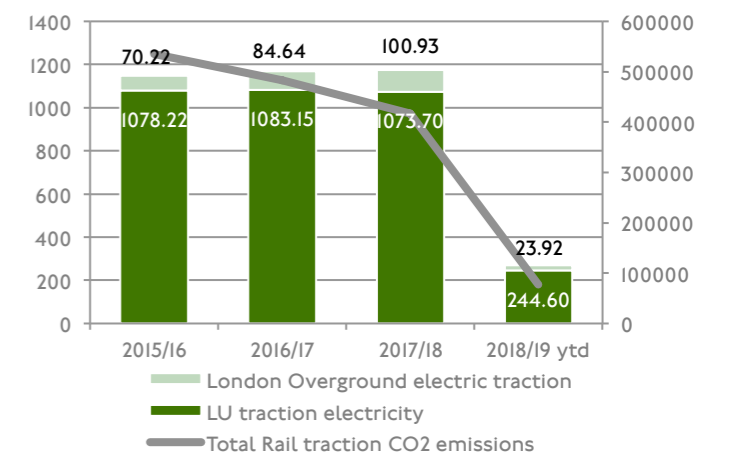
CO2 emissions from non-traction services decreased by 18.5 per cent in comparison to the equivalent quarter in 2017/18 due to a reduction in the emissions intensity of grid electricity.

Traction Electricity Use rolling 5 quarters



Within LO, we reduced the amount of traction energy used by 0.9 per cent compared with the same quarter last year, with a total of 23.9 GWh used in the quarter. For LU, our traction electricity usage rose slightly by 1.5 per cent with a total of 244.6 GWh used. For LU this is very marginal. However, for LO, the change since 2015/16 has been significant (up 53 per cent on 2015/16), because we ran more services.

Traction Electricity Use rolling 5 years

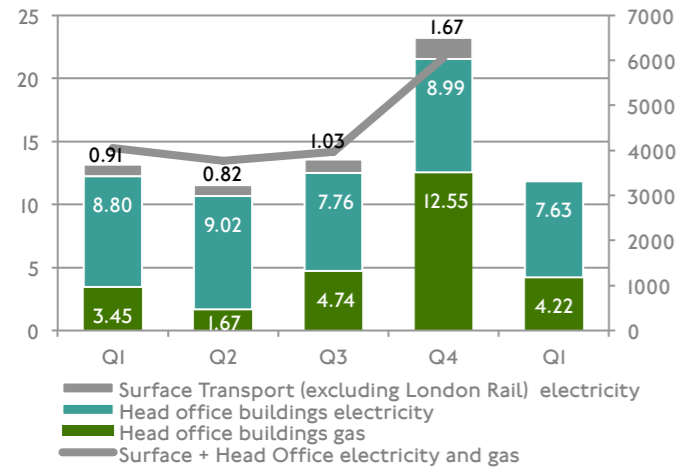


CO2 emissions from traction electricity decreased by 19.0 per cent in comparison to the equivalent quarter in 2017/18 due to a reduction in the emissions intensity of grid electricity.



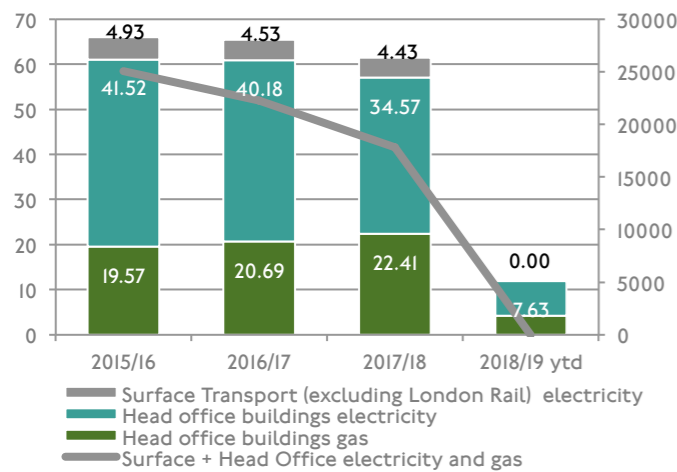


### Electricity and Gas Consumption rolling 5 quarters



Within our Head Office buildings, we used 4.22 GWh of gas, this is up 22.1 per cent on the same quarter 2017/18 and was due to the colder weather we experienced in the Spring. For electricity usage, we used less electricity, a reduction of 13.4 per cent.

