

TRANSPORT FOR LONDON

BOARD

SUBJECT: TfL HEALTH, SAFETY AND ENVIRONMENT REPORT 2010/11

DATE: 21 SEPTEMBER 2011

1 PURPOSE AND DECISION REQUIRED

- 1.1 The purpose of the TfL Health, Safety and Environment Report 2010/11 ('the report') is to inform the Board of TfL's health, safety and environment (HSE) performance during 2010/11. The Board is asked to note the report.

2 BACKGROUND

- 2.1 TfL made the decision to produce an integrated HSE report this year so as to reflect wider TfL efforts to consolidate its reporting and to drive efficiencies across the organisation.
- 2.2 Covering the financial year ending 31 March 2011, the report provides a review of TfL's HSE performance focusing on those issues that have the greatest alignment to the organisation's strategic objectives and outcomes. The report is attached as Appendix 1.
- 2.3 The report was produced by Group HSE, based on information provided by TfL's business areas and is produced according to government guidelines on good practice reporting for organisations.
- 2.4 Health and safety performance data covers employee safety, customer safety, contractor safety and staff sickness absence. Road safety data for Greater London and the Transport for London Road Network, from January to December 2010, is also provided in the report.
- 2.5 The report includes environmental performance data from London's public transport operations, including taxis and private hire vehicles, and the support services run by TfL and its main contractors. Performance is assessed against Group-wide environment targets, which were set in those areas where TfL considers it has the largest environmental impact. These are carbon dioxide emissions, air pollutant emissions and waste and recycling. Targets are set for 2017/18 against a 2005/06 baseline and were developed through the aggregation of a series of forecasts from the businesses.
- 2.6 The environmental impact of privately-owned vehicles falls outside the scope of the report. TfL publishes this material in its Travel in London Report, which takes a broader look at the environmental impact of transport in the Capital as a whole and summarises trends and progress in relation to the implementation of the Mayor's Transport Strategy.
- 2.7 The report has been reviewed by the GLA and the Safety, Health and Environment Assurance Committee (SHEAC) prior to its submission to the Board. The SHEAC

Advisers commended the integrated and succinct approach of the Report, which represents good practice. They concluded that the report indicates both substantial commitment to HSE throughout TfL and a generally good performance.

- 2.8 Following discussions at SHEAC, TfL has agreed to further consider developing leading indicators for health and safety performance. SHEAC also asked if the air pollution emissions figures can be presented normalised by passenger km. This analysis can be done using Travel in London figures due in the autumn, so the report will be updated in due course.
- 2.9 The SHEAC Advisers recommended that TfL undertakes more pro-active communication of the report with Non-Governmental Organisations (NGOs) and transport interest groups in addition to publishing the report on its web site and this will be done.

3 RECOMMENDATION

- 3.1 The Board is asked to NOTE the TfL HSE Report 2010/11.

4 CONTACT

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Transport for London

Health, safety and environment report 2011



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Message from the Commissioner



The Mayor has a clear and compelling vision for the future of London's transport and Transport for London (TfL) is delivering it.

We also recognise the importance of delivering the Mayor's vision sustainably. This means that we must operate all aspects of our business so that they benefit our customers, users, employees, London's communities and the environment.

With record numbers of people using our services, their health and safety remains our priority. We have continued our relentless drive for improved results and I am pleased to announce that this year there were no accidental customer fatalities and that the customer major injury rate has decreased significantly over the last five years.

A huge amount of work has been done to improve the Capital's transport system to meet the needs of our growing city. The Tube upgrades and the construction of Crossrail continued at pace while keeping their environmental impact to a minimum. The success of our approach has seen us meet our challenging construction and demolition waste recycling target ahead of schedule.

We have continued to deliver transport improvements to meet future demand.

The Capital has embraced the Barclays Cycle Hire Scheme and Barclays Cycle Superhighways, revolutionising the way that people now make short trips. Cycling, with all its social, environmental, health and financial benefits, has an important role to play in the future of the Capital.

Road safety in London has improved dramatically since the mid to late 1990s with a remarkable 57 per cent decrease in deaths and serious injuries by the end of 2010. Over the same period there was a 73 per cent reduction in the numbers of children killed or seriously injured.

We are committed to delivering better, cleaner, greener and safer transport services, and this report shows the significant steps we have made in reducing carbon dioxide (CO₂) emissions from our main public transport services. Providing Londoners with an attractive, low emissions alternative to the car will not only help London meet its climate change and air quality targets, it is also driving down costs providing better value for money for fare and tax payers.

London's transport network will play a crucial role in delivering the 2012 Games. We are committed to further delivering the Mayor's transport vision while achieving unparalleled value for money for our customers in a way that protects the environment and improves Londoners' quality of life.

Peter Hendy CBE
Commissioner
TfL

About this report

This year TfL has produced an integrated health, safety and environment (HSE) report for the first time. This is intended to improve the effectiveness of our performance reporting and to focus on our strategic objectives and outcomes in relation to HSE.

Performance data and scope

This report provides an update on the HSE performance across the TfL Group from 1 April 2010 to 31 March 2011. The TfL Group comprises London Underground, Surface Transport, London Rail, Crossrail and Corporate directorates.

TfL's HSE performance is measured through the monitoring of key performance indicators (KPIs), a summary of which is provided on pages 34–40.

Health and safety performance data covers employee safety, customer safety, contractor safety and staff sickness absence.

Road safety data for Greater London and the Transport for London Road Network (TLRN) from January to December 2010 is also provided in this report.

Environmental performance data relates to London's public transport operations, including taxis and private hire vehicles (PHVs), and the support services run by TfL and its main contractors.

All environmental metrics are Group-wide unless otherwise stated and allow for year-on-year comparison where applicable. All figures have been updated to reflect the latest available data and emissions factors¹ and as such they may differ from those reported in previous years.

Some business areas have reported new environmental information for the first time and, through improvements in reporting, some previously estimated data has been replaced by actual data. Figure 1 provides a summary of the changes affecting the scope of TfL's operations that have occurred to the TfL Group over the reporting year.

TfL is committed to delivering continual improvements and will continue to work towards improving the quality of data reported in this report.

Further information

Information associated with privately owned vehicles falls outside the scope of this report. TfL publishes this material and information on London-wide emissions in its Travel in London report, which looks at trends and progress in relation to the delivery of the Mayor's Transport Strategy.

For more information about TfL's structure, the Business Plan (which sets out funded programmes until 2014–15) and Annual Report, please visit the TfL website, tfl.gov.uk

¹ All environment figures in this report have been rounded to a maximum of three significant figures

Figure 1

Operational changes to TfL in 2010/11

TfL operated more transport services than ever before in 2010/11 and a number of improvements were made to TfL's services over the reporting year that affect the scope of TfL operations and some of the data in this report.

London Underground

- In June 2010, the infrastructure company Tube Lines became a wholly owned subsidiary of TfL
- A total of 23 new trains came into service on the Victoria line and new air-conditioned trains began running on the Metropolitan line
- Work progressed on major congestion relief projects at Bond Street and Tottenham Court Road in support of Crossrail

Crossrail

- Works, including enabling works such as utility diversions, continued at Canary Wharf station
- Demolition of buildings for the Bond Street, Tottenham Court Road and Farringdon station ticket halls and for the Royal Oak portal were carried out

- The construction of the western tunnel portal at Royal Oak and the eastern tunnel portal at Pudding Mill Lane started
- Work was carried out at Whitechapel to build a deck over the East London line to facilitate construction of the Crossrail Whitechapel station

Head offices

- The whole of the head office building Palestra came under TfL control as the London Development Agency was scaled down

Docklands Light Railway

- Engineering works continued on the Docklands Light Railway to allow three-car trains to be introduced. These longer trains have been running between Bank and Lewisham since April 2010, and between Stratford and Lewisham since November 2010

London Overground

- The extension of the East London line between Dalston Junction and West Croydon opened on 23 May 2010. The new line has a fleet of 20 new air-conditioned trains, four new, bright, fully accessible stations and 18 refurbished stations with upgraded systems

Health, safety and environment management in TfL

An HSE Policy Statement was first adopted in 2004 and since then has been regularly reviewed. The statement defines the guiding principles by which TfL conducts its business and also ensures it complies with legislative requirements. The TfL Board, Commissioner and Managing Directors are committed to having HSE performance that they are proud of.

HSE management

Managing Directors are responsible for setting and delivering the implementation of HSE specific objectives for their business area. HSE directors regularly meet to provide strategic coordination on HSE matters and there is a TfL-wide group of environmental managers that coordinates and aligns environmental activities.

Status of health, safety and environment management systems

TfL has a Group health, safety and environment management system (HSEMS) that sets out how its businesses should manage HSE. HSEMSs have been developed for each business area that address their significant activities and provide assurance that HSE is being managed in a focused and systematic manner.

The systems are reviewed at least every three years for their suitability and effectiveness and annual HSE Assurance letters are produced. TfL's HSEMSs are compatible with standards such as the International Organisation for Standardisation Series 14001 and the British Standard series of Occupational Health and Safety Assessments 18001.

Engaging employees

TfL recognises the contribution employees make to the successful management of HSE. Employees are provided with HSE information, instruction, training and supervision when required.

TfL continues to raise employee awareness of environmental issues through its internal environmental behavioural change campaign, Destination Green. This includes a network of more than 230 environmental champions and 200 London Underground station energy champions. Destination Green also brings together the tools needed to enable champions and employees to bring about environmental improvements.

Working with suppliers

TfL is a large purchaser of works, goods and services. Where applicable, TfL requires those who provide works, goods or services to have HSEMSs that are compliant with national or international standards.

TfL is committed to reducing its environmental impact by working with suppliers to ensure that their products and services meet the environmental requirements of the Greater London Authority (GLA) Responsible Procurement Policy and the Mayor's Green Procurement Code.

Monitoring and reporting of performance

Progress against HSE objectives is reported periodically within each business area and to the Safety, Health and Environment Assurance Committee (SHEAC) on a quarterly basis. SHEAC reports to the TfL Board after each meeting.

Each of the business areas has effective internal HSE monitoring systems in place that are proportionate to the risks of its operations. Reporting against HSE KPIs is built into the periodic business management review cycle.

During 2010/11, TfL worked towards its environment targets, which were set in those areas where TfL considers it has the largest environmental impact. These are CO₂ emissions, air pollutants, waste and recycling.

This process of accounting, auditing and reporting material impacts, risks, incidents and trends is a central component in TfL's drive for continual HSE improvement.

Occupational health and wellbeing

Figure 2 presents sickness absence in the business areas for 2010/11. TfL uses sickness absence data to identify key health risks and consider further health interventions.

