

TRANSPORT FOR LONDON

BOARD

**SUBJECT: TfL ENVIRONMENT REPORT 2008**

**DATE: 10 DECEMBER 2008**

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**1 PURPOSE AND DECISION REQUIRED**

- 1.1 The purpose of this report is to set out the environmental performance of the TfL Group during 2007/08 as reported in the TfL Annual Environment Report 2008. The Board is asked to note the report.

**2 BACKGROUND**

- 2.1 The TfL Environment Report 2008 is attached as Appendix 1. This is the fifth year that TfL has produced an annual report on Environmental performance. The Report has been produced by the Group Health, Safety and Environment Directorate based on information provided by the Modes and addresses TfL's environmental performance during 2007/08 and where appropriate makes comparisons with previous years.
- 2.2 Environmental performance highlights for 2007/08 included the establishment of a £25m three year Climate Change Fund, the launch of the world's largest Low Emission Zone and the increase in Smarter Travel activities, particularly Smarter Travel Sutton, TfL's first integrated behaviour change programme and the largest of its type in the world.
- 2.3 Future activities will include the delivery of the Mayor's programmes through encouraging the take-up of electric vehicles in London, smoothing traffic flows, helping to fund the Priority Parks initiative and transforming cycling in London.
- 2.4 A draft of the report was reviewed at the Safety, Health and Environment Committee (SHEC) meeting of 18 November 2008 and comments made at the meeting have been addressed. The SHEC Advisers also reviewed the Report prior to its submission to the Committee. They concluded that the Report showed a substantial commitment to the environment throughout TfL and a generally good performance. They suggested some areas that might be addressed going forward, for example setting Group level environmental targets and addressing biodiversity more widely in the Report.
- 2.5 In line with previous practice it is planned to publish the Report on the TfL web site and not to produce hard copies.

**3 RECOMMENDATION**

- 3.1 The Board is asked to NOTE the report.

**4 CONTACT**

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Transport for London

# Environment Report

2008



> The number of people cycling on London's major roads has risen by 91 per cent compared with 2000

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## > About TfL

Transport for London (TfL) was created in 2000 and is a functional body of the Greater London Authority (GLA). Its role is to deliver the Mayor's transport priorities for London and manage transport services across the Capital, for which the Mayor has responsibility.

Since the period covered by this report, Boris Johnson has been elected Mayor of London. His ambitions have been set out in the document, 'Way to Go!', which outlines his vision for the future of transport in the Capital.

The next 10 years will see a transformation as TfL works to deliver the Mayor's following key priorities:

- To expand public transport capacity
- To smooth traffic flows
- To lead a revolution in cycling and walking in London
- To deliver TfL's London 2012 transport projects and leave a lasting legacy
- To improve further the safety and security of the travelling public
- To dramatically improve the experience of travelling in London

TfL supports the Mayor's guiding principles of fairness, choice and accessibility for all transport users; ensuring transport needs of Londoners today and in the future are met in an environmentally friendly way;

developing a truly integrated and strategic approach to transport planning; working in partnership with key stakeholders, such as the London boroughs, to achieve consensus; and, of course, delivering value for money.

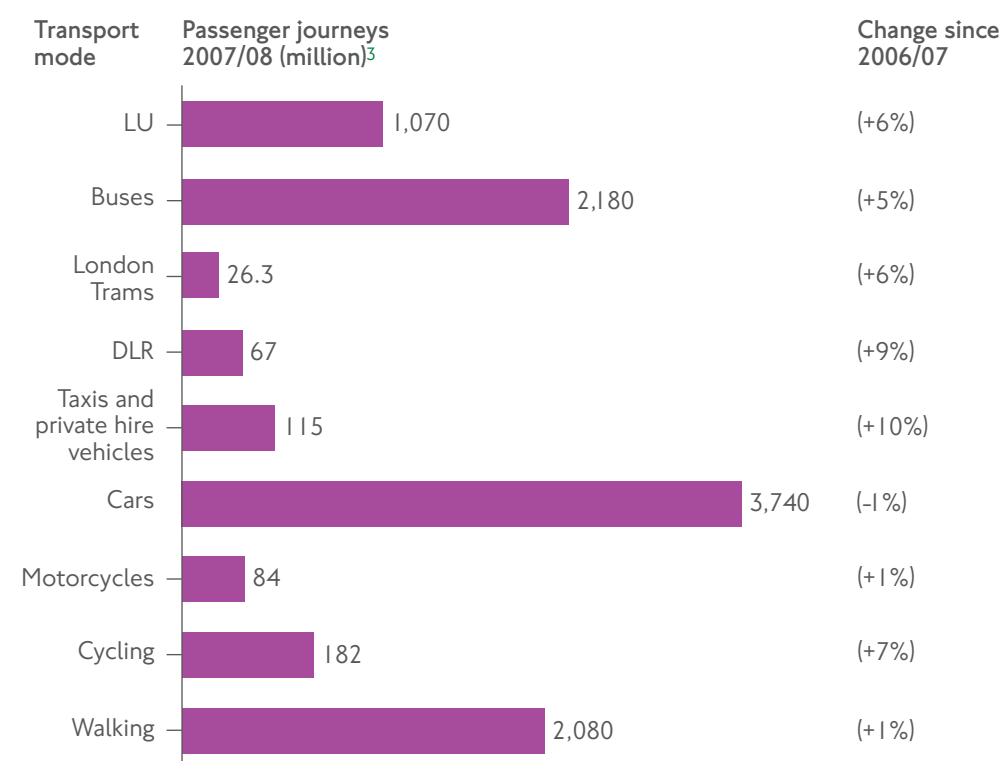
TfL manages London's buses, London Underground (LU), London Overground, Docklands Light Railway (DLR), London Streets and London Trams<sup>2</sup>. It also runs London River Services (LRS), Victoria Coach Station (VCS) and the London Transport Museum.

Every day, some 10 million passengers use the bus, Tube and DLR networks alone. Plans to achieve a 30 per cent capacity increase across London's transport system over the next decade include the delivery of Crossrail, by 2018. The new railway – the biggest transport project in Europe – will account for 10 per cent of this rise.

TfL runs London's Congestion Charging scheme, manages a 580km network of main roads and all of the Capital's 6,000 traffic lights. It also regulates taxis and the private hire trade. Considerable progress is also being made to improve road safety in London and to enhance conditions for drivers and freight operators.

In 2002, TfL and the Metropolitan Police (the Met) established the Transport Operational Command Unit. Its role is to tackle and prevent crime on London's buses, enforce traffic and parking regulations on key bus corridors, keep traffic moving at congestion hot spots and deal with illegal minicab touting.

Millions of passenger journeys by mode 2007/08



Cycling and walking are equally important means for people to travel around the Capital and help make London more liveable. Increased investment by TfL in cycling schemes and infrastructure have led to the number of people cycling on London's major roads rising by 91 per cent compared with 2000.

Since 2000 there has also been a five per cent shift from private to public and sustainable transport in London. The Capital is the only major city in the world to record such a shift.

To ensure greater accessibility, TfL coordinates schemes for transport users with mobility impairments as well as running the Dial-a-Ride scheme, a door-to-door service for disabled people who are unable to use buses, trams or the Tube.

In 2003, TfL launched its Oyster card. Now the UK's most advanced travel smartcard, it is used for around 80 per cent of journeys on London's transport network.

## > Message from the Commissioner



The Mayor is committed to a 60 per cent reduction in carbon dioxide (CO<sub>2</sub>) by 2025 from 1990 levels, and putting the environment and sustainability at the heart of his agenda – notably in transport – by a commitment to a massive increase in cycling and walking, as set out in his ‘Way to Go!’ document.

This report looks at how we are managing and improving the environmental performance of our operations and, where we have influence, for transport in the Capital as a whole. The environmental priorities are reducing CO<sub>2</sub> and pollutant emissions to air. We are also working to adapt our services to the changing climate, deliver efficiencies in energy and resource use, manage noise, protect and enhance wildlife and habitats, and procure goods and services responsibly.

Environmental performance highlights include the launch of a £25m, three-year Climate Change Fund that is supporting new innovative programmes to help achieve the

Mayor’s target of reducing CO<sub>2</sub> emissions by 60 per cent, by 2025. The fund is supporting the purchase of 56 hybrid buses by May 2009, which achieve around 30 per cent fuel efficiency. Other programmes include the development of a low carbon taxi and a smarter driving campaign.

I am pleased that TfL delivered the launch of the world’s largest Low Emission Zone (LEZ) during 2007/08. This is helping to cut emissions to air from the most polluting larger vehicles in London.

TfL is promoting sustainable travel choices to Londoners and further improving the modal shift from private to public and sustainable transport. This shift is being encouraged through significant investment to improve the most environmentally friendly modes of cycling and walking, and there will be much more activity in these areas as a result of the Mayor’s policies.

