



Date: 28 September 2017

Item: Health, Safety and Environmental Performance – Quarter One 2017/18

This paper will be considered in public

1 Summary

1.1 This quarterly health, safety and environment (HSE) report provides an overview of the HSE performance for London Underground (LU), TfL Rail, Surface Transport (including London Rail), and Crossrail services for quarter one 2017/18. This report covers 1 April 2017 – 24 June 2017.

1.2 **The Panel is asked to note the report.**

2 Regulatory Matters

2.1 Following the incident at Canning Town on 22nd January where a customer was fatally injured after a fall down stairs in a non-public area, the Office of Rail and Road (ORR) have issued LU with an Improvement Notice. The notice relates to how LU assess, document and manage the risk to lone working staff. LU is reviewing the risk assessments to strengthen them for lone working and thereby closing the Notice

3 Background and current status

3.1 There were 16 customer fatalities on the TfL public transport network in the quarter, 12 of which were on the London Underground (LU) network and are awaiting the outcome of Coroners' Inquests. Our investigations indicate these are all suspected suicides. Four of the fatalities occurred on the bus network; two were accidental deaths connected with the operation of bus services, one as a result of a pre-existing medical condition and one as a result of crime. The first accidental fatality was an elderly customer who fell on the stairs of a bus as it pulled away at traffic lights. The customer was taken to hospital and died from injuries three days later. The second was a member of public who fell from a bench into the path of an oncoming bus travelling at slow speed. The Police have eliminated the driver from their enquiry.

3.2 In the quarter, Coroner Inquests concluded three historic fatalities that took place on the Surface Transport infrastructure as death by road traffic collision. The Coroner did not issue any Prevention of Future Death reports or any recommendations to TfL or the bus companies involved in the incidents. Following a Police investigation into another incident where a pedestrian was fatally injured in a collision with a bus on 19 April 2015, the bus driver was subsequently found guilty of careless driving and the driver was sentenced to 10 months imprisonment and disqualified from driving for 3 years and 5 months.

- 3.3 The quarter 1 HSE performance did not meet the scorecard target of a reduction in total injuries. Slips, trips and falls continue to be the main cause of customer injury across the network, with incidents occurring on station escalators, stairs, at the platform train interface (PTI), and on buses. LU customer safety initiatives are focused on changing customer behaviour (through direct messages and 'nudge' messages) and on making infrastructure changes which will eliminate or reduce the risk. The 2017/18 LU customer safety plan has short, medium and long term actions focusing on all customer accidental physical injuries and aims to reduce the total number by 17 per cent compared to 2016/17.
- 3.4 In support of the scorecard target and the Mayor's Vision Zero approach where no fatality is treated as inevitable on the capital's highways, the Bus Safety Programme team ran a workshop with bus operator safety managers to drive reduction of customer injuries at a local level. The workshop identified a wide range of additional measures that could be undertaken by TfL or Bus Operators. Bus Operators each committed to one new Health and Safety Initiative. In addition we continue to take forward the six main work streams towards meeting the Mayor's Transport Strategy (MTS) targets of achieving a 70 per cent reduction (against 2005-09 levels) in the number of people killed or seriously injured by a bus by 2022, with zero people killed in or by a London bus by 2030.
- 3.5 There were no employee or contractor fatalities in the quarter. There was a small decrease in injuries to both direct employees and to employees of our suppliers.
- 3.6 Within LU common themes in accident trends include slips, trips and falls, manual handling and contact with an object. (These account for approximately 60 per cent of incidents.) Representatives from across LU came together to share ideas on how to tackle these issues across operations, maintenance and project teams using a Practical Problem Solving (PPS) technique. The output from these PPS workshops is being developed into an LU Workforce Safety Plan which will have short, medium and long term actions. Across LU projects, the scope of our supplier engagement forum (Zero Harm) increased to encompass all tier one organisations. The sessions promote collaboration across the client and principal contractor boundary on key HSE issues to improve performance, via focused improvement groups. The focus of the next forum (November 2017) shall be on preventing musculoskeletal injuries.
- 3.7 During the quarter, further work was undertaken to develop the surface transport improvement plans. The key types of injuries over the last three years and the activities giving rise to them were identified. These are now being developed into specific actions. Within Surface Transport, two engagement events with the Health and Safety Executive (HSE) took place during the quarter. For the Silvertown Tunnel project, we hosted a briefing event to help inform the HSE's monitoring regime for the project. We have also invited the HSE to participate in our engagement sessions with the bidders to help emphasise the importance of health and safety within the project. At the second event, we briefed the HSE on our arrangements for ensuring good health and safety management throughout the lifecycle on all our projects. Feedback on both events was positive and the events have helped build strong relationships with a key stakeholder.
- 3.8 There was one positive drugs test within LU in the quarter which is under investigation.

- 3.9 Of the 21 HSE and Technical audits carried out in the quarter, there was one 'Poorly Controlled' audit (Inspection of London Underground (LU) Earth Structures) and three which required improvement. Corrective actions are identified and being tracked for all.

List of appendices to this report:

Appendix 1: Health, Safety and Environmental Performance – Quarter One 2017/18

List of Background Papers:

Minutes of previous meetings of the Panel

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UNDERGROUND

PUBLIC SUBWAY

HSE Quarterly Report

2017/18 Quarter 1 Update

In this report:

- TfL significant incidents
- TfL customer safety
- Road safety
- TfL workforce safety and well being
- Construction workforce safety
- Measuring safety performance at TfL
- TfL Crime and antisocial behaviour
- HSE audit
- Resilience

TfL significant incidents

This section of the report includes significant incidents that occurred across TfL from 01 April – 24 June inclusive.

Fatalities

In quarter one there were twelve customer fatalities on the London Underground (LU) network. All fatalities await the outcome of Coroner Inquests. TfL investigations identify contributory factors that suggest suspected suicide in all cases.

Four customer fatalities occurred on the Bus network. There were two (2) accidental fatalities connected with the operation of bus services, one (1) attributed to a pre-existing medical condition, and one (1) crime related. All fatalities on the bus network await the outcome of Coroner Inquest where appropriate.

There were no customer fatalities on any of the other TfL transport networks.

Other significant incidents

On 22 April, two cranes came into contact on our construction site at Bank. The investigation revealed the crane supervisor failed to follow process. Following disciplinary procedures the crane supervisor has been dismissed and a weekly review of lifting operations has been introduced to ensure effective command, control and supervision.

On 17 May, a passenger filmed a Tram driver who appeared to be asleep at the controls of stationary tram. The Tram Operator (TOL)

has suspended the driver and commenced an investigation. The Office of Rail and Road (ORR) are also investigating. In response to this incident, and part of the wider improvements being implemented following the Sandilands incident in November 2016, a number of safety improvements have been implemented across the network, and others are being evaluated or trialled. These include a driver protection device, which automatically monitors the alertness and vigilance of drivers and provides immediate feedback to drivers if the system detects a drop in vigilance or concentration. It also includes the development of a system specification which will provide automatic detection of tram over speeding events and control the speed of the tram to within agreed speed limits. The overall top speed limit across the network is being reduced from 80kph to 70kph. Work is underway with TOL to ensure that a coordinated plan is in place to address all the recommendations being proposed by RAIB. London Trams continues to work closely with the ORR, RAIB and other parties as they conclude their investigations into the Sandilands incident.

Three incidents occurred within areas of restricted access (track possessions). Within Surface Transport, two unannounced Network Rail trains passed through a possession at Holloway Road (12 May). The incident has been investigated by Network Rail who identified a behavioral related issue with their Signaler and are taking corrective action. There were no findings related to TfL activity. On London Overground a road-rail vehicle (RRV) ran through a set of points on the New Cross Branch of the East London Line (21 May). The investigation revealed non-standard equipment impeded the view of the points and two different arrangements to set the points within the area of the movement were used. Additionally, there was confusion regarding accountabilities for the activities associated with the move. On

London Underground, a contracted workforce group strayed beyond the limits of the possession onto a live section of track adjacent to the depot entrance at Wembley Park (19 June). The investigation identified failures in the planning process leading to an increased scope of work as the cause of this incident. A TfL wide formal investigation into track access issues is underway and we will implement lessons learned across TfL.

There was one incident where a bridge was struck by a vehicle. A skip lorry hit a bridge at Carpenters Lane resulting in delays to DLR services (28 April). In order to mitigate against further bridge strikes, DLRL have installed redesigned lorry guidance posts.

On 23 May, whilst a coach was departing Victoria Coach Station (VCS) the customer boarding and alighting area became narrowed requiring customers to move to avoid a departing coach. A member of the coach operator's staff suffered a minor injury. The investigation revealed that coaches were not in their normal stands following an evacuation earlier in the day. A revised coach departure procedure has been introduced including exclusion zones for customers and clearer responsibilities for depot duty supervisors.

On 25 May, DLR received an improvement notice from the City of London Environmental Health Office due to the accumulation of waste material and associated vagrant activity beneath Tower Gateway station. Waste material has now been removed and the DLR franchisee will implement a cleaning regime as part of its planned maintenance works. All conditions of the notice have been met and compliance achieved.

There were four incidences of buried services utility strikes. On 6 April, a utility strike occurred at a Crossrail site whilst a precast concrete block was placed into an

excavation. The incident damaged an exposed gas pipe. National Grid attended the incident and replaced the damaged section of pipe. On 7 June, an LU contracted worker cut through redundant high voltage cables with insulated cutters. The investigation revealed the cable intended for removal had been tested and deemed dead a few weeks prior, but not tested prior to cutting. On 2 June, a contracted operative struck a gas main during Cycle Superhighway improvement works whilst using a mini digger at Ambassadors Gate (Buckingham Palace). The investigation identified that possession of site plans and digging manually could have prevented this utility strike. On 19 June, contracted operatives struck a water main while installing new cycle stands at Balham Hill. The investigation identified standard safe digging processes were not followed. All recommended improvement actions have been implemented.

There were three incidents where trains have derailed. On LU, a train derailed during a shunting operation at Northumberland Park Depot (24 June), and a train derailed over points whilst proceeding to Ealing Common Depot (13 June). There were no injuries in either incident. Formal investigations into both derailments are underway. Additionally, a Crossrail engineers train derailed when it came into contact at slow speed with an object that had been left on the track.

There were eight incidences of fire across the network. On LU, at Oxford Circus station (7 May) a fire in a disused area resulted in the station being closed and evacuated. The investigation identified opportunities to improve the operational response. This included; communication between staff, management of members of public during evacuation, and organisation of duty staff to ensure an efficient response. There were

seven incidences of bus fire. The fire that occurred on 20 April was caused by build up of carbon in the engine compartment. The investigation identified that this is indicative of a poor maintenance regime. We are working with the bus operating companies to address this. The fire that occurred on 23 April was caused by an oil leak. The oil leak was a result of poor workmanship by the manufacturer while undertaking work to rectify another issue. The remaining fires that occurred on buses during the quarter are undergoing independent investigations with results expected by the end of the next quarter.

There were six incidents of uncontrolled or unintended bus movement. There were four separate incidents of buses rolling into stationary objects after failing to be secured by Operators (15 April, 20 May and two incidents on 20 June). Investigations identified one incident of mechanical failure of a hand brake, and in the remaining incidents drivers failed to apply the hand brake. There were two incidents that involved drivers accidentally accelerating and colliding with objects (both 19 April). In one incident the investigation identified pedal confusion as the root cause. The driver has undergone further training. The remaining incident is under investigation with results expected by the end of the next quarter.

On 29 May, a bus collided with a level crossing at Northumberland Park Station. There were no reported injuries. The investigation identified that the driver failed to comply with mandatory road traffic signals. The driver was found guilty of dangerous driving and is no longer employed by the bus operator.

On 10 August, a route 77 bus left the road on Lavender Hill and collided with a building, resulting in nine minor injuries to passengers

and the driver. Two passengers were trapped on the upper deck and were freed by the emergency services. There were no injuries to anyone on the pavement or in the building. The CCTV footage is being gathered from the bus and local authority to inform the investigation. The vehicle is under the control of the Driver and Vehicle Standards Agency for investigation.

Where any incident occurs on the TfL network, the party accountable for the activity conducts an investigation to identify the root causes and contributory factors and identify action to prevent re-occurrence. This may include reinforcing safe behaviours through on site briefings to workers, revising risk assessments and implementing new controls, or increasing communication of safety messages to our customers where appropriate. We communicate lessons learned from significant incidents across relevant TfL businesses.

TfL Customer Safety

Customer safety: London Underground (LU) and TfL Rail

Fatalities

Twelve customer fatalities occurred on the London Underground (LU) network in quarter one. All fatalities await the outcome of Coroner Inquests, however, TfL investigations identify contributory factors that suggest suspected suicide in each case. There were zero (0) fatalities on the TfL Rail network.

In quarter one, Coroner Inquests have concluded 11 historic fatalities that took place on the LU network. Eleven fatalities were recorded by The Coroner as; suicide (6); narrative (3); open (1) and accident (1). An open conclusion arises in the absence of sufficient evidence to prove cause of death to the necessary standard. A narrative records the Coroner's conclusions on the important issues arising in the circumstances by which the deceased came by his or her death.

The accidental fatality occurred on 25 November 2016. The deceased climbed from the platform at Croxley station onto the tracks and was electrocuted by the rails. The inquest took place on 13 April 2017 and the Coroner concluded accident. The Coroner did not issue any Prevention of Future Death reports or issue any recommendations in these matters.

Following the accidental customer fatality at Canning Town on 22nd January the ORR have issued LU with an Improvement Notice. A customer was fatally injured after a fall down stairs in a non-public area. The notice relates to how LU assess, document and manage the risk to lone working staff. LU is reviewing

the risk assessments to strengthen them for lone working and thereby closing the Notice.

Customer accidental physical injuries

In quarter one 2017/18 a total of 924 customer accidental physical injuries were recorded on the LU network. This is a 2 per cent increase on the same quarter in 2016/17 (see Fig. 2).

Since 2012, incidents occur in three main areas: on escalators (40 per cent), stairs (20 per cent) and at the Platform Train Interface (20 per cent). Causes of incidents include; being encumbered with luggage, rushing for services, being under the influence of alcohol and distraction from hand held devices such as mobile phones and music devices.

London Underground Customer safety improvement plan

Customer safety initiatives are focused on changing customer behaviour (through direct messages and 'nudge' messages) and on making infrastructure changes which will eliminate or reduce the risk. The 2017/18 LU customer safety plan focuses on all customer accidental physical injuries and aims to reduce the total number by 17 per cent compared to 2016/17.

Short term safety improvement actions

- Continued roll out of enhanced escalator safety measures ('nudging' customers towards safer behaviours) at the top 20 stations with the most escalator related injuries. Carried out in August 2017.
- Trialling the use of additional employees at the top 4 stations with the most customer injuries during the summer holiday period. Carried out in August 2017.
- Escalator and platform train interface (PTI) safety specific posters launched

in July at top 20 stations and then further across the LU network (see Fig. 1 below).

- A new approach to managing customer movement and safety on platforms at all stations. This includes a proactive approach to management of risks and empowering station staff to deliver localised safety announcements. Carried out in August 2017.
- Finish the PTI quick wins programme to improve the Train Operator view of the PTI. Due by November 2017.
- Improvements to stairs at South Kensington to be completed. Due by November 2017. Improvements include upgrading handrails, risers, and treads to meet compliance with national standards.

- Improvements to stairs to be completed at Paddington (to be completed by December 2017) Piccadilly, Bond Street and Oxford Circus stations (to be completed by March 2018).
- New platform observation camera system to be brought into use at Bank (Central line platforms) and Shepherd's Bush (platform 1). Due by December 2017.
- Improve the Train Operators view of the PTI on Central Line stations through improvements to platform cameras. Due by April 2018.
- All work to adjust the nosing stones on the final 18 sub surface railway line platforms to be completed. Due by January 2018.

Below: Figure 1. London Underground customer safety posters.

Medium term safety improvement actions

- Festive season communication campaign to be rolled out, including a specific campaign focused at customers who may travel when under the influence of alcohol. Due by November 2017.