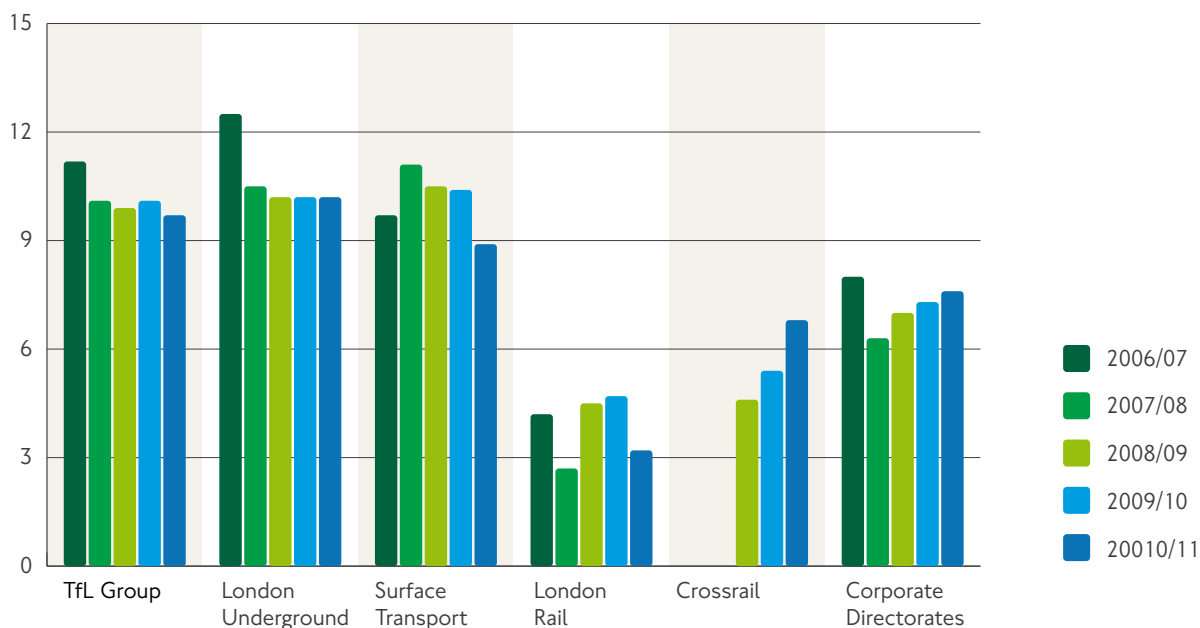
Annual sickness absence across TfL decreased from 10.1 days per full-time equivalent (FTE) in 2009/10 to 9.7 days in 2010/11.

Figure 3 shows the average days lost due to sickness absence per employee by category and business for the year 2010/11.

The three most frequently reported categories of sickness absence across TfL in 2010/11 were musculoskeletal disorders, colds and influenza and mental illness.

A number of health improvement activities were carried out during the year to address healthy lifestyles and the mental health issues of employees.

Figure 2: Average sickness absence per FTE by TfL business (2006/07 – 2010/11)



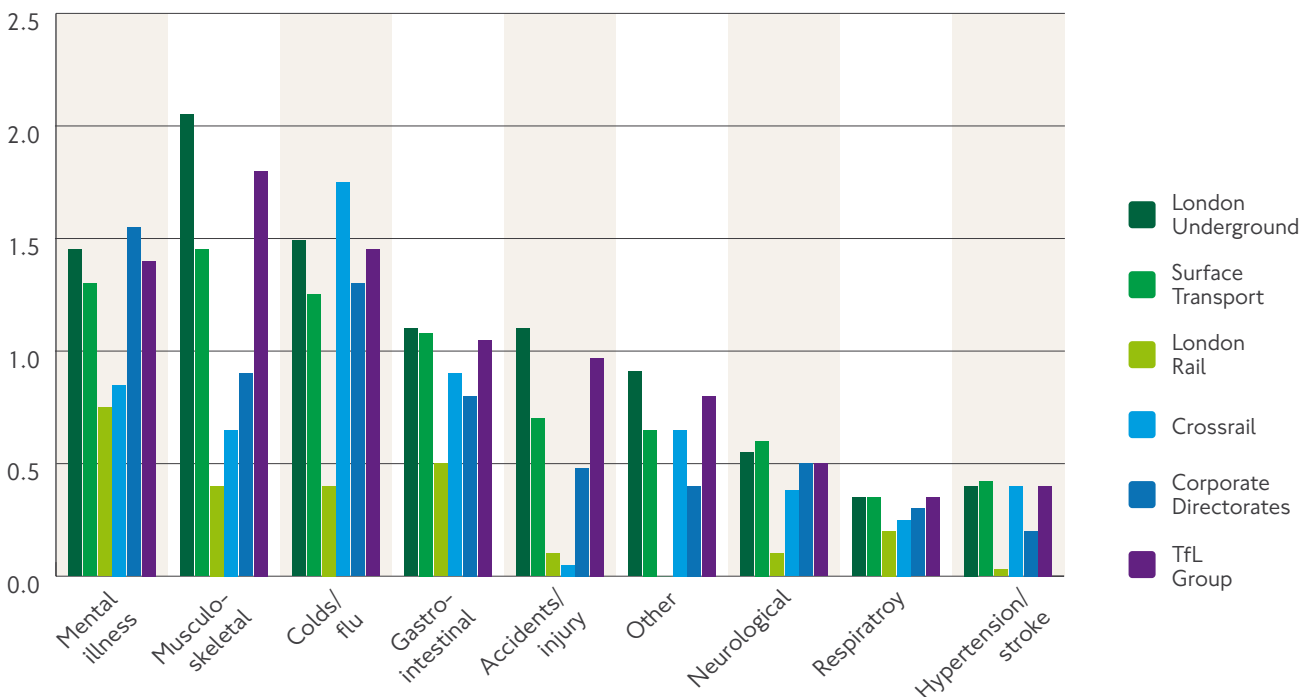
Forty-one health fairs were held in the year. Four of these took place at night – a new initiative to reach the significant group of employees who work night shifts.

The health fairs were attended by 1,995 employees during the year, with 1,135 (58 per cent) attending a health fair for the first time.

Counselling services for employees were improved by the introduction of a third party 24-hour telephone help and advice line.

In 2010/11, Crossrail signed up to ‘Constructing Better Health’ – a national industry scheme responsible for delivering standards for the improvement and management of occupational health in the construction industry. Crossrail has also introduced the requirement for its construction contractors and their subcontractors.

Figure 3: Average days lost due to sickness absence per employee by category and business area 2010/11



Safety

Employee safety

Accidents and assaults are monitored to ensure that adequate controls are in place to minimise workplace risk and injuries. TfL employee major injury and employee assault data are presented for the past five years.

Employee fatalities

There were no employee fatalities in TfL for the fifth consecutive year.

Employee major injuries

Employee major injuries are defined by the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) and must be reported to the Health and Safety Executive or the Office of Rail Regulation (ORR).

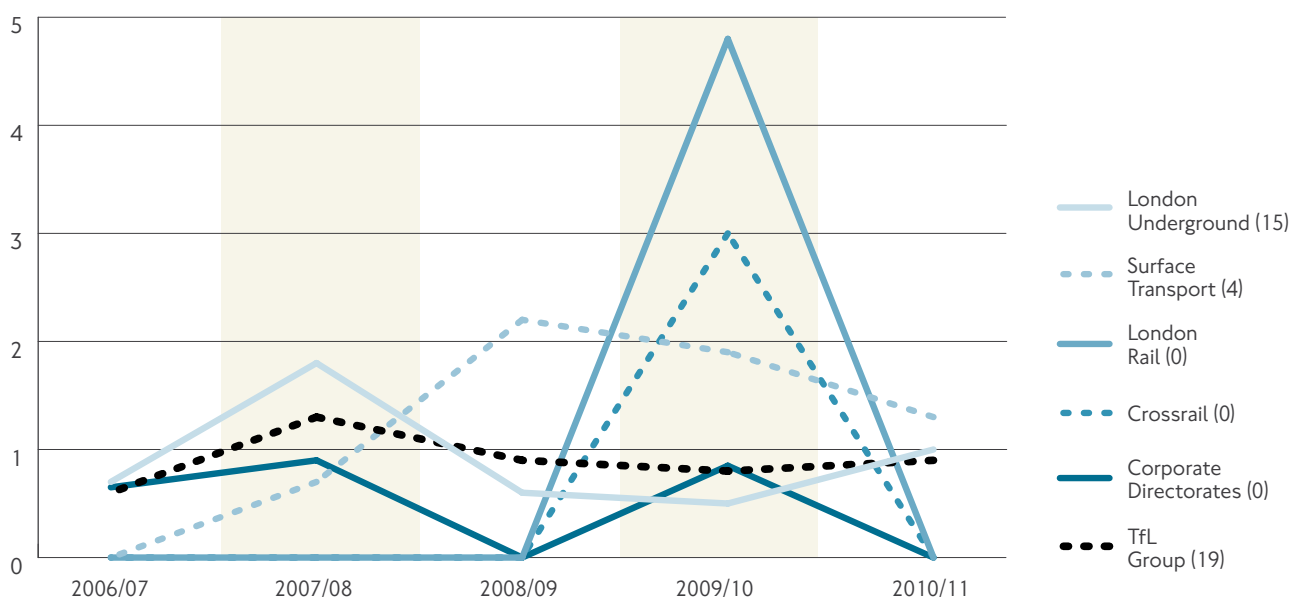
RIDDOR reportable injuries include limb fractures, injuries leading to unconsciousness or admittance to hospital for more than 24 hours.

In 2010/11, there were 19 employee major injuries in TfL, compared with 18 in 2009/10.

TfL's major injury rate for 2010/11 is 0.92 per 1,000 employees (see figure 4). This is higher than the 2009/10 employee major injury rate of 0.78. TfL's major injury rate has averaged 0.87 per 1,000 employees over the past five years.

The most recent major injury rate for the UK Transport sector reported by the Health and Safety Executive is 1.8 per 1,000 employees.

Figure 4: Employee major injury rate (per 1,000 employees)



In London Underground there was an 87.5 per cent increase on last year's employee major injuries from eight in 2009/10 to 15 in 2010/11. This is in part a result of the increased number of employees working on maintenance, projects and upgrades.

In Surface Transport, there was a 43 per cent decrease on last year's employee major injuries from seven in 2009/10 to four in 2010/11.

There were no employee major injuries in London Rail, Crossrail or the Corporate Directorates.

Employee assaults

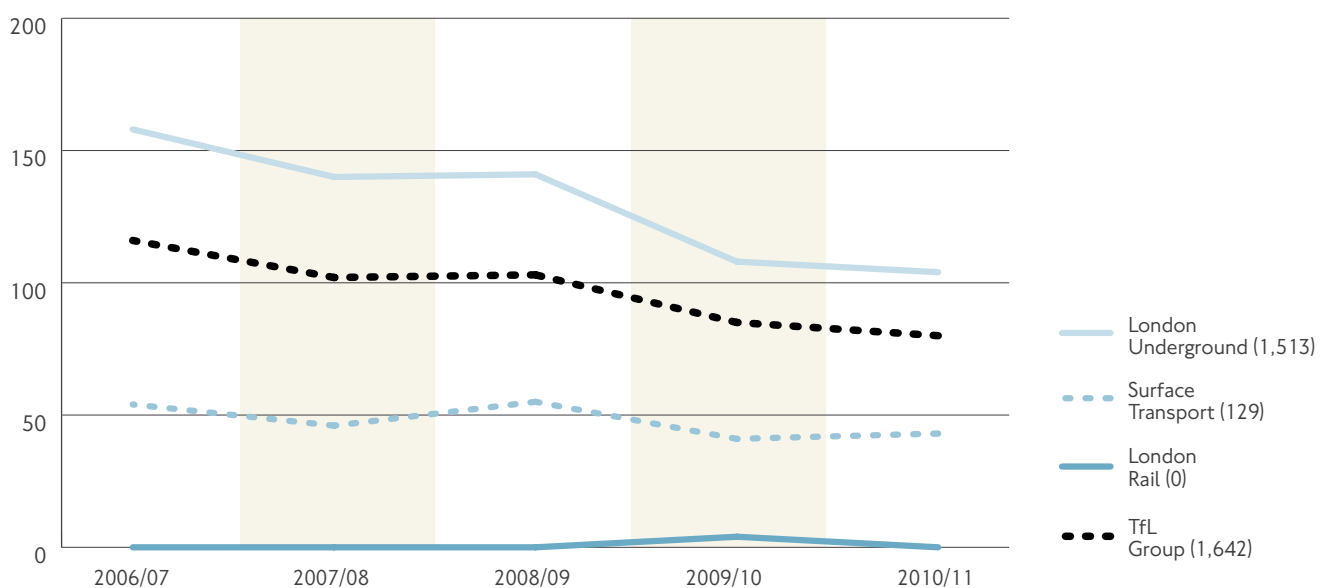
Employee assaults include any incident in which a person is verbally or physically abused, threatened or assaulted in circumstances related

to their work. For London Underground only, this includes employees who are travelling to and from work in uniform. Figure 5 illustrates the employee assaults within the operational customer facing businesses.