Throughout 2007/08, we saw activity step-up as part of Smarter Travel Sutton, TfL’s first integrated behavioural change programme and the largest of its type in the world.

This programme of smarter travel choices is being rolled-out in partnership with the London Borough of Sutton. The programme focuses on the people, organisations and trip types likely to have the greatest impact on travel behaviour. We are investing £5m over three years on travel awareness, car clubs, school and workplace travel planning plus personalised travel advice and information, which is being offered to the area’s 76,000 households. Its success so far has led to the announcement that a second programme is to be launched in Richmond.

Looking to the future, TfL will deliver the Mayor’s ‘Way to Go!’ priorities, including increasing transport capacity and supplying transport projects for the London 2012 Olympic and Paralympic Games. We aim to dramatically improve the experience of travelling in the Capital through, for example, further roll-out of the Oyster card, smoothing traffic flow, making buses safer, improving the public realm and introducing a 21st century Routemaster bus. We will do this in a way that protects the environment and improves the quality of life for Londoners.

During 2009/10, we will be increasing the proportion of low emission buses in the fleet, testing low energy traffic lights, trialling a low carbon taxi and delivering on plans to improve energy efficiency on the Tube network. We’ll need to look at how we can achieve security of supply while accessing low carbon sources of electricity. We will also introduce a support fleet policy that will contribute to our environmental goals and will work to deliver the Mayor’s policy to encourage the take-up of more electric vehicles in London.

To help us keep on track and make the necessary progress we will be reviewing our environmental objectives and key performance indicators (KPIs) and seeking to set Group-wide improvement targets for the most important environmental objectives.

**Peter Hendy CBE**  
Commissioner  
Transport for London



## > Environmental achievements



This is TfL's fifth annual Environment Report, covering the financial year ending 31 March 2008. It aims to provide an overview of the environmental issues that are most relevant to TfL's operations, and outlines the organisation's approach to addressing these to help make London a more sustainable city.

Progress made by TfL during 2007/08 is presented throughout this report and is

illustrated by examples highlighting TfL's environmental performance. Some data from previous years have been re-stated (see 'About this report' on page 54 for more details). A number of key achievements from 2007/08 are listed below:

> In February 2008, TfL launched the London-wide LEZ. Covering most of Greater London, it is designed to reduce harmful emissions by deterring the most polluting diesel-engined lorries, coaches and buses from driving in the zone

> TfL was instrumental in bringing the first stage of the Tour de France to London in July 2007. Following the event, there was a 10.5 per cent increase in the number of people cycling on London's major roads in the six months from April to September, compared with the same period in 2006 – an estimated 48,000 more cycle journeys every day

> A new report<sup>4</sup> showed the DLR extension to London City Airport has brought huge environmental benefits. Since it opened in December 2005, around 120,000 fewer taxi rides and 288,000 fewer

car journeys have been necessary, reducing CO<sub>2</sub> emissions by more than 156 tonnes

> Recycling of customer waste on the Tube increased from 31 per cent to 40 per cent from 2006/07 to 2007/08. This was achieved despite a 23 per cent increase in waste being left on Underground stations and trains

> During the last six months of 2007, a TfL staff pledge to help cut energy use saw electricity consumption in its head offices fall. The saving – 523 tonnes of CO<sub>2</sub> – is the equivalent of driving a car around the earth 63 times



**TfL provides support, advice and practical help to encourage staff, pupils and visitors to choose more active and sustainable ways to and from school**

- > In September 2007, London Buses won the Public Sector Innovation category in the GreenFleet Awards for introducing hybrid buses in the Capital
- > The three contractors responsible for carrying out maintenance works on behalf of companies that manage TfL's roads are proactively replacing older fleet vehicles with cleaner, green alternatives as part of their contract
- > TfL launched a campaign to boost walking in April 2007. Called 'Why not walk it?', the campaign encourages people to think about tackling short journeys on foot, instead of going by car
- > New figures released in September 2007 showed that TfL's work implementing school travel plans had reduced car journeys by two million, cutting carbon emissions by 1,150 tonnes. As part of its smarter travel programmes, TfL provides support, advice and practical help to encourage staff, pupils and visitors to choose more active and sustainable ways to and from school. Examples include funding cycle parking, road safety improvements and setting up car sharing schemes
- > In February 2008 London, through TfL, the Met and London Fire Brigade, was the first world city to sign a deal as part of the Clinton Climate Initiative for the C40<sup>5</sup> to cut carbon emissions by making existing buildings more energy efficient. TfL signed a contract to provide guaranteed energy efficiency improvements in 22 head office buildings
- > In January 2008 TfL published 'Sustainable Freight Distribution: a Plan for London'. It sets out how TfL and the GLA Group will lead, and work in collaboration with, London's boroughs, businesses and the freight companies operating in the Capital to cut CO<sub>2</sub> emissions. Major projects include the Prescott Lock works on the Bow Back rivers, which will provide an effective water-borne transport infrastructure for the 2012 Games and its legacy. The new lock is backed by TfL and partners.
- > LU introduced plans for the Victoria line and sub-surface line (SSL) upgrades, which will halve the potential energy rises caused by increasing capacity on the line. The trains for both upgrades will have regenerative braking capability and the specifications for the new SSL signalling system will cap the energy increase at 30 per cent
- > Improved incentives and obligations in respect of energy and carbon management were developed and will form a key part of the restated terms for the second period of the Public Private Partnership contract





## > Managing the environmental impacts of transport – TfL's approach



While transport provides a vital service for London it can impact on air quality, noise, climate change, biodiversity and the built environment.

In addressing these impacts, TfL has opportunities to protect and enhance London's environment because of the size and geographical coverage of its activities, which extend across the whole of the Capital. For example, 55 per cent of the Tube network is

above ground and LU is responsible for managing 10 per cent of London's wildlife habitat. TfL also directly manages 580km of road, as well as all traffic signals; influences vehicle flows; and funds some of the works on the remaining roads across the city.

With London's population forecast to grow from 7.5 million to 8.1 million by 2016, TfL will need to increase public transport capacity. The challenge is to meet this demand while minimising carbon and other emissions, and

reducing resource use and waste. For this, TfL seeks to continually monitor and improve its operational methods and working practices. Also important is TfL's influence over the environmental impacts of private cars and freight.

### > Environmental management

TfL has a health, safety and environment policy signed by the Commissioner and senior managers. Environmental management systems based on the international standard

for good practice set out in ISO 14001<sup>6</sup> have been established for LU, London Streets, TfL's Corporate Directorate and London Overground infrastructure. Systems are also being developed for other operational areas. TfL set its environmental priorities by selecting eight objectives and it monitors progress through associated KPIs<sup>7</sup>. The organisation has also adopted the principles of the GLA's Responsible Procurement Policy and the Green Procurement Code.



## Programmes are in place to achieve more efficient energy and water use

### > Governance

TfL has a board-level Safety Health and Environment Committee which reviews the progress on environmental performance. Environmental managers, planners and others within TfL provide the day-to-day environmental management.

### > Monitoring

At Group level, TfL reports on environmental performance through this document.

This report considers TfL's environmental priorities through three key themes:

> Focus on climate change – the need to help mitigate climate change by reducing CO<sub>2</sub> emissions from TfL's transport operations and influencing similar reductions from private cars and freight. There is also a need to ensure TfL's transport services can adapt to the effects of a changing climate by assessing and planning for risks such as flooding, extreme heat and drought

> TfL's impact on the local environment – TfL's transport services can have environmental impacts and affect Londoners' quality of life through issues such as noise and air pollution

> Resource use and waste management – TfL has influence through its 'purchasing power' to set the standard in buying goods and services with sustainable qualities. It also has a duty to minimise the generation of waste through, for example, recycling and sustainable construction practices. Programmes are in place to achieve more efficient energy and water use





## > Focus on climate change



Addressing climate change is probably the greatest environmental challenge facing the world today. Rising global temperatures will bring changes to sea levels and will increase the frequency and intensity of extreme weather events.

### > The challenge

Emissions of greenhouse gases, particularly CO<sub>2</sub>, are widely recognised as contributing to a changing climate. Projections suggest that, by 2100, global average temperatures could rise by between 1.4°C and 5.8°C, depending on emissions.

Limiting greenhouse gas emissions is a global challenge that requires worldwide collaboration and international initiatives have already come through the European Union (EU) and the G7 group of countries. The UK Government will be the first to introduce a Climate Change Act, which will set out a national CO<sub>2</sub> reduction target and restrictions on carbon budgets<sup>8</sup>.

Climate change presents a significant challenge for TfL – ground-based transport produces 22 per cent of the Capital's carbon emissions, with private vehicles and freight accounting for almost three quarters of this. As well

as introducing measures to reduce its CO<sub>2</sub> emissions, TfL also supports emissions reductions from private vehicles and freight.