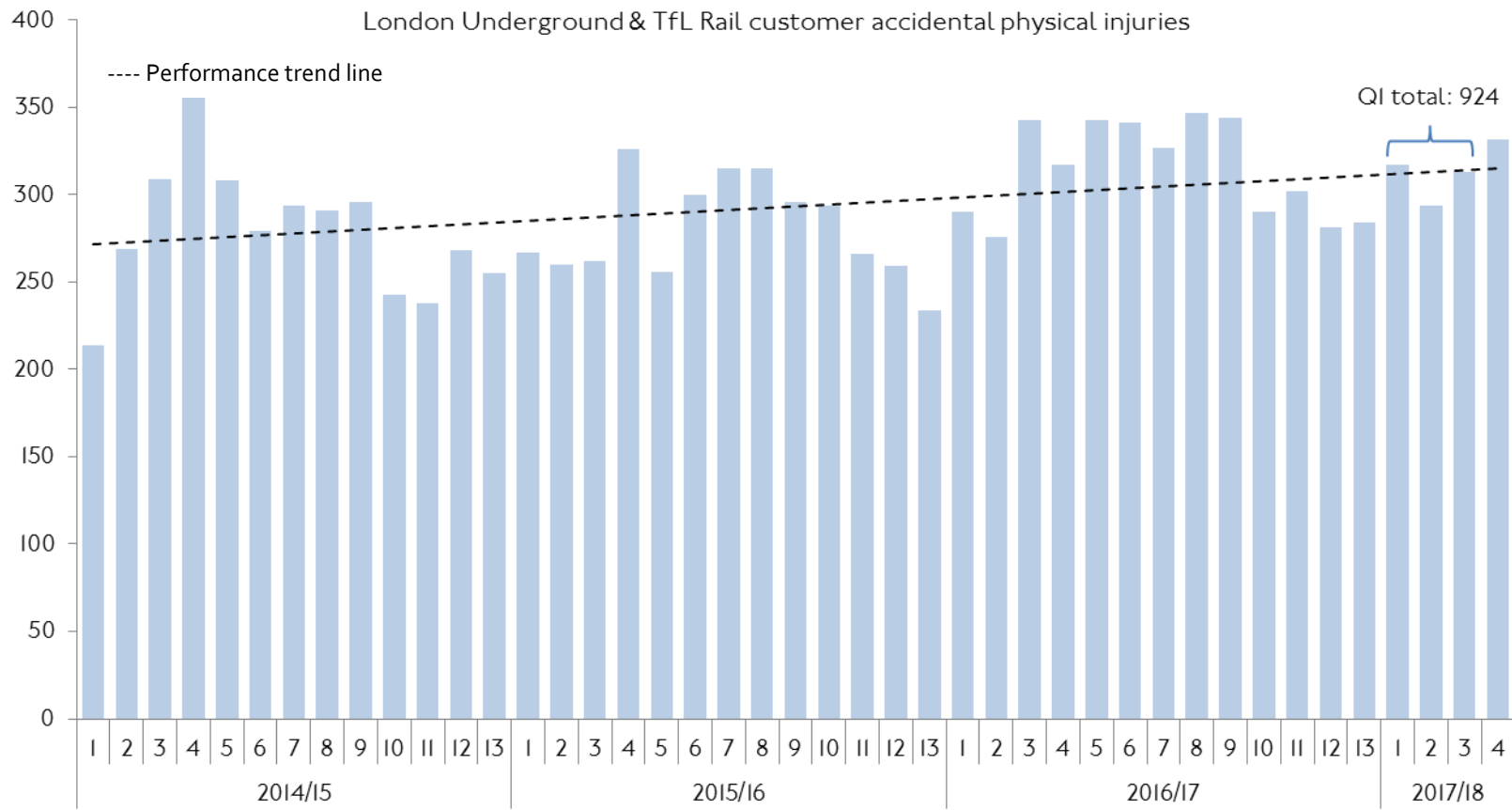
Long term safety improvement actions

In the long term, maintaining and further improving customer safety depends on delivering infrastructure improvements (particularly at the PTI) and developing new ways to engage with our customers to influence and change their behaviour in a way which will help keep our customers safe. Actions include;

- Reducing the PTI risk through upgrading observation systems, and exploring the use of a gap filler.
- Further developing the LU Customer Engagement Strategy to include influencing customer behaviour
- Securing additional funding for safety improvement initiatives on stairs and escalators throughout 2018/19.

On TfL Rail, customer safety improvements focus on managing vulnerable people at risk of attempting suicide on the railway and reducing

incidents at the PTI. In quarter one, the contracted supplier (MTR) continued engagement with national forums to raise the profile of mental health awareness and identify collaborative opportunities to improve the management of vulnerable people on the railway. In order to minimise the PTI risk when the new Class 345 trains operate on the Great Eastern infrastructure, installation and adjustment of the Driver Only Operation (DOO) CCTV is underway.



Above: Figure 2. London Underground and TfL Rail customer accidental physical injuries 2014/15 – Period 4 2017/18.

Customer safety: Buses

Fatalities

Four customer fatalities occurred on the Bus network. There were two (2) accidental fatalities connected with the operation of bus services. On 7 April, an elderly customer fell on the stairs of a bus as it pulled away at traffic lights. The customer was taken to hospital and died from their injuries three days later.

On 9 April, a member of public fell from a bench into the path of an oncoming bus travelling at slow speed. The Police have eliminated the driver from their enquiry. TfL continue to support the Operator with their investigation. There was one (1) fatality attributed to a pre-existing medical condition. On 10 May, a customer was found unresponsive whilst travelling on board a bus. The investigation identified the customer experienced underlying medical conditions. There was one (1) fatality attributed to an act of crime. On 28 April, a customer was fatally wounded during a stabbing incident on the upper deck of a bus. The bus Operator is assisting the Police with their ongoing investigation. All fatalities await the outcome of Coroner Inquests.

In quarter one, three historic fatalities were recorded by the Coroner as death by road traffic collision. The Coroner did not issue any Prevention of Future Death reports or any recommendations to TfL or the bus companies involved in the incidents. Police investigation into a historic pedestrian fatality following collision with a bus (19 April 2015) found fault with the bus driver. The driver received a custodial sentence and ban from driving.

Customer injuries

In quarter one 2017/18 a total of 1243 injuries were recorded on the bus network. This is a

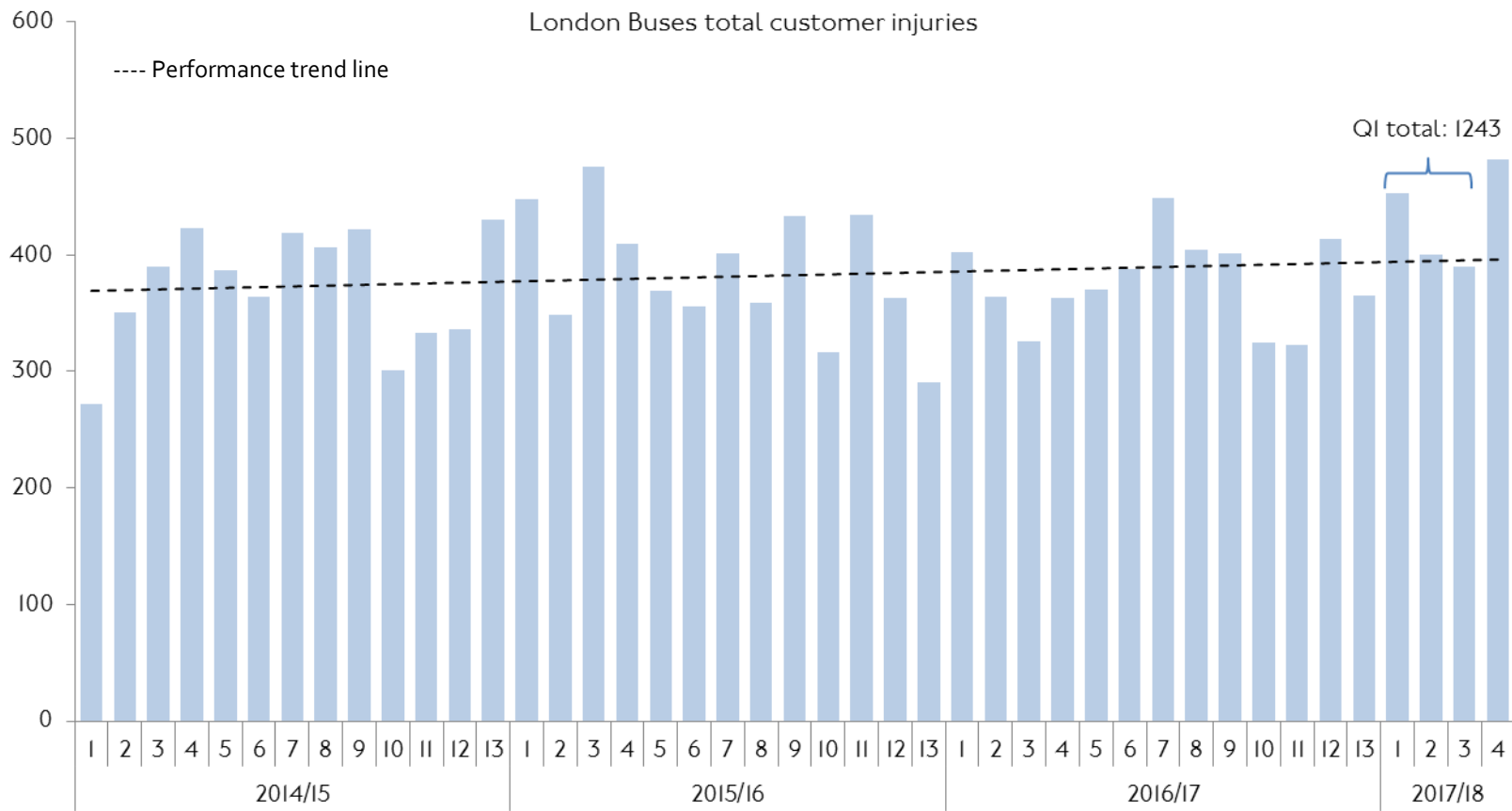
13.8 per cent increase on the same quarter in the 2016/17 year (see Fig. 3).

Buses Collisions

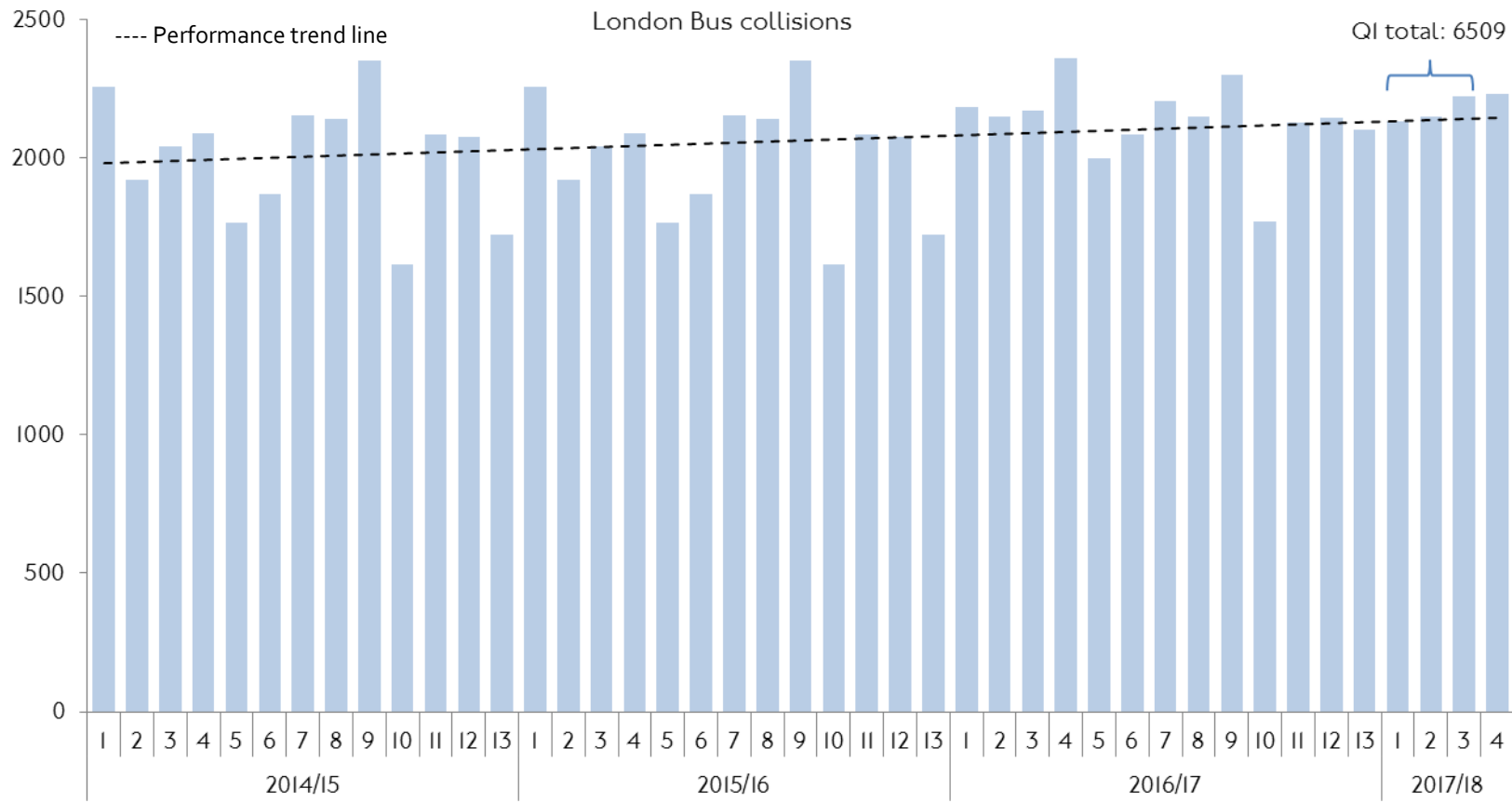
In quarter one 2017/18 a total of 6509 collisions involving buses were recorded, two more than in the same quarter in the 2016/17 year (see Fig. 4). Just over three per cent of the collisions resulted in injuries to other road users or bus customers. Just under 80 per cent of the total collisions involved another vehicle. The actions of third party drivers contributed to 53 per cent of the total collision incidents. Where available (about a third of the incidents), initial information has suggested that driving too close was a factor in 38 per cent of these collisions; with bus drivers being the party identified as driving too close in 52 per cent of these cases.

Falls on buses

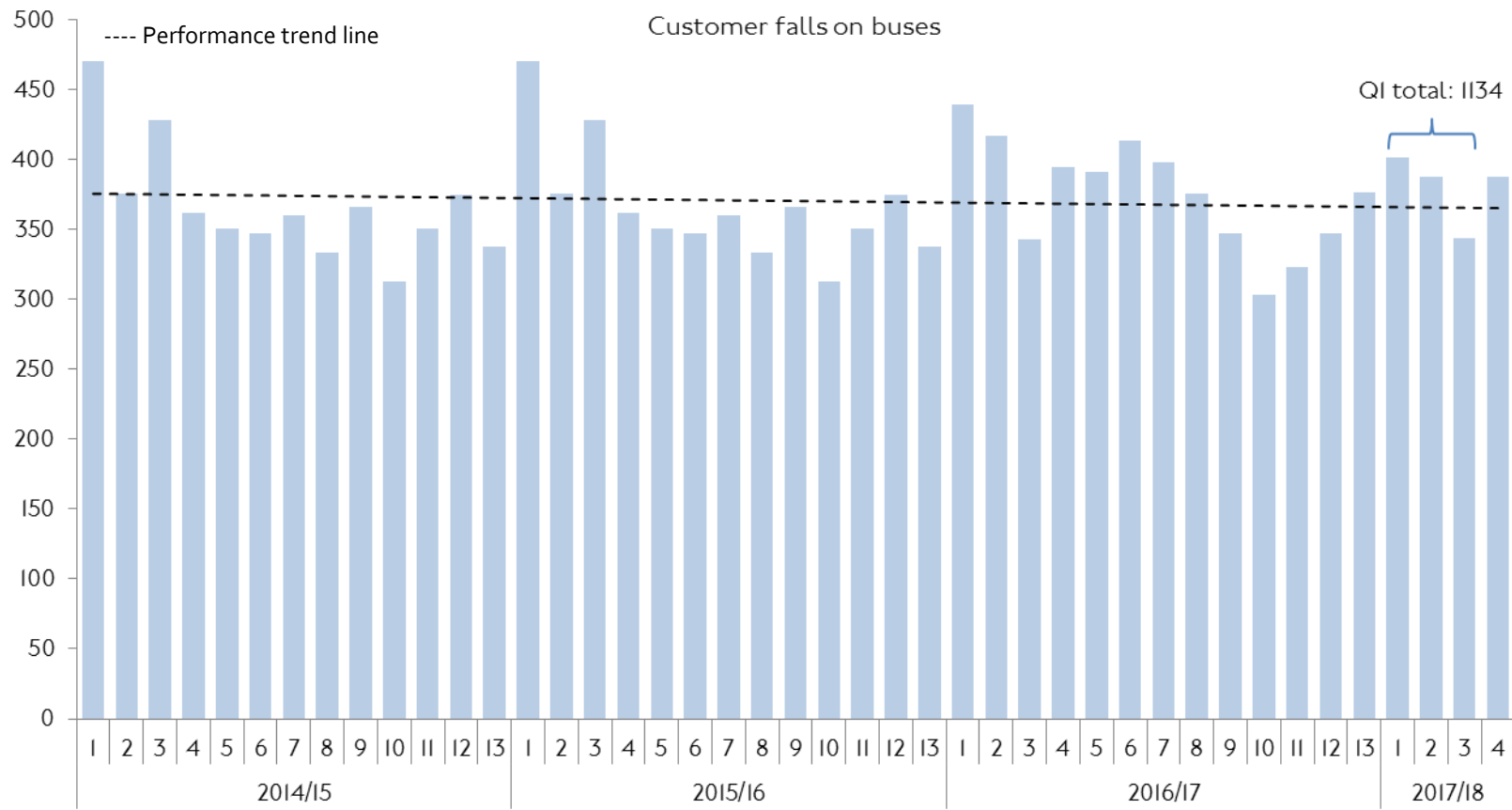
In quarter one 2017/18 a total of 1134 customers fell on buses (see Fig. 5). This is a 5.5 per cent decrease on the same quarter in the 2016/17 year. Sixty-two per cent of slips, trips and falls resulted in injury, a significantly smaller proportion than previously observed. In quarter one, slips, trips, falls to customers alighting buses saw the highest improvement (from 139 in quarter one 2016/17 to 106 in quarter one 2017/18), and represented half of the 66 fewer falls recorded overall. There were reductions seen with boarding related falls (6 per cent). On-board incidents account for two-thirds of customer injuries and this was a key focus for the recent Casualty Reduction Workshop held with Bus Operators in June. Targeted customer campaigns promoting the need to hold on and the focus given to passenger care may be contributors to this improvement.