Over the past five years, TfL has seen a downward trend in the employee assault rate.

In London Underground there was a 21.6 per cent decrease in employee assaults from 1,932 in 2009/10 to 1,513 in 2010/11. London Underground introduced a revised work-related violence action plan that targeted immediate enforcement action for incidents and enhanced communications to the public. These actions were contributory factors to this year's reduction in employee assaults.

Figure 5: Employee assault rate (per 1,000 employees)



In Surface Transport, there was an 11 per cent decrease in employee assaults from 145 in 2009/10 to 129 in 2010/11. Targeted conflict avoidance and incident training of employees and enforcement measures by the workplace violence unit have helped to reduce assaults on employees.

There were no employee assaults in London Rail.

Customer safety

TfL provided more services than ever before in 2010/11 with some 3.5 billion customer journeys made. TfL recognises its customer safety responsibilities and continually seeks improvements to its operations to reduce accidents and injuries.

Customer accidental fatalities

This performance indicator is a measure of the number of customer fatalities arising from incidents involving a TfL business operation. Suicides, crime-related and medical fatalities are excluded.

The definition of customers includes members of the public using a TfL business or premises, including people using rights of way, tenants and off-duty employees.

There were no customer accidental fatalities in 2010/11; last year there were five.

Customer accidental fatalities

	2006/07	2007/08	2008/09	2009/10	2010/11
London Underground	2	0	0	1	0
Surface Transport	3	4	2	4	0
London Rail	0	0	0	0	0
TfL Group	5	4	2	5	0

Customer major injuries

Customer major injuries are those that result in the customer being taken to hospital following an incident that involves a TfL business operation.

Over the past five years, there has been a downward trend in the customer major injury rate for TfL. The customer major injury rate in 2010/11 was 0.28 per million customer journeys (see figure 6). This rate is monitored to enable the introduction of appropriate safety measures.

London Underground's customer major injuries increased by 12 per cent, from 111 in 2009/10 to 127 in 2010/11.

Surface Transport's customer major injuries increased by eight per cent, from 790 in 2009/10 to 861 in 2010/11. In London Rail, customer major injuries decreased by 27 per cent, from 11 in 2009/10 to eight in 2010/11.

Contractor safety

The contractor incident data in this section is not normalised. As the numbers of contractors tend to fluctuate on large projects, this makes actual data difficult to compare. Plans are under way to report normalised contractor safety data throughout TfL in future.

Contractor fatalities

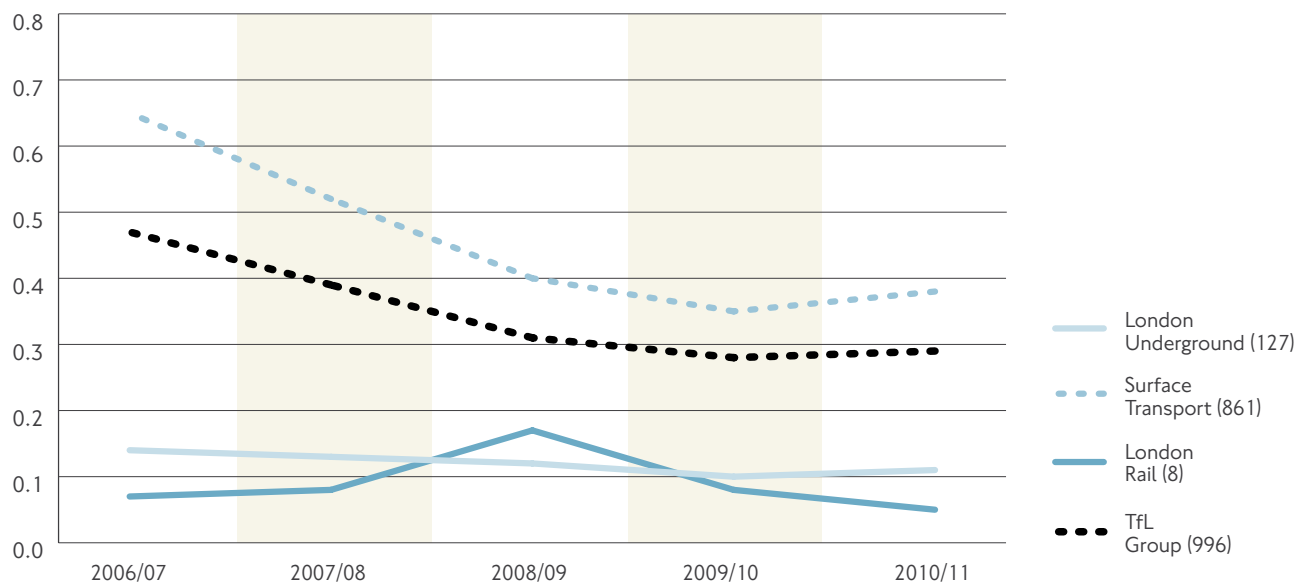
There was one contractor fatality in 2010/11. In Surface Transport, a bus contractor engineer was fatally injured while attending to a mechanical fault at the roadside.

Contractor major injuries

	2006/07	2007/08	2008/09	2009/10	2010/11
London Underground	10	13	24	20	4
Surface Transport	106	149	105	87	116
London Rail	3	10	4	0	4
Crossrail	-	-	1	2	0
Corporate Directorates	3	1	0	1	0

The contractor major injury data has not varied greatly in any of the businesses until 2010/11 when London Underground's contractor major injuries decreased from 20 in 2009/10, to four. This reduction was, at least in part, the result of contractors joining TfL.

Figure 6: Customer major injury rate (per million customer journeys)



Surface Transport's contractor major injuries increased from 87 in 2009/10 to 116 in 2010/11. All the contractor major injuries in Surface Transport involved bus drivers.

In London Rail, contractor major injuries increased from zero in 2009/10 to four in 2010/11.

Contractor assaults

	2006/07	2007/08	2008/09	2009/10	2010/11
London Underground	12	24	15	58	35
Surface Transport	708	1,168	888	618	1,288
London Rail	88	41	217	188	339
Crossrail	-	-	0	0	0
Corporate Directorates	0	0	0	0	0

London Underground's contractor assaults decreased from 58 in 2009/10 to 35 in 2010/11.

Of the 1,288 assaults in Surface Transport, 1,277 were against bus drivers. This is equivalent to 54 incidents per 1,000 contractors. Instances of verbal abuse contribute significantly to this figure.

In London Rail, contractor assaults increased from 188 in 2009/10 to 339 in 2010/11, largely because of an increased number of contractors during the year. The vast majority of the assaults were verbal assaults.

Crossrail and Corporate directorates had no contractor assaults this year.

Major incidents

Incidents that are classified as major incidents are:

- Fatality to employee, contractor, transport user or member of the public on TfL property or premises (excluding suicide or suspected suicide, crime-related fatality or non-work-related medical fatality)
- Incidents resulting in three or more people requiring treatment in hospital due to accidental injury
- Significant incidents where the final total costs are (likely to be) more than £1m to TfL, including those covered by insurance
- Incidents where prosecution is likely, there is a regulatory interest, or there is (or likely to be) significant media interest

TfL specifically excludes public road traffic accidents (RTAs) from this classification as they are not within TfL's directly managed activities. However, TfL remains responsible for collating and reporting on RTAs and instigating, where appropriate, action to improve road safety.

There were four major incidents in TfL in 2010/11 described below. Last year there were five major incidents reported.

Major incidents involving fatalities

- In September 2010, a bus contractor engineer was fatally injured while attending to a bus mechanical fault at the roadside. The incident is under investigation by the Health and Safety Executive

Major incidents not involving fatalities

- In August 2010, during the recovery of a failed rail grinder unit, the coupling between the unit and the assisting train failed. The unit rolled from Highgate on the Northern line to Warren Street station where it was stopped. No injuries were sustained. The incident remains under investigation by the Rail Accident Investigation Branch
- In November 2010, London Underground was fined £5,000 following an ORR prosecution. The prosecution was due to an incident in November 2009 in which customers were injured by a damaged inter-car barrier at Mile End station
- In December 2010, London Underground was fined £7,000 following an ORR prosecution. The prosecution was due to incidents between May and October 2009 in which customers were injured by falls at Cannon Street station

Road safety

In March 2000, the Government announced a national road safety strategy and casualty reduction targets for 2010. In 2006, London set more stringent targets as a result of good progress made. Targets were set against the 1994–1998 average casualties numbers.

By the end of 2010, four of the six targets had been met and good progress made in the other two.

Casualty category	2010 Target reduction against 1994–98 average (%)	Achieved reduction by December 2010 (%)
Total killed and seriously injured (KSI)	50	57
Pedal cyclist (KSI)	50	18
Pedestrian (KSI)	50	57
Powered two-wheeler rider and passenger (KSI)	40	34
Child (KSI)	60	73
Slightly injured casualty rate, expressed as the number of people slightly injured per 100 million vehicle kilometres	25	33

The graphs in this section give more details of type of injury by road user, for Greater London as a whole and for the TLRN.

During 2010/11, work started on preparing a new Road Safety Plan for London, which will set out a road safety strategy and delivery plan for the next 10 years.

TfL implemented road safety programmes to reduce further casualties in vulnerable road user groups. Activities included monitoring and research, education, training and publicity as well as road safety engineering.

Monitoring and research

During 2010/11, TfL supported road safety professionals in London to achieve casualty reduction targets by undertaking and commissioning research. Two research projects focusing on pedestrian and motorcycle fatalities were commissioned.

Education, training and publicity

In 2010/11, publicity material was distributed to parked bicycles as part of the heavy goods vehicles/pedal cycles 'Undertaking at junctions can be fatal' campaign. In addition, short films portraying a collision between a cyclist and a goods vehicle were shown in the new Certificate of Professional Competence freight driver training to help educate lorry drivers.