Additionally, there is the challenge of adapting to climate change in the longer term. Changes include flooding, heat extremes, droughts and higher frequency of storms.

### > TfL's approach

In 2008, the Mayor of London set a manifesto target of a 60 per cent reduction in the Capital's CO<sub>2</sub> emissions by 2025, against 1990 levels, and TfL supports the delivery of this target through its climate

change mitigation programme. As part of this, specific implementation plans were developed in 2007/08 for LU, Surface Transport and London Rail (covering London Overground, DLR and the East London line (ELL) extension).

The climate change mitigation programme has four key elements:

#### 1. Changing the way people travel

TfL has an influential role to play in supporting people to make more informed decisions about the way they travel in London. As well as managing the CO<sub>2</sub> impacts of its own operations, it influences CO<sub>2</sub>



**TfL aims to ensure that its vehicles are driven as efficiently as possible, as well as promoting smarter driving to Londoners**

reductions more widely through the promotion of public transport use, walking and cycling; smarter travel programmes; and Congestion Charging

**2. Operating vehicles more efficiently**

TfL aims to ensure that its vehicles are driven as efficiently as possible, as well as promoting smarter driving to Londoners. This brings fuel savings with associated cost benefits and emissions reductions

**3. Promoting lower carbon vehicles, fuel and infrastructure**

Reductions in CO<sub>2</sub> emissions are also being delivered through the introduction of new engine technology, such as diesel-electric hybrid buses, and by using lower carbon energy sources such as renewable electricity

**4. Sustainable buildings and behavioural change**

TfL manages CO<sub>2</sub> emissions from its offices, stations, depots and staff accommodation. It has set up a network of Head Office Environmental Champions and Station Energy Champions, and has implemented campaigns across the organisation aimed at improving energy efficiency and waste reduction

**> TfL's performance**

TfL uses the following KPIs to monitor progress in reducing its contribution to climate change:

- > Total CO<sub>2</sub> emissions and CO<sub>2</sub> emissions per passenger kilometre
- > Energy consumption, by energy type
- > Proportion of electricity obtained from renewable sources

KPI data is from transport modes directly managed through TfL, although it is working on ways to include CO<sub>2</sub> data from private transport, cars and freight. Details of the data available are in the separate data tables section of this report.

Electricity use accounted for 38 per cent of emissions, with the remaining 62 per cent coming directly from the combustion of gas and liquid fuels.

In 2007/08 TfL's CO<sub>2</sub> emissions were 1.93 million tonnes.

CO<sub>2</sub> emissions from electricity use were calculated using latest Government guidance. A change in Government policy on carbon accounting means that purchased renewable energy is no longer classed as carbon-free.

continued on page 21

**> The TfL Energy Pledge**

More than 2,100 staff members signed up to TfL's six-month Energy Pledge in 2007, helping to cut electricity use at head office buildings by nine per cent compared with the same period in 2006.

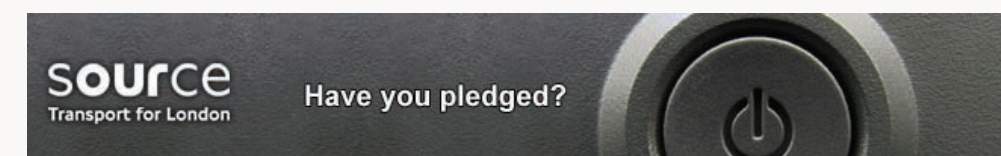
The initiative encouraged staff to make one simple change to their working lives to help reduce the amount of energy TfL uses. They were encouraged to pick from a list of personal pledges, which included turning off computers and monitors every night, unplugging mobile phone chargers and printers, or only printing when necessary.

Twenty per cent of head office employees got involved in the carbon-cutting project. Their efforts, alongside efficiency measures implemented by TfL – for example, sensors which automatically turn

lights on and off – helped achieve the impressive saving, which amounted to more than one million kilowatt hours of electricity (523 tonnes of CO<sub>2</sub>). That's the equivalent of driving a car around the earth 63 times or making 75 million slices of toast.

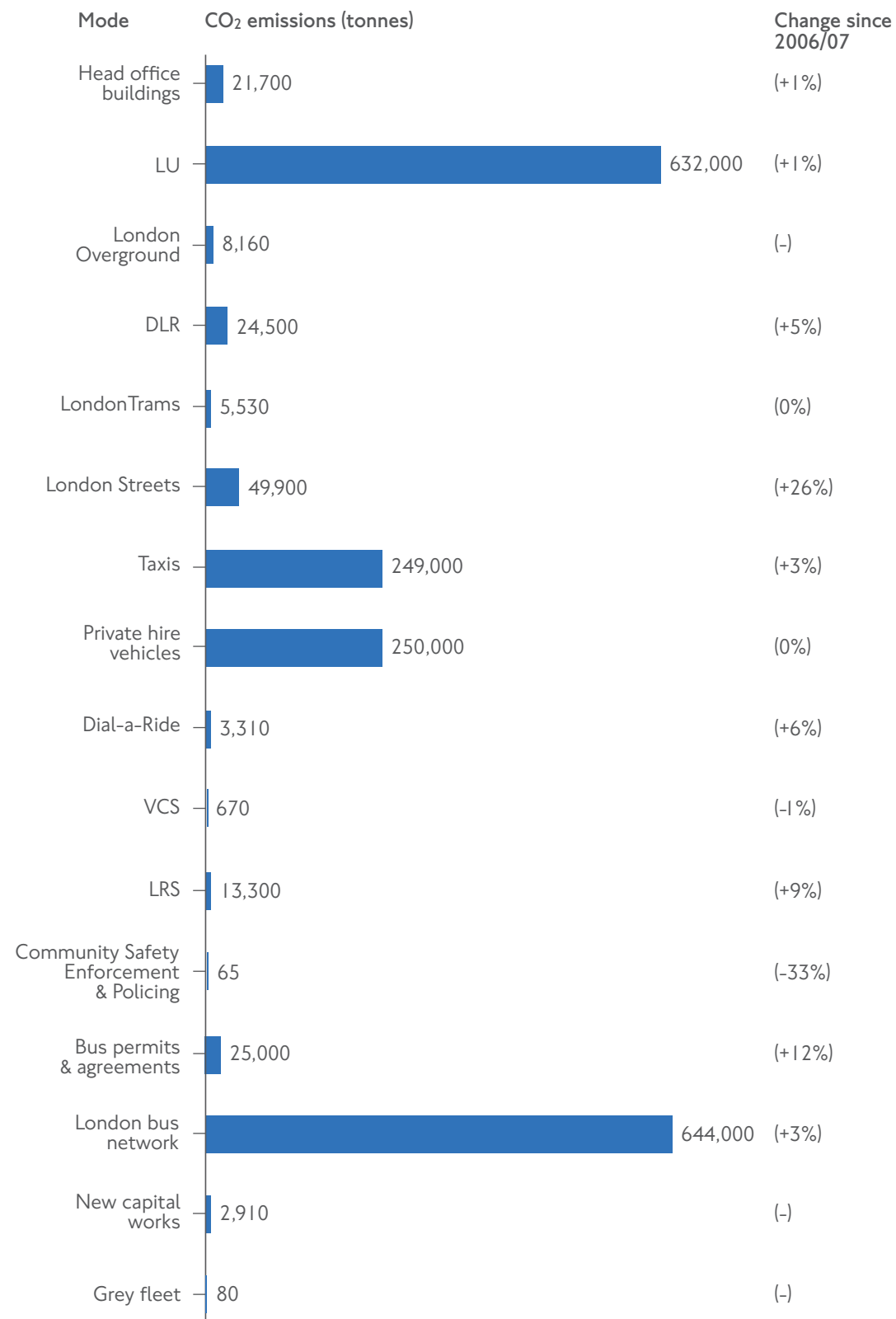
By running the pledge over six months, TfL hoped many of the changes made by staff would become second nature, leading to longer-term savings.

TfL has established a network of more than 160 Head Office Environmental Champions to encourage and inspire their colleagues to reduce their environmental impacts. It demonstrates that, if everyone makes a small change, the overall impact can be significant.