Above: Figure 3. London Buses total customer injuries 2014/15 – Period 4 2017/18.



Above: Figure 4. London Buses total collisions 2014/15 – Period 4 2017/18.



Above: Figure 5. Customer falls on buses 2014/15 – Period 4 2017/18.

London Buses Customer safety improvement plan

TfL continues to take forward the six work streams towards meeting the Mayor's Transport Strategy (MTS) targets of achieving a 70 per cent reduction (against 2005-2009 levels) in the number of people killed or seriously injured by a bus by 2022, with zero people killed in or by a London bus by 2030. The work streams are:

1. **Vehicle Design and Bus Safety Standard:** develop a world-leading bus safety standard for London, and roll out Intelligent Speed Assistance (ISA). (See bus safety standard update).
2. **Contracts and Performance Management:** update TfL's bus contracts to include new safety requirements and incentives. Work is underway on a safety performance index and revised assurance regime for bus Operators. This is due for full implementation by the end of the 2017/18 year.
3. **Driver Training:** provide a new safety training module to all 25,000 drivers. (See safe urban driving update).
4. **Sarah Hope Line:** provide a UK first Incident Support Service for those affected by fatal or serious injuries. (Complete - service is now in place).
5. **Bus Collision Data:** publish additional bus collision data and make it more accessible. (Complete – data now available via TfL website).
6. **Transparency:** provide greater transparency on bus collision investigations. (Complete – data now available via TfL website).

Bus Safety Standard

The Transport Research Laboratory (TRL) was awarded the Test House contract to develop TfL's Bus Safety Standard (BSS) for London. This will test innovative new technologies including collision avoidance systems, which utilise sensors to warn drivers of potential dangers and trigger Automatic Emergency Braking systems, and Intelligent Speed Assistance systems.

Other potential design innovations include improving the front of bus, wing mirror and windscreen glazing design to reduce the impact of any collision. The measures this contract develops and proves will be incorporated into the London Bus Specification, driving collaborative implementation of the BSS.

Casualty Reduction Workshop

In a bid to contribute towards the Mayor's Vision Zero approach where no death or serious injury is treated as inevitable on the capital's highways, the Bus Safety Programme team ran a workshop with bus operator safety managers to drive reduction of customer injuries at a local level. The workshop identified a wide range of additional measures that could be undertaken by TfL or Bus Operators to support Vision Zero. In response, to contribute to achieving a challenging customer injury reduction target for this financial year, Operators each committed to one new Health and Safety Initiative.

Safe Urban Driving-style Training

Funding approval has been achieved for a Vulnerable Road User focused training course for bus driver instructors, trainers and supervisors. The content will reinforce how to spot vulnerable road users, understand

how they interact with other forms of highway traffic and how driving defensively can help to keep all road users safe. The Bus Performance Team and Bus Safety programme team carried out a collaborative engagement exercise with Operator Training Staff to provide further focus for this piece. The collective expertise of the group was leveraged to agree key areas of concern, share known approaches to tailoring training for them, advise any innovative work in the area and will feed into the focus of the course specified above. It is intended this will addresses behavioural traits, trainer input and how bus drivers can mitigate the risks they are presented with on a daily basis

Customer safety: London Rail (Docklands Light Railway, London Trams, Emirates Airline, London Overground)

Customer injuries

There were no customer fatalities in quarter one 2017/18.

A total of 61 customer injuries were recorded on the London Rail network, in quarter one 2017/18. This is a 28 per cent decrease on the same quarter in 2016/17 (see Fig. 6). Sixty-two per cent of the customer injuries were recorded on the London Overground network.

Analysis of London Overground (LO) incidents from the beginning of 2016/17 shows that 56 per cent of all incidents took place at twenty stations on the network. Slips, trips and falls accounted for 30 per cent of all incidents and 18 per cent of incidents involved stairs. Analysis of Docklands Light Railway (DLR) incidents from the beginning of 2014/15 shows that seven stations have accounted for 50 per cent of all incidents on the DLR network; with Woolwich Arsenal and Canning Town (both interchange stations) accounting for almost a 25 per cent of all incidents. Similar to LU, being encumbered with luggage, under the influence of alcohol, or rushing for services are the key contributory factors in causing injury. All of the London Rail businesses are active in sharing experiences and best practice.

London Rail Customer safety improvements

London Overground (LO)

Rollout of the wrong side door opening protection system for the remaining London Overground routes (West Anglia and Gospel Oak Barking lines) continues. The system provides additional mitigation against doors being opened on the wrong side of the train by providing a visual and audible warning to drivers. Whilst such events are rare, the consequences are potentially severe and additional warning systems provide further protection. The system is planned for testing and commissioning in quarter three 2017/18 and will be ready for the entry into passenger service of the new Class 710 London Overground trains in 2018.

The programme to upgrade the train protection warning system (TPWS) between Harrow and Wealdstone and Queens Park continues. The work is due to be completed by the end of the 2017/18 year and will enable new trains to operate without the need to rely on the existing tripcock protection system. The upgraded system is expected to improve reliability of the London Overground service for customers.

Arriva Rail London continue to deliver their collaborative workforce training programme that upskills workers to assist vulnerable customers and members of public on railway premises. The training is coordinated through Network Rail and the Samaritans.

Docklands Light Railway (DLR)

To further prevent platform train interface (PTI) injuries to customers using the DLR, a new PTI customer safety strategy has been developed through a DLR Passenger Safety Focus Group. The strategy has been approved for delivery by DLRL and their franchisee, KeolisAmey Docklands. The strategy was launched in quarter one. Safety improvements that are due for implementation throughout 2017/18 include enhanced signage that show customers where emergency help points are located on platforms and localised platform specific announcements. Beyond 2019/20 the long term strategy includes exploring the use of smart technology, such as enhanced observation systems on the platform, to reduce the risk at the PTI. To further complement the strategy, DLR continue to work in partnership with other TfL business functions to share PTI safety enhancements and best practice.

DLR has continued its work to further prevent customer injury caused by slips, trips and falls on the DLR network in quarter one. DLR stakeholders are adopting best practice improvements from the London Underground escalator safety study and have continued with the introduction of red combs being fitted to escalators. In quarter one, a trial was held at Cutty Sark station, with a red comb plate fitted beside an escalator with the conventional yellow comb plates. The trial demonstrated that the red plates had a positive effect on passenger behaviour. The red combs are fitted during planned maintenance and highlight the entry and exit points of the escalator.

DLR continue to engage with its customers, and have delivered a series of Passenger Engagement Roadshows in quarter one. The roadshows are being delivered across the network and involve staff from DLRL and the Franchisee. The roadshows help DLR

understand why customers make decisions that lead to injury on the network. A road show will be held at London City Airport in quarter two, a known location of customer trips and falls on escalators. The roadshow will engage with customers and further identify customer behaviours associated with carrying luggage whilst using escalators.

London Trams (LT)

Safety improvements at London Trams are listed as a continuation within the Significant Incidents section of this report.



Above: Figure 6. London Rail total customer injuries 2014/15 – Period 4 2017/18.

Customer safety: Other Operational Services (London River Services, Cycle Hire, Taxi and Private Hire, Victoria Coach Station, Dial-a-Ride)

Customer injuries

There were no customer fatalities in quarter one 2017/18.

A total of 28 customer injuries were recorded on Other Operational Services within Surface Transport in quarter one 2017/18. This is a decrease of 26 per cent on the same quarter in 2016/17 (see Fig. 7). Thirty-nine per cent of the customer injuries were recorded by Cycle Hire users, and 43 per cent from the Dial-a-Ride customers.

Dial-a-Ride service users are the group most affected within the Other Operational Services customer profile. During the quarter, six service users were injured after falling while boarding or alighting a bus. On five occasions, injuries were sustained by users whilst being escorted to or from buses. One Dial-a-Ride service user was injured in a collision. Within Cycle Hire, four users were injured in road traffic collisions and seven received injuries after falling off their hire bikes. There was no discernible pattern in the injuries recorded within Victoria Coach Station (2) and London River Services (3).

Other Operational Services Customer safety improvements

Taxi and Private Hire Compliance

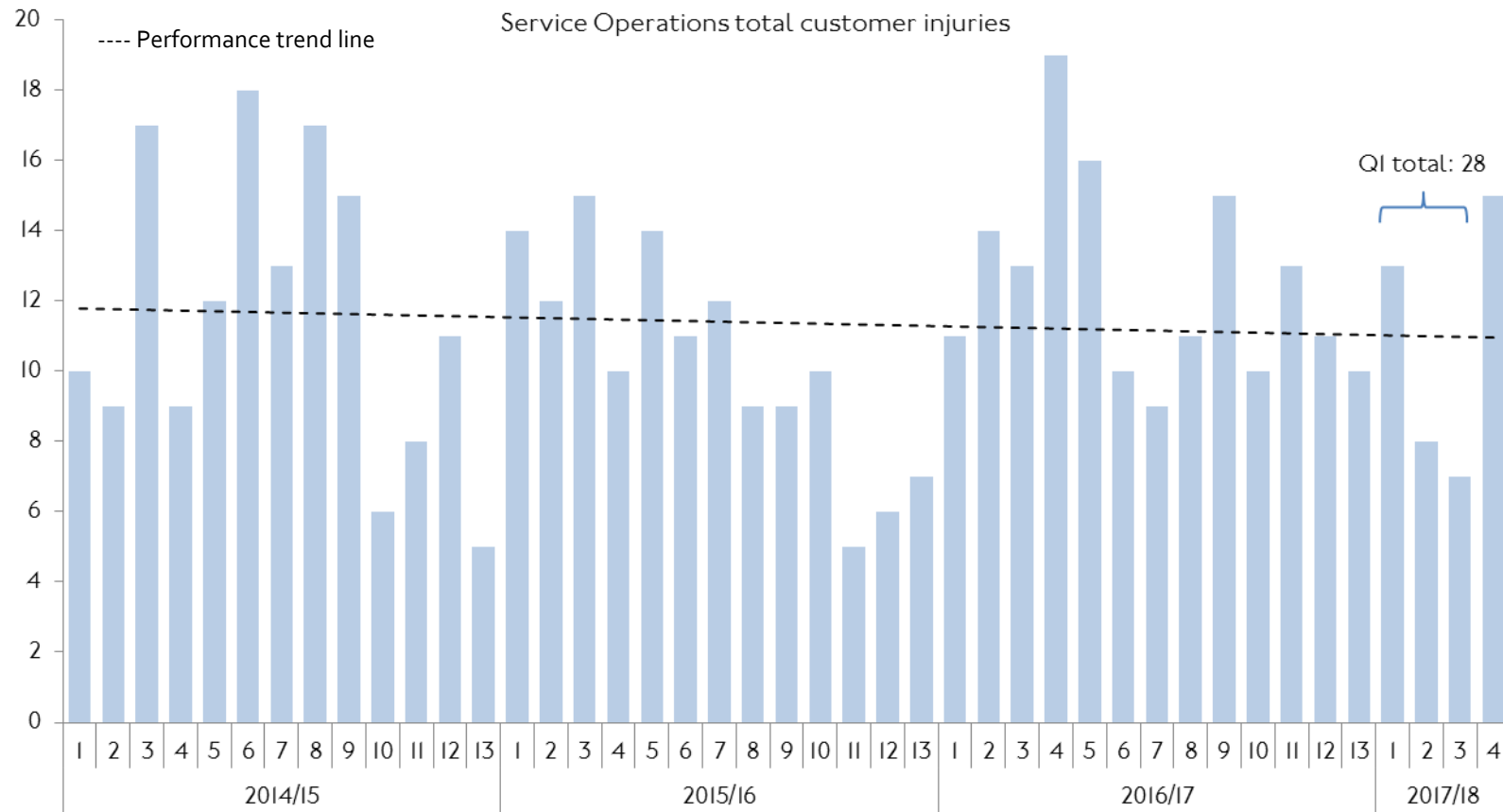
Last year, the Mayor committed to increase the size of our Taxi & Private Hire Compliance Unit and asked us to recruit 250 new compliance officers. This uplift in numbers has significantly increased our ability to tackle non-compliant and illegal taxi and minicab activity in London. TfL

expects to meet the target of 250 new compliance officers in quarter two of 2017/18.

Underpinning the recruitment of the officers, there was a drive to improve female representation in operational roles. TfL can report that 35 per cent of the 250 new recruits will be women and 56 per cent will be BAME (Black, Asian and Minority Ethnic). All new staff have a very strong customer service ethos and we regularly receive positive comments from both drivers and the Taxi and Private Hire trade bodies.

TfL is now checking more than five times as many Taxi and Private Hire drivers and vehicles than in 2016/17 and this number is increasing as the new staff are trained and fully operational. In July, there were 29,976 Private Hire Vehicle (PHV) driver and vehicle checks compared to 21,710 in the previous month and 11,087 taxi driver and vehicle checks in July compared to 8,686 checks in the previous month. Compliance checking on PHV Operators was also increased.

Compliance levels remain high, at 90 and 89 per cent for taxis and private hire respectively. The key cause of non-compliance for taxi drivers is leaving their vehicle unattended on the taxi-stand. The top three non-compliances for private hire vehicles are drivers not displaying their badges, not being in possession of their insurance documents at the time of inspection and parking their vehicle on a taxi rank. To maintain a safe network, identifying and taking action against illegal drivers is a key area of focus for the Taxi and Private-Hire Compliance Unit. During the quarter they reported 14 unlicensed drivers.



Above: Figure 7. Service Operations total customer injuries 2014/15 – Period 4 2017/18.

Road Safety

Transport for London (TfL) receives all recorded personal injury collision and casualty data for Greater London (as reported under STATS19) from the Metropolitan Police Service (MPS) and City of London Police (CoLP) (see Figures 9 – 11 inclusive overleaf).

Data for the period January 2016 to August 2016 was collected using the previous MPS Personal Injury Accident NOTification (PIANO) system and paper Collision Accident Report Books (CARBs). From September 2016 onwards the MPS introduced the new Case Overview and Preparation Application (COPA) system to report road traffic collisions. The CoLP adopted the similar Department for Transport (DfT) Collision Reporting and SHaring (CRASH) system in September 2015. COPA and CRASH aim to bring significant improvements to the reporting of road safety data for London.

COPA and CRASH use a new method of assessing the severity of injury sustained in collisions, as recommended by the DfT. Under COPA and CRASH, Police officers record the type of injury suffered rather than their assumptions about the severity of the injury. The recording system then automatically assigns an injury severity according to the type of injury recorded. This contrasts with the previous system, where officers recorded whether in their judgement an injury was 'slight' or 'serious'. The use of these systems has resulted in improved accuracy in the recording of injury type. This has resulted in more injuries being classified as serious rather than slight.

Analysis of the data available so far from COPA and CRASH shows that, nationally police forces using these systems are more likely to record a casualty as being 'seriously' injured than they were using previous systems¹. Around half of all English police forces are now using CRASH with most of these forces adopting the system between January and May 2016. Early indications are that England police forces using CRASH are reporting 10 to 15 per cent higher numbers of serious injuries than the non-CRASH police forces.