Road safety engineering

TfL is responsible for operating and improving conditions for all users of the TLRN, which is made up of approximately five per cent of London's roads but carries 33 per cent of its traffic. In 2010/11, TfL set up a road safety engineering programme with 120 schemes at

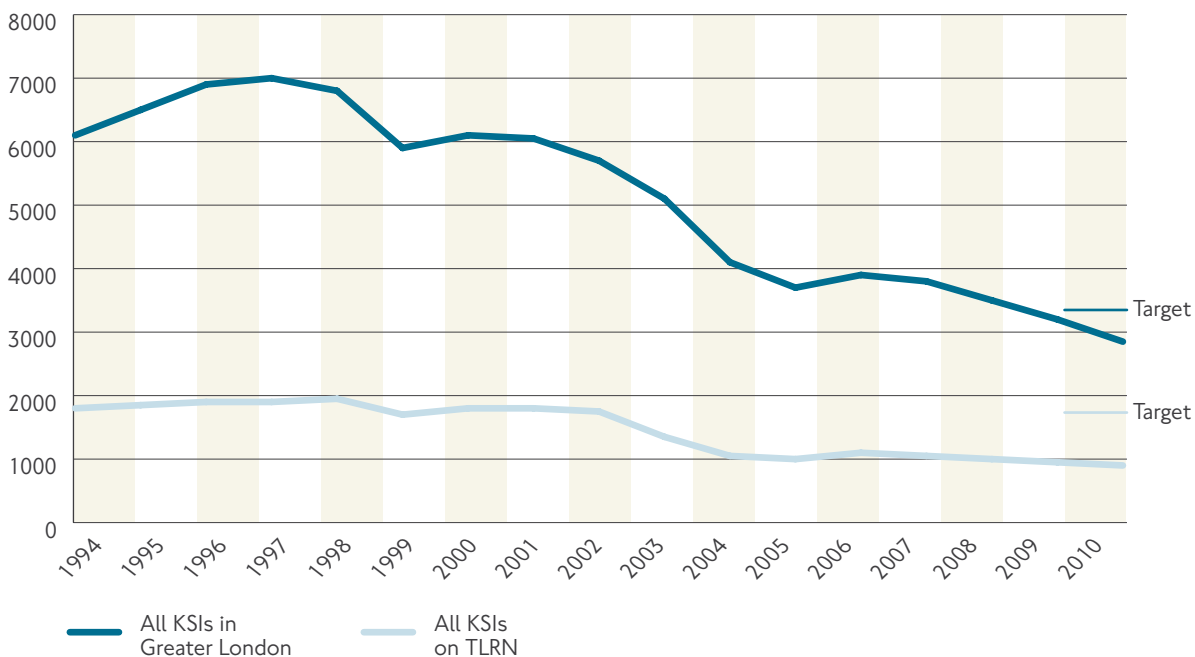
locations on the TLRN with high collision levels. TfL also identified 13 'Biking Boroughs' to create cycle hubs and safer cycling environments in Outer London.

All KSIs and slightly injured casualties for Greater London and TLRN

In 2010, fatalities decreased by 32 per cent when compared with 2009, from 184 to 126. Serious injuries decreased by nine per cent while slight injuries increased by five per cent. The total number of casualties increased by three per cent between 2009 and 2010.

Figure 7 shows trends in KSI casualties in Greater London and on the TLRN since 1994.

Figure 7: Greater London and TLRN all KSIs



There was an 11 per cent decrease in KSI casualties among all road users within Greater London during 2010. There was a three per cent decrease in the number of KSIs on the TLRN during 2010.

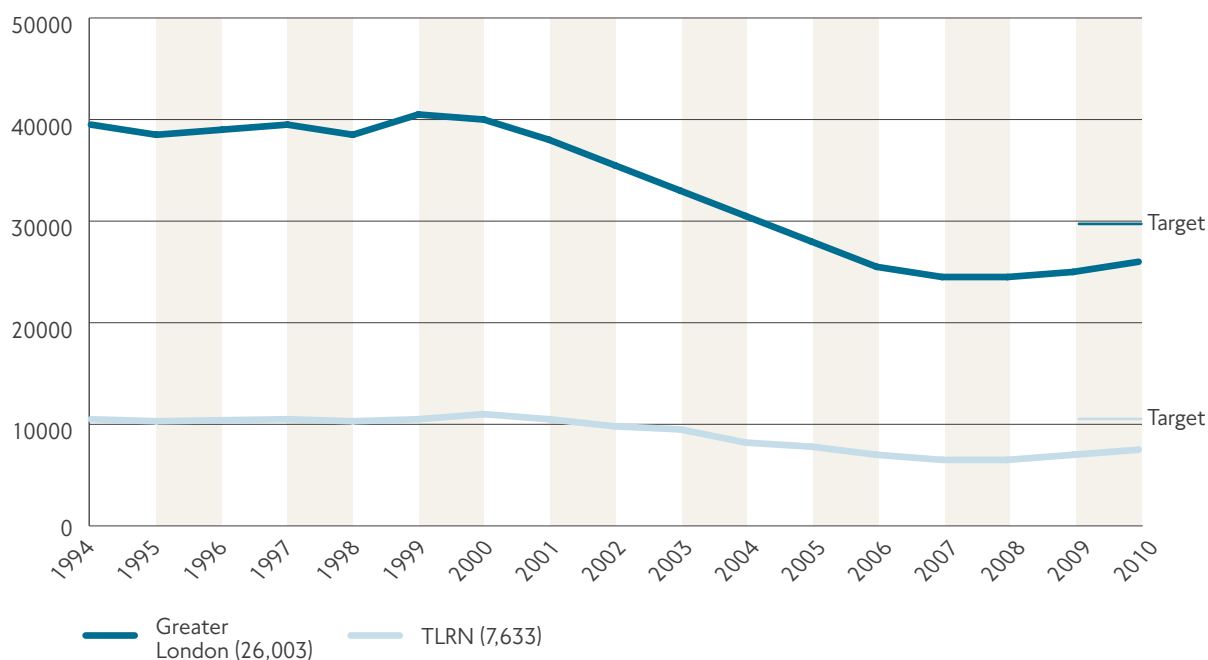
Figure 8 shows the trend in slight casualties within Greater London and on the TLRN since 1994. In Greater London, all slightly injured casualties increased by five per cent in 2010. The trend in slight casualties on the TLRN mirrors that of Greater London as a whole, with an increase of six per cent in all slight casualties in 2010.

Greater London KSI trends for vulnerable road users

Figure 9 shows the trend in KSI casualties among vulnerable road user groups in Greater London since 1994.

Pedestrians accounted for 46 per cent of all fatalities and 32 per cent of all serious injuries in 2010. Overall, pedestrian casualties increased by three per cent compared with 2009. Within this figure, pedestrian fatalities decreased by 34 per cent, from 88 to 58, serious injuries decreased by 12 per cent and slight injuries increased by eight per cent.

Figure 8: Greater London and TLRN – all slightly injured casualties

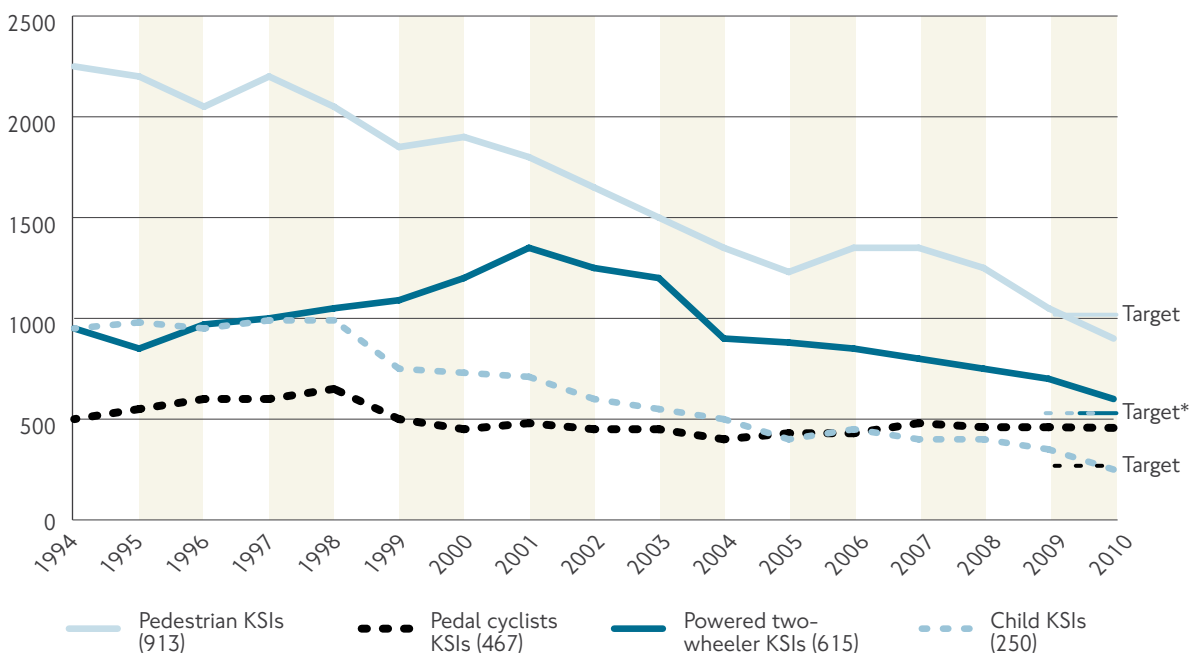


In 2010, pedal cyclists accounted for eight per cent of all fatalities and 16 per cent of all serious injuries. Casualties increased overall by nine per cent compared with 2009. Within this, the number of fatalities fell from 13 in 2009 to 10 in 2010. Serious injuries increased by nine per cent and slight injuries increased by nine per cent.

In 2010, riders and passengers of powered two-wheelers (P2W) accounted for 22 per cent of all fatalities and 21 per cent of all serious injuries. P2W casualties decreased by four per cent over 2009 levels, and fatalities decreased by 28 per cent.

In 2010, all child KSIs reduced by five per cent from 263 in 2009 to 250.

Figure 9: Greater London – KSIs among vulnerable road user groups



* All targets shown are for 2010. Powered two-wheeler KSIs and Child KSIs have the same target.

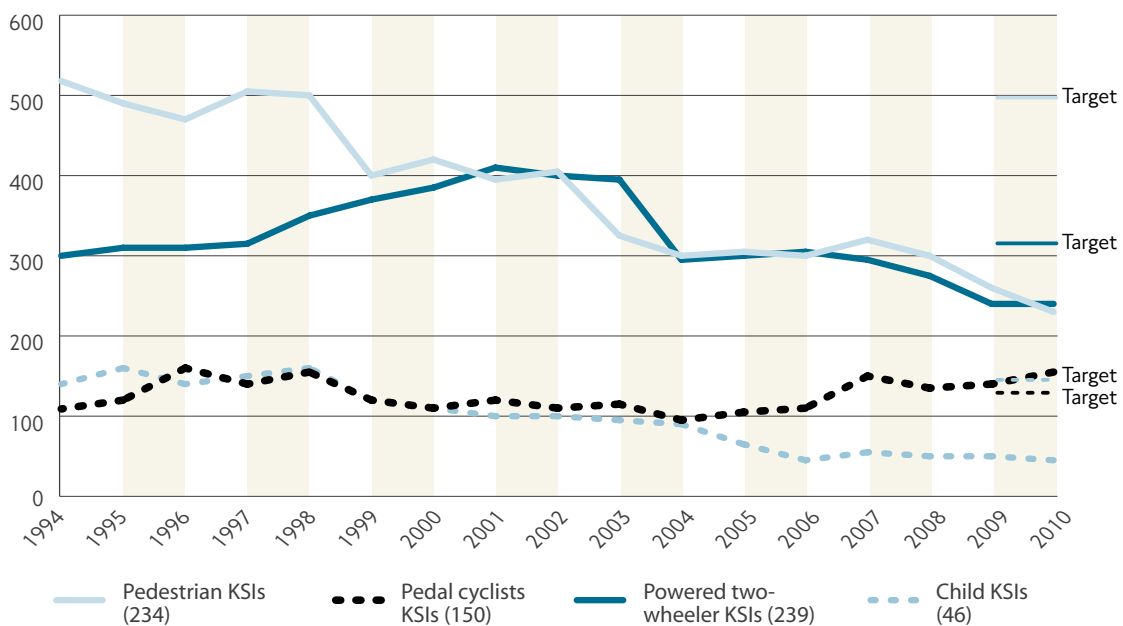
TLRN KSI trends for vulnerable road users

Figure 10 shows the trend in KSI casualties among vulnerable road user groups on the TLRN since 1994.