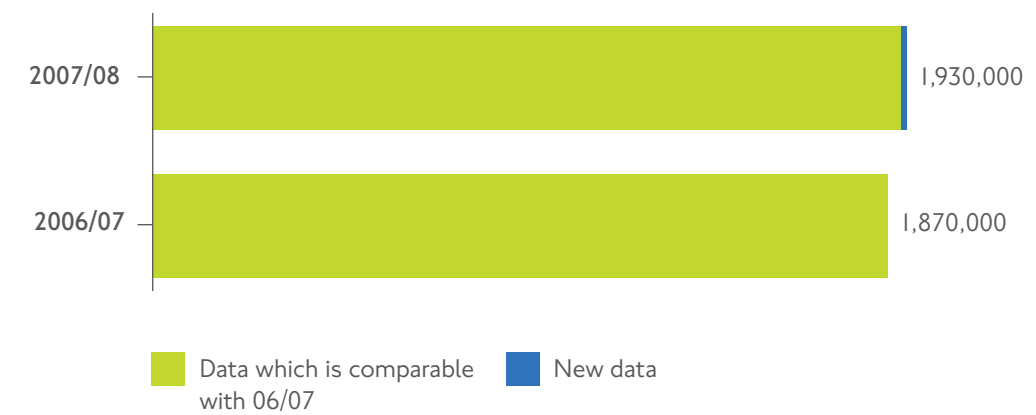
**CO<sub>2</sub> emissions from transport in London during 2007/08 by mode**



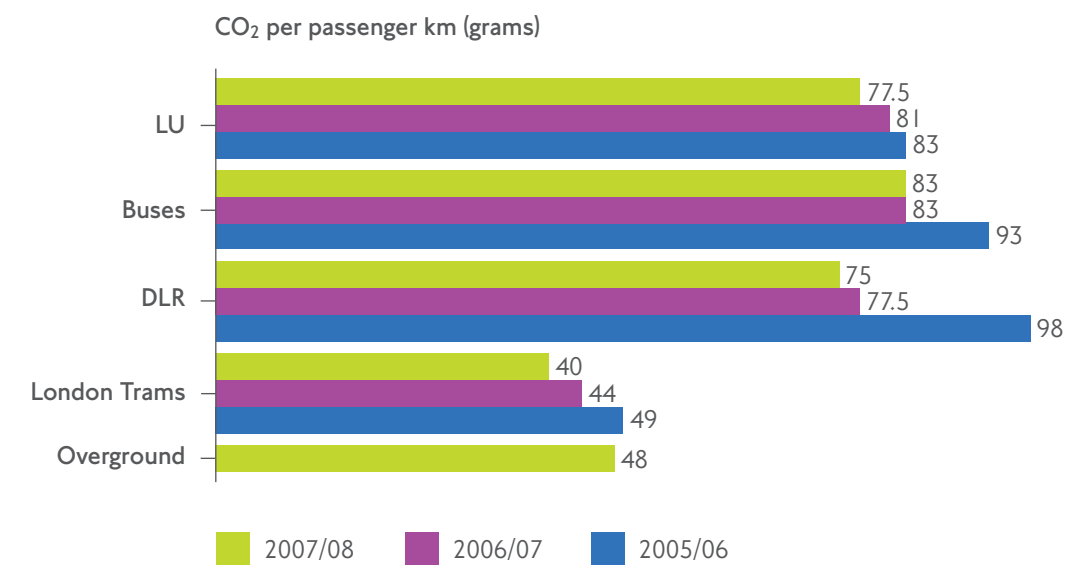
Applying these new emissions factors to the previous years, so that figures can be compared directly with 2007/08, shows CO<sub>2</sub> emissions have increased by three per cent.

The increase is partly due to first-time reporting from London Overground, London Streets, TfL's 'grey fleet'<sup>9</sup> and new capital works occurring on the ELL, with the remainder coming from increased service provision.

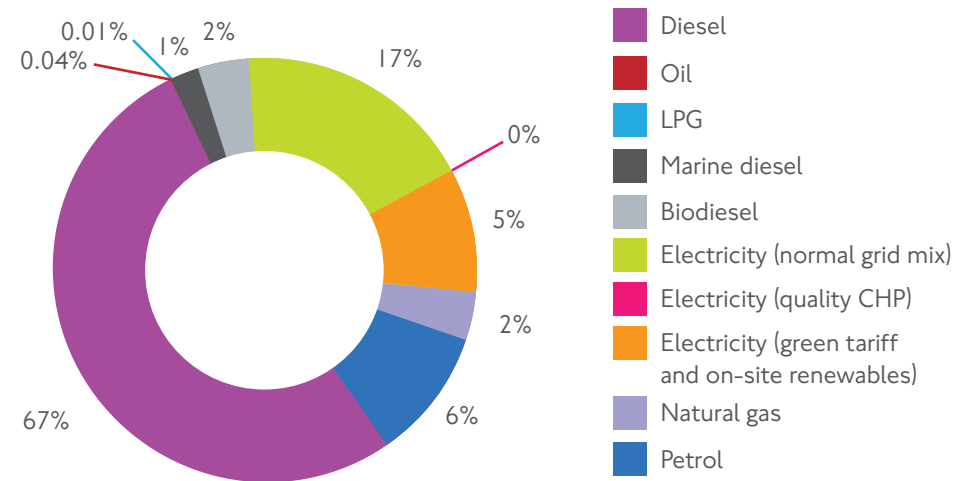
**CO<sub>2</sub> emissions per year by TfL operations (tonnes)**



**CO<sub>2</sub> per passenger kilometre by mode**



Sources of energy used in 2007/08



Importantly, the underlying trends for CO<sub>2</sub> per passenger kilometre are positive. For instance, LU experienced a five per cent decrease in emissions. London Buses emissions per passenger kilometre remained the same, and on the DLR, CO<sub>2</sub> per passenger kilometre dropped by three per cent.

> Adapting to a changing climate

There is a degree of change in the climate that is inevitable due to the amount of CO<sub>2</sub> that has already been emitted. This will result in both gradual change in average conditions plus

increases in the frequency of extreme weather events such as flooding, storms, drought and heatwaves.

TfL's approach to managing its operations in a changing climate is to understand and prioritise the risks and put measures in place that minimise impacts and enable it to respond to, and recover from, events as quickly as possible. An important element is the partnerships with key stakeholders across the Capital, such as London Resilience, the Environment Agency and the emergency services.



Examples include participation in the Capital Ingot planning exercise in February 2008 to test command and control arrangements that are in place for dealing with a major emergency in London. TfL is also participating in the Environment Agency's Thames Estuary 2100 project to develop a tidal flood risk management plan for London and the Thames estuary.

TfL has processes in place to help identify risks caused by serious weather events. Flood management plans have also been developed across

all TfL modes and emergency strategies are regularly tested.

As well as new initiatives, TfL is working to adapt existing infrastructure to help it withstand the effects of climate change. Projects include LU's Cooling the Tube programme to reduce temperatures on the Underground and changes in the specification of the bus fleet to include, for example, white roofs and improved ventilation.

## > The Climate Change Fund

To help deliver its mitigation programme, TfL set up the Climate Change Fund in 2007. Providing £25m over three years, it supports projects that make use of low carbon technologies plus opportunities outside of those highlighted in TfL's Business Plan.

To date, the fund has allocated £14.7m to seven programmes.

### > Hybrid buses

The Climate Change Fund has supported the introduction of 56 hybrid buses, which will be purchased by May 2009. The number of new hybrid buses will increase each year and, from April 2012, all new buses entering the fleet will be hybrid.

Hybrid buses are quieter, cleaner and consume less fuel than conventional diesel buses. They combine an engine and electric motor to reduce emissions of local pollutants and CO<sub>2</sub> by around 30 per cent. A number of different types of hybrid technologies are being trialled during 2008 and 2009.

The buses have a battery pack which provides power to the wheels via an electric motor. Batteries are kept at operating power by a diesel engine running independently.

When the vehicle brakes, energy which would otherwise be wasted is recycled and used to charge the batteries. With continuous charging, the vehicle is far more efficient than a diesel bus and achieves more miles to the gallon.

Most of TfL's 8,300 buses run on diesel fuel, so emit 644,000 tonnes of CO<sub>2</sub> annually, or five per cent of the emissions attributed to ground-based transport in London. More than 500 vehicles are replaced each year. A progressive introduction programme will mean a saving of some 5,000 tonnes of CO<sub>2</sub> in 2012.

TfL is leading the way in this area and the fleet is already the cleanest in the UK. In September 2007, it won the Public Sector Innovation category in the GreenFleet Awards for its work introducing hybrid buses in London.

### > Smarter driving campaign

The CO<sub>2</sub> emissions from private vehicles equal 4.4 million tonnes a year, or 49 per cent of the total for ground-based transport in the Capital.

In February 2007, the Climate Change Fund supported the launch of the two-year smarter driving campaign, which promotes a range of efficiency tips – such as keeping tyres inflated to the right pressure and changing gear at low revs – to London's car drivers.

The aim is to show how making a few small changes to driving habits can have a real difference. If all drivers in London adopt the techniques, CO<sub>2</sub> emissions could be cut by around 500,000 tonnes, the equivalent of taking 225,000 vehicles off the Capital's streets.

Drivers would also use 182 million litres less fuel over the course of the year – enough to fill 73 Olympic-sized swimming pools.

The first wave of advertising included roadside billboards, bus rear adverts and petrol pump nozzle covers. Radio adverts were also broadcast in the London area.