### Electricity and Gas Consumption rolling 5 quarters

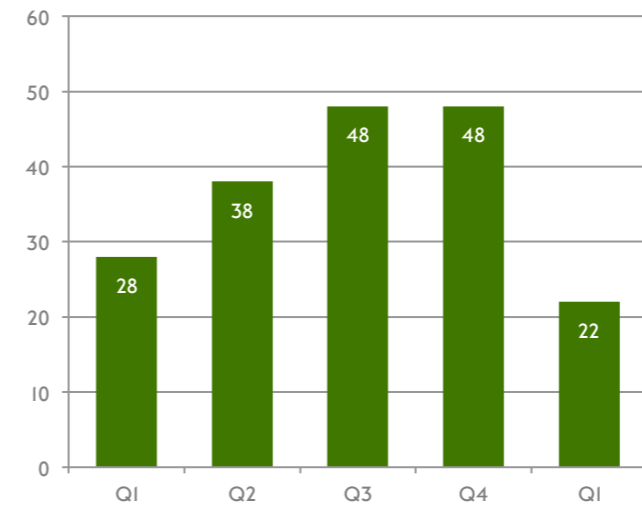


### Environmental incidents in quarter 1

Streets	Buses	LU	Rail	Other	Total
0	0	17	0	6	23

We encourage reporting of environmental incidents that may occur on our operations, maintenance and construction sites, as part of our environmental management system.

### Environmental incidents – rolling 5 quarters



The number of waste-related incidents has doubled compared with the same quarter last year. However, there has been a significant reduction in incidents relating to noise, vibration and pollution, resulting in an overall reduction of 18 per cent in environmental incidents.

### Top 4 causes of environmental incidents

Waste	Pollution	Noise & Vibration	Other
48%	30%	13%	9%

The majority of environmental incidents reported are minor and relate to waste disposal. These are investigated locally and improvement measures implemented.

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## Regulatory investigation and enforcement update

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### Progress of regulatory investigations and enforcement action

#### Serious injury to a contractor at Whitechapel

LU is being prosecuted by the ORR in relation to an incident at Whitechapel station on 4 June 2016. A third party contractor was crushed between a road rail vehicle and the platform edge at Whitechapel station whilst undertaking track improvements and sustained serious injuries. LU appeared at Thames Magistrates' Court on 17 May 2018 and entered a guilty plea to an offence under Section 3 of the Health and Safety at Work Act 1974. The Magistrates' Court has referred the case to the Crown Court for sentencing on a date to be confirmed.

#### Breach of Environmental Protection (Disposal of Polychlorinated Biphenyls and other Dangerous Substances) (England and Wales) Regulations 2000

