

Board



Date: 15 December 2016

Item: TfL Health, Safety and Environment Annual Report 2015/16

This paper will be considered in public

1 Executive Summary

Decision required	Approval of the publication of the TfL Health, Safety and Environment Annual Report 2015/16.
Previous Consideration	On 17 November 2016, the Safety, Sustainability and Human Resources Panel endorsed the submission of the report to the Board.
Sponsoring Director	Contact Officer: Jill Collis, Director of Health, Safety and Environment Number: 020 3054 8158 Email: jill.collis@tube.tfl.gov.uk
Information classification	Public.
Summary	
<p>1.1 The TfL Health, Safety and Environment (HSE) Annual Report describes the HSE performance across all of the TfL businesses. Generally, the report covers the financial year from 1 April 2015 to 31 March 2016. However, the road safety data for Greater London and the Transport for London Road Network (TLRN) covers the calendar year from January to December 2015.</p> <p>1.2 The safety data includes customer, employee and supplier details. Health data relates to employee wellbeing and includes employee sickness absence, but does not cover contractor or customer health issues. Environment data covers London's public transport operations, including taxis and private hire vehicles, plus the activities we and our suppliers undertake.</p> <p>Safety, Sustainability and Human Resources Panel Considerations</p> <p>1.3 The Panel considered an earlier draft of the Annual Report and supported its submission to the Board, noting that some changes were proposed and the Commissioner's foreword was to be added.</p>	

2 Recommendation

- 2.1 **The Board is asked to approve the publication of the TfL Health, Safety and Environment Annual Report 2015/16.**

List of appendices to this report:

Appendix 1: TfL Health, Safety and Environment Annual Report 2015/16

List of Background Papers:

None

Health, Safety and Environment report

2015/16 – Draft 07

MAYOR OF LONDON



**TRANSPORT
FOR LONDON**
EVERY JOURNEY MATTERS

About Transport for London (TfL)

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

As a core element in the Mayor's overall plan for London, our purpose is to keep London moving, working and growing, and to make life in our city better. We reinvest all of our income to run and improve London's transport services and to make it more modern and affordable for everyone.

Our operational responsibilities include London Underground, London Buses, Docklands Light Railway (DLR), London Overground, TfL Rail, London Trams, London River Services, London Dial-a-Ride, Victoria Coach Station, Santander Cycles and the Emirates Air Line.

On the roads, we regulate taxis and the private hire trade, run the Congestion Charging scheme, manage the city's 580km red route network, operate all of the Capital's 6,300 traffic signals and work to ensure a safe environment for all road users.

We are delivering one of the world's largest programmes of transport capital investment, which is building the Elizabeth line, modernising Tube services and stations, transforming the road network and making it safer, especially for more vulnerable road users, such as pedestrians and cyclists.

We work hard to make journeys easier through effective use of technology and data. We provide modern ways to pay through Oyster and contactless payment cards and provide information in a wide range of formats to help people move around London.

Real-time travel information is provided directly by us and through third party organisations, which use the data we make openly and freely available to power apps and other services.

We listen to, and act upon, feedback and complaints to constantly improve our services and work with communities, representative groups, businesses and many other stakeholders to shape transport provision in London.

Improving and expanding transport in London is central to driving economic growth, jobs and housing throughout the United Kingdom. Under the Mayor's housing strategy, we are using our surplus land to provide thousands of new, affordable homes. Our own supply chain creates tens of thousands of jobs and apprenticeships across the country.

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About this report

Generally, the report covers the financial year from 1 April 2015 to 31 March 2016. However, the road safety data for Greater London and the Transport for London Road Network (TLRN) covers the calendar year from January to December 2015.

The safety data includes customer, employee and supplier details. Health data relates to employee wellbeing and includes employee sickness absence, but does not cover contractor or customer health issues.

Environment data covers London's public transport operations, including taxis and private hire vehicles, plus the activities we and our suppliers undertake.

Our continual effort to provide more accurate data means that there are some changes to the figures that we reported last year following further checks. Where possible, data is compared over five years and, where appropriate, comparisons have been made with previous years.



Foreword

On 9 November, a tram derailment near Sandilands in Croydon resulted in the tragic deaths of Dane Chinnery, Donald Collett, Robert Huxley, Philip Logan, Dorota Rynkiewicz, Philip Seary and Mark Smith. More than 50 people were injured.

Urgent investigations are under way to find out the cause of what went so terribly wrong and additional safety measures have been put in place on the tram network while that cause is determined. We and tram operator First Group are offering support to the bereaved families and those injured in what is an incredibly difficult time.

The period covered by this report also saw 15 people losing their lives following accidents involving buses, and three people suffered fatal injuries on the London Underground network.

This is why our number one priority every day is doing everything we can to make sure those who use our services are safe. This includes constant improvement of our road and public transport infrastructure, explaining potential hazards on the network and how they can be avoided, and enhanced training for our employees.

We are carrying out a massive investment programme to improve and expand London's transport network. More than 30 million journeys a day take place across the Capital, and this will rise as the city's population grows – from 8.6 million today to 10 million by 2030.

The number of people killed or seriously injured on London's roads is at an all time low but clearly there is so much more to be done. We must work towards removing

all death and serious injury from our roads through improvements to infrastructure and raising awareness of the dangers of travelling too fast, being distracted, carrying out risky manoeuvres, driving under the influence of alcohol or drugs and failing to comply with the laws of the road.

We focus particular attention on those who need the most protection – pedestrians, cyclists and motorcyclists. A high proportion of road deaths involve heavy goods vehicles, so we are working with freight operators and vehicle manufacturers to help stop these and with the Government and regulators to remove dangerous trucks from our streets.

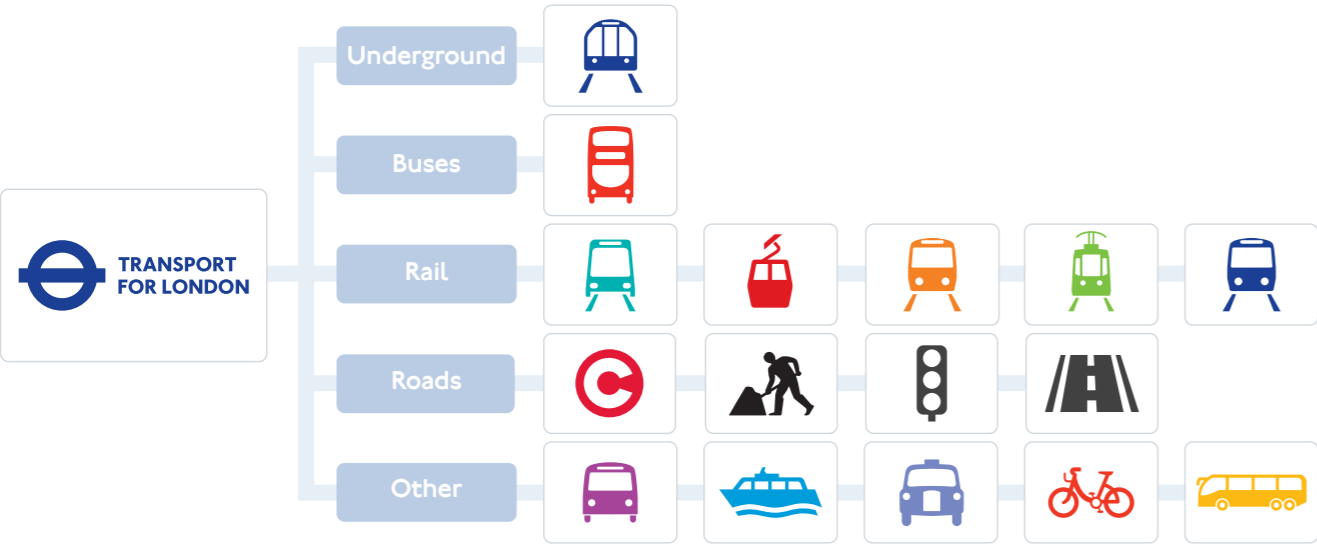
There is a link between poor air quality and public health in London. We have cut carbon dioxide (CO₂) and other damaging pollutants from our services year-on-year, but we must do more. Around 9,400 people die from air quality-related illnesses every year, and this must be reduced. The Mayor has an ambitious plan of action. This includes making our bus fleet cleaner and greener, a massive programme to update more of our older bus fleet to meet latest European emissions standards, and consulting on proposals to introduce the central London Ultra Low Emission Zone in 2019, a year earlier than planned.

London is one of the greatest cities in the world and everyone using or working on our transport network should be able to do so as safely as possible. Delivering our work on health, safety and the environment is our top priority and always will be.

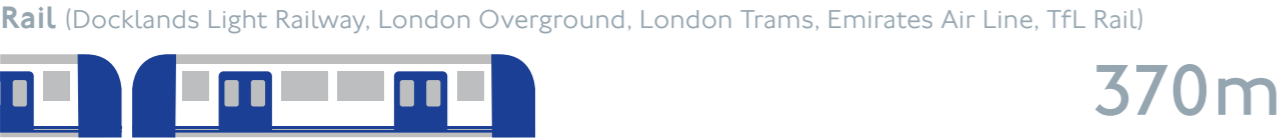
Mike Brown MVO
Commissioner

Our business

How we report on our business



Passenger journeys



* Excluding road journeys and pedestrians

Facts and figures



Underground and Rail

London Underground, London Overground, DLR, London Trams, TfL Rail and Emirates Air Line



Customer safety

Three accidents occurred at London Underground stations this year that led to fatal injury. A passenger at Stockwell station died after bending down to pick something up at the platform edge and was struck by a train; a passenger at Waterloo fell between the platform and train; and another fell down some steps at London Bridge and later died from their injuries. There were no customer fatalities on DLR, the Emirates Air Line, London Overground, London Trams or TfL Rail in 2015/2016.