There was a decrease of eight per cent of all child KSIs and a decrease of 0.4 per cent of P2Ws KSIs in 2010.

Pedestrian KSIs on the TLRN decreased by seven per cent in 2010 but there was an increase of 10 per cent in pedal cycle KSIs.

Figure 10: TLRN – KSIs among vulnerable road user groups

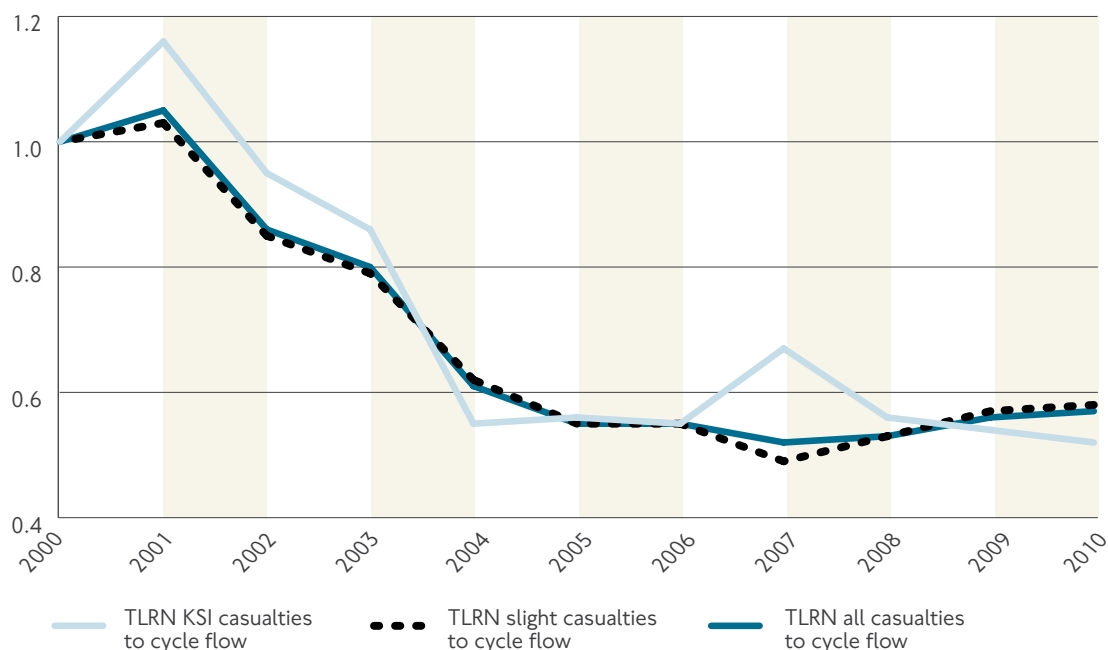


Since 2000, TfL has provided a reliable measure of cycling activity on the TLRN. Cycle flow is measured by cycle counters located across the TLRN based on a randomly stratified sample.

Figure 11 shows the trend in the estimated pedal cycle casualty rate on the TLRN since 2000. All casualties have been normalised by the cycle flows and are shown as indices, with the year 2000 set as 1.00, to estimate changes in the pedal cycle casualty rate.

By 2010, the pedal cycle casualty rate had fallen by more than 40 per cent compared with 2000, for each of the severity levels (all, KSI and slight casualties). It should be noted that there is more year-to-year fluctuation in the KSI casualty rate due to the relatively smaller numbers compared with the slight and all TLRN casualty rates, and that the fall in casualty rates on the TLRN has slowed since 2004.

Figure 11: Index of cyclist casualties to cycle flow on the TLRN



Reducing carbon emissions

A major challenge facing TfL is how to reduce its total CO₂ emissions while increasing service capacity. Investment in London's public transport system will result in a 30 per cent increase in capacity over the next decade. Boosting the efficiency of TfL's operations will be essential if CO₂ emissions are to be minimised.

Normalised CO₂ emissions reduction

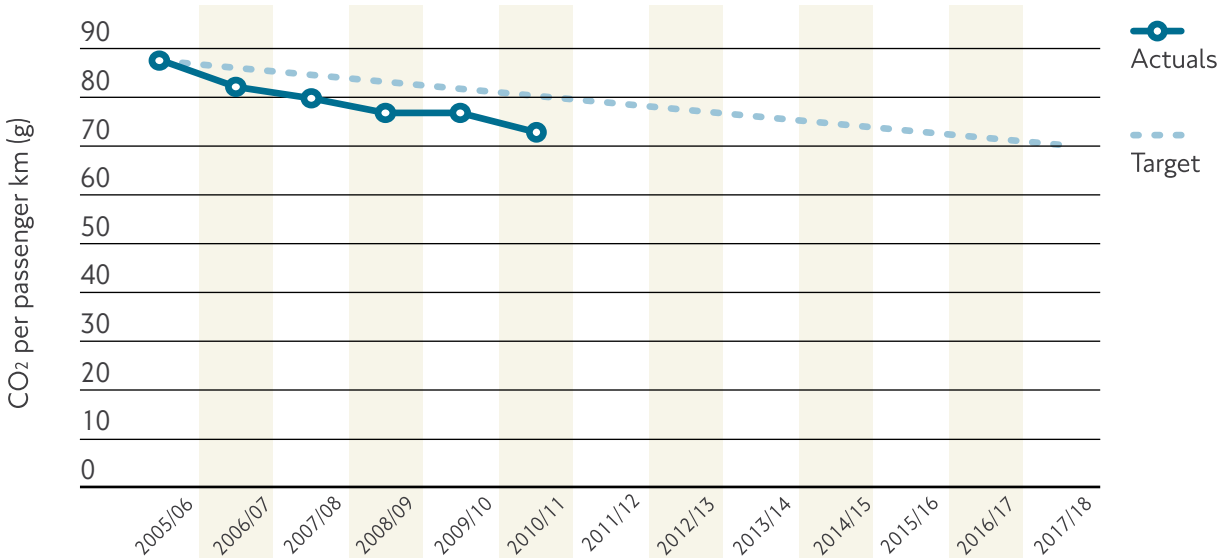
TfL has set a target to reduce the normalised emissions (measured in grams CO₂ per passenger km) from its main public transport services by 20 per cent in 2017/18, against a 2005/06 baseline. These are emissions associated with the London

Underground, buses, Docklands Light Railway, the Overground and Tramlink. At present, emissions from taxis and PHVs cannot be normalised with sufficient accuracy to be included in the target.

In 2010/11, all of TfL's public transport services experienced a fall in normalised emissions. They now emit 74 grams CO₂ per passenger km on average, which is four per cent below 2009/10 levels and 16 per cent below the baseline (see figures 12 and 13).

Figure 12: CO₂ target for a 20 per cent reduction in normalised emissions from TfL's public transports services

Includes emissions from LU, buses, DLR, Overground and Tramlink



Due to the scale of their operations, buses and London Underground remain the main contributors to TfL's performance.

- **Buses**

In 2010/11, normalised CO₂ emissions reduced by three per cent to 78 grams of CO₂ per passenger km. This was achieved through a combination of eco-driver training and new Euro V double-decker buses, which emit approximately four per cent less CO₂ than the older Euro II buses they replaced.

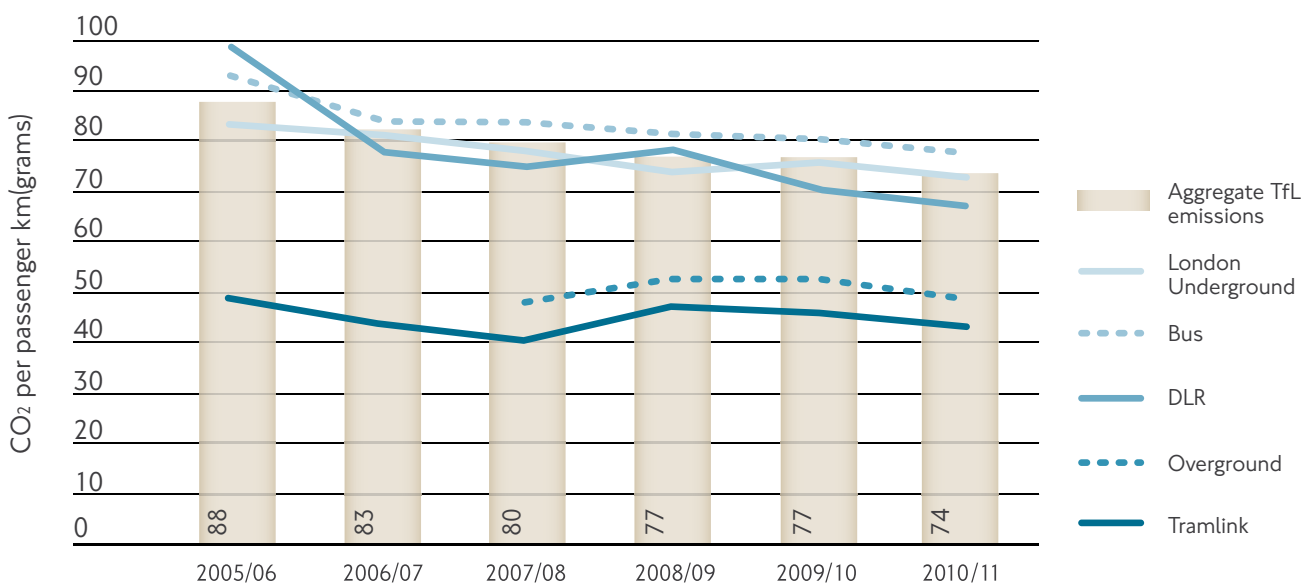
- **London Underground**

The Tube carried 42 million more passengers in 2010/11, a rise of five per cent compared to the previous year. The combination of increased passenger journeys and investment in energy-saving schemes, such as regenerative braking, reduced normalised emissions by five per cent to 72 grams CO₂ per passenger km.

- **Overground**

The extension of the East London line between Dalston Junction and West Croydon provides a third more service capacity, helping to increase passenger numbers and reduce normalised emissions by eight per cent to 49 grams CO₂ per passenger km.

Figure 13: Normalised emissions of CO₂ by mode of public transport



- **Docklands Light Railway**

Normalised emissions fell by four per cent in 2010/11 to 68 grams CO₂ per passenger km as the three-car service launched on the Bank-Lewisham route and between Stratford and Lewisham caused a rise in passenger journeys on the network.