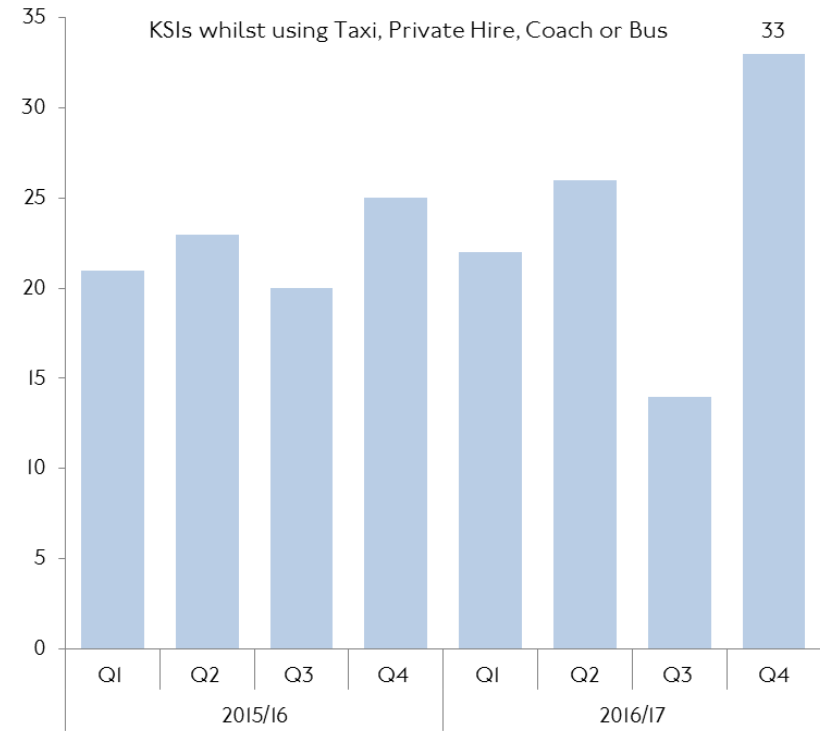
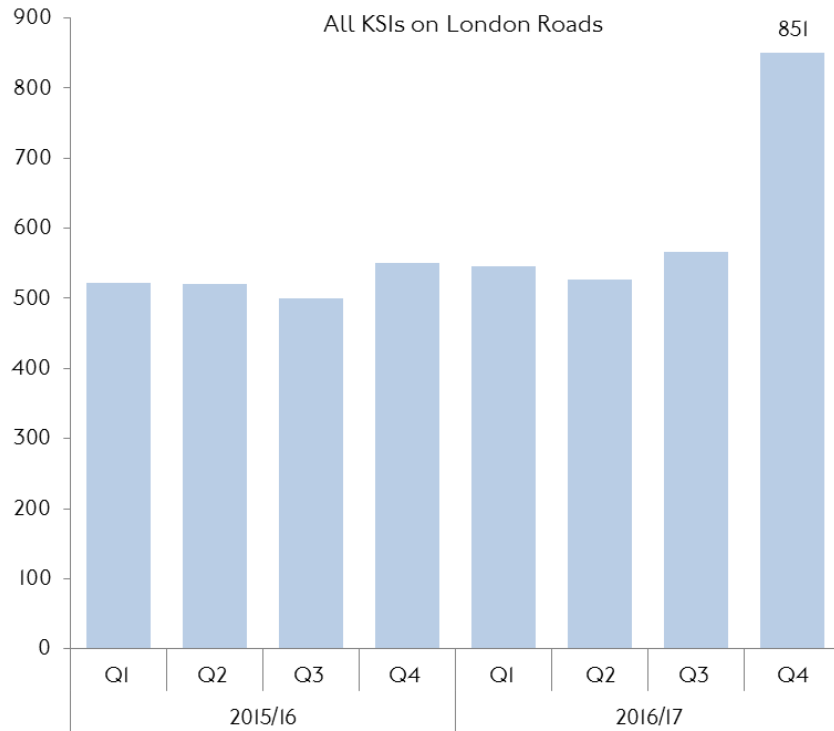
The DfT intends to publish more detailed analysis of this effect later in 2017 and it is expected that this will include back-estimates of the number of seriously injured casualties that would have been reported by the police using an injury-defined system rather than a severity-defined system. TfL is working with the DfT on this research, which will provide a greater understanding of the impact of COPA and CRASH systems on the injury severity classification of road user casualties in London.

Delay in finalising the 2016 Road Safety performance data

Collision data for 2016 is currently being verified and it is anticipated that TfL's 2016 'Casualties and Collisions in Greater London' factsheet will be published at the end of September 2017 alongside the DfT's national figures.

1

<https://www.gov.uk/government/statistics/report-ed-road-casualties-great-britain-provisional-estimates-july-to-september-2016>



Above: Figure 8. All KSIs on London Roads. Data for Q4 of 2016 is not directly comparable with previous quarters.

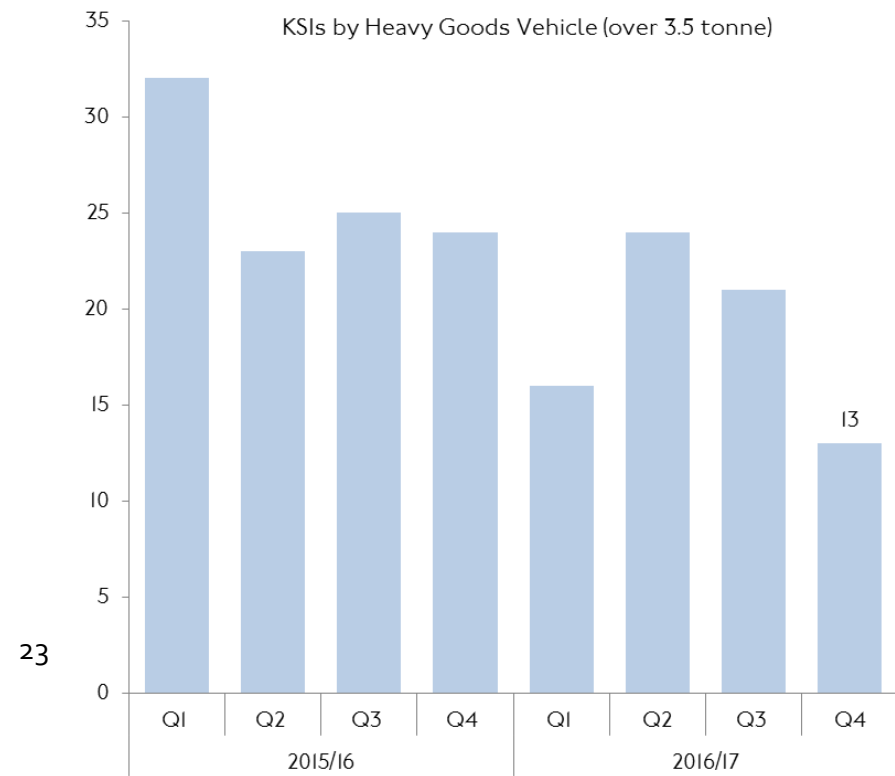
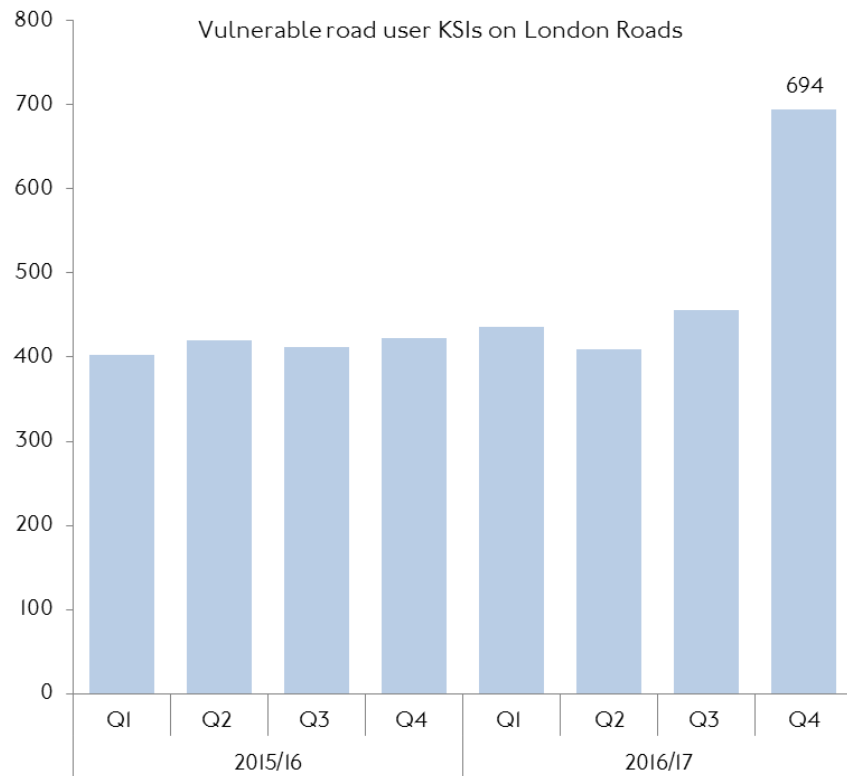
lowest level on record and an 11 per cent reduction from 136 fatalities during 2015.

Provisional figures show that there were 851 KSIs on London's roads during quarter 4 of 2016. This is an increase of 55 per cent when compared to the same quarter of the previous year; however this increase primarily reflects the improved reporting of serious injury by the police following the introduction of COPA in September 2016. Provisionally, there were a total of 2,504 KSIs during 2016. Of this total, there were 121 fatalities, which is the

private hire vehicle occupant KSIs during quarter 4 of 2016. This is a 32 per cent increase in quarter four 2016 compared with the same quarter in the previous year; however this increase primarily reflects the improved reporting of serious injury by the police.

Above: Figure 9. Taxi, private hire, coach or bus occupant KSIs. Data for Q4 of 2016 is not directly comparable with previous quarters.

Provisional figures show that there were 33 bus, coach, taxi and



Above: Figure 10. Vulnerable road user KSIs on London's roads. Data for Q4 of 2016 is not directly comparable with previous quarters.

Provisional figures show that there were 694 vulnerable road user (cyclists, pedestrians and motorcyclists) KSIs during quarter 4 of 2016. This is an increase of 64 per cent, compared with the same quarter in the previous year; however this increase primarily reflects the improved reporting of serious injury by the police.

Above: Figure 11. KSIs by HGVs (over 3.5 tonne). Data for Q4 of 2016 is not directly comparable with previous quarters.

Provisional figures show that there were 13 KSIs involving Heavy Good Vehicles (HGVs) during quarter 4 of 2016, which is a 19 per cent reduction compared to the same quarter in the previous year. This reduction occurred in the context of improved reporting of serious injury by the police.

Road Safety improvement initiatives

Safer Junctions evidence analysis

On 19 April, the TfL Walking and Cycling Commissioner, Will Norman, advised the London Assembly Transport Committee of the programme of work towards the manifesto commitment to deliver Safer Junctions across London. As part of this work, a number of junctions on the TfL Road Network (TLRN) were identified by analysing most recent data to find those with the highest number of collisions involving pedestrians, cyclists and motorcyclists. A number of these junctions already had improvements planned, and further analysis will identify a final list of locations where new safety schemes will be initiated.

Targeted Junctions

Analysis of the last three years of casualty figures on the TfL road network has helped identify 73 junctions with the most concerning safety record to be targeted for work. This analysis will now continue each year as part of a new approach that will see work continually monitored and the junctions with the most incidents prioritised. The list of 73 junctions is now being considered in detail to assess what can be done to make them safer. The current list includes some that have had work recently completed, some have work planned, and others that require further review.

- 21 junctions have had significant improvements made within the last three years. These will now be monitored to review casualty changes at these locations and to ensure that lessons are learnt to improve the future design and construction of projects.
- 33 junctions have improvements planned within TfL's current business

plan. This includes Lambeth Bridge North and Waterloo IMAX consulted on this summer. Design work on other junctions within the list of 33 continues at pace, including Jamaica Road/Lower Road/Rotherhithe Tunnel, which will be part of Cycle Superhighway 4.

- 19 junctions will be reviewed to identify possible solutions and safety improvements. This includes locations such as Holloway Road and Parkhurst Road, Clapham Road and Union Road and Hyde Park Corner and Park Lane.

Improving the safety of the Capital's junctions is a central part of the Mayor's £2.1bn Healthy Streets approach. This aims to create more attractive, accessible and people-friendly streets, where everybody can enjoy spending time and being physically active by making walking and cycling easier and safer across London.

TfL's new 'Vision Zero' approach to reducing road danger is a central part of the Mayor's draft Transport Strategy. This means vigorously enforcing traffic law, putting safety at the core of road engineering projects and working to discourage dangerous behaviour on the roads.

Westminster Bridge South

It is anticipated that the Westminster Bridge South scheme will introduce significant improvements and connectivity for pedestrians and cyclists, tackling an intimidating junction currently dominated by motor traffic. Following the Westminster attack on 22 March, and after careful consideration and discussion with all key stakeholders including Parliamentary Estates, Westminster Council and Lambeth Council, construction began on 18 April with works initially around the gyratory south of Westminster Bridge. Work on the bridge

itself will start later this year and will introduce segregated cycle lanes on both sides of the carriageway. The full scheme is due to be completed by early 2018.

Lambeth Bridge northern and southern roundabouts

Interim road safety improvements at Lambeth Bridge northern roundabout have been completed. The scheme focused on: addressing safety concerns by widening footways and extending traffic islands to reduce traffic speeds; raising zebra crossings on all four sides of the junction to slow traffic on the approach to the roundabout; and installing clearer lane markings to improve vehicle lane discipline. The changes also provide more space for pedestrians and improve the crossings. TfL has launched a public consultation on proposals for transformative longer-term solutions at both the northern and southern roundabouts, which began on 26 June.

Mini Hollands

The Mini-Hollands scheme was completed on St Mark's Hill (Kingston) one-way cycle track and consultation commenced on connectivity to Portsmouth Road and New Malden to Raynes Park cycle and pedestrian link. Work has completed on Chingford and Highams Park cycle parking (Waltham Forest). Mini-Hollands have features that make cycling feel safer and more convenient. The programme targets people who make short car journeys in outer London that could easily be cycled or walked instead.

Promoting cyclist and driver safety

On 21 July, the Metropolitan Police Service's (MPS) Cycle Safety Team (CST) launched a new programme called 'Give Space to Cyclists' to improve cyclist and driver safety. Cycle Safety Team officers from the

MPS Roads and Transport Policing Command have been holding a number of events in locations across London, based on intelligence and complaints, to ensure drivers were obeying the rules of the road. The officers worked in plain clothes, wearing video cameras and riding unmarked bicycles donated by BMW, to identify and manage offences that most deter people from cycling, including: tailgating; unsafe overtaking; and unsafe turning.

During the first week of action, deployments in Bexley, Hackney, Southwark, Bromley, Lewisham and Richmond, led to 18 vehicles being stopped and offered advice. Five drivers were charged with other traffic offences. We are also working with MPS to develop a social media film to raise awareness and further support this activity.

Construction Logistics and Community Transport (CLOCS)

CLOCS brings the construction logistics industry together to manage work related road risk (WRRR) and ensure a road safety culture is embedded across the industry.

A revised version of the CLOCS standard is due to for release by the end of the 2017/18 year and will feature updated standards. The 2017/18 target of 500 CLOCS champion organisations and / or individual construction projects actively implementing the requirements within the Standard for construction logistics has now been achieved. CLOCS can be accessed at: www.clocs.org.uk

Fleet Operator Recognition Scheme (FORS)

FORS is a commercial vehicle accreditation scheme open to trucks, vans and coaches. Initiated by TfL, the scheme now consists of over 135,000 vehicles covering 14 countries

across Europe. In quarter one, FORS accredited its first operator in Qatar. The scheme standards are set above the legal minimum with additional requirements set for Drivers, Management, Operation and Vehicles.

Safe Urban Driving

Safe Urban Driving (SUD) focuses on driving in urban areas and specifically vulnerable road users, such as cyclists and pedestrians. It is the first and original Driver Certificate of Professional Competence (CPC) approved course in the UK to include practical on-road cycle training. At the end of quarter one, 3,502 people had undertaken funded approved training which is on target to exceed TfL's objective to have 6000 HGV drivers trained on road safety SUD or Van Smart (VS) in 2017/18. In total, over 47,000 have undertaken the course since in launch in 2011.

TfL Workforce Safety and Wellbeing

TfL employee safety

There were no workforce fatalities in quarter one 2017/18.

There were a total of 277 injuries to direct employees in quarter one 2017/18. This is a 3 per cent decrease on the same quarter in 2016/17 (see Fig. 12). Eighty-four per cent of these injuries were recorded by London Underground employees.

TfL supplier employee safety

There were no supplier employee fatalities in quarter one 2017/18.

There were a total of 267 injuries to supplier employees in quarter one 2017/18. This is a 7 per cent decrease on the same quarter in 2016/17 (see Fig. 13). The majority of these incidents were recorded by employees of Bus Operators (44 per cent) and London Underground construction suppliers (18 per cent).

Workforce safety improvement plan

The workforce safety improvement programme for London Underground (LU) is built to focus on three key areas;

1. High risk activities. Areas where we don't have many accidents, but the potential consequences are high. These activities include electricity at work, working at height, manual handling, and lifting operations.
2. Reducing accidental injuries
3. Employee wellbeing.

Electricity at work

During 2014 and 2015, there were two significant electric shock incidents (at Stratford Market Depot and at Northfields Depot). These two incidents, along with a number of other incidents, identified that our compliance with the Electricity at Work Regulations was not as robust as it should be. The number of electric shock incidents on LU are low, but the consequence could be fatal. As a result, LU established an Electricity at Work improvement work stream to improve the systems which keep our workforce safe. Following a compliance check of all maintenance areas, new fuse bay covers for Signal Equipment Rooms (SERs) have been successfully trialled in two rooms at Liverpool Street and Chancery Lane. The covers will be applied across other SERs across the LU network where appropriate.

Manual Handling

Working alongside an external provider, a new tailored manual handling training course is now being delivered to Fleet, Track, Signals and Power teams within LU. Manual Handling is a causal factor in approximately 20 per cent of injuries to LU maintenance employees. It is forecast that the training will reduce these injuries by 10 per cent. The training focuses on practical techniques, relevant to our working environment, that reduces the risk of exposure to manual handling injuries.