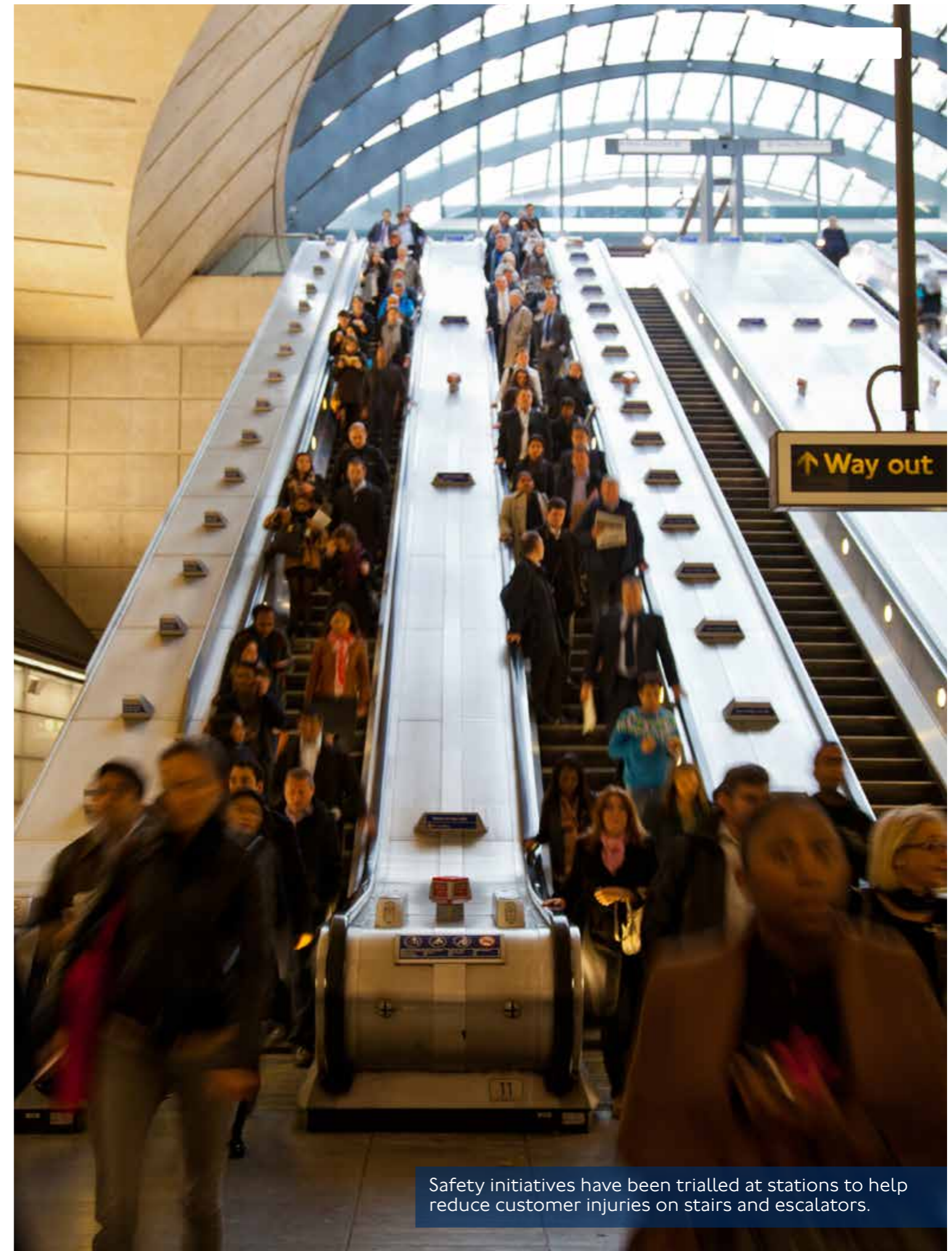
Customer injury: stairs and escalators

Slips, trips and falls on stairs and escalators are the main causes of customer injury. We trialled a number of initiatives on stairs and escalators and identified a number of measures now being introduced to influence customer behaviour to reduce incidents. They include passenger positional footprints, which show people where to place their feet; step riser messages in between steps, highlighted entry/exit points, electronic message signs, messages embedded in handrails, floor vinyls and holograms. All of our physical safety mechanisms are supported with more customer information through posters, announcements and employees are on hand at hotspots.

Customer injury: platform train interface

There has been an increase in the number of incidents between the platform and train on the London Underground network this year. Sixty per cent of incidents resulted from people being caught in the doors as they board or alight trains, while a further 30 per cent resulted from falls between the train and the platform. New trains serve to improve level access by removing the need to step up into the train, however this increased the platform gap at certain locations.

We are committed to providing the safest possible service and have launched a long-term programme looking at measures to reduce incidents, which includes methods of highlighting risks and realigning platforms to reduce or remove the gaps between the train and platform. We are also continuing with awareness campaigns that encourage customers not to rush to catch their service.

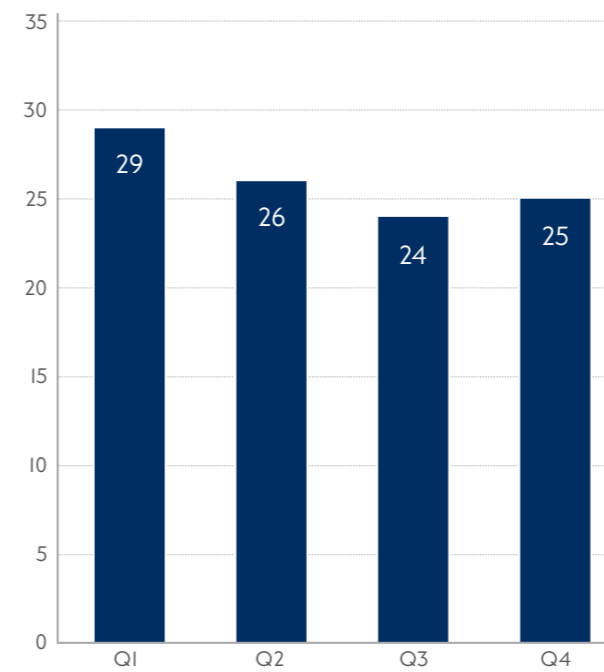


Safety initiatives have been trialled at stations to help reduce customer injuries on stairs and escalators.

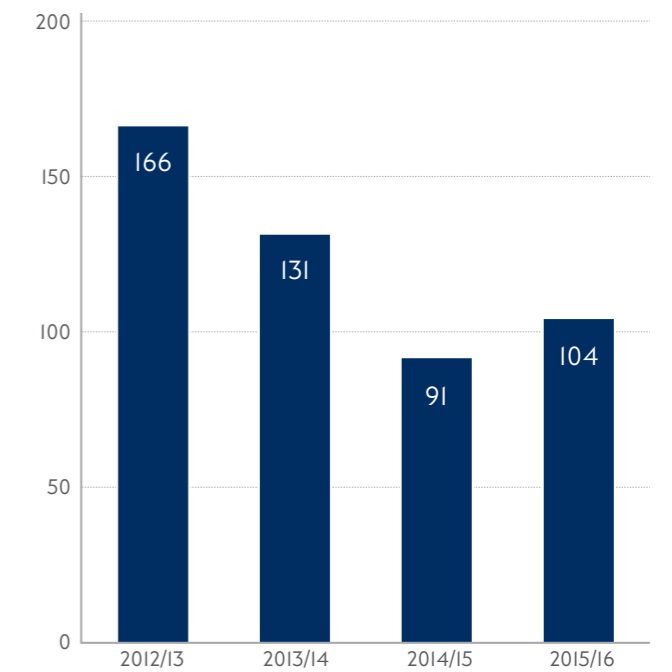


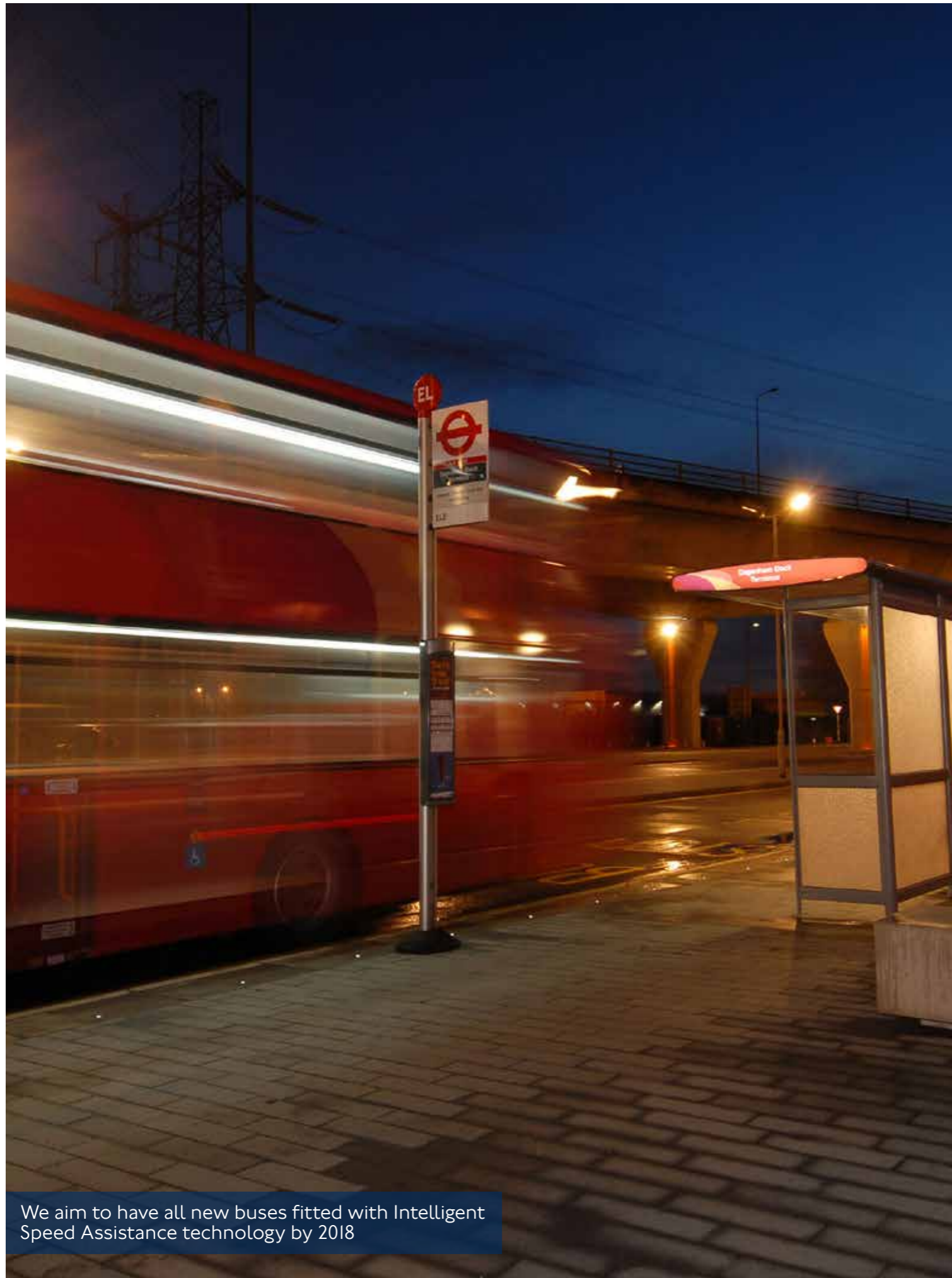
Heron Quays Docklands Light Railway station