As part of the campaign, TfL also offers advice via its website on subjects ranging from lift sharing to buying a greener car.

### > Low carbon taxi development programme

TfL is supporting a programme to develop and trial low carbon technology in London's taxi fleet. Additional funding is being provided by Cenex, the UK's National Centre of Excellence for Low Carbon and Fuel Cell Technologies.

TfL has invited motor manufacturers to come forward with proposals for suitable low carbon vehicles such as 'micro-hybrid' technology, where the taxi engine cuts out automatically when the vehicle stops and starts up again when the accelerator is pressed.

The Capital's 22,000 taxis spend about 40 per cent of their time stationary – at ranks, traffic signals or waiting to pick up or drop off passengers. Under these conditions, a micro-hybrid taxi could reduce fuel consumption by 10 to 15 per cent.





## > The Climate Change Fund (continued)

### > DLR regenerative braking trial

The DLR is carrying out a trial of capacitors to store energy recovered by regenerative braking.

The project at Royal Mint Street junction will reduce traction electricity consumption at the junction by at least 10 per cent. It will also provide a basis for assessing the feasibility of using similar technologies across the DLR network.

### > LU low carbon station specification

LU and Tube Lines are to trial new measures to improve energy efficiency in Underground stations.

A feasibility study will assess a number of measures, ranging from energy-efficient lighting to renewable energy technologies. Selected options that deliver cost-effective carbon savings will then be designed and tested at one or more pilot stations.

The trial will help LU identify technologies and measures that, when rolled-out at suitable locations across the network, should lead to significant carbon and energy savings.

### > Fuel cell combined heat and power plant at Palestra

TfL's office building 'Palestra' will welcome the largest fuel cell combined heat and power plant to be housed in a UK building, thanks to the Climate Change Fund.

The fuel cell is part of a tri-generation system being installed as one element of works aimed at dramatically improving the environmental performance of the building in Southwark, which is now home to around 2,000 Surface Transport staff and the London Development Agency (LDA).

A low-carbon way to generate electricity, the plant will also provide cooling and heat to the building and is due to be operational in 2009. The hydrogen for the fuel cell will initially be supplied by converting natural gas, but there is potential for using more sustainable off-gas from waste or sewage treatment in the future.

The plant will generate around one megawatt of power, with approximately 20 per cent of that coming from the hydrogen fuel cell. At times of peak energy use, the building will generate a quarter of its own power, rising to 100 per cent off-peak. The plant will also deliver an estimated 24 per cent reduction in CO<sub>2</sub> emissions for the whole of Palestra.

The project is part of TfL's contribution to London's approach to stimulating low and zero carbon technologies. Other measures in the package include rainwater harvesting, energy efficiency works and the use of innovative recycled materials.

The Building Research Establishment Environmental Assessment Method (BREEAM) is the recognised independent benchmark for auditing a building's environmental performance. The current BREEAM rating for Palestra is 'very good', but TfL's package of sustainability measures will increase this to an 'excellent' rating, the highest currently available.

### > LDA green homes and organisations

Support was given to the LDA to encourage householders and employees to choose healthier and more environmentally friendly ways to travel, such as walking, cycling, public transport and car sharing.

London's homes account for 40 per cent of the Capital's CO<sub>2</sub> emissions, with the average household generating around six tonnes per year.

The LDA's Green 500 programme offers London's businesses advice on carbon cutting measures.

The aim is to deliver a 1.5 million tonne reduction in carbon emissions from the Capital's commercial and public sector by 2010, and together with the LDA's Better Buildings Partnership, a reduction of 35 million tonnes by 2025.

The programme also sets out to bring together the top 500 businesses and organisations to reduce London's CO<sub>2</sub> emissions, reinforcing the Capital's position as a global city leading the way in tackling climate change.

### > Further information

For the GLA's policies and strategies relating to climate change, visit [www.london.gov.uk/mayor/environment/climatechange](http://www.london.gov.uk/mayor/environment/climatechange)

To find out more about the UK Government's outlook on climate change and energy, go to [www.defra.gov.uk/environment/climatechange](http://www.defra.gov.uk/environment/climatechange)

The guidelines to the Department for Environment, Food and Rural Affairs' (Defra's) greenhouse gas conversion factors for company reporting (June 2008), are available at [www.defra.gov.uk/environment/business/envrp/conversion-factors](http://www.defra.gov.uk/environment/business/envrp/conversion-factors)

For details about the London Climate Change Partnership, go to [www.london.gov.uk/lccp](http://www.london.gov.uk/lccp)



## > Focus on the local environment



London has a unique range of environments and TfL is one of the organisations that can help to protect and enhance these. The quality of people's local environment can have a direct impact on their health and wellbeing, the extent to which they make use of the areas available to them and, therefore, the way they live their lives.

### > The challenges

London's environment is affected by a range of issues including air pollution, noise, accessibility and community safety.

Levels of harmful atmospheric pollutants have fallen during recent years with the introduction of newer, cleaner vehicles. However, the Capital's air quality (particularly in Inner London) is the worst in the UK, and continues to breach safe EU and national health-based targets.

Noise pollution can also seriously affect people's lives. Sound levels from transport, including train and vehicle movements, construction works and public announcements, are greater in built-up areas. More people in London are bothered by noise from transport than by loud neighbours<sup>10</sup>.

Green spaces with high biodiversity value encourage people to explore and exercise more and need to be protected, including against expected future changes in climate (such as flooding). TfL's network of cycling and walking

facilities also runs through these areas. This is why TfL is helping to fund the Mayor's Priority Parks initiative.

Poor maintenance of the public realm can encourage antisocial behaviour and more serious crime, which may deter people from using transport facilities and public spaces. Investment in a modernised, well-maintained and efficient public transport system, together with the provision of accessible areas where people can walk and cycle, is helping to address this.



**TfL has been encouraging the use of new technologies and innovation to reduce adverse environmental and health impacts from vehicles**

**> TfL's approach**

As the owner of large areas of land and buildings in London, TfL is working to ensure that its properties are well maintained, or enhanced, and the impact of its transport operations are minimised.

The Capital is the only major world city to measure a shift from the use of cars toward public transport, walking and cycling, which have benefits for air quality and noise. Similarly, policies are introduced to shift freight from road to rail where economical and practicable. TfL published its Rail Freight Strategy in August 2007, which contains a range of initiatives for encouraging mode switch of freight to rail.

TfL has been encouraging the use of new technologies and innovation to reduce adverse environmental and health impacts from vehicles. For the bus fleet, this involves the roll-out of hybrid-electric buses and the introduction of a small fleet of hydrogen fuel cell buses. TfL promotes the introduction of quieter, cleaner vehicles that comply with, or exceed, European emissions requirements. For example, TfL has established a Support Fleet Environmental Group, which is developing new policies to 'green' the fleet.

The London Taxi Emissions Strategy requires all of the Capital's 22,000 licensed taxis (black cabs) to meet

stringent emissions targets from July 2008.

The London Freight Plan and Freight Operator Recognition Scheme (FORS) were also launched in January 2008 to help freight operators increase their efficiency while reducing air pollutant and CO<sub>2</sub> emissions, congestion and costs.

In addition, noise from music and public address systems on riverboats that use TfL-managed piers is being controlled through devices that allow the vessel operator to regulate the volume centrally.

As part of managing its responsibilities for the built and natural environment, TfL has published Streetscape Guidance to help designers achieve excellent streetscapes. It is also providing people with improved access to green infrastructure through the Cycling on Greenways programme.

This seeks to improve access to London's parks and open spaces. TfL has been working with the East London Green Grid network to improve cycling and walkways. TfL also monitors wildlife habitats and is installing bird nesting boxes and other equipment to encourage, and protect, flora and fauna at its sites.

TfL is managing noise from its assets. This includes using quieter road surface materials on the Transport for London Road Network (TLRN).

The impacts of new projects and established operations are identified and assessed through consultation with local residents. This helps to minimise disruption, an example being the recent upgrade of a highway maintenance depot in Tulse Hill, which has been redeveloped to bring it up to a compliant standard and to benefit its local neighbours.





## > A40 Western Avenue bridge replacement

TfL has replaced the two A40 Western Avenue bridges over railway lines at Wales Farm Road and Perryn Road in Acton.

The complex project began in 2005 and is being carried out in phases to ensure normal traffic and rail operations are maintained. During the project, TfL has taken steps to protect the area's biodiversity and minimise the impact on the environment and local community.

Recycling containers are located on-site for timber, plastics, packaging, metal and paper. In addition, as the old bridges are dismantled, the sections are crushed so that the steel and concrete can be separated. The materials are then either reused or sent for recycling.

Examples include granite kerbs that have been supplied to TfL's highways

maintenance contractors for red route works. Clay dug from the site has also been used to line a new lake at a nearby nature reserve.