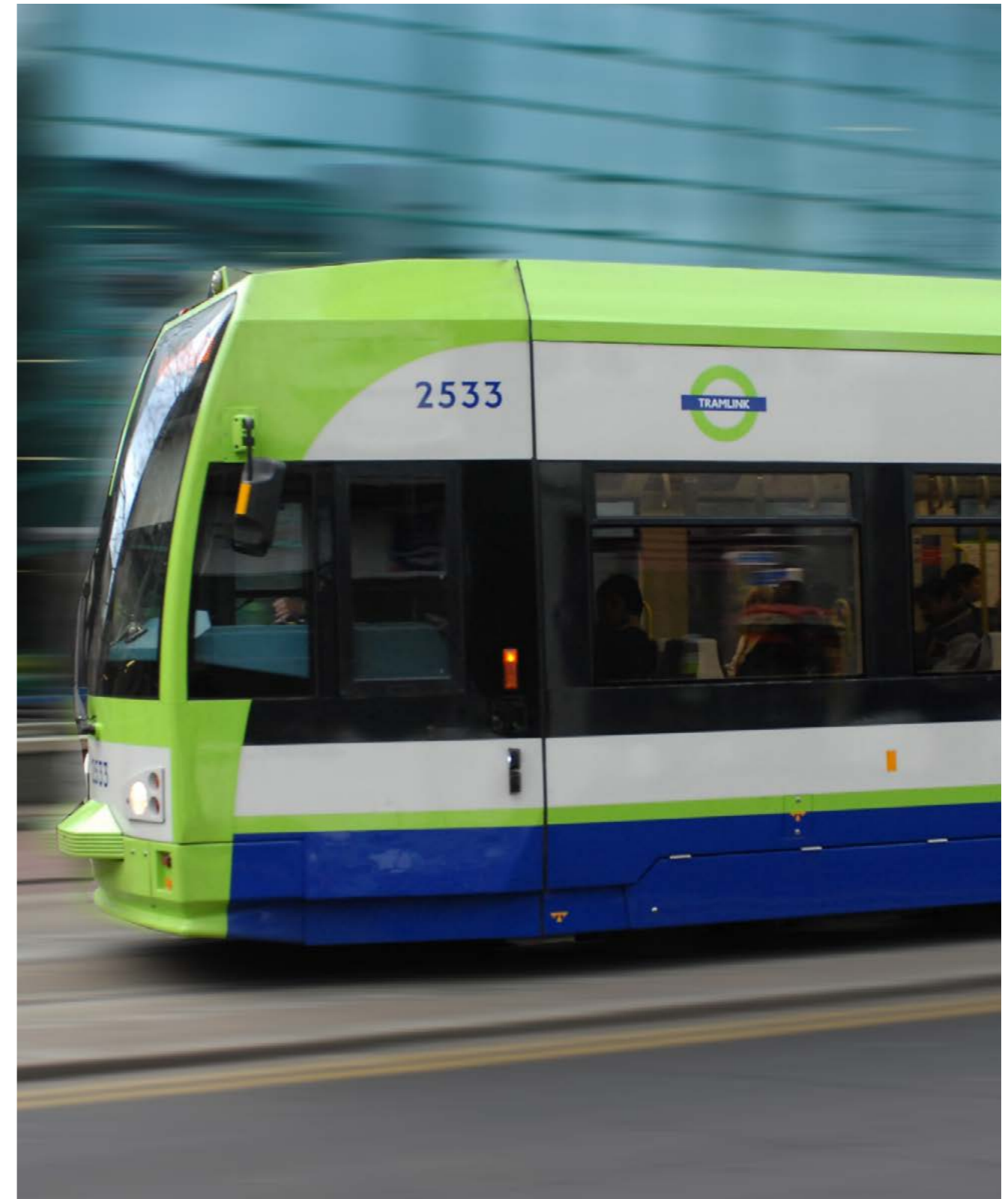
The Environment Agency (EA) is investigating LU for a breach under the The Environmental Protection (Disposal of Polychlorinated Biphenyls and other Dangerous Substances) (England and Wales) Regulations 2000 relating to the disposal of Polychlorinated Biphenyls (PCBs). The investigation is ongoing. The breach arises from the identification of additional PCB containing components. We have programmes in place to remove all such components by 2024 in accordance with the Stockholm Treaty, which seeks to eliminate persistent organic pollutants and support the transition to safer alternatives.

#### Overturning of tram at Sandilands

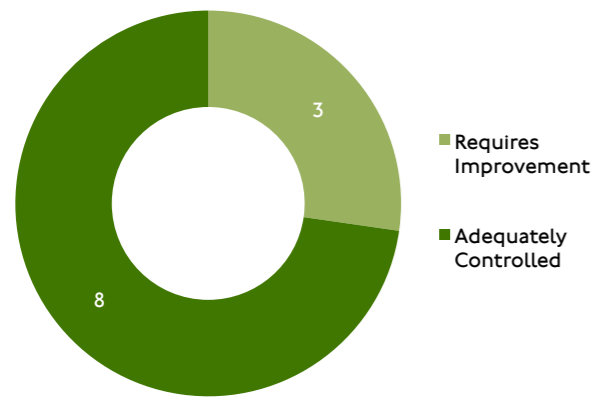
British Transport Police (BTP) and the ORR continue to investigate the tragic tram derailment at Sandilands which occurred on 9 November 2016.

#### Fatality of contractor at Pudding Mill Lane

The prosecution case by the HSE against Clancy Docwra commences on the 12 September at Southwark Court.