Number of statutory reportable injuries to underground and rail customers Quarterly



Number of statutory reportable injuries to underground and rail customers Annually





We aim to have all new buses fitted with Intelligent Speed Assistance technology by 2018

Buses

London Buses 🚌

Customer safety

This year, 15 people suffered fatal injuries following accidents that involved buses. Two fatalities occurred owing to falls on bus services, 11 pedestrians died after collisions with buses and two people were fatally injured as a result of collisions between buses and other road vehicles.

As in London Underground, slips, trips and falls continue to be the main causes of customer injury. This year we trialled the use of Intelligent Speed Assistance (ISA) technology, which has successfully prevented vehicles operating beyond speed limits in a variety of road environments with different speed limits. By controlling speed, we will provide a smoother journey and reduce the number of falls. We intend that all new buses have this technology fitted from 2018.

We will also continue with campaigns to encourage customers to stay safe by holding on to the rails while travelling and taking care when getting on and off services.

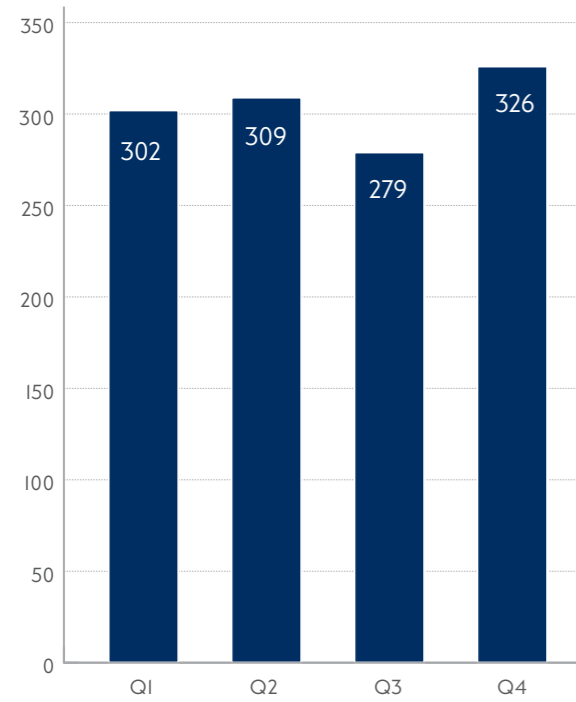
Bus network safety strategy

We are committed to making the network safer, and in February launched a major initiative to boost bus safety that contributes towards meeting our goal of halving the number of people killed or seriously injured on the Capital's roads by 2020. The programme involves:

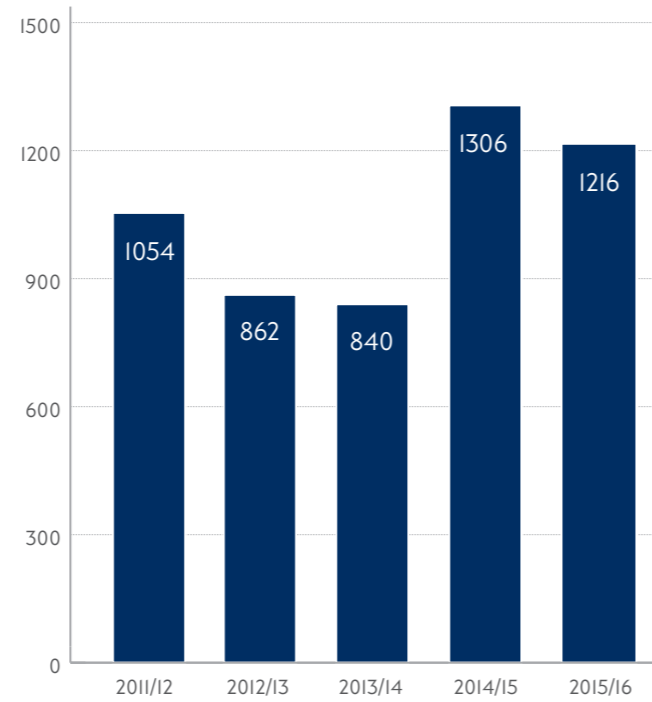
- Developing a world leading bus safety standard for London
- Updating our bus contracts system to include enhanced road safety performance indicators
- Publishing additional bus collision data and making it more accessible
- Providing greater transparency on bus collision investigations

The programme also included 'In The Zone' hazard perception training for bus drivers which raises awareness of the risks taken when on the road, whether as a driver or as a vulnerable road user such as a pedestrian, cyclist or motorcyclist. It helps drivers anticipate and avoid potential hazards and all 25,000 drivers have now been trained.

Customers hospitalised through injury
Quarterly



Customers hospitalised through injury
Annually



Our work with Sarah Hope

We introduced a helpline service in March that ensures support is available to anyone involved in a life-changing incident on the transport network, including witnesses and close family members. Sarah Hope was involved in a life-changing incident in 2007 and her story is the inspiration behind this service. The Sarah Hope Line offers access to a range of practical and emotional help, including helping with travel, accommodation and other needs following an incident, and referral to a number of support services including counselling.



Sarah Hope at the launch of her accident support help line

Other operations

London Dial-a-Ride (DaR), London River Services (LRS), Taxi & Private Hire (TPH), Santander Cycles, Victoria Coach Station (VCS) and other



Using enforcement to protect public safety: Operation Neon

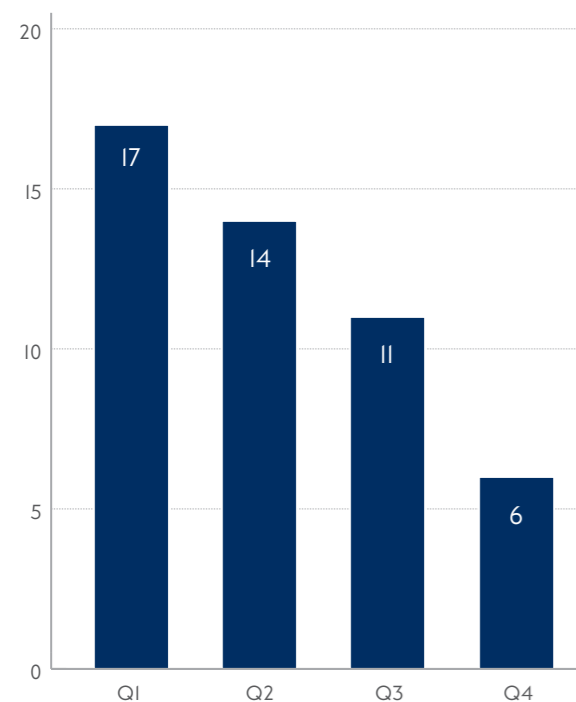
We launched Operation Neon in May 2015, which aims to tackle touting and illegal minicab activity. This highly visible, multi-agency operation involves our enforcement and compliance officers and those that we fund in the Metropolitan Police Roads and Transport Policing Command, and local authority parking attendants. Initial indications show it is effectively dealing with many of the issues identified by the trade and is keeping roads

and ranks clear so that the legitimate, law abiding trades can operate.

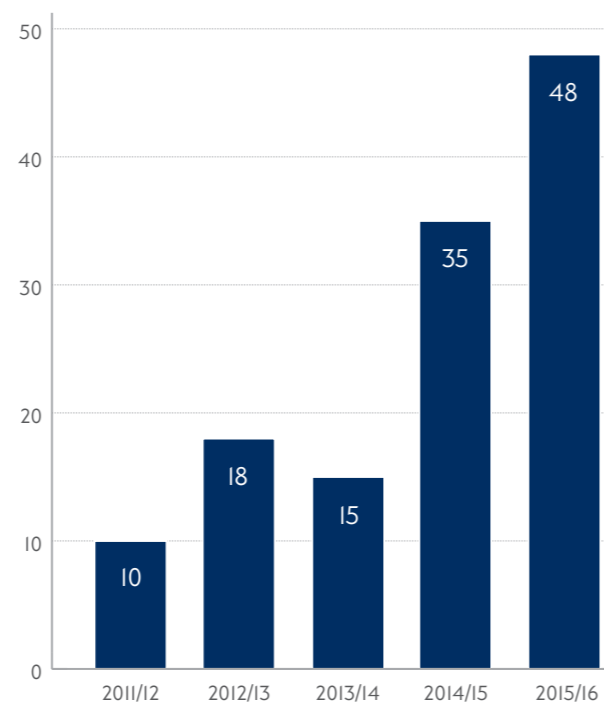
Cycle hire safety

All 11,500 Santander Cycles will be fitted with Blaze Laserlights after a successful trial with overwhelmingly positive feedback and strong independent test results. The lights provide a bigger, brighter presence on the road and early warning of a cyclist's proximity. Santander UK will contribute 90 per cent of the funding for the lights.