To protect wildlife, for instance newt and slow worm habitats, a Natural England-approved reptile barrier has been installed around the site. Bird boxes have also been placed in trees protected from the works, to provide shelter and encourage nesting. Once the project is completed, extensive landscaping will be carried out.

The work has been recognised with a Considerate Constructors Scheme 2008 National Award.

The environmental initiatives are reported in quarterly project newsletters, which are distributed to 20,000 residents and businesses, as well as to local councils and stakeholder groups.



### > TfL's performance

TfL has continued working towards its objectives for reducing pollutant emissions to air, managing noise and maintaining or enhancing the quality of the built and natural environment.

For example, Tube Lines, working on behalf of LU, has been delivering a conservation project on the Jubilee line that has seen a number of different habitat areas installed. These include woodpecker and barn owl boxes, field mouse and dormouse habitats, solitary bee boxes and hedgehog habitats.

TfL monitors the impact of its activities on the local environment with the following KPIs:

> Total nitrogen oxides (NO<sub>x</sub>), NO<sub>x</sub> emissions per bus passenger kilometre and total fine particle (PM<sub>10</sub>) emissions, as a measure of air pollution

> Number of noise complaints received, related to TfL's operations

> The proportion of the TLRN which is covered with quieter surface materials and the proportion of the bus fleet which is at least two dB(A) quieter than the legal noise test limit

> Mystery shopper surveys (MSSs), customer satisfaction surveys (CSSs) and the Local Environmental Quality Survey (LEQS) of England, as measures of monitoring the quality of the built environment and operational ambience<sup>11</sup>



> Air pollution: NO<sub>x</sub> and PM<sub>10</sub> emissions

Forty-two per cent of London's emissions of NO<sub>x</sub> and 69 per cent of its PM<sub>10</sub> emissions come from road transport. This is a slight decrease of one and two per cent respectively on previously reported figures<sup>12</sup>.

Overall across the TfL Group, NO<sub>x</sub> emissions were similar to last year but there was a one per cent decrease in emissions per bus passenger kilometre. This is largely thanks to

improvements to the London bus fleet, which accounts for more than three-quarters of TfL's NO<sub>x</sub> emissions.

PM<sub>10</sub> emissions have been reduced by 12 per cent across the network since last year. Taxis, which account for around a third of PM<sub>10</sub> emissions, recorded a 30 per cent drop compared to the previous year. This was a result of older vehicles being replaced or retrofitted with abatement technologies, such as filters, to meet higher European emission standards.

NO<sub>x</sub> emissions (tonnes)



PM<sub>10</sub> emissions (tonnes)



> The Low Emission Zone

The LEZ was launched on 4 February 2008 to cut harmful emissions by deterring the most polluting vehicles from driving in the Greater London area. It is the first scheme of its type in the UK and the largest in the world.

Initially applying to diesel-engined lorries weighing more than 12 tonnes, vehicles not meeting the required emissions standards incur a daily charge of £200 if driving in the zone. It is in operation daily and covers most of Greater London.

The current emissions standard of the LEZ is Euro III for particulate matter, which became mandatory for

all new lorries, buses and coaches sold in the EU from October 2001. London buses under TfL contract met the standard by December 2005 after particulates filters were fitted to older buses in the fleet.

Since the launch, results are proving very positive and the Capital is already benefiting from reduced emissions. By the end of March 2008, 96 per cent of the heaviest lorries driving in the zone met the necessary standard, compared to 70 per cent during 2007. Many of the improvements were delivered before the scheme went live, thanks largely to an effective information campaign and a great deal of work to help operators comply with the LEZ standard.





### > Noise

Noise complaints, which were reported by LU, DLR and, for the first time by London Rail, increased by 16 per cent during 2007/08. This can be attributed to major construction work on the ELL extension and complaints associated with increased announcements from public address systems on the Underground, which are designed to provide better information for passengers. For all complaints received, TfL seeks to address and resolve the issue, for example by amending speaker systems or working to best practical means during construction projects.

TfL is also working to ensure that buses are as quiet as practicable – eight per cent of buses are now quieter than the required legal limit, up from four per cent in the previous year. This has happened as a result of all buses being purchased at least 2dB(A) quieter than the current legal limit.

### > Built environment

Customer satisfaction with the quality of the built environment managed by TfL, for example trains and station cleanliness, remains consistently positive.



## > Encouraging sustainable travel

About 30 million journeys are made every day in Greater London and, by 2025, this is projected to increase by four million daily. However, if more people were to reduce their reliance on private cars for short trips, the Capital's carbon emissions would be drastically cut and air pollution reduced.

TfL has increased its focus on smarter travel – programmes that encourage people to think about the journeys they make. Initiatives include supporting the development of school and workplace travel plans, tailored advice for households and the introduction of car clubs.

In the summer of 2007 alone, more than 100,000 London homes were given individually-tailored travel advice. TfL is also working with organisations across the Capital to provide secure cycle parking spaces to businesses to encourage employees to cycle to work.

To date, there has been around a seven per cent average reduction in the number of car journeys to schools that have travel plans in place. There has also been a 14 per cent average fall in car journeys, and a 17 per cent increase in public transport use, at workplaces with TfL-approved travel plans.

Alongside increased investment in walking and cycling and the introduction of the Congestion Charge, these programmes have played a key part in helping Londoners swap the car for more sustainable modes of travel.

### > Smarter Travel Sutton

In 2006, TfL launched the three-year Smarter Travel Sutton programme, which set out to offer travel planning advice to residents, businesses and schools to encourage uptake of more sustainable travel options.

The £5m initiative is London's first borough-wide green travel programme and the largest in the UK. Its aim is to help people in Sutton make travel choices which will save money, improve their health and reduce congestion and pollution – at a cost to TfL of just £27 per resident.

The scheme is a partnership between TfL and the London Borough of Sutton, often working with other organisations such as Sutton and Merton Primary Care Trust and Sutton Chamber of Commerce. It has included:

- > Personalised travel planning offered to all 76,000 residents
- > Travel plans for schools and businesses
- > Alternative-fuelled community minibuses



## > Encouraging sustainable travel (continued)



- > The introduction of car clubs and car sharing schemes
- > Cycle courier services and cycle parking
- > GP referrals for healthy travel to help people overcome barriers to walking or cycling

The programme has seen some great results during 2007, with awareness levels of nearly 40 per cent among local residents.

Of the households offered tailored travel advice, 34 per cent requested information and incentives to help them reduce their car use. All schools in the borough now have travel plans and 5,000 children are benefiting from cycling training. Travel plans are

also in place for more than 14,000 employees in Sutton.

In November, the Streetcar scheme was launched in the borough, giving residents quick and easy access to a car club vehicle when needed.

A sustainable travel-themed summer festival called 'Move it at the Manor' attracted more than 5,000 residents and won the National Outdoor Events Association Award for 'most innovative' event.

It is estimated that, by the third year, Smarter Travel Sutton will cut residents' car trips by five per cent. Success so far led to the announcement, in March 2008, that a second programme would be unveiled for Richmond, with investment of £5m in the borough.

The formal launch is due to take place in early 2009.

### > Cycling and walking

In 2007/08, TfL announced a further increase in funding for walking and cycling initiatives, representing close to a five-fold rise in investment compared to TfL's first full year of operation.

Thanks to this, the number of cycle journeys being made on the Capital's major roads has hit an all-time high. Since 2000, there has been a 91 per cent increase and it is estimated that there are now around 500,000 cycle journeys made every day across London as a whole.

Increased investment has led to, among other things:

- > An overall 33 per cent reduction in cycling casualties (compared against the 1994-1998 average) and a fall in cycle thefts since 2005/06
- > Around 12,000 modern cycle parking spaces at schools and colleges across London
- > More than 40,000 cycle parking spaces at stations and on streets
- > A new practical, performance-based system for cycle training
- > A comprehensive set of London cycling design standards
- > Cycle training for approximately 55,000 children and adults, including those with special needs

- > Millions of free London Cycling Guides issued to the public showing 4,000km of recommended routes for cycling across all 33 London boroughs

As part of its promotion of cycling, TfL was instrumental in bringing the first leg of the world-famous Tour de France to London and Kent in July 2007. The largest annual sporting event in the world, it attracted around three million spectators over two days.

In September 2007, the city also successfully hosted stage one of the Tour of Britain. The same month saw the first London Freewheel take place. Now established as an annual event, it was the largest mass participation cycle ride to be held in the Capital, with more than 38,000 cyclists taking part.

In addition to improving conditions for cyclists, TfL is committed to making London one of the world's most pedestrian-friendly cities by 2015.

In April 2007, TfL launched its first ever walking campaign. Called 'Why not walk it?', the campaign encourages people to think about tackling short journeys on foot, instead of going by car. Research shows that half of all car journeys in Outer London are less than 2km – a distance that can be easily walked by most people in 25 minutes.