Reducing accidental injuries to employees

LU aims to reduce the number of accidental employees injuries by 17% in 2017/18 compared to 2016/17. The focus for the first quarter of the year was on local teams focusing on their key issues and developing local action plans. Common themes in accident trends include slips, trips and falls, manual handling and contact with an object accounting for approximately 60 per cent. In

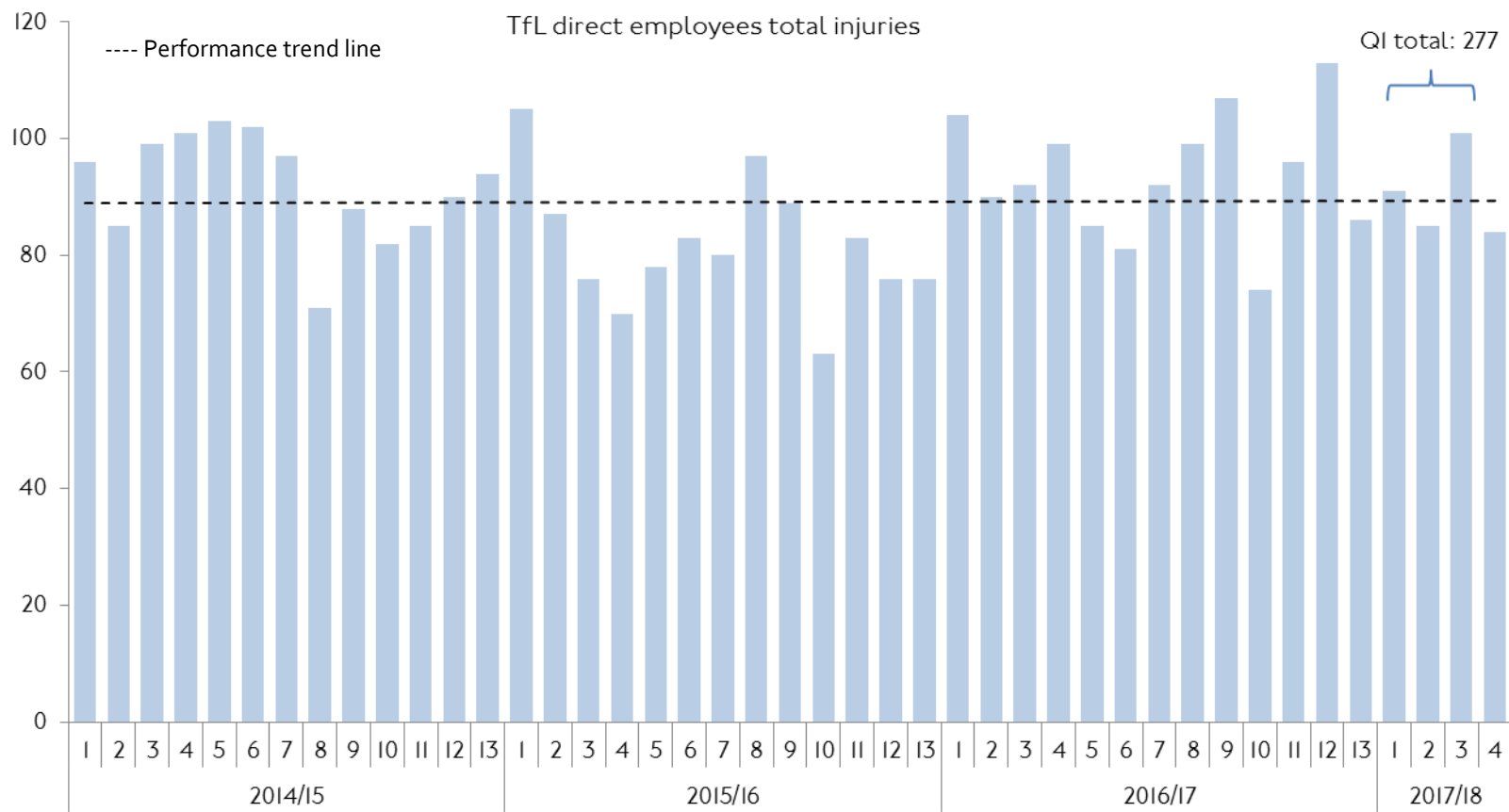
August, representatives from across LU came together to share ideas on how to tackle common issues across operations, maintenance and project teams using a Practical Problem Solving (PPS) technique. The output from these PPS workshops is being developed into an LU Workforce Safety Plan which will be built around two key themes; making safety personal and safety leadership.

Surface Transport has established a target to reduce accidental employee injuries by 10 per cent in 2017/18 compared to 2016/17. During the quarter, further work was undertaken to develop improvement plans for the priority areas outlined in the quarter four quarter 2016/17 report. The key types of injuries over the last three years and the activities giving rise to them were identified. Additionally, the key causes of sickness absence were identified, with a particular focus on those related to TfL activities, or where TfL has specific occupational health support available to employees. This confirmed two of the priority areas for TfL identified by the Employee Injury Working Group; musculoskeletal injuries to Dial- a-Ride drivers arising from manual handling of wheelchairs and assaults on operational staff. However, the analysis identified the need prioritise actions to address slips trips and falls experienced by operational staff rather than Repetitive Strain Injuries. Combined these account for approximately 75 per cent of employees. Mental health and musculo-skeletal issues continue to be the most significant cause of absence to address through the improvement plans. During quarter two, a representative from the group involved in the development of the LU plans will attend the Employee Injury working Group to share learning and proposed solutions. The key areas of focus for our contracted workforce are prevention of assaults on frontline staff and slips, trips and falls. We continue to work with the

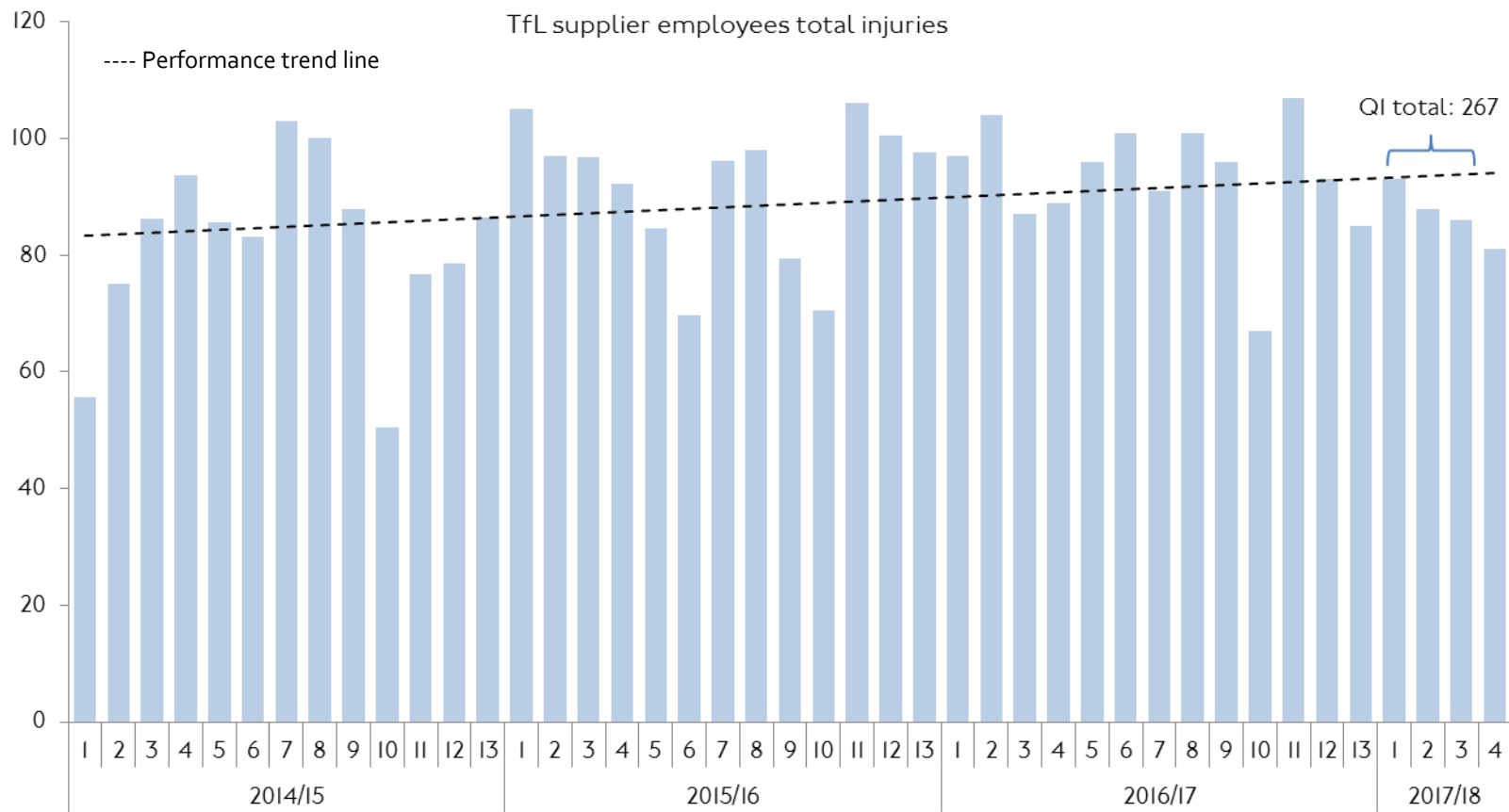
operators of our bus and rail services to support their own injury reduction plans.

Enhanced safety arrangements on London Buses

CentreComm, the London Buses control room, has introduced SafeApp which allows employees working remotely to sign-on at the start of their shift using a mobile device, and confirm they are fit and well at the end of their shift. This is particularly useful for employees who are considered mobile and do not operate from a base location. The application also means TfL can respond to incidents on the network faster, as an employee's proximity to a specific event can be seen from the control room.



Above: Figure 12. TfL direct employees total injuries 2014/15 – Period 4 2017/18.



Above: Figure 13. TfL supplier employees total injuries 2014/15 – Period 4 2017/18.

TfL workplace violence

TfL direct employees affected by work place violence

There were a total of 557 TfL direct employees affected by work place violence in quarter one 2017/18 (see Fig. 14). This is a 15 per cent increase on the same quarter in 2016/17. Eighty-eight per cent of these injuries were recorded by London Underground employees.

TfL supplier employees affected by work place

There were a total of 547 TfL supplier employees affected by work place violence in quarter one 2017/18 (see Fig. 15). This is a 7 per cent decrease on the same quarter in 2016/17. Ninety-six per cent of these injuries were recorded by supplier employees operating within Surface Transport.

TfL workplace violence safety improvements

The workplace Support Team (WST) continues to work in partnership with the Metropolitan Police Service (MPS) in tackling staff assaults. In the quarter, the team assisted Police investigations by taking 95 victim and witness statements. This means the MPS are better able to spend more time on arrest enquiries and obtaining CCTV, assault reports and following up with witnesses.

During the quarter, the WST worked with a range of stakeholders including bus operators as part of tackling the causes staff assaults and issues surrounding them. This saw the team facilitate 18 training events, presentations, checkpoints and forums. These events provide the opportunity for staff to ask questions about the work of the WST and also obtain updates on cases they are involved in. The events also enable the

WST to gather intelligence which is shared with other TfL areas and the police, which could include the concerns staff may have.

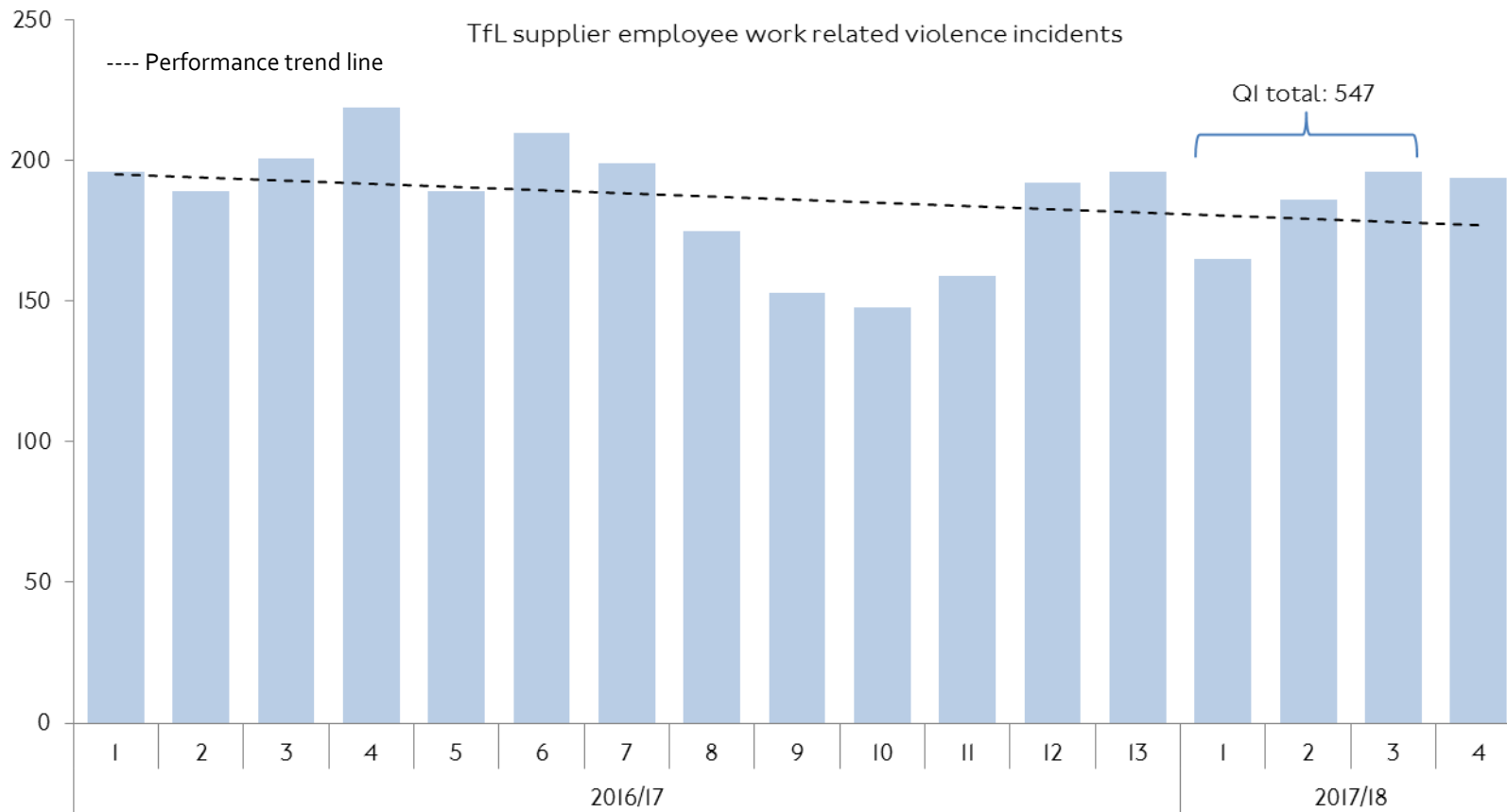
TfL continues to work in partnership with the British Transport Police (BTP) to deliver Operations Spearhead - an early intervention tactic to prevent low level anti-social incidents escalating to staff assaults. To further support our workforce, a new 'Handling Workplace Violence and Aggression' training module has been rolled out to our operational frontline employee

In an effort to reduce workforce assaults on TfL Rail, the contracted supplier (MTR) continue to closely monitor these incidents and assess the benefit of the body cameras currently under trial with Travel Safe Officers.

To continue focusing on reducing the number of staff assaults, KAD (the DLR supplier) have been focusing on continued delivery of their conflict avoidance training to both new recruits and existing staff, as well as having one to one coaching sessions with individual staff who appear to experience higher levels of conflict than other staff.



Above: Figure 14. TfL direct employees affected by work place violence Period 1 2016/17 - Period 4 2017/18.



Above: Figure 15. TfL supplier employees affected by work place violence Period 1 2016/17 - Period 4 2017/18.

TfL workforce wellbeing

Drug and alcohol testing

London Underground (LU) Operations have 13,458 safety critical employees, with a minimum five per cent target of 680 for unannounced testing for the 2017/18 year. In quarter one, the number of employees tested on each monitoring code was: Unannounced (112) For Cause (13), Monitoring (14) and Post incident (19). There was one positive drugs tests in quarter one.

LU Capital Programmes Directorate (CPD) have 247 safety critical employees, with a minimum five per cent target of 13 for unannounced testing for the 2017/18 year. In quarter one, the number of employees tested on each monitoring code was: Unannounced (4), For Cause (0), Monitoring (0) and Post incident (0). There were no positive test results in quarter one.

In Surface Transport, at the end of quarter one 1169 operational employees were within scope for drug and alcohol testing. In quarter one, the number of employees tested on each monitoring code in was: Unannounced (3), Monitoring (10), For Cause (0) and Post Incident (0). There we zero (0) positive result in quarter one.

In the event of a failure, appropriate disciplinary action up to and including dismissal is taken against anyone who is found to be in breach of the drugs and alcohol policy.

Sickness Absence

TfL headcount full time equivalent (FTE) (not including agency / contractors) for quarter four was 24,638. Average days absence per employee across TfL for quarter one is 2.5 days. Musculoskeletal injury and mental health continue to be the top causes of absence in the quarter.

UK average day's sickness absence is 4.3 days per year (Office of National Statistics, Sickness absence in the labour market: 2016).

Occupational health and wellbeing improvement programme

TfL operate a five-year Health and Wellbeing Improvement Programme, focussing on lifestyle health factors by engaging with employees to improve musculoskeletal, mental health and general health.

In quarter one 2017/18, the following employee engagement programmes took place;

- 480 employees took part in an Online Healthy Eating Programme. The programmes are designed to educate employees about the importance of balanced nutrition.
- 500 employees attended mental health workshops. The workshops aim to educate employees on a range of mental health practices including; sleep, stress, building resilience and managing working relationships.
- 174 employees participated in a walking challenge, covering the equivalent distance of the Central Line over a working week.