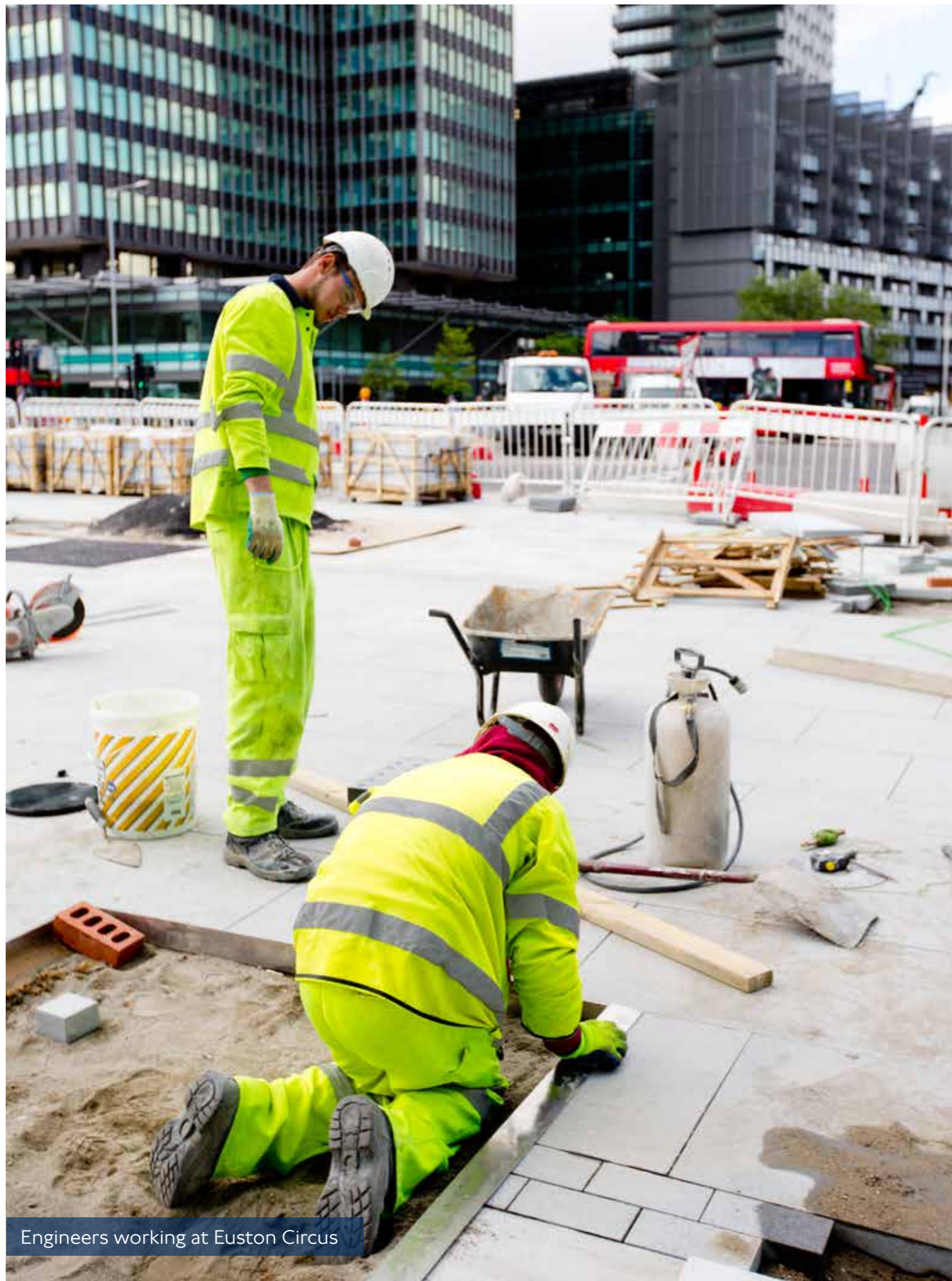
Customers hospitalised through injury Quarterly



Customers hospitalised through injury Annually



Santander ambassador and Olympian Jessica Ennis-Hill CBE rides a Santander Cycles bike fitted with a Blaze Laserlight



Engineers working at Euston Circus

Safety of our suppliers

Construction supplier safety

Important safety requirements and considerations are built into our contractor selection processes, with emphasis on developing a consistent set of standards across the supply chain. Construction activity risks are monitored and we help organise safety networking events that aim to foster an environment for suppliers to share good practice and enhance the supply chain's performance.

Our safety support teams are continuing to develop further the tools to support good HSE management standards. We have made improvements to contractor incident reporting processes and the supplier performance assessment tool to ensure effective monitoring. Making sure our contractors and supply chain continue to achieve high standards of safety management will be a main focus as our investment programme continues.

Diesel fuel substitute

We have begun trialling a diesel fuel substitute in order to reduce occupational health risks (and associated pollution) where we use diesel plant and equipment. This supports the Mayor of London's Air Quality Strategy, reducing carbon dioxide (CO₂) and carbon monoxide emissions (by up to an estimated 70 per cent). The substitute is also non-toxic to water organisms. Trials will continue into 2016/17.

Operational supplier safety

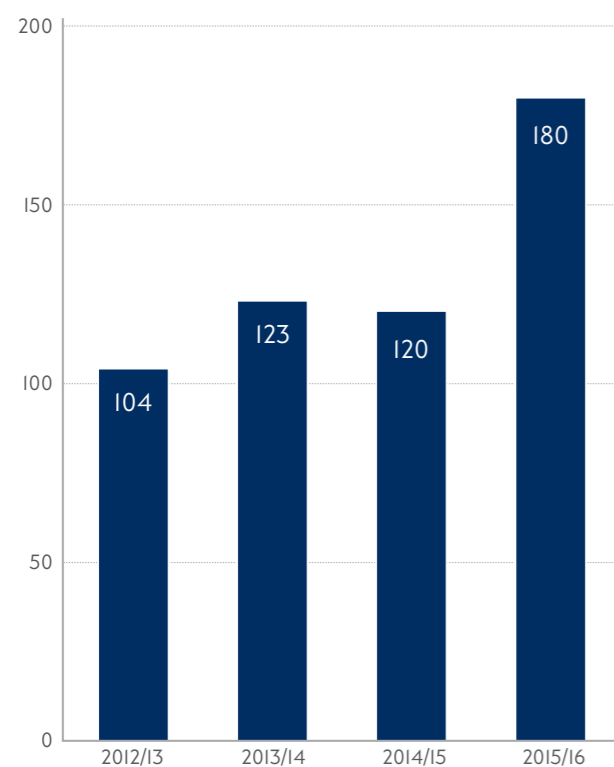
Our operational suppliers are central to our service delivery. In London Rail and Surface Transport, the main customer-facing service is provided by private sector suppliers.

Surface Transport saw a notable rise in supplier injuries resulting in hospital attendance from 97 in 2014/15 to 157 in 2015/16. This rise has been dominated by bus drivers where the significant injuries went up from 58 to 110 in 2015/16, equivalent to five injuries per 1,000 drivers. Road traffic collisions were the main cause of injuries accounting for 57 per cent of incidents. A range of new initiatives are being introduced to reduce these incidents, including the Intelligent Speed Adaptation system and further driver training.