## Audit



We set clear standards for ourselves and our suppliers to ensure we manage our transport services and deliver improvements safely and in a way which protects health and the environment. We make sure that we, and our suppliers, meet these standards through regular audits on health, safety and environmental issues. Where any risk management is identified to be deficient of the required standard, a corrective action plan is implemented to ensure improvements are made.

A total of 11 health, safety or environmental related audits were conducted in quarter 1. In the majority of audits, our independent audit team found that the risks were being managed effectively and the relevant teams were working to the standards we set. Five of the audits addressed the handover of assets from the Crossrail project to the Elizabeth line, all were concluded as 'Adequately Controlled' which gives us confidence that we are managing health, safety and environment issues appropriately.

Of the remaining audits undertaken across our commercial, operational and engineering functions. Three audits identified the arrangements audited as "Requiring Improvement":

1. An audit of the Management of Occupational Noise concluded that more robust systems were required to ensure that noise assessors have been demonstrably assessed as competent and that the HSE Management System contains all the requirements of the regulations to ensure compliance. In response to the findings, revisions are being made to our Noise Assessment Form and records. Our Noise Risk Assessment Training Programme will be increased in length and introduce a practical exercise and assessment and additional written guidance introduced. A formal register of Noise Assessors will be established.

2. The mid-life refurbishment of the '96 Tube Stock project was audited for engineering assurance. Six priority two findings were raised regarding the application of good engineering principles, collectively they resulted in the 'Requires Improvement' conclusion. The project has agreed an action plan to address these and has introduced a Handover Pack for refurbished trains in conjunction with the fleet maintainers. It will be completed retrospectively for trains that were refurbished prior to the audit.
3. An audit of a supplier of traction motors to LU required the supplier to improve the quality of the work instructions provided to their staff. The supplier is addressing the actions required.



# Appendix I: Sandilands investigation recommendations applicable to TfL

Table I: Sandilands investigation recommendations applicable to TfL and its subsidiaries

Recommendation	Progress to date
UK tram operators, owners and infrastructure managers should conduct a systematic review of operational risks and control measures associated with the design, maintenance and operation of tramways.	<p>TfL and London Trams (LT) are represented on the UK Tram Industry Sandilands Sub Committee, established to consider the RAIB findings and take action on behalf of the UK tram industry.</p> <p>LT and Tram Operations Ltd (TOL) review of route risk assessments and the network risk model has been shared with the wider UK tram industry. The industry is reviewing all risk assessments within the industry to agree a standard approach. The LT/TOL risk assessments will be further reviewed and revised in line with this approach. An industry risk model will be developed, starting Autumn 2018, via UK Tram and the Light Rail Safety and Standards Board.</p>
[RAIB recommendation 2. Links with RAIB Recommendation 1, 10, and TfL Recommendation 5]	TfL presented an overview and findings of Risk Model work to Rail Safety and Standards Board Risk Management Forum in June 2018.
UK tram operators, owners and infrastructure managers should work together to review, develop, and install suitable measures to automatically reduce tram speeds if they approach higher risk locations at speeds which could result in derailment or overturning.	<p>The tender process for the installation of a new safety system on the London Trams network that will automatically apply the brakes should the speed limit be exceeded at high risk locations, continues.</p> <p>The initial evaluation of suppliers is underway. The Invitation to Tender was issued 31 July and the contract is due to be awarded by the end of the year. The ambition is that the system will be installed and in operation by the end of 2019, including a period of training and familiarisation with tram drivers ahead of it becoming fully operational. TOL are an active stakeholder in this.</p> <p>The new system will automatically bring a moving tram to a controlled stop if it were to exceed the speed limit at a designated location. The system would also automatically alert the operations control centre.</p>
[RAIB recommendation 3. Links with TfL recommendation 2]	The system will initially be configured to priority locations as suggested by the RAIB but will have the flexibility to be introduced elsewhere on the tram network.
UK tram operators, owners and infrastructure managers should work together to research and evaluate systems capable of reliably detecting driver attention state and initiating appropriate automatic responses if a low level of alertness is identified.	<p>Complete: Working closely with TOL, LT has procured and commissioned the 'Seeing Machine Guardian' driver protection system fleet wide. This system uses proven facial movement technology to monitor driver fatigue and distraction. The system was fully installed across the LT fleet in October 2017.</p> <p>An additional feature of the Guardian system is that it is programmed to alert drivers if the maximum speed goes above 70kph.</p> <p>TOL were closely involved in the selection and implementation of this system and played the major role in securing driver support.</p>
[RAIB recommendation 4]	LT and TOL have already hosted several delegations, including UKTram and others, to demonstrate the technology in operation.