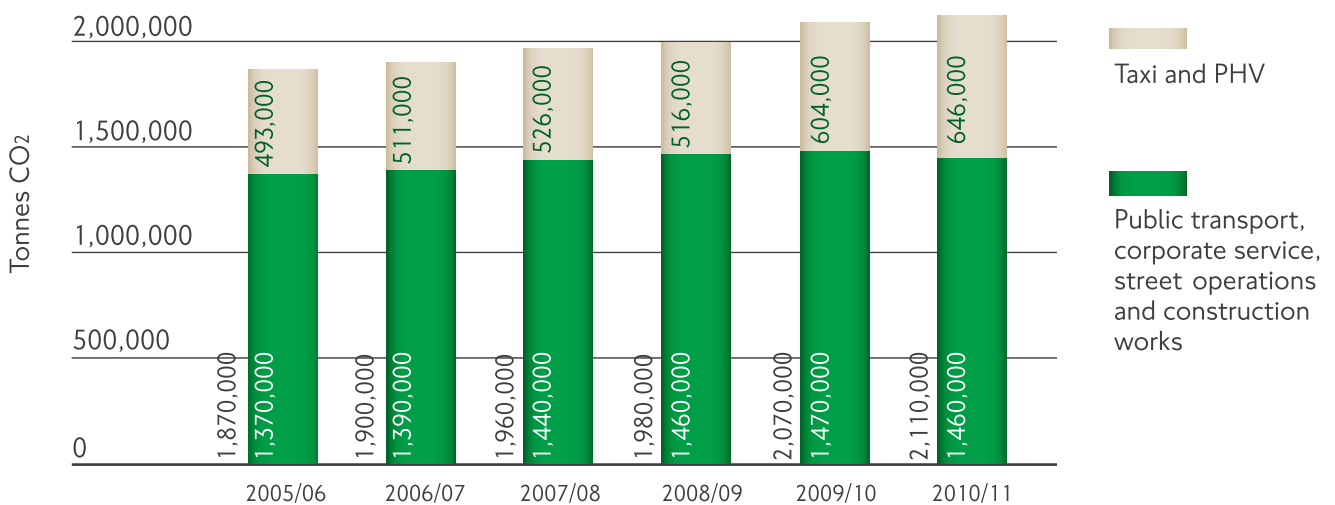
- **Tramlink**

Tramlink operated the same level of service as last year but a five per cent rise in passenger journeys caused normalised emissions to fall by the same amount to 43 grams CO₂ per passenger km in 2010/11.

Absolute CO₂ emissions

TfL has direct control over the emissions from its main public transport services, the maintenance and operation of the TLRN, the energy consumption of traffic lights in London, construction works and head offices. In 2010/11, TfL recorded 1,460,000 tonnes of CO₂ emissions from these sources, with TfL's main public transport services accounting for 91 per cent of the total (1,340,000 tonnes of CO₂). Despite operating more public transport services and construction works over the year, absolute emissions from TfL's direct operations were one per cent down on the previous year.

Figure 14: Total CO₂ emissions from TfL operations



The remaining emissions associated with TfL's activities come from taxis and PHVs and in 2010/11 absolute CO₂ emissions from these sources were 646,000 tonnes. This is an increase of seven per cent on the previous year as 6,800 more vehicles joined the PHV fleet and the number of taxis increased by 1,180.

In figure 14, taxi and PHV emissions have been separated out from those associated with TfL's other operations. This is because they are from vehicles owned and operated by third parties. TfL exercises influence over taxi and PHV emissions through licensing arrangements (which state limits on Euro standards and vehicle age).

Overall, absolute CO₂ emissions associated with all of TfL's operations in 2010/11 were 2,110,000 tonnes, which reflects the gradual year-on-year upward trend.

Carbon reduction commitment energy efficiency scheme (CRC)

Energy used at TfL's stations, depots, highway structures, piers, head offices and buildings is within the scope of the Government's CRC scheme. In 2010/11, absolute CO₂ emissions from these sources were 149,000 tonnes.

Energy efficiency

Head office electricity efficiency improved by five per cent due to a number of energy efficiency initiatives including the installation of the CHP Fuel Cell at Palestra, RE:FIT efficiency works (in particular lighting and building fabric upgrades), a move to thin client computers and staff engagement campaigns.

Cold winter weather contributed to more gas being consumed in 2010/11, causing overall head office energy consumption to increase by one per cent to 322 kWh/m².

Improving air quality and noise

Air quality

TfL monitors the total amount of nitrogen oxides (NO_x) and particulate matter (PM₁₀) from its operations. These air pollutants largely arise from internal combustion engines in vehicles. They also arise from construction site dust and the wear of brake pads on vehicles, but as they are difficult to measure they are not included in the scope of the KPIs.

TfL controls the emissions associated with its main public transport services but has less control over the size of the taxi and PHV fleets as they are from vehicles owned by third parties. TfL exercises influence over taxi and PHV

emissions through licensing arrangements (which state limits on Euro standards and vehicle age). To reflect this, taxi and PHV NO_x and PM₁₀ emissions have been separated from those associated with TfL's public transport services in figures 16 and 18.

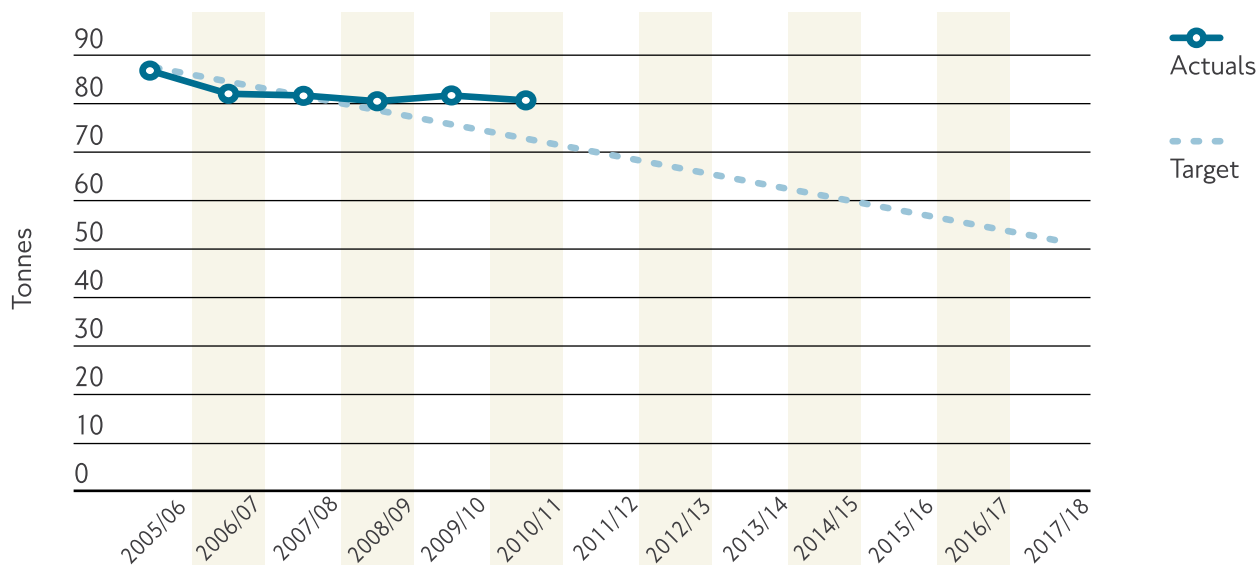
TfL will amend this report with air emissions data normalised by passenger kilometres in the coming months.

NO_x

TfL has set a target to achieve a 40 per cent reduction in total NO_x emissions by 2017/18 against 2005/06 levels. The target applies to

Figure 15: NO_x target of a 40 per cent reduction in total emissions from TfL's operations

Includes emissions from public transport services, taxis and PHVs



all TfL public transport services, including taxis and PHVs.

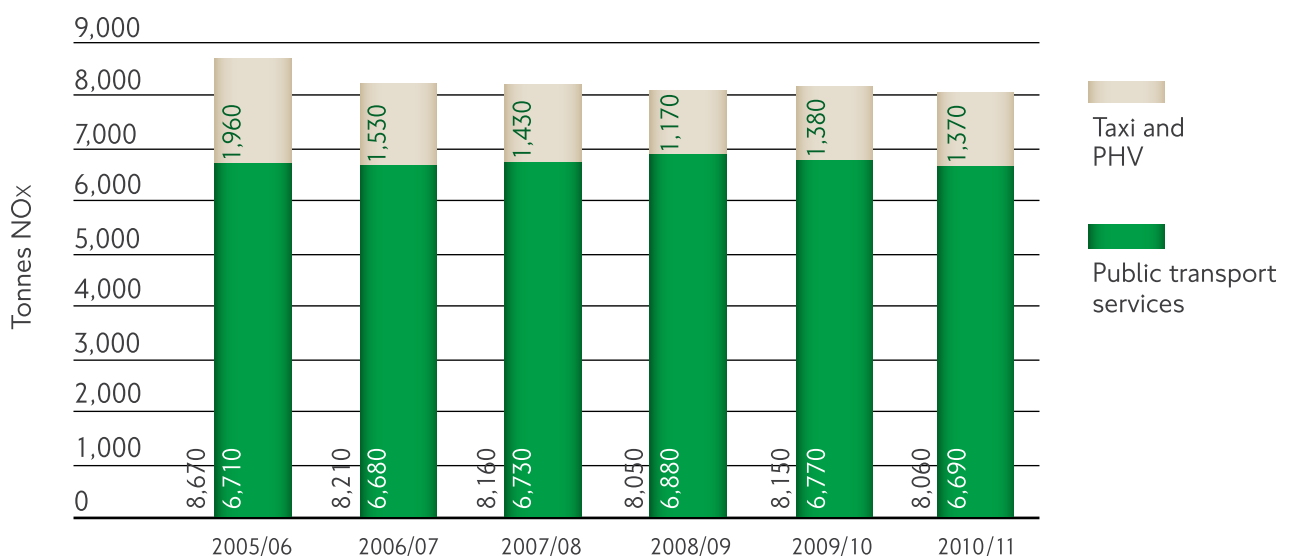
In total, TfL recorded 8,060 tonnes of NOx emissions from all its operations in 2010/11 which is one per cent down on the previous year. Performance in 2010/11 means that total emissions are seven per cent lower than the 2005/06 baseline total but they are still above the required trend line to achieve the 2017/18 target (see figure 15).

Buses accounted for 76 per cent of recorded TfL NOx emissions and, in 2010/11, total emissions from the bus fleet fell by one per

cent due to continued investment in cleaner vehicles. Euro V buses emit 19 per cent less NOx emissions than Euro II buses and, in 2010/11, approximately 700 Euro V and Enhanced Environmental friendly Vehicles (EEV)² entered the fleet.

The remaining emissions are principally associated with the taxi and PHV fleet, with total emissions split evenly between the two sources. Together they emitted 1,370 tonnes of NOx in 2010/11, which is similar to last year.