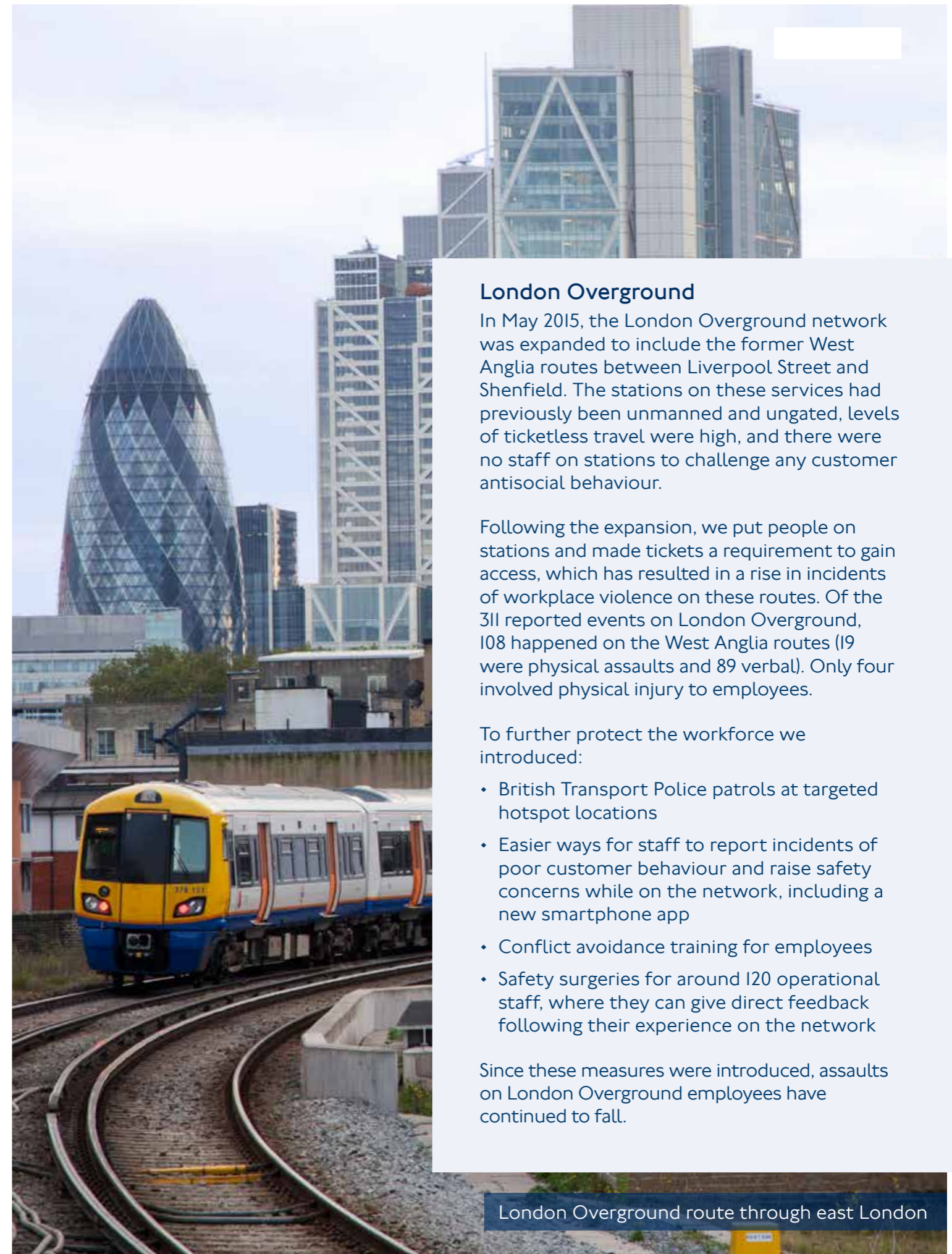
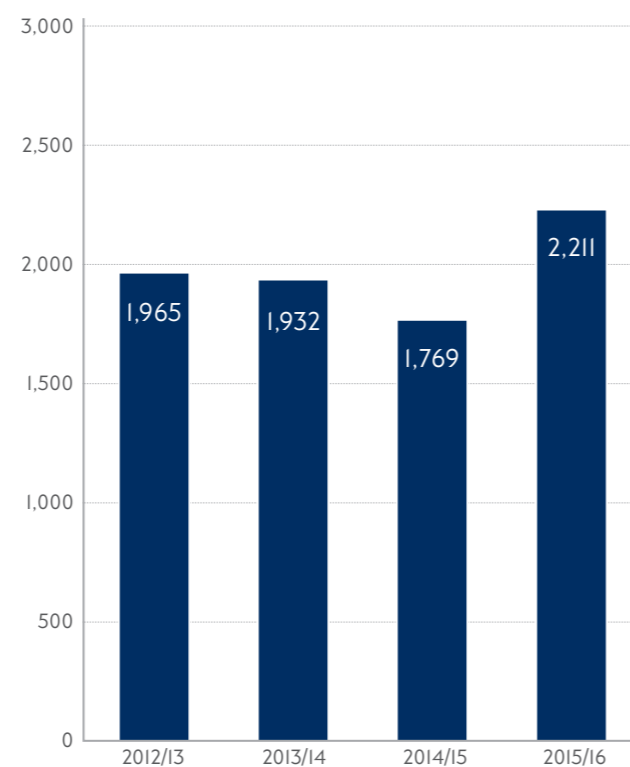
Supplier work-related violence and aggression

Most work-related violence and aggression involving suppliers in London Rail and Surface Transport are towards employees in frontline customer service. Most events tend to be connected with revenue protection and occur while fares are being checked and result in verbal abuse. Incidents involving employees in construction and maintenance remains low. Training of frontline staff in conflict avoidance, and strong management support for employees enables them to deal with such issues effectively.

TfL supplier injuries resulting in hospital attendance
Annually



TfL supplier assaults
Annually



London Overground

In May 2015, the London Overground network was expanded to include the former West Anglia routes between Liverpool Street and Shenfield. The stations on these services had previously been unmanned and ungated, levels of ticketless travel were high, and there were no staff on stations to challenge any customer antisocial behaviour.

Following the expansion, we put people on stations and made tickets a requirement to gain access, which has resulted in a rise in incidents of workplace violence on these routes. Of the 311 reported events on London Overground, 108 happened on the West Anglia routes (19 were physical assaults and 89 verbal). Only four involved physical injury to employees.

To further protect the workforce we introduced:

- British Transport Police patrols at targeted hotspot locations
- Easier ways for staff to report incidents of poor customer behaviour and raise safety concerns while on the network, including a new smartphone app
- Conflict avoidance training for employees
- Safety surgeries for around 120 operational staff, where they can give direct feedback following their experience on the network

Since these measures were introduced, assaults on London Overground employees have continued to fall.

London Overground route through east London



Blackwall Tunnel, east London

Roads

Transport for London Road Network (TLRN)



Road safety

A total of 25,193 collisions occurred in 2015. This resulted in 136 deaths on the road network and 1,956 serious injuries.

While the number of people killed or seriously injured (KSI) in London is now at the lowest level since records began, we continue to make our roads as safe as possible and have set a new target of a 50 per cent reduction in KSIs by 2020.

Throughout the year we delivered a number of road safety projects and programmes as part of the Safe Streets for London Road Safety Action Plan.

Safe roads

After successful trials of 20mph limits on two key routes through the city, they have now been made permanent and there are plans to introduce more across the capital.

Our target to upgrade 400 crossings (10 per cent of crossings in London) with Pedestrian Countdown by April 2016 was exceeded, with more than 523 sites upgraded. The target was subsequently increased by 200 sites and by summer, 600 crossings received the technology. The system works on traffic signals by replacing the 'blackout' period after the green man disappears with a numerical counter that shows how many seconds a pedestrian has to cross the road safely.

Motorcycle safety

The Metropolitan Police Service Motorcycle Safety Team and wider Roads and Transport Policing Command continue to target those boroughs where motorcyclists

are at the greatest risk of injury. Along with tackling incidents such as speeding, careless riding and red light running, they offer road safety advice and information on BikeSafe-London rider skills days.

Two phases of Operation Winchester took place this year, with officers out at hotspots during peak times enforcing the laws of the road to help keep motorcyclists and scooter riders safe. Officers stopped 5,389 riders, issued 742 Traffic Offence Reports, gave 1,335 verbal warnings, seized 96 motorcycles and made 10 arrests.

The TfL Urban Motorcycle Design Handbook was published in March 2016. The guide, for people who design, build and maintain London's roads, provides a better insight of how road and traffic conditions affect this vulnerable road user group.

Safe people

In 2015/16, the number of UK licensed HGV drivers completing TfL's Safe Urban Driving (SUD) course reached 20,000. This programme shows drivers how to share the road safely with others and is the first accredited course in the UK to include an on-road cycle training element. Participants have the opportunity to see the road from the viewpoint of a cyclist and the course can help change attitudes towards cyclists and pedestrians. A further 4,000 drivers will be trained in 2016/17.

TfL's Children's Traffic Club is a free road safety education programme designed for three to four-year-olds and their parents or carers. It promotes valuable road safety skills and sustainable forms of transport such as



Road Safety Awards

In September, we received a public authority award at the European PRAISE Awards for outstanding measures for reducing road deaths and injuries by improving road safety at work. The award reflects our continuing commitment to improving road safety, both in our own fleets and throughout our supply chain, by the use of responsible procurement. We have also been cited as a case study in the European Transport Safety Council publication on managing road risk at work and the Construction Logistics and Cycle Safety Programme won the Prince Michael International Road safety award in November, for outstanding contribution to road safety.

The Safer Lorry Scheme aims to radically improve cyclist and pedestrian safety

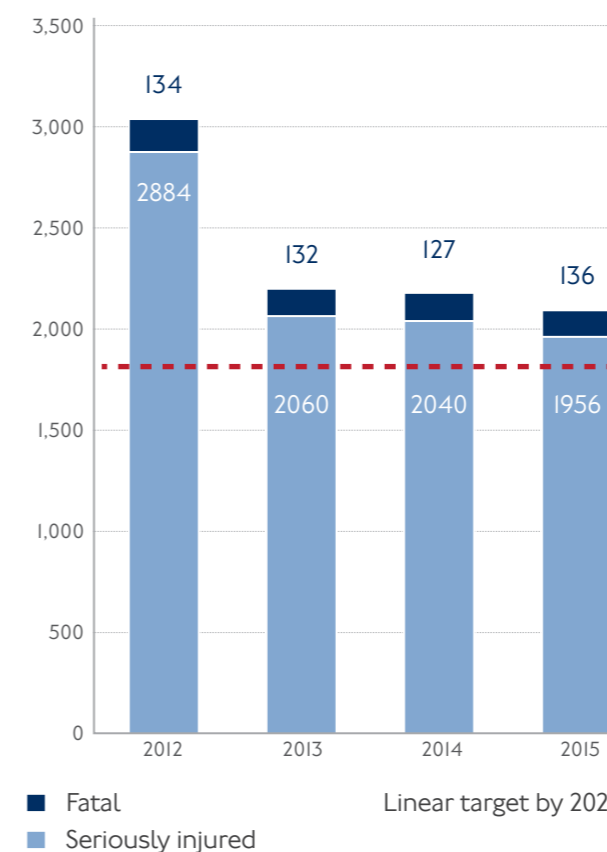
walking, scooting and cycling. The scheme has seen 66,542 children join from the 33 London boroughs that have registered. We aim to target 100,000 by the end of the school year in 2016.