Recommendation	Progress to date
UK tram operators, owners and infrastructure managers, in consultation with the DfT, should work together to review signage, lighting and other visual information cues available on segregated and off-track areas required by drivers on the approach to high risk locations.	<p>LT undertook a comprehensive review of tram speeds and speed signage across its network.</p> <p>As a result the following measures were put in place by September 2017. TOL are an active and engaged stakeholder on this initiative:</p> <ol style="list-style-type: none"> <li>1. The maximum tram speed on the network was reduced by 10kph, from 80kph to 70kph. The effect is that the potential for coasting in high speed areas has been removed, and that continual speed management is required in these low workload areas so increasing driver alertness.</li> <li>2. Additional step down speed signage was implemented in all locations where speeds reduced by more than 20kph, enhancing driver visual cueing and orientation.</li> <li>3. Where speed signs are located immediately in advance of higher risk locations, e.g. a tram stop or a curve with low approach visibility, the sign has been enhanced with the addition a high visibility outer border as an additional visual cue to drivers of an approaching hazard.</li> </ol> <p>iTram</p> <p>Prior to the implementation of an automatic braking system, LT will implement iTram to provide audible in-cab over speed alerts. iTram is a performance monitoring tool that as well as driving safety improvements by trend analysis of tram speeds, also utilises GPS technology to provide over speed warnings to drivers at all points across the network. It is therefore an enhancement on the Guardian system which can only alert drivers if they exceed the maximum speed limit.</p> <p>The software release design continues and installation resource has been established. A Human Factors specialist has reviewed tram drivers' task load. During August approval will be sought for the first iTram equipment installation and engagement with the original equipment manufacturers will commence.</p> <p>Review of Visual Cueing</p> <p>LT and TOL have completed a comprehensive Route Hazard Analysis. The conclusion is that the already completed installation of additional speed signage work improves driver visual cueing on the network.</p> <p>Tunnel Lighting</p> <p>Post the Sandilands incident we installed additional temporary lighting on the approach to the Sandilands tunnel.</p> <p>An updated specification and outline design has been issued by TfL highway engineers to implement a comprehensive improvement to the existing Sandilands tunnel lighting. The new design will adopt best practice from the automotive industry to reduce the impact of glare on driver's eyes both when entering and exiting the tunnel. Work is expected to be complete on the improved tunnel lighting in early 2019.</p> <p>We are also trialling illuminated warning signs, similar to those used on roads to warn drivers their speed is above the limit. The effectiveness of these signs will be evaluated in summer 2018 and the feedback will be shared with the UK tram industry.</p>
[RAIB recommendation 5. Links to TfL Recommendation 1]	