Planned activity for quarter two includes a Diabetes Awareness Campaign and the continuation of the One Million Step Challenge (950 employees are currently participating).

TfL construction workforce safety performance

We engage with our construction delivery teams and suppliers to ensure they have the necessary culture and competence to safely deliver our investment programme. As part of this, we organise safety networking events to build an environment where our suppliers share good practice.

We also set clear health and safety requirements within our contract clauses and monitor performance against them to make sure our suppliers continue to achieve high standards of health, safety and environmental management. Figure 16 (overleaf) shows the performance of our construction supplier teams.

London Underground

Within LU, we recognise suppliers who demonstrate good practice in site management through our Beacon award scheme, which champions HS&E excellence through a structured assessment at site or team level. In quarter one, six teams and two sites achieved Beacon status, including the lift replacement and station improvement project at Lancaster Gate.

Within Renewals and Enhancements, HSE Stand Downs for all front line track workers, Supervisors and Foreman continued in quarter one. These focused on Manual Handling, Decision Making, Small Tools, Person/Machine Interface and Mental Health & Wellbeing.

The scope of our supplier 'Zero Harm' engagement forum will increase to encompass all major projects from November 2017. Sessions promote collaboration across the client and principal contractor boundary on key HSE issues to improve performance, via focused improvement groups. The focus of the next forum (November 2017) shall be on preventing musculoskeletal injuries.

Surface Transport

Within Surface Transport, we continue to develop tools to support good HS&E management standards. We have improved our incident reporting processes by extending the HS&E InfoExchange module (already in use within LU) so that projects can report incidents in real-time. Our suppliers can now also submit performance data via this system each period, which provides a single source of truth and makes data immediately available to all users.

We held two engagement events with the Health and Safety Executive (HSE) during the quarter. For the Silvertown Tunnel project, we hosted a briefing event to help inform the HSE's monitoring regime for the project. We have also invited the HSE to participate in our engagement sessions with the bidders to help emphasise the importance of health and safety within the project. At the second event, we briefed the HSE on our arrangements for ensuring good health and safety management throughout the lifecycle on all our projects. Feedback on both events was positive and the events have helped build strong relationships with a key stakeholder.

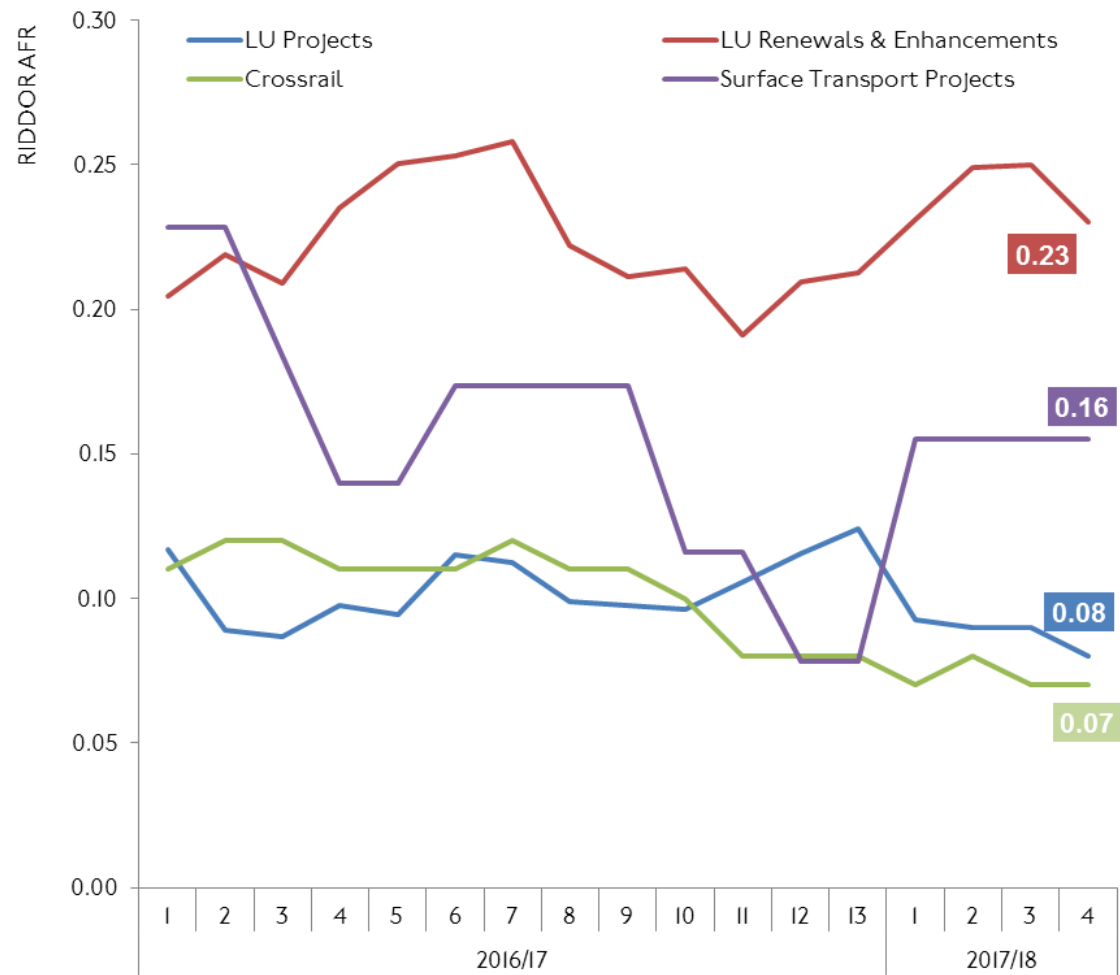
Piling has started at West Hampstead, where we are liaising closely with local residents to keep them updated during the works. We have ensured suitable noise mitigation is in place and we are monitoring the noise levels. Although we expect these to reduce as the piling sequence moves away from the residents' properties, we will continue to monitor them until the piling completes at the end of August. So far, noise monitoring has confirmed that the works are below the limit specified by the London Borough of Camden under Section 61 of the Control of Pollution Act.

Crossrail

'Stepping Up Week' is a health and safety engagement initiative run across all contracts and sites on Crossrail. It forms part of Crossrail's Target Zero strategy and has been successful in continuous improvement of health and safety at Crossrail. The eighth Stepping-Up-Week which was officially held between 18 April and the 19 May.

Over three hundred events took place. Events were held over weekends and in the evenings to ensure a wide coverage. Some events were supported by the attendance of Crossrail Directors and Senior Managers, whose feedback was consistently positive. The theme was Co-operation and Collaboration. Keynote speakers included Former World Heavyweight Boxing Champion Frank Bruno who spoke about Mental Health and Wellbeing; Ex Red Arrows Display Pilot Andy Wyatt who spoke about the importance of Collaboration and Cooperation; Paul Mahoney and Lisa Ramos who both spoke about the impact of a serious accident on their lives; and Louise Taggart who spoke about the death of her brother as a result of a workplace electrical accident.

Events included demonstrations of safety equipment, practice evacuation exercises, workshops on slips trips and falls, talks on mental health, diet and fatigue management, and practical training in manual handling.



Above: Figure 16. TfL construction workforce RIDDOR accident frequency rate comparison Period 1 2016/17 – Period 4 2017/18.

Measuring safety performance at TfL

Our vision for health, safety and environment (HSE) is to get everyone home safe and healthy everyday. An important part of our HSE management strategy is measuring and benchmarking our performance internally and against international standards.

Across the TfL businesses we use a management maturity model to assess our approaches to HSE management. Initially developed by the Office of Rail and Road, the model allows us to benchmark our approach to HSE management. The model assesses five areas within our safety management system: policy, organising for safety, co-operation and competence, planning and implementing, and monitoring, audit and review. The method provides analysis of safety at the systematic level and it allows TfL to identify long term actions and address root cause barriers to safety improvement. Across TfL we have set a target of achieving Level 4 (of 5) by the end of the 2020 year.

Alongside the use of maturity models, TfL businesses set HSE targets against a number of performance indicators for driving improvements in day-to-day safety performance. These performance indicators have been developed progressively and have changed over time to ensure they reflect a continually improving understanding of risks. This enables improved trend analysis and focuses management on any necessary remedial actions.

To complement performance targets, each business area develops HSE improvement plans and objectives to help identify

hazards and evaluate how to manage risks. Each area monitors and reviews the plans and tests the control measures. HSE performance is then reported at business unit level and to the appropriate management meetings at all levels of the organisation. This process of planning, implementing, monitoring and reviewing risks is vital to our achieving our vision.

Monitoring our activities

Through our HSE monitoring activity TfL evaluates the effectiveness of controls for managing identified hazards. Monitoring activity identifies where controls are deficient in consideration of the risk, or where personnel at risk are not following the safe system of work. TfL businesses develop and implement monitoring regimes in accordance with the level of risk associated with its activities.

Where an injury occurs we conduct a full investigation to identify the root causes and contributory factors. Action is taken to prevent re-occurrence. This may include reinforcing safe behaviours through on site briefings, revising risk assessments or implementing new controls. We also communicate lessons learned from the incident across relevant TfL businesses.

Safety Culture Survey

In quarter one an industry-accepted questionnaire, developed by the Health and Safety Laboratory, was distributed to operations, maintenance, and major projects teams across London Underground. The survey tool is anonymous and assesses factors known to be indicative of safety attitudes and behaviours within the workforce. Results are analysed for groups across the workforce and actions plans developed to address low scoring areas. Results from the survey are expected to be

fed back to the London Underground workforce by the end of quarter two.

The same safety culture survey will be used across the remaining parts of TfL to monitor changes in our safety culture and are planned for delivery by the end of 2018.

Safety Performance Indices

The safety performance index (SPI) was first introduced at DLR in 2010 as a method of measuring safety performance over time using a collection or 'basket' of safety indicators, similar to the Retail Price Index (RPI) basket of goods. Following the introduction of the SPI at DLR, the mechanism was implemented across all London Rail modes and Buses as the key tool for measuring safety performance. A safety performance index for London Underground is under development and due for implementation by the end of the 2017/18 year.

The SPI is a general measure of comparative performance and offers the ability to benchmark performance against a baseline performance or a representative 'what good looks like'. The approach provides an overall safety index with the ability to drill down to individual performance indicators. Additionally, the SPI offers the ability to monitor safety performance at three levels; leadership (overall SPI score), functional/departmental (basket contribution) and operational level (safety indicators).

Each SPI is made up of a selection of weighted safety indicators, relevant to that business, and grouped together into 'baskets'. The purpose of the basket is to provide a collection of indices which can be used to evaluate a specific dimension of safety performance. To ensure

accountability, each basket is assigned a business owner based on their ability to exercise the required leverage to drive safety improvement. As part of a regular safety evaluation process, the basket owner is required to provide commentary on performance, including remedial steps and other safety improvement initiatives that are implemented to control performance.

Measuring asset precursor performance

In quarter one, London Underground (LU) introduced a new mechanism for measuring asset performance. For each asset precursor a limit is determined using the quantified risk assessment (QRA). The LU QRA is the network wide model which is used to assess the risks from the major hazards to which customers and other members of the public are exposed to as a result of LU operations.

At the end of the reporting period, the number of confirmed defects that have occurred are reported as a percentage of the precursor limit. Using statistical analysis, it is possible to predict the likelihood of getting closer to the limit for each asset precursor in the next period. This allows the business to look ahead and implement management interventions to prevent asset failures.

TfL Crime and Antisocial behaviour

Annual Transport related crime figures 2016-2017

TfL has recently published its annual crime statistics bulletin for 2016-2017. A full summary can be found on our website <http://content.tfl.gov.uk/crime-statistics-bulletin-1617.pdf>. The levels of pan-modal transport crime, excluding TfL Rail, in 2016/17 were 0.5 per cent higher (161 additional offences) compared with the previous year. The rate of crime has also increased slightly to 7.5 crimes per million passenger journeys (from 7.4 in 2015/16).

The levels of bus-related crime in 2016/17 were 2.0 per cent lower (356 fewer offences) compared with the previous year. The rate of crime for the bus network has remained at 7.5 crimes per million passenger journeys. Levels of violence on the bus network remained stable but it remains a priority and efforts to drive this down continue.

Reported sexual offences on the transport system have continued to rise in 2016/17. This was anticipated and is considered a positive result of the ongoing efforts to tackle unwanted sexual behaviour on public transport and to increase confidence in reporting sexual offences. The Project Guardian initiative and Report It To Stop It campaign are part of an ongoing effort to reduce the risk of becoming a victim, challenge unwanted sexual behaviour and target offenders. This important work continues.

Hate crime

As part of ensuring TfL services are safe, welcoming and accessible to everyone, in collaboration with the policing partners, actions against hate crime to reassure those who feel vulnerable have been prioritised. A programme is now in place that includes regular days of engagement where police and TfL staff speak with customers and local communities about hate crime, raising awareness of how to report it and the action under way to tackle it.

A programme of staff briefing and training is also under way. This raises awareness and clarifies expectations of staff if they experience, witness or are told about hate crime, and to reassure them how seriously we and the police take crime against TfL staff. TfL are also developing an eLearning course, which will be suitable for all staff and contractors.

TfL Internal Audit

All of the issues described in this section of the report have a corrective action plan to ensure improvements are made. Thirty four internal audits were completed in quarter one, of which 21 were Health, Safety, Environment (HSE) & Technical audits.

There was one HSE & Technical audit which resulted in a 'Poorly Controlled' conclusion; Inspection of London Underground (LU) Earth Structures. There were 13 audits which resulted in a 'Requires Improvement' conclusion (key themes are summarised later in this report), of which three of the 13 were HSE & Technical.

Inspection of LU Earth Structures

The audit which resulted in a 'Poorly Controlled' conclusion relates to the inspection of LU earth structures such as rail embankments.

On the Bakerloo Line, Central Line, Victoria Line, District Line, Circle Line, Hammersmith and City Line, and Metropolitan Line the following issues were identified;

- The work of an Earth Structure Inspector is subject to review and countersignature. The audit revealed inspections that had been completed had not been subject to countersignature and independent review as required. Obvious defects were being reported immediately, underlying issues may not be programmed for work until reports are completed and reviewed.

In order to correct this audit result, Inspectors are now fully qualified and the backlog of reports and reviews has been addressed.

For earth structures on the Jubilee Line, Northern Line and Piccadilly Line, the following issues were identified;

- There had been insufficient competent resource to complete all required inspections. In mitigation, inspections had been prioritised locally, although this had not been subject to formal review and approval together with a plan to reach compliance. In order to correct this audit result, a formal plan has now been approved and additional resource to complete inspections has been allocated for the September 2017.
- Whilst the prioritised inspections had been physically completed, few had been written up, reported and subject to independent review. In order to correct this audit result, all outstanding inspections have now been written up, reported, and will be reviewed by October 2017.
- Concerns raised in inspections had not been subject to assessment to determine appropriate action. This audit actions will be addressed by September 2017.

Key themes of 'Requires Improvement' audit results

Of the 13 'Requires Improvement' conclusions (see table xx overleaf for conclusions) issues of interest include;

- Movers and Leavers Processes: the collection of building passes was not conducted in a controlled process and there were inadequate processes for ensuring TfL assets are transferred or

returned from movers and leavers. Additionally the audit identified there were insufficient controls in ensuring the return or transfer of mobile devices across LU stations. In order to correct this audit result, roles and responsibilities have been re-enforced with relevant managers and a monitoring process introduced. Systems are being reviewed to improve the capture and tracking of TfL assets.

- LU Supplier Assurance: the commercial toolkit which governs how supplier assurance is undertaken was not always followed and there were low levels of awareness. Good practices were identified however these had developed through custom and practice rather than through the implementation of a developed supplier assurance system.
- LU Signals Calibration Equipment: the environmental requirements (temperature and humidity) in the Calibration Centre had not been sufficiently defined. The environment can affect the results of the calibration equipment.
- LU Operations Changes to Station Fire Precautions: the audit revealed that there wasn't a second line of defence assurance regime in place to monitor and measure compliance with standards.

In quarter one, two Audit Memorandums were issued. Audit Memorandums record the output of consultancy work and / or highlight issues outside the scope of the audit programme. Themes from the issued audit memorandums include;

- Work looking at personnel security and security culture identified good practice, although there was inconsistency with no pan-TfL

approach or strategy for managing risks associated with personnel security.

- In Surface Transport, an audit memorandum was issued in relation to planned audit work for the management of asbestos. The management team had recognised that there was a need for improvement in the management of asbestos and arrangements are being developed. An audit is planned for delivery by March 2018 to provide assurance that Surface Transport has implemented the arrangements and these are effective.