During 2015, we celebrated reaching almost half of all London schools with our STARS (Sustainable Travel: Active, Responsible, Safe) scheme. A total of 1,475 schools are now participating in this accreditation programme that encourages children, parents and teachers to adopt more sustainable and safer ways of travelling to school.

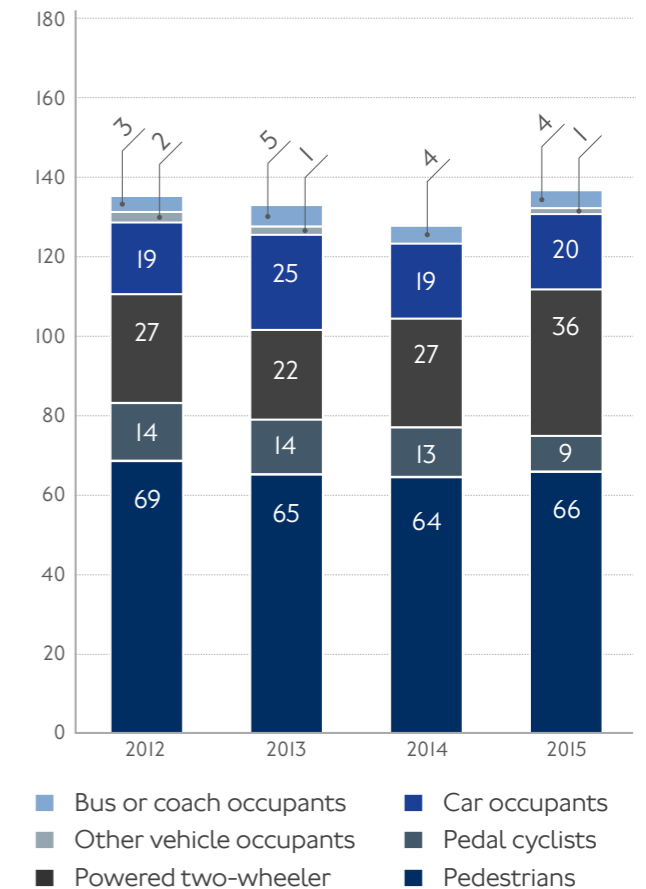
Safe vehicles

The Safer Lorry Scheme launched in September 2015 to improve the safety of cyclists and pedestrians. It requires every vehicle in London weighing more than 3.5 tonnes (with a small number of exemptions) to be fitted with side guards, to protect cyclists from being dragged under the wheels in the event of a collision. It also requires the vehicles to have mirrors that give the driver a better view of cyclists and pedestrians around their vehicles.

Killed and seriously injured road users Annually



Fatalities by vulnerable road user group Annually



TfL workforce safety, health and wellbeing

We aim to eliminate occupational illness and create workplaces that protect employees' health and promote wellbeing. We focus on identifying occupational health risks and introduce practices to control exposure, led by our Occupational Health team. Workforce wellbeing has a beneficial effect on safety and productivity as well as TfL families and communities.

Workforce attendance

Overall average employee sickness absence is 9.9 days per employee across TfL and its subsidiaries. Musculoskeletal injury and mental health are the main reasons for absence declared through self-certification and fit notes. Our health improvement activities include measures to address the causes of absence.

Mental health

TfL Mental Health First Aid Volunteers are trained to recognise the signs that someone may be unwell and provide initial help to guide a person towards appropriate professional help. We also set up 'WellMent', a support group for employees who have experience of mental health conditions and wish to help others who do.

Health fairs

Forty-five health fairs were held for employees at different locations across the organisation. The fairs aim to encourage self-health management, with clinicians providing coaching on both physical and mental health, nutrition and medical conditions.

Nutrition

We are in the fourth year of a five-year strategy to reduce obesity across the organisation and help employees maintain a healthy weight. A 12-week weight management booklet has been developed

and two 12-week weight loss programmes have been run with 771 employees taking part. Throughout the year, employees received support via the I-Will website with access to videos, podcasts, factsheets and training plans that focused on exercise and losing weight.

Step It Up

A series of events were promoted during the third year of our Step It Up programme, which aims to increase employees physical activity levels. The initiative includes an initial fitness assessment and encourages employees to sign up to 150 minutes of exercise each week. This year, 1,099 employees accepted the challenge.

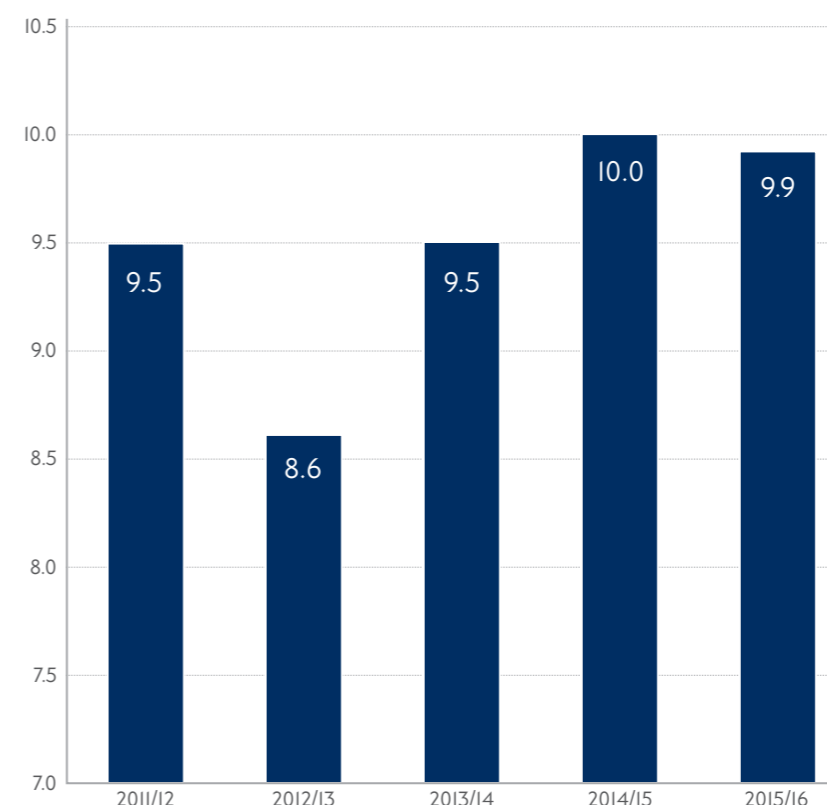
Global Corporate Challenge

A total of 1,001 employees signed up to walk at least 10,000 steps per day for 100 consecutive days. A total of 66 per cent of participants reported lower stress levels either at home or at work and 64 per cent felt that taking part in the challenge had improved their energy levels. As a result, this initiative will be rolled out across the organisation more widely in 2016/17.

Winter health

The flu jab campaign ran between October and December at many operational and office locations. A total of 2,838 vaccinations were given.

Sickness absence rate Annually



Drug and alcohol testing

We take a zero-tolerance approach to drug and alcohol misuse. This is enforced through random unannounced testing. Disciplinary action up to and including dismissal is taken against anyone who is found to be in breach of our drugs and alcohol policy. This year we conducted 894 screenings, meeting our target to test five per cent of our safety critical workplace. There were 12 failures.

TfL workforce safety

We want all of our employees to return home safe and healthy every day and are committed to creating the safest possible conditions for our employees. Safety risks are continually reviewed and control measures are put in place to ensure our employees work in a safe environment. This is the tenth year without a workforce fatality.

There were 160 workforce statutory reportable injuries this year – fewer than last year – against a backdrop of more hours delivering infrastructure upgrades and services. There is no single reason for this but the figure reflects our continuing efforts to prevent accidents and injuries through local action plans.

Workforce injury: slips, trips and falls

The main causes of an employee requiring time off work are slips, trips and falls resulting in musculoskeletal injury. There were 160 statutory reportable workforce injuries, most of which met the criteria for a statutory report, owing to the injured person taking seven days absence, rather than the nature of the injury¹. Our 'Go Look See' programme is one of a number of initiatives aimed at preventing

reoccurrence. It involves senior managers going to the incident site, discussing the causes with the injured person and the local manager, and agreeing preventative actions.

Work-related violence and aggression

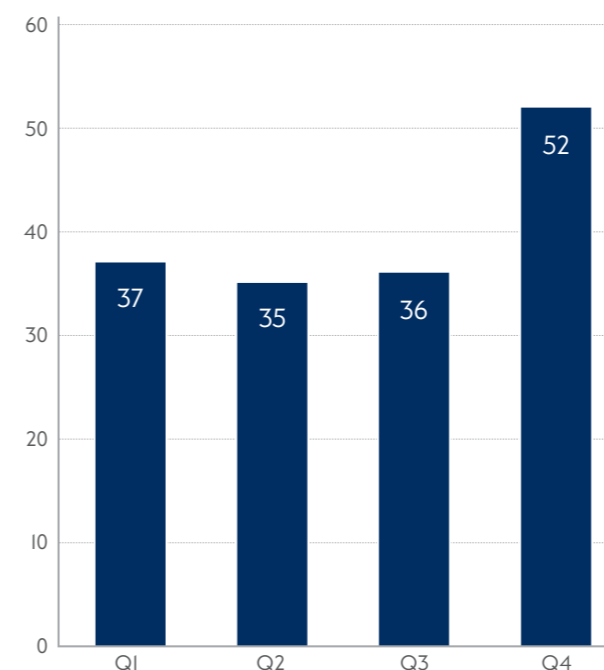
Most incidents of work-related violence are in connection with revenue collection and temporary station closures as part of our congestion control plans.

Our partnerships with the British Transport Police and Metropolitan Police Service continued to focus on targeting hotspots, and supporting investigations and court proceedings. We have rolled out refreshed training to frontline employees and trialled the use of body-worn video cameras to assess the extent to which they deter attacks.