Recommendation	Progress to date
UK tram operators and owners should, in consultation with appropriate tram manufacturers and other European tramways, review existing research and, if necessary, undertake further research to identify means of improving the passenger containment provided by tram windows and doors.  [RAIB recommendation 6. Links to TfL Recommendation 8]	<p>LT has commissioned the manufacture and testing of several prototype windows that may provide an appropriate level of additional containment. These prototypes have been assessed against the conditions likely to have been encountered during the Sandilands incident, and take into account any affect they may have on ease of access for the emergency services.</p> <p>LT have decided that mainline rail crash worthiness standard GM/RT2100 is more likely to offer protection against the conditions experienced during the Sandilands event. We are currently evaluating the results of the testing work conducted to date and will make a decision in the near future. The final glazing option selection will be assessed to ensure that any impact on passenger emergency egress is fully understood, and the results shared with UKTram to inform their work under RAIB Recommendation 8. TOL will be fully consulted in the decision making process.</p> <p>LT is investigating the practicalities of modifying tram doors and we will consider the recommendations made by the RAIB when designing new vehicles in the future.</p>
UK tram operators and owners should install (or modify existing) emergency lighting so that the lighting cannot be unintentionally switched off or disconnected during an emergency.  [RAIB recommendation 7]	<p>In conjunction with industry experts, LT have formulated a Technical Specification for the retrofitting emergency lighting to its fleet. The system will be fully autonomous, and will operate independently of the trams battery system in the event of an emergency.</p> <p>Additionally, LT are aware of the conditions resulting in the failure of its existing standby lighting system during the Sandilands incident, and are also investigating how the existing system may be modified in order to achieve the desired emergency lighting outcomes in a simpler and more cost effective manner.</p> <p>TOL are an active and engaged stakeholder on this initiative.</p>
UK tram operators and owners should review options for enabling the rapid evacuation of a tram which is lying on its side after an accident.  [RAIB recommendation 8]	<p>We will work with tram operators and tram manufacturers to identify and evaluate options to achieve this objective.</p>
TOL and LT should commission an independent review of its process for assessing risk associated with the operation of trams.  [RAIB recommendation 10. Links with RAIB recommendation 2]	<p>The network risk model and route risk assessments have been reviewed and updated. They have been shared with the wider UK tram industry and TfL also presented an overview and findings of Risk Model work to Rail Safety and Standards Board Risk Management Forum in June 2018. Work has also been completed on our tram crossing risk assessments for Croydon town centre.</p> <p>A joint management process for the embedment of the models has been developed.</p> <p>The industry is reviewing all risk assessments within the industry to agree a standard approach. The LT/TOL risk assessments will be further reviewed and revised in line with this approach.</p>

Recommendation	Progress to date
TOL should review and, where necessary, improve the management of fatigue risk affecting its tram drivers with reference to the ORR's good practice guidance.  [RAIB recommendation 11]	<p>TOL are implementing a safety improvement plan designed to address the intent of this recommendation through their own internal safety governance arrangements. An action plan is being developed for our next phase of action.</p>
TOL should commission an external organisation to review, the way that it learns from operational experience.  [RAIB recommendation 12]	<p>TOL have implemented a "Just Culture" Programme designed to address the intent of this recommendation through their own internal safety governance arrangements.</p>
TOL and LT should review and improve the process for managing public and employee comments that indicate a possible safety risk.  [RAIB recommendation 13]	<p>Complete: We have reviewed our customer complaints procedure and implemented improvements to ensure that any safety issue raised by a customer is dealt with efficiently and thoroughly across the TfL network.</p>
TOL and LT should review and improve their processes for inspecting and maintaining on-tram CCTV equipment to greatly reduce the likelihood of recorded images being unavailable for accident and incident investigation. This recommendation may apply to other UK tram operators.  [RAIB recommendation 14]	<p>All LT Bombardier fleet has been fitted with new CCTV image recorders. CCTV health checkers which actively monitor the status of recording units and identify faults.</p> <p>A review is underway to establish whether similar remote monitoring capabilities can be introduced on the Stadler vehicles as is now used on the Bombardier vehicles. The review will be completed by September 2018.</p>
TOL and LT should review and revise where required existing tram maintenance and testing documentation to take account of experienced gained, and modifications made, since the trams were brought into operational service.  [RAIB recommendation 15]	<p>LT has undertaken a comprehensive review of its written standards, maintenance processes and identified quality deficiencies. LT has appointed an independent entity to author new written standards, maintenance processes and forms addressing all quality gaps. This process will be in two phases, with sixteen critically prioritised standards and associated documents being delivered in the first phase. 4 standards have been issued for review.</p>
Review available driver cues in relation to braking points on approaching a curved section of the tramway.  [TfL recommendation 1. Links to RAIB recommendation 5]	<p>Overall network top speed has been reduced from 80kph to 70kph. Additional 70kph signs have been provided to aid driver awareness of the permitted maximum speed.</p> <p>A design and signal sighting exercise has been concluded and the provision of additional step down speed signage to aid driver speed awareness and visual cueing is complete.</p> <p>Additional visibility signs have also been provided, which will heighten driver speed awareness in high risk areas.</p>