Figure 16: Total NOx emissions from TfL operations



² EEVs are vehicles over 3.5 tonnes that comply with the voluntary EEV standard, a more stringent standard than Euro V

PM₁₀

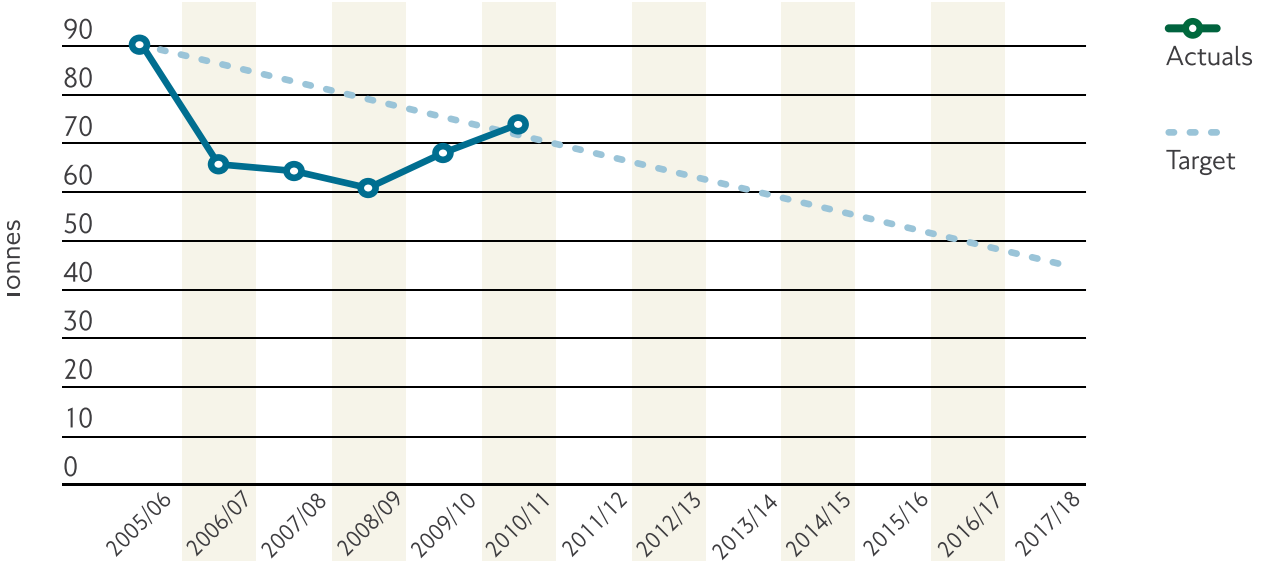
TfL has set a target to reduce total PM₁₀ emissions from its operations by 50 per cent in 2017/18 against 2005/06 levels. The target applies to TfL public transport services and the taxi and PHV fleet. Over the reporting year, TfL recorded 147 tonnes of PM₁₀ emissions from all its operations. Total emissions were up by eight per cent on the previous year but they remain 19 per cent lower than the 2005/06 baseline (see figure 17).

Taxis and PHVs accounted for 79 per cent of total TfL PM₁₀ emissions. Due to changes in the size of the taxi and PHV fleets, total emissions from these sources increased by eight per cent to 116 tonnes in 2010/11. Emissions from taxis account for around two thirds of the total.

TfL's public transport services emitted 31 tonnes of PM₁₀ in 2010/11. The absolute amount of PM₁₀ emitted from buses is now low due to the initiatives that have been introduced by TfL. By replacing the older, more polluting vehicles with cleaner ones, emissions of PM₁₀ from the bus

Figure 17: PM₁₀ target of a 50 per cent reduction in total emissions from TfL's operations

Includes emissions from Overground, taxis and PHVs, river services and buses

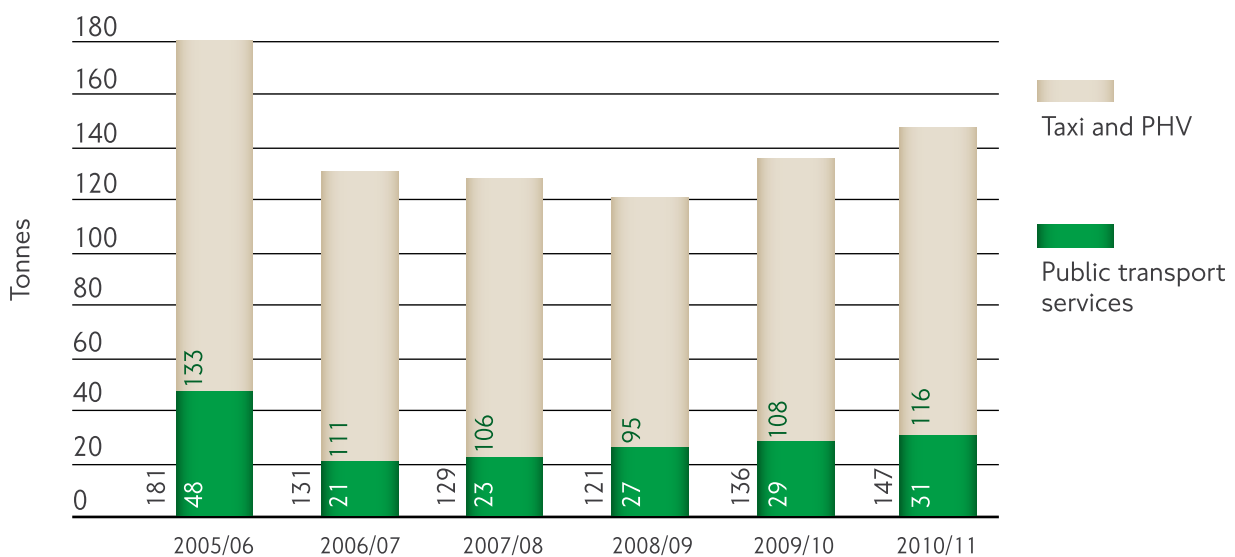


fleet have dropped from more than 200 tonnes in 1997 to 16 tonnes in 2010/11. Over the same period, the number of kilometres operated by London's buses increased by 42 per cent.

Buses are responsible for a relatively small proportion of TfL's absolute emissions (around 10 per cent) and while there was a small increase in PM₁₀ emissions from buses, this increase was less than one per cent of the total PM₁₀ emitted in 2010/11.

The remaining PM₁₀ emissions from TfL's public transport services are mainly associated with river services, which includes the TfL operated Woolwich Ferry and Thames Clippers and other scheduled services, which TfL does not operate. PM₁₀ emissions increased slightly as fuel use went up by 1.5 per cent due to additional Woolwich Ferry operations during Blackwall Tunnel closures and increased operation of Thames Clippers.

Figure 18: Total PM₁₀ emissions from TfL operations



Noise

Noise complaints rose by nearly half to 951 (from 643) compared with the previous year. More complaints (324) were received in 2010/11 about construction works associated with Crossrail and upgraded public address (PA) systems at a small number of new London Overground stations.

While noise complaints associated with asset noise, construction, contractor noise and PA announcements on the Underground remain the largest source of complaints, the number received (574) remained broadly consistent with that reported last year. Throughout the year London Underground improved its processes for the planning of works and resolving PA noise complaints to reduce this in the future.

TfL aims to reduce noise on the TLRN by using quieter noise surfaces. Around 74 per cent of the TLRN is now covered with quieter surfaces.

TfL requires that all new buses are two decibels quieter than the legal limit. The number of buses that are two decibels quieter than the required legal limit rose from 28 per cent last year to 37 per cent in 2010/11. As new vehicles come into the bus fleet, the proportion will rise.

Resource consumption and waste recycling

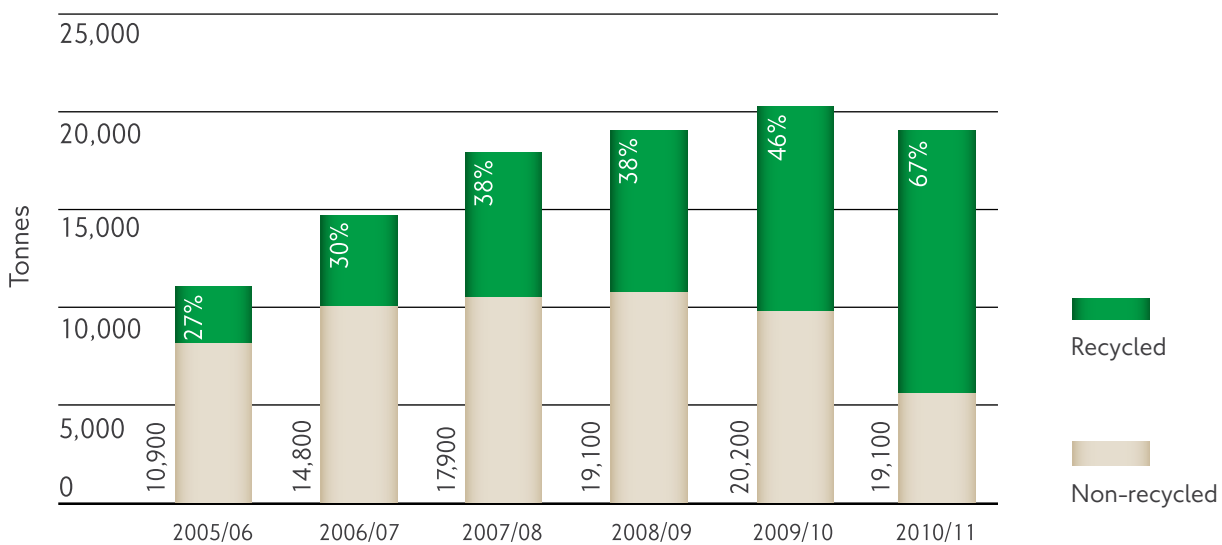
TfL's operations give rise to different types of waste including construction waste, litter left by passengers on public transport vehicles and waste from its offices. TfL has a duty to manage these wastes and use resources responsibly. TfL has taken great strides in this area in recent years, with more and more materials being recycled and there has been an increasing focus on reducing and reusing waste at source. Applying these principles to all the resources consumed helps to ensure that they are used efficiently and responsibly.

Commercial & Industrial (C&I) waste

Station, depot and office waste is classified as C&I waste. TfL has committed to increasing the recycling rate of C&I waste to 70 per cent by 2017/18.

In 2010/11, TfL collected 19,100 tonnes of waste at its stations, depots and buildings (see figure 19). As with previous years, litter left by passengers using London Underground's services and waste from their stations and depots accounted for the majority of TfL's C&I waste. Improvements in the way that London Underground handles this type of waste at some

Figure 19: Total annual station, depot and office waste from TfL operations



of its maintenance locations contributed to the five per cent drop in the total volume of C&I waste reported by TfL in 2010/11.

In 2010/11, TfL recycled 67 per cent of its C&I waste, narrowly missing its 2017/18 target. This was a significantly higher recycling rate than the 46 per cent achieved in 2009/10.

Most of London Underground's station and depot waste now goes to recycling centres, which separate these materials and send them for recycling. As a result, 74 per cent of London Underground's station and depot waste is now recycled – a significant improvement compared to the previous year (46 per cent).

TfL's network of environmental champions has been crucial in helping staff reduce TfL's impact on the environment at its head offices. By raising awareness of waste management issues and encouraging staff to use less, the total amount of waste produced at TfL's head offices fell by 13 per cent in 2010/11.

TfL recycled 70 per cent of the waste generated at its head office locations because of the implementation of bin sharing at key sites and the ongoing success of its recycling contract.

Construction and demolition (C&D) waste

TfL has set itself a target to reuse or recycle at least 90 per cent of C&D waste over the period to 2017/18 and to achieve 95 per cent by 2017/18.

A total of 331,000 tonnes of C&D waste was generated from construction sites, improvement works, maintenance activities and track replacement projects in 2010/11 (see figure 20).

The amount of this type of waste generated fluctuates over time depending on the programme of works scheduled during the reporting year. Total TfL C&D waste was 42 per cent lower in 2010/11 when compared with the previous year, as the extension of the East London line between Dalston Junction and West Croydon was completed ahead of schedule.