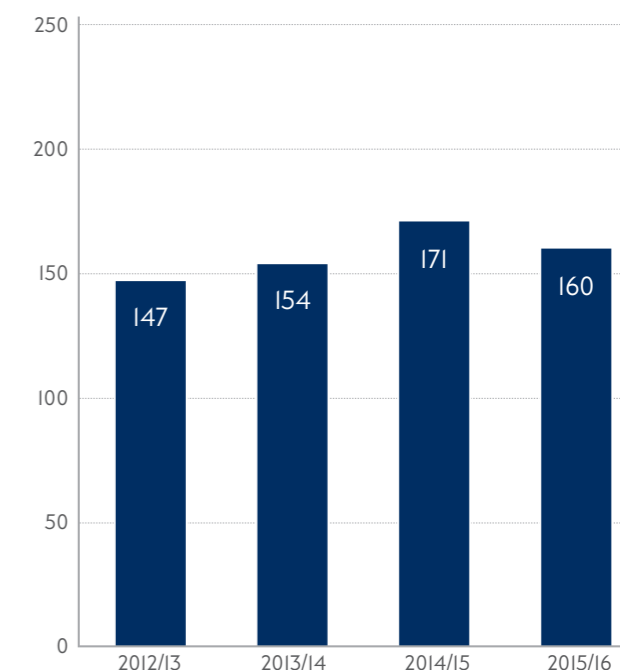
Support for victims

The TfL Workplace Support Team provides practical support to employees and contractors who have been victims of work-related violence. In 2015/16, 436 employees and supplier staff reported assault cases to the police for investigation with sanctions against perpetrators ranging from community orders to prison sentences.

Total number of workforce statutory reportable injuries Quarterly



Total number of workforce statutory reportable injuries Annually



DLR workforce safety engagement programme

'Tea with Safety', or 'Safe-Tea' as it has become known throughout the DLR, was set up in 2015/16. Groups of five to six employees attend these 30-minute sessions to discuss safety issues, supporting the idea that 'safety lives in the business, not in the safety department'. Each session is chaired by a DLR senior manager and the format encourages discussions around personal safety at home and in the workplace, and helps employees think about safety in their day-to-day decision-making.

1. The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) requires employers, and other people in control of work premises, to report and keep records of deaths, injuries, occupational diseases and dangerous occurrences. Not all accidents need to be reported, a RIDDOR report is only required when the accident is work related and results in an injury type which is reportable. Additionally, an accident resulting in employee absence or where they are unable to perform their normal work duties for more than seven consecutive days is also reportable.

Environment

This report details the environmental impacts of our directly managed activities and operations. Such as transport services, projects, maintenance and office functions.

Environmental accreditations

In April 2015 we successfully retained our Carbon Trust Standard accreditation for continual year-on-year carbon emission improvements. For the first time, we additionally achieved accreditation for water management, while our waste management processes were also audited. We are looking to achieve triple Carbon Trust Standard accreditation at our next audit in 2017.

CO₂ emissions and energy use

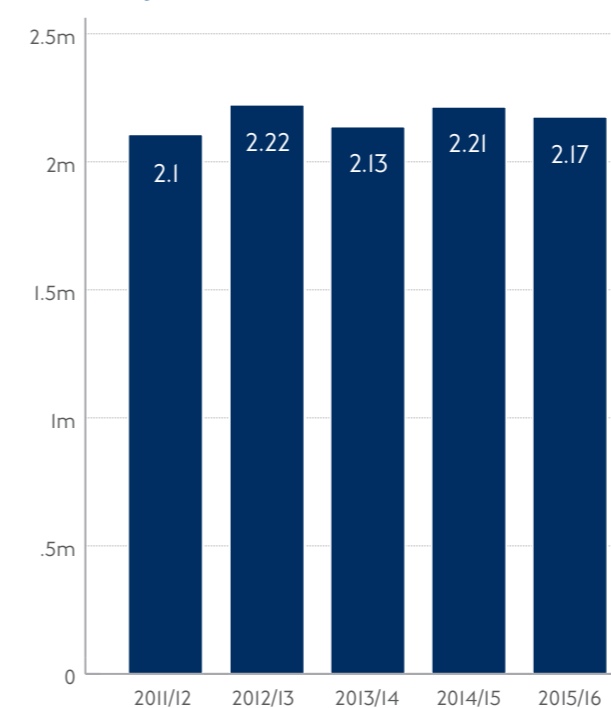
Our carbon dioxide (CO₂) emissions come from the fuel used to run buses and other vehicles, electricity to power trains and trams, and the energy supplied to our buildings. Electricity use in 2015/16 rose by 4.3 per cent to 1.727m kWh. This is due to our continuing major programme of investment in network capacity, reliability and frequency improvements. Total CO₂ emissions associated with our activities was 2.17 million tonnes compared with 2.2 million tonnes in 2014/15 – a 1.5 per cent decrease. This is largely due to a reduction in carbon intensity of our supply from National Grid.

A greener city

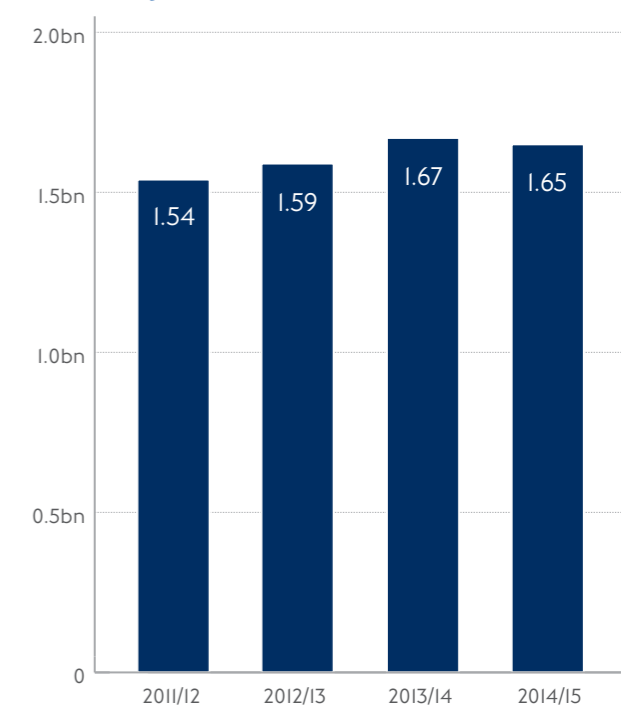
We are introducing more green infrastructure to help improve air quality and improve bio-diversity. This year we have built a new concrete retaining structure incorporating a 200-metre green wall along the A406 North Circular at Golders Green. It has allowed us to re-open the footpath and improve access and safety for the public in the area. More than 10 plant species have been specially chosen for the green wall, including flowers and evergreens.

In addition, a bee and bug-friendly habitat has been created at Norwood Depot using recycled materials. It is helping to increase the diversity and abundance of pollinating insects and is managed by CVU, a member of the London Highway Alliance Contract.

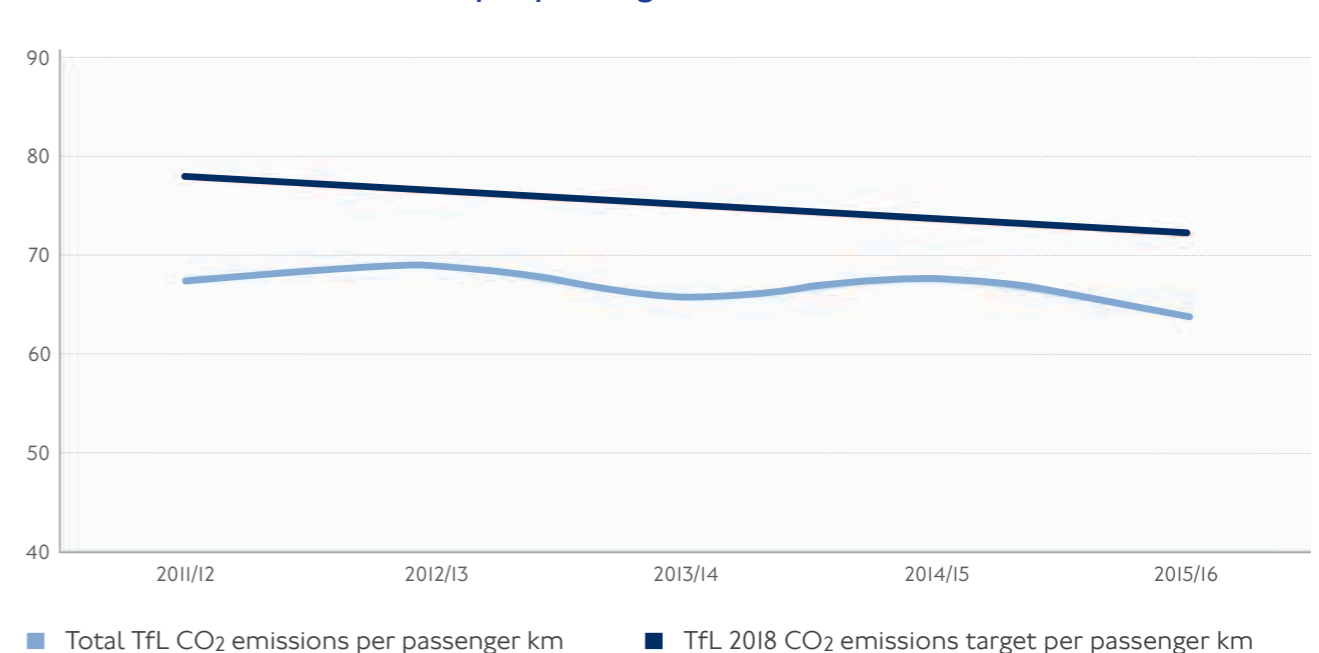
**Total carbon emissions (CO₂e)
Annually**