Recommendation	Progress to date
<p>Review of arrangements for the monitoring and management of speeding.</p> <p>[TfL recommendation 2. Links to RAIB recommendation 3]</p>	<p>LT has commissioned the installation and commissioning of the 'iTram' system, which will provide driver over-speed alerts network wide. iTram will also provide oncoming hazard awareness to drivers of high risk areas.</p>
<p>Review of traction brake controller (TBC) driver's safety device design.</p> <p>[TfL recommendation 3]</p>	<p>LT has procured and commissioned the 'Seeing Machine Guardian' driver protection system fleet wide. This system provides proven driver fatigue and distraction management via facial recognition technology.</p>

Table 2 - Sandilands investigation recommendations lessons applied to Docklands Light Railway, London Underground and Emirates Airline

Sandilands Learning Point	Action
Network risk assessments did not look broadly enough across the tram industry and other relevant sectors to identify all credible accident scenarios	<p>Docklands Light Railway (DLR) the network safety risks model is currently undergoing review to take into account this learning point. The approach to operational risk management is under review to ensure it matches the safety risk model and clear links are provided to precursors. Clear owners for key risk controls have been identified.</p> <p>London Underground (LU) take account of external incidents in their risk assessments and risk reviews. With respect to this specific incident the maximum design speed for LU trains is well below the roll over limit. LU rolling stock and track standards are developed as a system to ensure compatibility.</p> <p>Emirates Airline have reviewed external incident reviews to identify any new risks not already captured on their risk register. Their Safety Risk Case is being updated to reflect the results of this review.</p>
Route risk assessments did not adequately identify location specific hazards / mitigations, particularly those relating to design / maintenance of infrastructure	<p>DLR is undertaking route specific risk assessments identifying specific locations where controls should be reviewed.</p> <p>LU has regular track inspections in place for each line. The regularity of these is determined by the condition of the track or areas where changes to wear are identified. Where new rolling stock is delivered or modifications take place that effect the gauge of the line, dynamic modelling is carried out to ensure the train remains within the operational gauge.</p>
A number of risk factors existed in TOL's fatigue management arrangements which did not meet ORR good practice guidance	<p>Reviews of fatigue management arrangements by DLR, Keolis Amey Docklands (KAD) and CGLR have all been completed. Procedures are in the process of being updated; minor changes to the DLR process. KAD have had an independent report produced which contains a number of recommendations which are now being worked through.</p> <p>LU undertook an audit of its arrangements for managing fatigue in 2017 and is implementing the recommendations from that audit.</p> <p>Mace Metro who operate the Emirates Airline is undertaking a fatigue management review as part of their 2018 safety improvement activity. This includes development of a fatigue management policy that takes into account the ORR's good practice guide on fatigue management. Assurance on fatigue management</p> <p>A pan TfL review of our fatigue management system compared to ORR's recommended system is underway. Recommendations for improvement are due November 2018.</p>

Sandilands Learning Point	Action
In cab vigilance device introduced in Croydon tram fleet which needs to be actively considered by other transport undertakings.	<p>A visit to Trams was undertaken on the 20 July 2018 by the LU Line Operations Director and HSE to better understand the use of Trams in-cab vigilance device. The decision on the value this would provide to LU is being considered by the Line Operations Director.</p> <p>Not applicable for Emirates Airline and DLR.</p>
Consider whether the glazing improvements being implemented on trams (laminated glass) also need to be adopted to improve containment functionality on other passenger vehicle fleets	<p>DLR has reviewed the specification for new trains. The structural elements (including glazing) of the new trains will be built and designed in accordance GM/RT2100, which as an industry standard for building trains.</p> <p>The LU standards for saloon windows require the saloon windows to retain passengers under normal operation since the control of speed mitigates the risk of over turning. LU standards require that the door and its glass shall retain passengers in a rollover situation, so no further action is required.</p> <p>Emirates Airline is reviewing the type of glass and whether it can be detached from the gondola.</p>
Review the adequacy of the approach adopted locally to monitoring and responding to customer safety complaints	<p>KAD and DLR are reviewing KADs customer complaints process against the revised TfL process to identify improvements.</p> <p>LU has completed a review of it's arrangements for managing customer safety complaints. Random sampling of responses to customer complaints is now underway.</p> <p>The Emirates Airlines process has been reviewed and is robust no further action required.</p>
Review adequacy of on-train CCTV	<p>KAD now reports on functioning CCTV each period.</p> <p>Emirates Airline is reviewing the in cabin CCTV and two way communication technology to ensure it remains fit for purpose.</p>