TfL Internal Audits completed quarter one 2017/18

Strategic risk	SR1: Safety Standards			SR2: Workforce Adaptability	SR3: Governance Suitability	
Audit Q1 17/18	16 792 LU CPD People and Plant	16 762 Principal Designer Role in LoHAC	17 713 LU Operations Northumberland Park Rolling Stock Depot HSE Management	16 100 Movers and Leavers Processes	16 127 Transparency	17 129 Thorntask Lessons Learnt
	17 707 Asbestos Management in Surface Transport	17 705 Management of Fatigue in LU	17 757 LU Operations Ealing Common Rolling Stock Depot HSE Management	17 109 Bullying and Harassment Procedures	17 601 Follow up to Garden Bridge Project audit	16 125 Compliance with the Scheme of Authorities
	17 759 Signals Bakerloo & Victoria HSE Management	17 773 DLR Check Certificate Process	17 760 NLE Project Tunnelling Safety Management		17 104 Data Privacy and Protection - preparation for GDPR	17 112 Data Privacy and Protection - Surveillance Cameras LU
	17 775 London Overground Safety Assurance Arrangements	17 719 REW Competence Management	17 416 Building Incident Management			
	17 115 Safety Complaints Handling					

TfL Internal Audits completed quarter one 2017/18 (continued)

Strategic risk	SR7: Financial Sustainability	SR9: Delivery of commercial revenue Targets		SR10: Ability to meet increasing demand	SR11: Catastrophic event	SR12: Significant technology failure or cyber attack			
Audit Q17/18	17 123 Traffic Enforcement	16 210 Procurement and Management of Professional Advisers in Commercial Development	16 202 Management of the Property Partnerships Programme	17 121 Dial a Ride	16 400 Personnel Security and Security Culture	16 414 Security and Availability of Surface Transport Road Space Management Applications	16 416 Payment Card Industry Data Security Standard Compliance in Docklands Light Railway Limited	16 410 Taxi & Private Hire – Controls over Disclosure of Personal Information to External Agencies	
	17 104 Construction Industry Scheme (CIS)	16 212 Investments appraisal in Commercial Development	16 200 Management of TfL's interest in Earls Court Partnership Limited		17 403 IT Disaster Recovery and Operational Resilience (TfL)	16 419 Payment Card Industry Data Security Standard Compliance in London Transport Museum	16 410 Controls over disclosure of personal information to external agencies - EoS	16 417 Card Industry Data Security Standard Compliance in Enforcement and On-street Operations	
		16 205 Contract Management of the TfL Advertising Partnering Agreement	17 215 Forecasting and financial reporting – data validation				16 410 Controls over disclosure of personal information to external agencies	16 411 Procurement of Access and Wide Area Network (WAN) services – Evaluation - Invitation to Participate in Dialogue (ITPD)	16 411 Patch Management - Internet Services (IS) Zone
		17 201 Operation and Delivery of Roadside Advertising Contracts	17 200 Use and prioritisation of Car Parks				17 640 Implementation of the new e-tendering system	17 407 IT Infrastructure Control (IP Telephony)	17 411 Pension Data Access/Security

TfL Internal Audits completed quarter one 2017/18 (continued)

Strategic risk	SR3: Deliver of key investment programmes			SR4: Managing railway or strategic road network asset base			
Audit Q1 17/18	17 600 Pan-TfL Retention of Procurement Records	16 642 Procurement of Facilities Management Category	16 609 Fraud Risk in projects and contracts within the Station Works Improvement Programme (SWIP)	16 809 LU Earth Structures Inspections	17 774 Supplier Assurance in London Underground	17 731 Signals Calibration Equipment	16 743 LU Operations - Automatic Track Monitoring System
	17 624 Project resourcing	17 625 Effectiveness of Target Cost Contracting	17 631 Benefits realisation reviews	16 730 LU Operations - Repeat Asset Failure Avoidance	16 741 LU SSL Track Maintenance	16 745 LU Operations - Fleet Central Line HOPL	17 741 Maintenance of TransPlant Vehicles
	17 620 Peer reviews with TfL Commercial	17 622 Value management & innovation in the IP	17 621 Pathway Refresh	16 806 Northern Line Extension Signalling Assurance	17 709 LU Power Planned Maintenance Regime	17 709 Suppression water supply and Wet Hydrant performance testing and condition reporting	17 703 Keolis Amey Docklands (KAD) Management of DLRL Lifts and Escalators Statutory Inspections
	17 623 Lessons learned from project failures	17 618 Project control in the Investment Programme	17 625 Effectiveness of target cost contracting	17 702 KAD's - Management of DLRL Gas System	17 126 Fixed Assets	17 704 Management of Engineering Design Change Control	17 779 LU Power Planned Maintenance Regime
	17 632 Assessing benefits from Lean Six Sigma reviews	17 727 Commercial Management within Planning	17 629 MTR Crossrail Commercial Management by Rail for London	17 710 LU Ultrasonic Testing	17 711 DLR Underframe maintenance and CCTV Checks	17 769 DLR Premises and Civils Inspection and Maintenance	17 770 DLR Permanent Way
				17 712 DLR Signals Annual Asset Management Plan (AAMP), Audit Schedule and Improvement Plan	17 715 Supplier Assurance ST	17 716 LU Warranty Process	17 717 LU Signal Incident Team Management
				17 721 LU Operations - Inspections of LU Premises	17 708 Rotork Supplier Audit	17 732 LU Operations Control and Information (C&I) Asset maintenance Regime	17 740 09TS and S Stock Handover arrangements
				17 741 Maintenance of TransPlant Vehicles			

TfL Internal Audits completed quarter one 2017/18 (continued)

Strategic risk	SR16: Operational Reliability			SR16: Impacts on Environment and resilience to extreme weather	London Transport Museum
Audit Q1 17/18	16 786 LU Operations Changes to Station Fire Precautions	16 791A LU Operations - IRSE Competence Management System in LU BCV/SSL	16 701 LU CPD Working with Electricity	17 726 LU & TfL Rail Environment data and reporting	16 113 LTM Safeguarding
	17 79B LU Operations - IRSE Competence Management System in JNP	16 602 Management of the DLR Franchise Agreement in London Rail	17 606 Integration of Crossrail into TfL	17 102 Delivery of environmental responsibilities	17 70 LTM Management Information

Resilience

The TfL Resilience function combines prevention activity, preparedness, implementation of emergency arrangements, and ensures continuity of operations during periods of business strain. Resilience activities are designed to reduce the impact of incidents on our customers, recover TfL services to customer expectations and minimise costs of failures.

Major pre-planned events

There were multiple high profile events delivered across London in quarter one, including; The London Marathon, The London to Brighton cycle, and The Tour of Britain.

Crowd control measures for these events were reviewed in detail with event organisers and stakeholders. This ensured passenger flows and transport networks were adequate and safely managed in light of the enhanced security measures following the Westminster Bridge terrorist attack on 22 March 2017.

London Resilience Forum (LRF)

The London Resilience Forum met on 28 June to discuss the proposal of creating a 'Blue Lights Group' and to discuss recent major incidents across London.

TfL has close working relationships with all emergency services and will be included in the formation of the 'Blue Lights Group' forum. Furthermore TfL will continue to input into the development of the London Emergency Services Liaison Panel Major incidents Procedures Manual.

TfL continue to engage with resilience stakeholders across London. The LRF hosted a summer preparedness briefing which included member organisations of the London Resilience Partnership, the Mayors Chief of Staff, and Deputy Mayors. TfL represented the transport sector across London.

TfL Resilience activities

During the quarter, significant resource was devoted to supporting major incident management and subsequent debriefing of major incidents that occurred across London. As part of the debriefing work, further stakeholder engagement took place with partner organisations to review security and incident management processes and capabilities.

The resilience planning team supported the London Transport Museum in reviewing their contingency, business continuity and emergency planning activities.

Further tactical and operational incident management training has been provided to employees across TfL.

Significant resilience incidents

Manchester Terrorist Attack

On 22 May a terrorist detonated an improvised explosive device in the foyer area of the Manchester Arena. Twenty two victims were fatally injured and over 250 people sustained injury.

Following the attack, the UK national threat level was raised to critical for four days and then lowered to severe. Military and non-Home Office armed police personnel were deployed to iconic sites and crowded spaces across London. Furthermore, enhanced security activities

were implemented across London and the transport networks.

London Bridge and Borough Market Area Terrorist Attack

On 3 June a terrorist attack took place on London Bridge and at Borough Market. A van was driven into pedestrians on London Bridge and was then followed by an attack in Borough Market. Eight victims were fatally injured, and 48 people sustained injury.

In response to the incident, TfL closed London Bridge Underground station and the London Bus Station. On site staff moved customers and members of the public to safety. London Buses were used to move members of the public who had been involved in the attacks to a survivors rest centre within the City.

As mitigation to further attacks of this nature barriers have been installed on major Thames crossings in central London.

Grenfell Tower Fire

On 14 June a fire occurred in the Grenfell Tower block in the Royal Borough of Kensington and Chelsea. The preliminary estimations indicate the fire fatally injured 80 people, and injured over 70 people. A definitive death toll is not expected until 2018.

TfL supported the response to this incident by providing buses to move survivors to rest centres and walking wounded to medical care. On the road network, there were significant road closures in the local area surrounding Grenfell Tower. On London Underground, the Hammersmith and City Line was closed due to potential debris falling on to the track.

Alongside implementing incident response protocols, we have also sought to support those affected by the terrible fire at Grenfell Tower. Our Lost Property Office team helped on location with the logistics of handling the generous donations from the public and our Contact Centre Team has also been on hand to supply free Oyster cards. We

also offered our vacant arch units in Shepherd's Bush for storage and enabled collections on behalf of the British Red Cross London Fire Relief Fund. We have been operating a free shuttle bus service between the Community Assistance Centre, at the Westway Sports Centre, and the hotels where large numbers of families have been temporarily housed.

Consideration will be given to early lessons learnt from the Grenfell Tower fire in the recently commissioned review of actions related to fire safety within the road tunnels on TfL's network.

Finsbury Park Mosque Terrorist Attack

On 19 June a terrorist attack took place in Finsbury Park. A van was driven into pedestrians injuring 8 people.

Following the incident, several roads were closed in the local area and some bus routes were temporarily diverted in order to support the Police with maintaining a cordoned crime scene.

Terrorism threat levels

Threat levels are used to indicate the likelihood of a terrorist attack in the UK, and can change at any time based on intelligence gathered. The threat level is set by the Joint Terrorism Analysis Centre and the Security Service (MI5). There are 5 levels of threat; low (an attack is unlikely); moderate (an

attack is possible but not likely); substantial (an attack is a strong possibility); severe (an attack is highly likely); critical (an attack is expected imminently). Current threat level assessment:

- The threat to the UK from international terrorism: severe.
- The threat to UK mainland from Northern Ireland-related terrorism: substantial.
- The threat to Northern Ireland from Northern Ireland-related terrorism: severe.

Environmental Management

Environmental improvement initiatives

Mayor's Transport Strategy

TfL published the draft Mayor's Transport Strategy (MTS) for consultation on 21 June. The promotion of sustainable transport is the core of the MTS, which has ambitious targets for walking, cycling and public transport and bold policies and proposals to help achieve these. Although almost all of the MTS contributes to improving the environment and helping to create a sustainable London, there are four policies and 26 proposals with a strong emphasis on environmental issues related to London's transport. Measures cover; air quality, energy and carbon (supporting the Mayor's ambition of London becoming a zero carbon city by 2050), biodiversity, climate resilience and noise. They are

aligned with the draft London Environment Strategy, published for consultation on 11 August.

Air Quality

The T-Charge (or Emissions Surcharge) will be launched on 23 October in central London. Cars, vans, minibuses, buses, coaches and heavy goods vehicles (HGVs) in central London during Congestion Charging hours will need to meet minimum exhaust emission standards, or pay a £10 supplement to the Congestion Charge. The minimum emissions standards are Euro 4/IV for both petrol and diesel vehicles and Euro 3 for motorised tricycles and quadricycles that currently pay the congestion charge. TfL has launched an online compliance checker to allow vehicle owners to check in advance if their vehicle meets the required emission standard.

The Mayor's consultation on introducing the Ultra Low Emission Zone (ULEZ) in central London closed on June 25. There were 18,126 responses to the consultation from the public and businesses and 115 responses from stakeholders. Responses are being analysed and a Mayoral decision will be taken in the Autumn. A consultation on proposals to expand the zone London-wide for heavy vehicles in 2020, and up to the North and South Circulars for light vehicles in 2021, will be launched in Autumn 2017.

Cleaner Buses

Introduction of low emission buses to the fleet continues in readiness for the ULEZ. 2700 buses in the TfL fleet now meet the Euro VI standard for emissions. 81 Zero Emission (electric or hydrogen) buses are now in service.

Electric Vehicle Charging Infrastructure: Location Guidance for London

On 13 July TfL published our 'Electric Vehicle Charging Infrastructure: Location Guidance for London' and research undertaken on Ultra Low Emission Vehicles (ULEVs). The information is available on the TfL website at tfl.gov.uk/ulev-research. Our evidence-based guidance will help inform London Boroughs and charge point operators where best to deliver charging infrastructure in order to meet the current and future needs of electric vehicle users. This will enable more people and businesses to switch from conventionally fuelled vehicles to ULEVs across London.

Greening the taxi fleet

TfL launched its £42m Taxi Delicensing Scheme on 28 July to remove the oldest taxis from the Capital. Up to £5,000 is available to retire 10 to 15 year olds taxis from licensing. Owners of taxis can check if they are eligible at tfl.gov.uk/taxi-delicensing. Orders are now being taken for the first Zero Emission Capable (ZEC) taxis. This is in advance of the requirement from January 2018 that all newly licensed taxis in London are ZEC. Grants of up to £7,500 are available to help with purchase of a new ZEC taxi. TfL is delivering a rapid charge point network, with locations dedicated to taxis, to enable drivers to maximise fuel savings and operate mostly with zero emissions. The first 75 rapid charge points will be operational by the end of this year.

Carbon Trust Standard for Buildings

TfL have achieved the Carbon Trust Standard, which independently verifies the impact of an organisation's carbon reduction actions, for the energy management of our head office buildings. The Carbon Trust reviewed our management approach and

results. They reviewed our performance data for April 2015 to March 2017 which showed we have reduced our carbon emissions from head office buildings by 8 per cent. The reduction in emissions has been achieved by upgrading building management systems, air conditioning systems, and lighting.

Solar Tender

TfL have launched a tender under the Mayor's RE:FIT framework on 6 June for installation of solar photo voltaic arrays and energy efficient technology at 24 buildings. Tenders are to be received by 6 September with a delivery partner in place by October 2017. The project is referenced in the Mayor's Draft Solar Action Plan for London which was launched for consultation on 11 August.

Sustainability in Joint Developments

TfL Property Development and the Greater London Authority (GLA) have finalised sustainability criteria for developers who work with TfL on our joint developments. It is the first stage in a programme of initiatives to support delivery of the Mayor's 'Good Growth' ambitions, that aims for developments to be designed and delivered in a sustainable way.

Periodic consumption of traction electricity (energy used to power trains) for London Underground and London Overground, and the CO₂ emissions associated with this, is shown in figure 18 (below). As traction electricity represents approx. 75 per cent of total TfL energy consumption this is shown separately from other energy use.

TfL waste management improvements

Quarterly waste and recycling / recovery volumes are shown in figures 19 – 23 inclusive (below). A project is underway to map all the sources of waste arising and associated data reporting flows in TfL offices, operational buildings, contracted services and construction suppliers. This forms part of an improvement initiative that will allow us to further identify areas of waste management that can be improved upon.