**Grid electricity usage (kWh)
Annually**

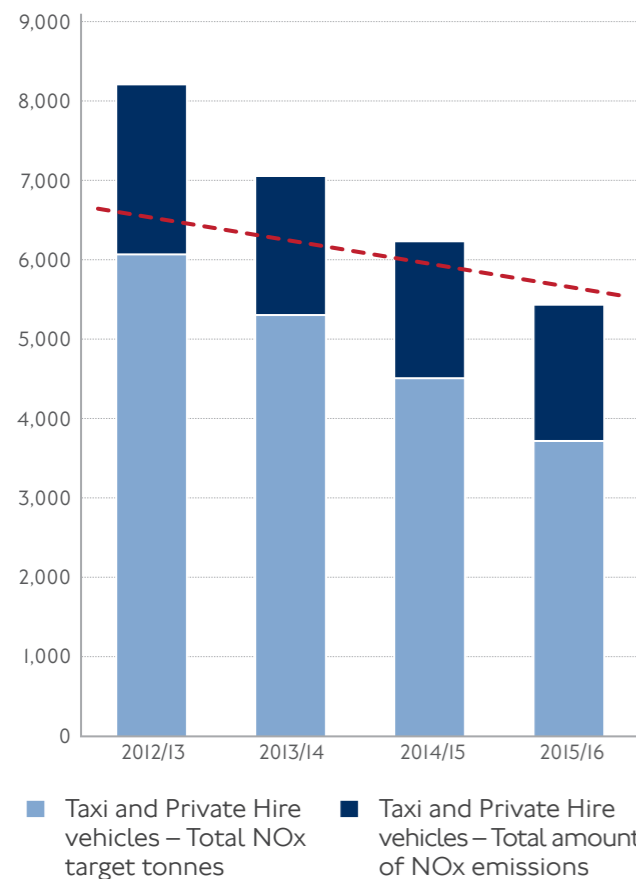


Total carbon emissions (CO₂e) per passenger kilometre

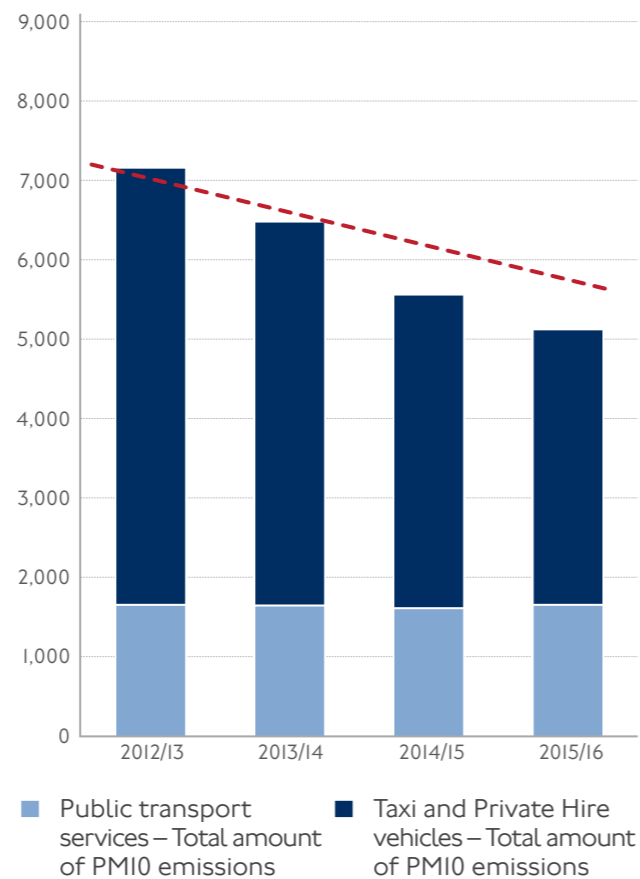


PM₁₀ is particulate matter up to 10 micrometres in size. Nitric oxide (NO) and nitrogen dioxide (NO₂) are together referred to as oxides of nitrogen (NO_x). CO₂e is carbon dioxide equivalent - the standard unit for measuring carbon footprints. It expresses the impact of each different greenhouse gas compared to the amount of carbon dioxide that would cause the same warming effect

NOx emissions (tonnes)



Particulate matter (PM10) emissions (tonnes)



Air quality

We aim to halve total particulate matter (PM10) emissions from our operations by 2017/18, against 2005/06 levels. This applies to our public transport services and the taxi and private hire vehicle fleet. This year we fitted diesel particulate filters to all Euro VI buses and procured higher standard Euro engines in taxi and private hire fleets. Emissions fell from 98 tonnes last year to 91 tonnes.

We aim to reduce nitrogen oxides (NOx) emissions by 40 per cent from our operations by 2017/18 against 2005/06 levels. Total NOx emissions fell 13 per cent from last year to 5,489 tonnes, keeping us on track to meet our target. NOx emissions from buses fell 19 per cent from last year due to retrofitting 2,100 buses with selective catalytic reduction and newer vehicles in the private hire fleet.



Our role in addressing air quality issues

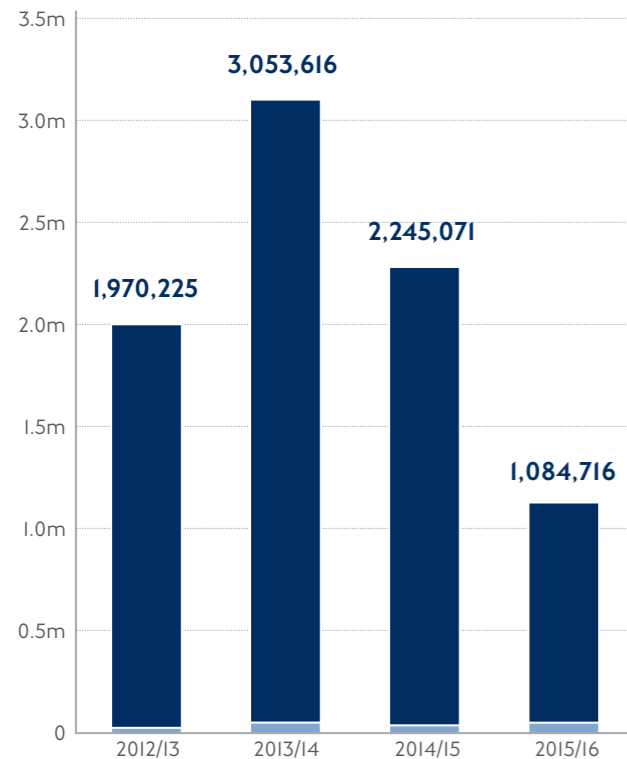
The Ultra Low Emission Vehicle (ULEV) Delivery Plan was launched in July 2015 and sets out how London will grow as a sustainable city and tackle air quality and CO2 challenges. It will also provide the opportunity for the Capital to be at the forefront of a technological revolution in the motor industry.

Part of the plan is the development of the Low Emission Commercial Vehicle Programme, which aims to help fleet operators prepare for the introduction of the Ultra Low Emission Zone.

This year, seven more battery-powered buses joined the two Optare Metro City vehicles already running on route 312 to make it the Capital's first entirely electric route.

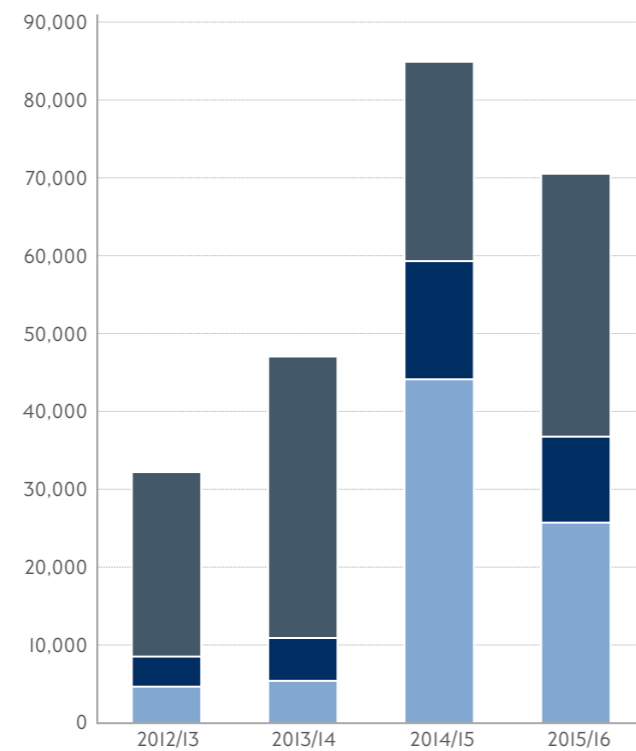
Whitehall with a view of Big Ben

Construction, demolition and excavation (CDE) waste produced (tonnes)



- Amount of CDE waste reused
- Amount of CDE waste sent to landfill

Commercial and industrial (CI) waste produced (tonnes)



- Amount of CI waste recycled
- Amount of CI waste recovered via energy from waste
- Amount of CI waste sent to landfill
- Amount of CI waste reused

Waste management

We produced 1.13 million tonnes of construction, demolition and excavation (CD&E) waste this year compared with 2.75 million tonnes in 2014/15. The amount of CD&E waste fluctuates in line with our investment programme works, but we aim to keep the proportion of reused and recycled waste high and constant. CD&E waste reduced this year as key construction stages on Crossrail, Tottenham Court Road, Bond Street, Overground and trams were completed.

In 2015/16, we collected 70,059 tonnes of waste from our stations, maintenance depots and buildings and 48 per cent of it was recycled. Legislation introduced last year, together with a recycling facility code of practice, means facilities will no longer accept mixed recycling contaminated with food waste. This means that much less waste from around the transport network can be recycled. However, we are still on track to achieve our target of 99 per cent waste diverted from landfill by 2031.

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