## > Encouraging sustainable travel (continued)

TfL has also produced guidance for borough officers involved in walking schemes. It provides detail on how to develop a coordinated approach to key pedestrian routes that maximise the benefits for walking – known as Key Walking Routes. The guidance, and TfL’s increased funding, is improving the walking environment and encouraging people to walk more.

Legible London was unveiled in November 2007 as a prototype at Bond Street. It is a wayfinding system which provides details on walking routes for the Capital’s pedestrians.

TfL has also been working to improve accessibility across London.

In 2007 a London-wide bus stop audit was completed to identify

which ones required accessibility improvements. London already has an accessible bus fleet, but by improving bus stops, TfL can ensure that the Capital has a bus service that is accessible to everyone. The results of this work will feed into an overall programme of improvements.

TfL also works to improve the accessibility of the TLRN by improving crossings and replacing subways and footbridges with level crossings, where possible.

### > Congestion

The Capital suffers from the worst traffic congestion in the UK, and among the worst in Europe. The Congestion Charge was launched in 2003 to encourage motorists to

use other modes of transport, in order to cut traffic volumes.

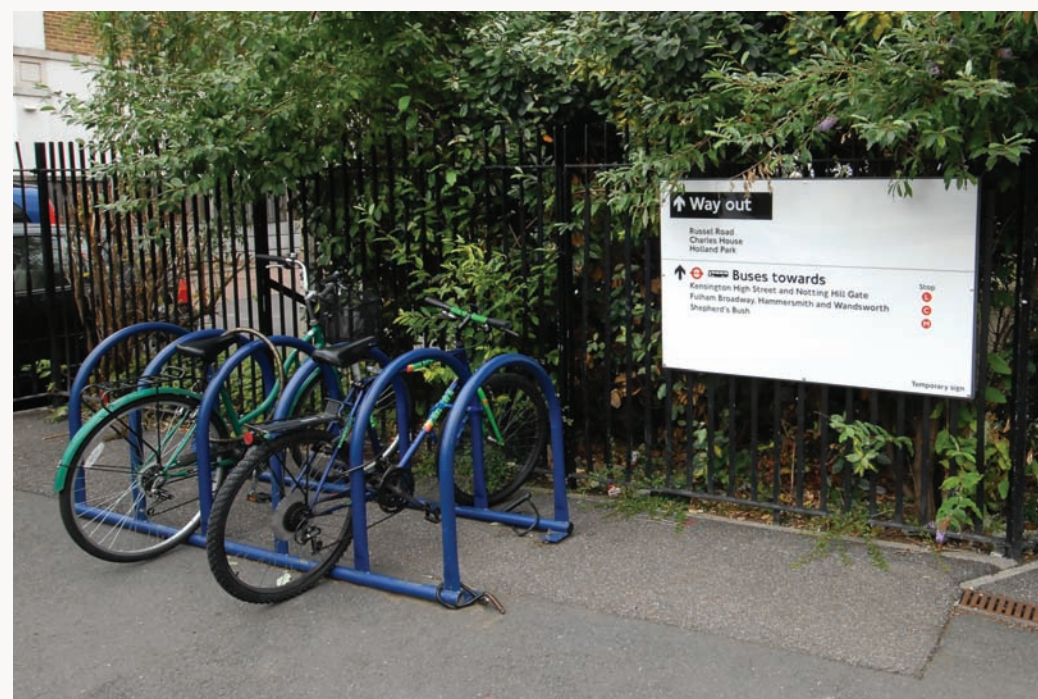
Congestion Charging continues to make a significant and valuable contribution to London’s transport network. The Sixth Annual Impacts Monitoring Report, published in July 2008 (which refers to data for 2007/08), revealed that:

- > A 21 per cent reduction in traffic entering the original charging zone has been maintained
- > There has been a six per cent increase in bus passengers during charging hours
- > Despite initial falls, congestion in the Charging zone has returned to pre-charging levels.

Nevertheless, congestion would be significantly worse without the sustained traffic reductions brought about by the charge

The trend for increasing public transport and cycle use, despite growing car ownership, sets London apart from other major UK and European cities. Annual passenger numbers on the Tube have hit an all-time high of more than one billion a year and bus use is at its highest since 1962.

Net revenues from the charge are spent on improving transport measures, including bus network operations, road improvements and bridges. A total of £137m was raised and reinvested during 2007/08.





## > Encouraging sustainable travel (continued)

TfL is developing a range of measures, such as upgraded equipment at signal-controlled junctions and the coordination of roadworks, to improve traffic flow and reduce disruption. Its aim is to significantly improve the efficiency of London's most important signals, increase road capacity, reduce delay and improve pedestrian provision where possible.

### > Encouraging sustainable freight transport

TfL's 'Sustainable Freight Distribution: a Plan for London' sets out how TfL and the GLA Group will lead, and work in collaboration with, London's boroughs, businesses and the freight companies operating in London.

The FORS is the cornerstone of the plan. It is designed to help enhance road freight efficiency and increase opportunities for companies to secure work by helping them to demonstrate their legal compliance and, through the use of best practice, reduce their costs, fines, collisions, fuel use and CO<sub>2</sub> emissions.

Benefits delivered by TfL, such as driver training, driver behaviour profiling and efficiency advice programmes, are designed to increase operator benchmark performance and help promote the uptake of low carbon vehicles.

By April 2010, 75 per cent of TfL, GLA, LDA and boroughs' own and contracted fleets will be signed up to the scheme.

TfL and the GLA Group will also take a lead in implementing Delivery and Servicing Plans and Construction Logistics Plans for group premises and construction contracts. These travel plans will help to reduce the volume of freight on London's roads, and promote operators who demonstrate their legal compliance and sustainability.

### > Further information

The UK Air Quality Archive contains an explanation of air pollution. Find out more at [www.airquality.co.uk](http://www.airquality.co.uk)

Defra's Noise Mapping England website, which provides further information on how noise is mapped in the UK, is available at <http://noisemapping.defra.gov.uk/wps/portal/noise>

The GLA's current strategies for air quality, ambient noise and biodiversity in the Capital are available from [www.london.gov.uk/mayor/environment/strategy.jsp](http://www.london.gov.uk/mayor/environment/strategy.jsp)

The London Plan and associated documents provide more detail on the built environment. For more, go to [www.london.gov.uk/thelondonplan](http://www.london.gov.uk/thelondonplan)



The London Air Quality Network (run by King's College London) provides information on air quality across the city. To find out more, visit [www.londonair.org.uk](http://www.londonair.org.uk)

TfL's Sustainable Freight Distribution: a Plan for London is available at [tfl.gov.uk/freight](http://tfl.gov.uk/freight)



## > Resource use and waste management



TfL has a duty to ensure that it uses resources responsibly. This includes helping to minimise natural resource depletion and reducing emissions and other negative impacts associated with the extraction of natural resources, manufacturing and transportation of goods and waste.

### > The challenge

The UK generates rubbish fast enough to fill the Royal Albert Hall every two hours, and space at landfill

sites is limited. Londoners produce 3.4 million tonnes of waste a year and the problem is growing. With landfill space for London predicted to run out within the next 10 years, something has to be done. But more than this, there is a duty for all organisations to manage waste and resources responsibly.

TfL recognises the importance of managing the materials it uses and the waste it produces. Various different types of waste are produced as a consequence of operating, maintaining and investing in TfL's operations. The primary sources

include waste from infrastructure, project and maintenance works and waste left by passengers on the Tube, buses, rail and other services.

### > TfL's approach

Using the principles of reduce, reuse and recycle as a starting point, TfL is committed to:

- > Reducing resource consumption and minimising waste
- > Reusing materials on-site where possible, including aggregates
- > Recycling water use, such as grey water<sup>13</sup>

### > Choosing more environmentally sensitive products

TfL's huge purchasing power can be used to drive up demand for recycled and green products. Through its adoption of the GLA's Responsible Procurement Policy and Green Procurement Code, TfL is committed to purchasing goods and services in a socially and environmentally responsible way.<sup>14</sup>

### > TfL's performance

Fuel and electricity are among the main resources used by TfL. Its performance on energy

consumption is described earlier in this report. Other significant resources include water, construction materials, vehicles, electrical equipment, furniture and office supplies.