Waste associated with the construction of Crossrail increased significantly as enabling works continued, more demolition works were carried out and construction of the western tunnel portal at Royal Oak and the eastern tunnel portal at Pudding Mill Lane started. The total volume of C&D waste from capital programmes, ongoing maintenance renewal projects on the Tube and from TLRN maintenance increased slightly as works generating more waste were undertaken during the year.

TfL met its 2017/18 target by reusing or recycling 95 per cent of its C&D waste in 2010/11.

London Underground achieved a 92 per cent recycling rate for C&D waste from projects, including ballast track replacement and station capacity projects such as Tottenham Court Road. A 93 per cent recycling rate was achieved for decommissioned Victoria line trains ('67 stock).

Around 99 per cent of the C&D waste generated from the TLRN is either reused or recycled.

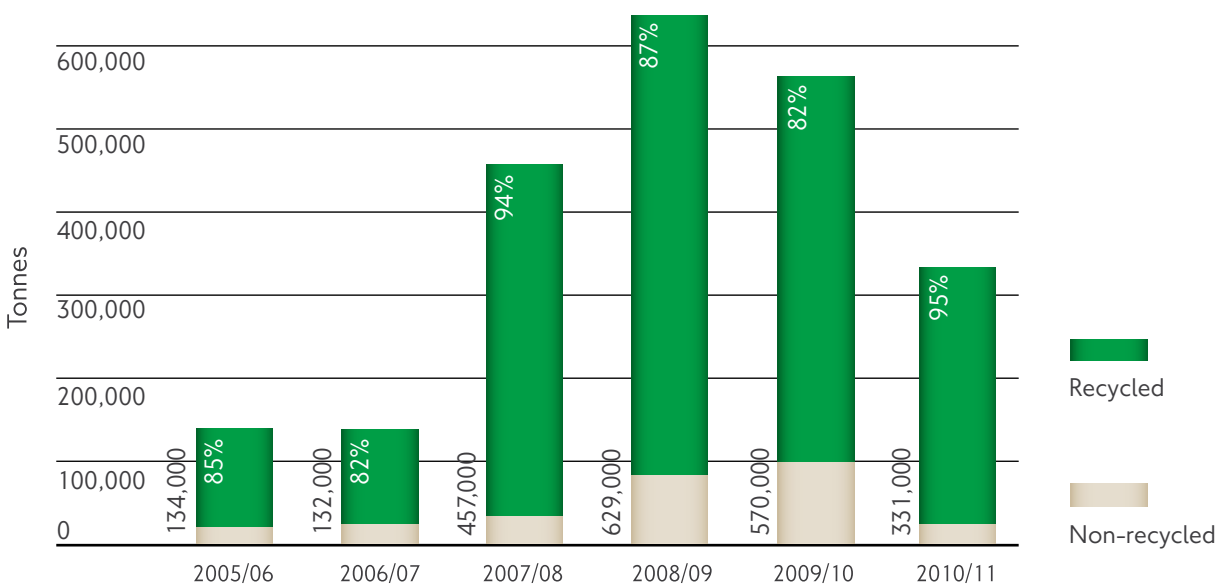
Crossrail recycled 96 per cent of its C&D waste in 2010/11, achieved in part by actively encouraging the reuse of waste on its sites. For example, 1,000 tonnes of material were reused to construct a haulage route linking the Royal Oak portal and Westbourne Park worksites.

practice guidelines issued by Defra (6.4m³ per person). The five per cent drop in 2010/11 was achieved by the implementation of various water saving projects, such as installing more water-efficient dual-flush toilets, which can reduce consumption by up to 50 per cent.

Water consumption

Water consumption is measured at head office buildings and in 2010/11 was 5.7 cubic metres per person, which is well below best

Figure 20: Total annual construction waste from TfL operations



Summary of TfL health, safety and environment KPIs

Health and safety

London Underground					
	2006/07	2007/08	2008/09	2009/10	2010/11
Customer injuries					
Fatal	2	0	0	1	0
Major	150	144	134	111	127
Customer journeys (millions)	1,014	1,072	1,089	1,065	1,107
Employee on-duty injuries – Injuries sustained as a result of physical assault are included					
Fatal	0	0	0	0	0
Major	8	23	7	8	15
Employee numbers	14,000	14,388	13,215	17,882	14,605
Contractor injuries					
Fatal	0	0	1	0	0
Major	10	13	24	20	4
Employee assaults					
Actual	2,024	1,881	1,857	1,932	1,513
Employee numbers	14,000	14,388	13,215	17,882	14,605
Contractor assaults					
Actual	12	24	15	58	35

Surface Transport					
	2006/07	2007/08	2008/09	2009/10	2010/11
Customer injuries					
Fatal	3	4	2	4	0
Major	1,238	1,169	908	790	861
Customer journeys (millions)	1,906	2,216	2,217	2,295	2,284
Employee on-duty injuries – Injuries sustained as a result of physical assault are included					
Fatal	0	0	0	0	0
Major	0	3	10	7	4
Employee numbers	4,577	4,632	4,228	3,545	3,008
Contractor injuries					
Fatal	0	1	1	0	1
Major	106	149	105	87	116
Employee assaults					
Actual	229	215	245	145	129
Employee numbers	4,577	4,632	4,228	3,545	3,008
Contractor assaults					
Actual	708	1,168	888	618	1,288

London Rail					
	2006/07	2007/08	2008/09	2009/10	2010/11
Customer injuries					
Fatal	0	0	0	0	0
Major	4	4	20	11	8
Customer journeys (millions)	61.0	66.6	199.0	130.0	167.3
Employee on-duty injuries – Injuries sustained as a result of physical assault are included					
Fatal	0	0	0	0	0
Major	0	0	0	1	0
Employee numbers	138	180	232	235	216
Contractor injuries					
Fatal	0	0	1	0	0
Major	3	10	4	0	4
Employee assaults					
Actual	0	0	0	1	0
Employee numbers	138	180	232	235	216
Contractor assaults					
Actual	88	41	217	188	339

Crossrail			
	2008/09	2009/10	2010/11
Employee injuries			
Fatal	0	0	0
Major	0	1	0
Employee numbers	294	326	290
Contractor injuries			
Fatal	0	0	0
Major	1	2	0

Corporate Directorates					
	2006/07	2007/08	2008/09	2009/10	2010/11
Employee injuries					
Fatal	0	0	0	0	0
Major	1	2	0	2	0
Employee numbers	2,011	2,336	2,177	2,417	2,461
Contractor injuries					
Fatal	0	0	0	0	0
Major	3	1	0	1	0

Average sickness absence per FTE by TfL business area (2006-2011)					
	2006/07	2007/08	2008/09	2009/10	2010/11
TfL	11.4	10.1	9.9	10.1	9.7
London Underground	12.5	10.5	10.2	10.2	10.2
Surface Transport	9.7	11.1	10.5	10.4	8.9
London Rail	4.2	2.7	4.5	4.7	3.2
Crossrail	-	-	4.6	5.4	6.8
Corporate Directorate	8.0	6.3	7.0	7.3	7.6

Average days lost due to sickness absence by TfL business area 2010/11						
	LU	ST	LR	CR	CD	TfL
Mental illness	1.45	1.29	0.82	0.94	1.54	1.43
Musculoskeletal	2.04	1.47	0.42	0.65	0.94	1.83
Cold/flu	1.49	1.26	0.45	1.72	1.34	1.43
Gastrointestinal	1.09	1.08	0.50	0.91	0.83	1.06
Accidents/injury	1.10	0.66	0.14	0.04	0.48	0.96
Other	0.91	0.64	0.0	0.65	0.39	0.81
Neurological	0.52	0.57	0.14	0.38	0.52	0.52
Respiratory	0.35	0.35	0.15	0.22	0.29	0.34
Hypertension/stroke	0.38	0.40	0.02	0.38	0.16	0.35

Road safety casualty data

Casualty severity	User group	Casualty numbers		Percentage change in 2010 over 2009
		2009	2010	
Fatal	Pedestrians	88	58	-34
	Pedal cyclists	13	10	-23
	Powered two-wheeler	39	28	-28
	Car occupants	41	27	-34
	Bus or coach occupants	3	0	-100
	Other vehicle occupants	0	3	-
	Total	184	126	-32
Fatal and serious	Pedestrians	1,055	913	-13
	Pedal cyclists	433	467	8
	Powered two-wheeler	706	615	-13
	Car occupants	818	722	-12
	Bus or coach occupants	124	98	-21
	Other vehicle occupants	91	71	-22
	Total	3,227	2,886	-11
	Child pedestrians	174	189	9
	Child pedal cyclists	39	22	-44
	Child car passengers	34	31	-9
	Child bus / coach passengers	6	5	-17
	Other child casualties	10	3	-70
	Children (under 16 yrs)	263	250	-5
	Slight	Pedestrians	4,154	4,478
Pedal cyclists		3,236	3,540	9
Powered two-wheeler		3,795	3,722	-2
Car occupants		11,230	11,851	6
Bus or coach occupants		1,319	1,303	-1
Other vehicle occupants		1,018	1,109	9
Total		24,752	26,003	5
All severities	Pedestrians	5,209	5,391	3
	Pedal cyclists	3,669	4,007	9
	Powered two-wheeler	4,501	4,337	-4
	Car occupants	12,048	12,573	4
	Bus or coach occupants	1,443	1,401	-3
	Other vehicle occupants	1,109	1,180	6
	Total	27,979	28,889	3

NB: Green shaded areas show the National and London casualty reduction target categories

The Mayor's target is for a 25 per cent reduction in the slight casualty rate per 100 million vehicle km. Until guidance is received from the Department for Transport on how this should be measured, slight casualties are shown as casualty numbers rather than a casualty rate.

Environment						
	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Carbon dioxide emissions						
Total CO ₂ emissions (tonnes)	1,870,000	1,900,000	1,960,000	1,980,000	2,070,000	2,110,000
CO ₂ emissions from TfL's main public transport modes (grams per passenger km):						
TfL's Public Transport Operations (average)	88	83	80	77	77	74
London Underground	83	82	78	74	76	72
London Bus Services	93	84	84	82	81	78
Docklands Light Railway	99	78	75	78	70	68
Tramlink	49	44	40	47	46	43
Overground	-	-	48	53	53	49
Energy consumption in head office buildings (kWh/m ²)	413	357	317	314	319	322
Air pollutant emissions						
Total PM ₁₀ emissions (tonnes)	181	131	129	121	136	147
Total NO _x emissions (tonnes)	8,670	8,210	8,160	8,050	8,150	8,060
Transport related noise and vibration						
Number of noise complaints received	479	458	529	411	643	951
Percentage of TLRN with lower noise surface material	70	70	70	70	74	74
Percentage of buses in fleet at least 2dB(A) quieter than the required legal limit	0	4	8	14	28	37
Waste generated by TfL activities by applying the principles of reduce, reuse and recycle						
Total C&I waste (tonnes)	10,900	14,800	17,900	19,100	20,200	19,100
Proportion of C&I waste recycled (%)	27	30	38	38	46	67
Total C&D waste (tonnes)	134,000	132,000	457,000	629,000	570,000	331,000
Proportion of C&D waste recycled (%)	85	82	94	87	82	95
Water consumed per occupant in head office buildings (m ³ per person)	11.3	9.4	7.7	6.5	6.0	5.7

TfL welcomes your views to help improve its HSE performance, including feedback on this report.

Please send your comments to:

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