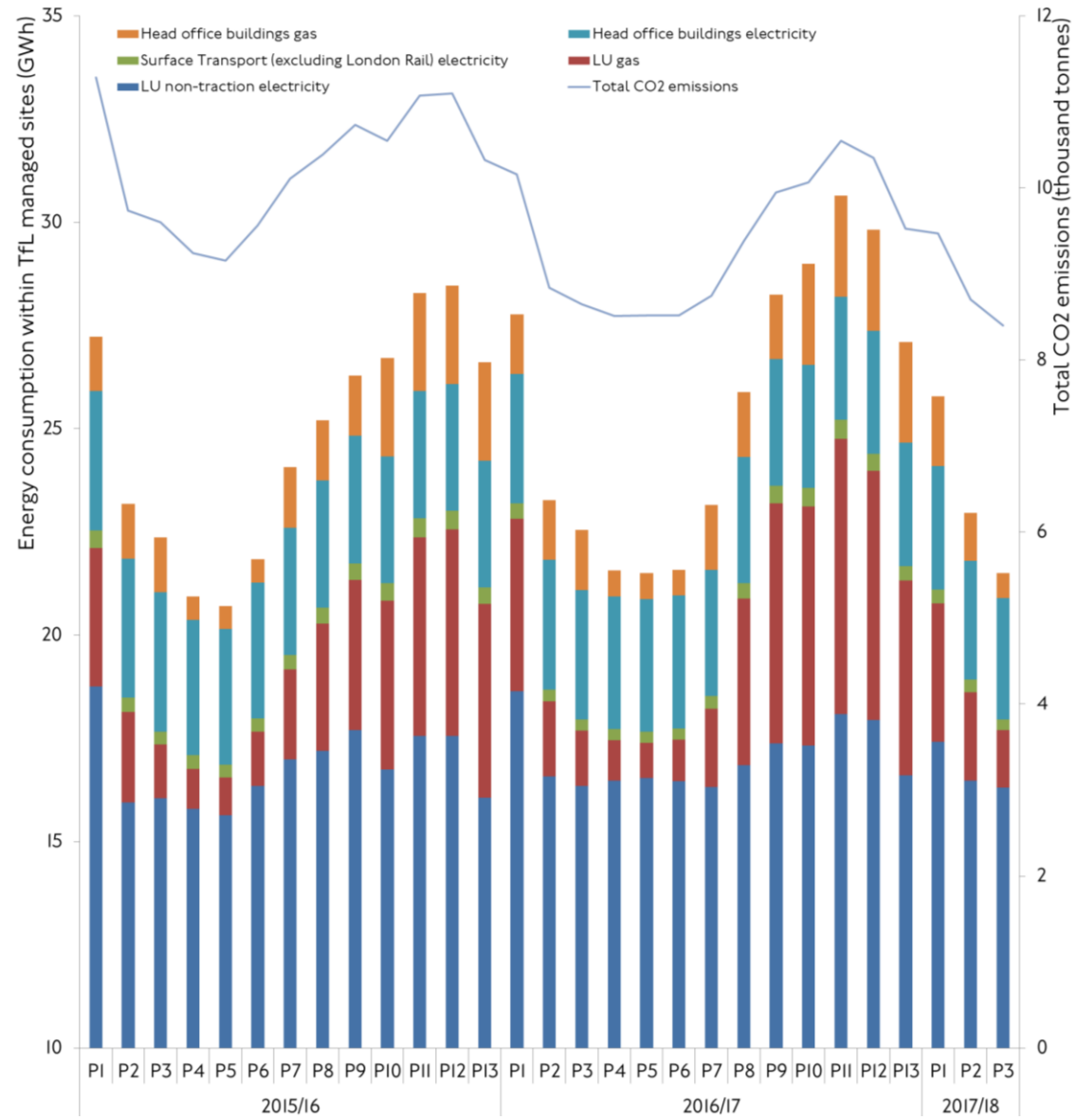
Environmental performance

Energy consumption within TfL managed sites

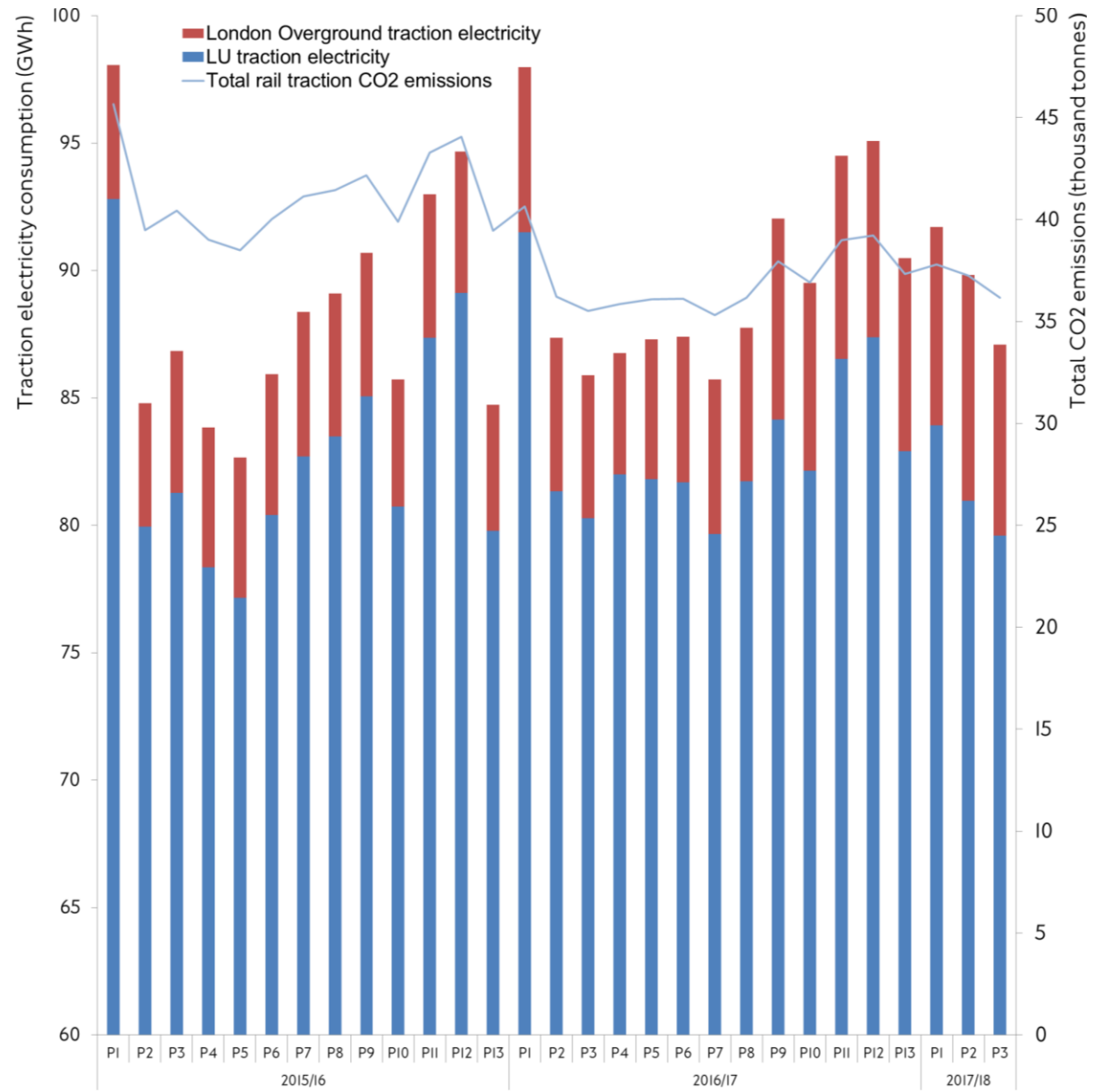
TfL's directly consumed energy per period, excluding traction electricity is shown in figure 17 (below). This includes Surface Transport infrastructure, London Underground stations, depots and other assets, and head office buildings. The chart also shows the CO₂ emissions associated with this energy consumption.

The total amount of CO₂ emissions associated with energy consumption at TfL managed sites was 8,422 tonnes at the end of quarter one 2017/18. This represents a two per cent reduction compared with 8.653 tonnes at the end of the same period in 2016/17.

Traction energy consumption on London Overground and London Underground



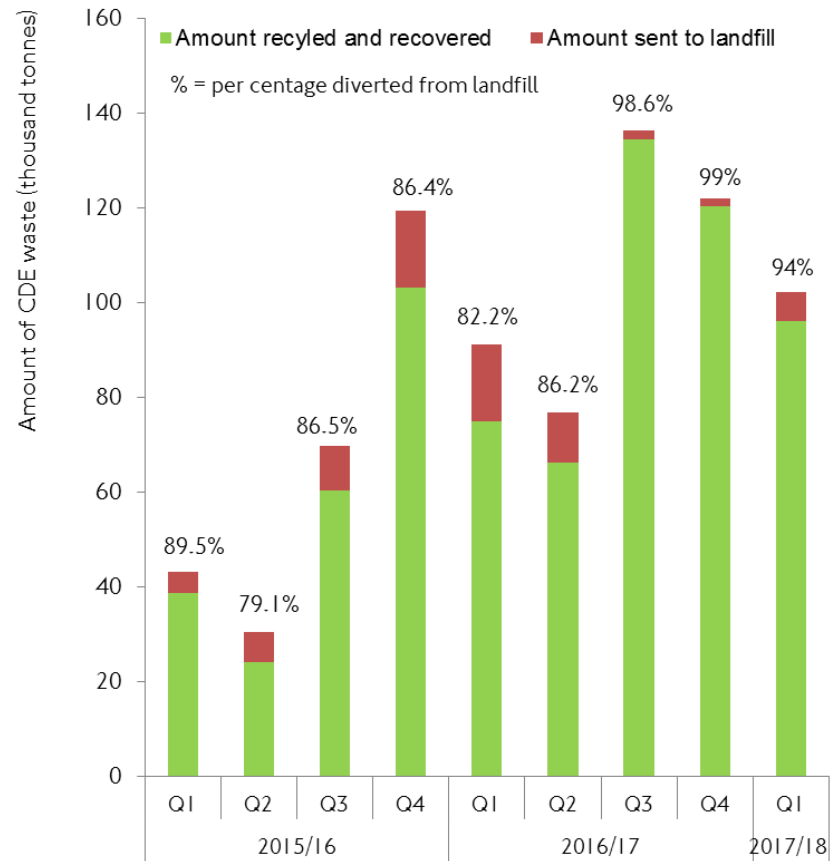
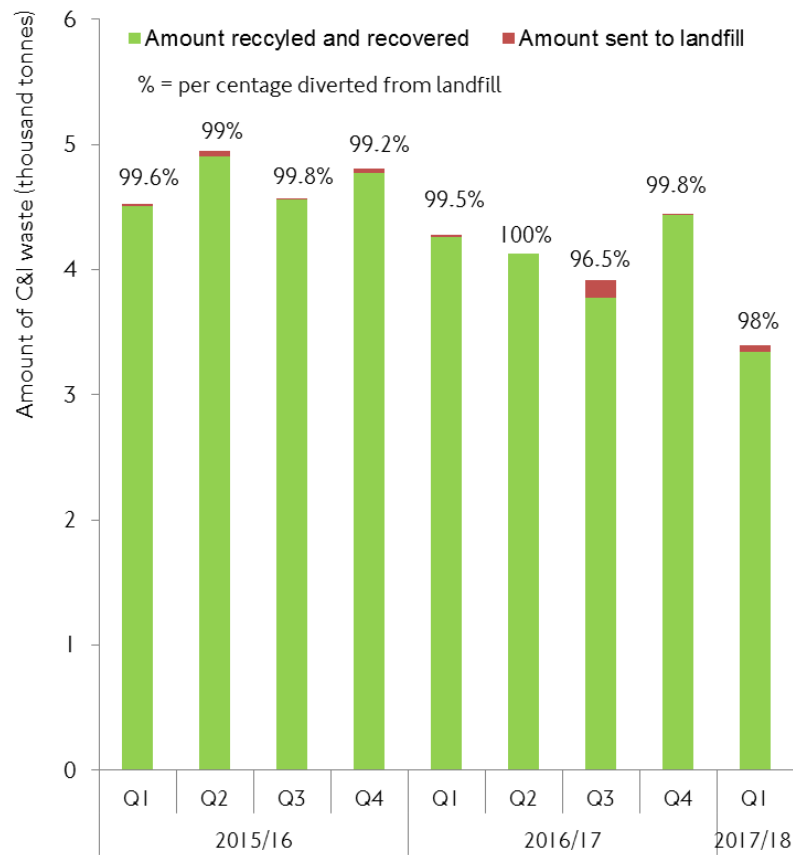
Above: figure 17.
within TfL managed
2017/18.



Energy consumption
sites P1 2015/16 – P3

Above: figure 18. Traction energy consumption on London Underground and London Overground network P1 2015/16 – P3 2017/18.

Waste management within London Underground and London Rail



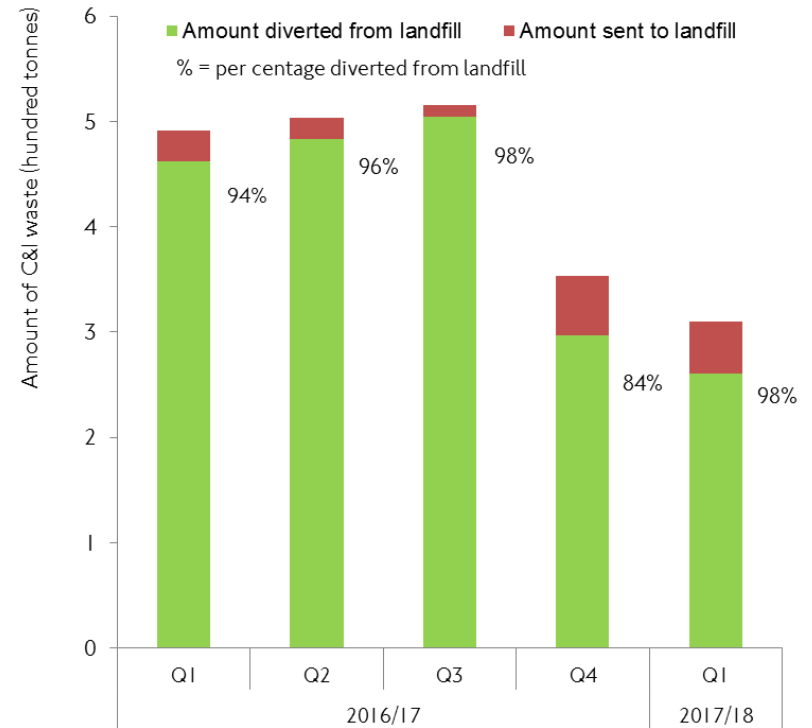
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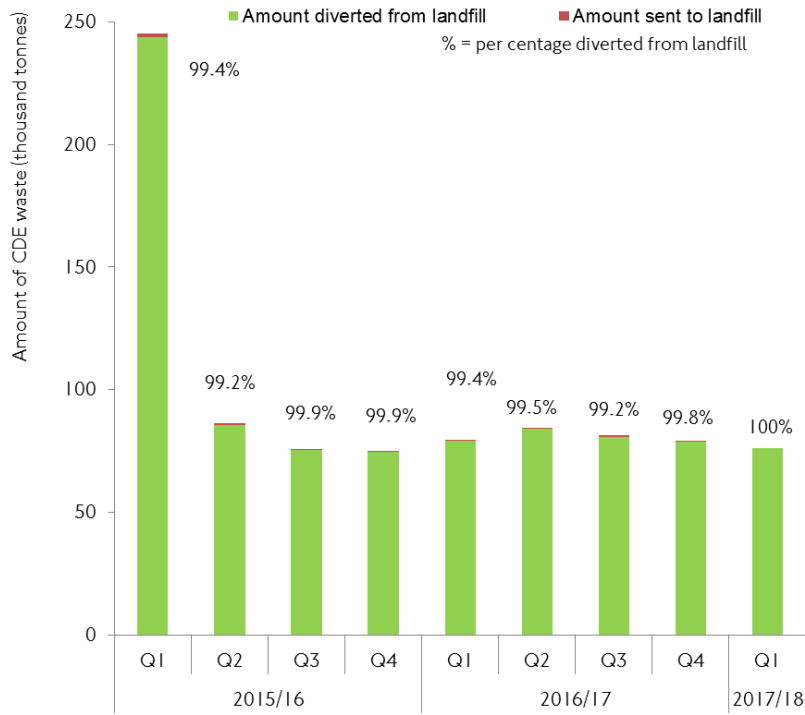
London Underground commercial and industrial waste Q1 2015/16
 – Q1 2017/18.

Above: figure 20. London Underground construction, demolition and excavation waste Q1 2015/16 – Q4 2016/17.

Waste management within Surface Transport

Surface Transport commercial and industrial waste data for Q1 2016/17 to Q1 2017/18 year is shown. Historic data is not available.

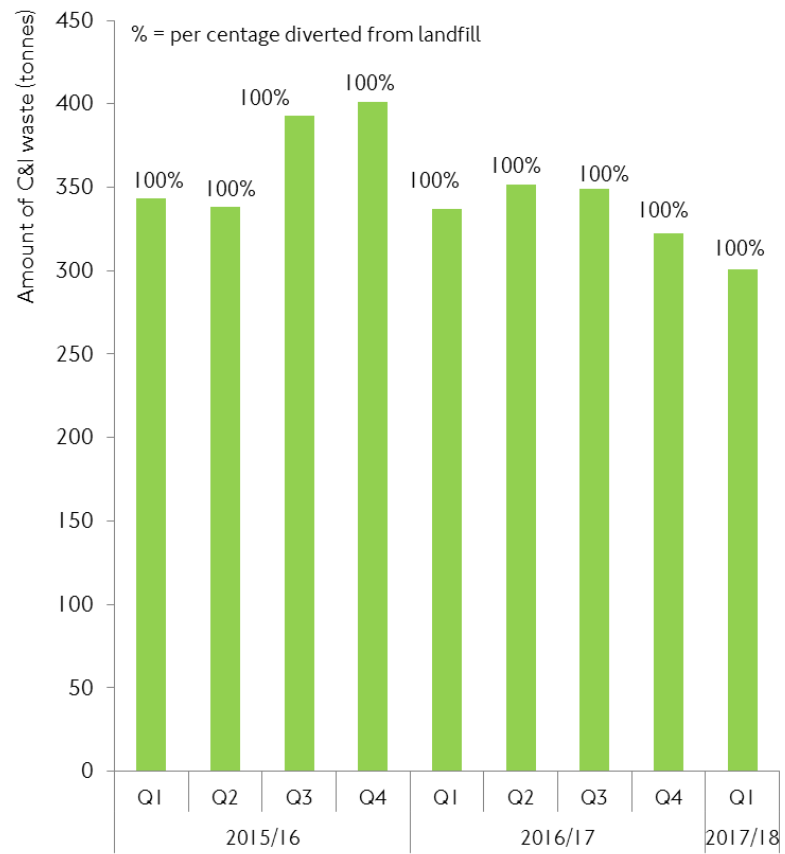




Above: figure 21. Surface Transport commercial and industrial waste Q1 – Q4 2016/17.

Above: figure 22. Surface Transport construction, demolition and excavation waste Q1 2015/16 – Q1 2017/18.

Waste management within Head Office buildings



Above: figure 23. Head Office buildings commercial and industrial waste Q1 2015/16 – Q1 2017/18.