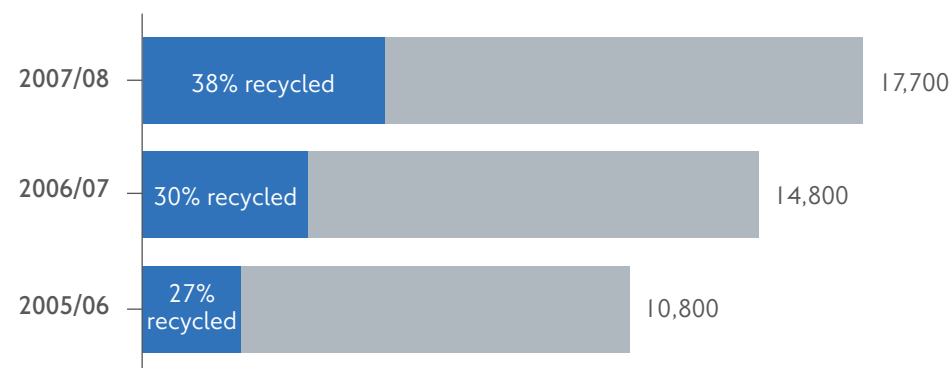
TfL has established KPIs for paper use, waste generated by TfL activities, water consumption and recycling rates.

TfL is seeking to improve data collection and to review what is measured.

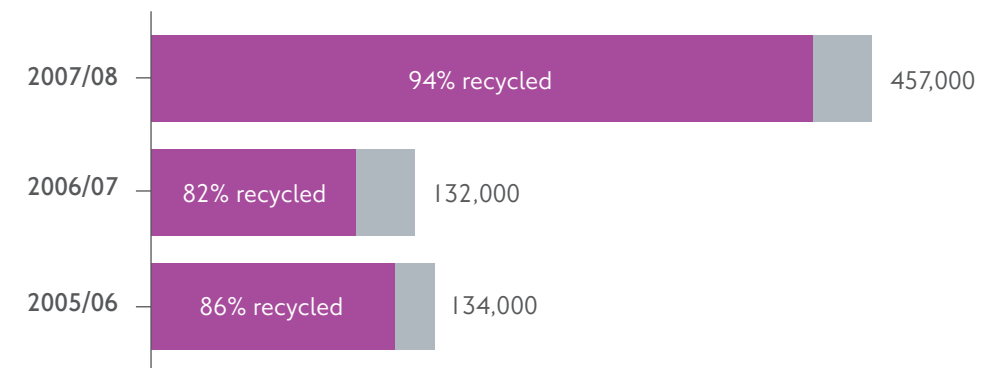
**> Reduce resource consumption and improve green procurement**

TfL has replaced standard white A4 80gsm copier paper in its stationery catalogue with an equivalent recycled stock. Head office paper consumption across TfL has been reduced by 13 per cent. The proportion of A4 recycled paper purchased has risen from 13 per cent to 99 per cent. TfL is working to increase the proportion of recycled paper used for other activities, including marketing and communications.

**Total C&I waste (tonnes)**



**Total C&D waste (tonnes)**



**> Reduce the waste generated by TfL activities, by applying the principles of reduce, reuse, and recycle**

Waste from TfL operations falls into three categories: commercial and industrial (C&I), including passenger waste; construction and demolition (C&D); and hazardous waste, including lamps, contaminated ballast<sup>15</sup> and engine oil.

Reported C&I waste has increased by 19 per cent compared to the previous year, with 38 per cent of it being recycled. This was because LU's contractors collected and recycled more of the increasing number of free newspapers being left on the Underground.

Reported C&D waste accounts for the majority of waste generated by TfL. The volume has increased because this is the first year that figures have been reported for London Streets and the additional C&D waste generated from the major construction work on the ELL. Together, they account for 84 per cent of the increase in the total amount of waste reported during 2007/08.

The proportion of C&D waste being recycled has increased to 94 per cent, largely thanks to the ELL's materials reuse and reprocessing achievements. The vast majority (99 per cent) of waste arising from the construction work has either been crushed and reused on-site or sent off-site for processing and reuse at other locations.

continued on page 49



## > Recycling on the Tube

Despite a significant rise in the amount of waste paper being left on the Tube, LU is achieving its highest ever recycling rate.

More than 7.5 million free newspapers are distributed in the Capital each week and many of these are left on Tube trains by passengers. In 2007/08, this contributed to a significant increase in train and station waste. LU stepped up efforts to recycle more of this paper and recycled a record 40 per cent of station and depot waste. This was an increase from 31 per cent in 2006/07 and was enough to fill more than 100 Jubilee line train carriages.

It was achieved by expanding a dedicated paper recycling collection scheme at terminus stations, encouraging passengers to take their newspapers with them to recycle, and appointing newspaper collecting staff at certain stations.

There are challenges to overcome in further increasing recycling – such as scarcity of space at central London stations, where the volume of newspapers is often highest, and the hundreds of stations on the Tube network. However, LU is working with its contractors to find more ways to improve recycling.

Future plans include a customer recycling bin trial at six Underground



stations, in partnership with the Metro newspaper, and a poster campaign to encourage people to recycle their newspapers at work or at home.

Work is also underway within other areas of the business, including London Buses and the DLR. For London Buses, the situation is more complex than on the Underground but opportunities for recycling are being investigated. On the DLR, waste collected from trains is separated at the depot for recycling.

Total water consumption (m<sup>3</sup>)



If these new figures were to be taken out of the calculation, so that 2006/07 could be compared directly with 2007/08, C&D waste would have actually decreased by 45 per cent, due to fewer ballast replacement projects being carried out on the Underground this year.

Hazardous waste accounts for one per cent of total waste generated across the TfL Group, with the majority of it being reported by LU. However, data from other modes are not complete. Where possible, hazardous waste is recycled.

### > Reduce water consumption

Reported water consumption across TfL has increased by six per cent, due to the inclusion of Overground information for the first time and the collection of more accurate data. The majority of reported water used was for operational purposes such as train washes, depots and stations. TfL aims to minimise water consumption by using low-water usage systems and recycling water for train and vehicle washing.

Water use in head office buildings has seen an 18 per cent decrease in consumption per occupant, thanks to the continued roll-out of water saving devices. This presented an opportunity for further energy savings as passive infra-red devices for lighting control were fitted while undertaking works to washrooms.

### > Further information

More details on resource use and waste management, as well as the GLA's Responsible Procurement Policy, can be found by visiting the following websites:

GLA Responsible Procurement Policy – [www.london.gov.uk/rp](http://www.london.gov.uk/rp)

Green Procurement Code and recycling in London – [www.londonremade.com](http://www.londonremade.com)

Waste and Resources Action Programme – [www.wrap.org.uk](http://www.wrap.org.uk)

Environment Agency (including information on water) – [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

## > Summary of TfL Group environmental objectives and KPIs

To aid the implementation of environmental policy and strategy, and assist in the monitoring of environmental performance, TfL has a suite of environmental objectives and KPIs (see table below). Previous chapters provide a more detailed explanation of the data and trends.

Objective	KPI	Data 2005/06	Data 2006/07	Data 2007/2008
Reduce greenhouse gas emissions	Total CO <sub>2</sub> emissions (tonnes)	1,850,000	1,870,000	1,930,000
	CO <sub>2</sub> emissions from the main public transport modes (g per passenger km):			
	> LU	83	81	77.5
	> Buses	93	83	83
	> DLR	98	77.5	75
	> London Trams	49	44	40
	> London Overground	-	-	48
	Consumption (million kWh) of:			
	> Standard grid supplied electricity	1,040	1,020	1,040
	> Electricity from good quality CHP	17.8	36.7	0
	> Renewable electricity generated on-site or green tariffs <sup>16</sup>	248	256	307
	> Natural gas	111	93	96
	> Diesel	3,850	3,910	4,040
	> Marine diesel	48	43	48
	> Biodiesel (as part of a 5% blend in diesel)	0	89	92
	> Petrol	417	391	388
	> LPG	0.6	2.5	0.45
> Fuel oil	0	1.93	2.2	

Objective	KPI	Data 2005/06	Data 2006/07	Data 2007/2008
Reduce greenhouse gas emissions (continued)	Energy consumption efficiency in head office buildings (kWh/m <sup>2</sup> )	413	357	344
	Proportion of electricity obtained from renewable sources <sup>17</sup> (%)	19	20	23
Reduce pollutant emissions to air	Total NO <sub>x</sub> emissions (tonnes)	8,410	8,110	8,120
	NO <sub>x</sub> emissions from buses (g per passenger km)	0.96	0.84	0.82
	Total PM <sub>10</sub> emissions (tonnes)	187	161	142
	PM <sub>10</sub> emissions from buses (g per passenger km)	0.0018	0.0015	0.0016
Reduce transport related noise and vibration	Number of noise complaints received	479	458	529
	Percentage of TLRN with lower noise surface material	70	78	79
	Percentage of buses in fleet at least 2dB(A) quieter than the required legal limit	0	4	8



Objective	KPI	Data	Data	Data
		2005/06	2006/07	2007/2008
Reduce resource consumption and improve green procurement	Reported value of spend on recycled products, across TfL Group (£)	4,080,000	4,470,000	No data produced
	Amount of office paper consumed across TfL Group (tonnes)	312	393	343
	Proportion of A4 office paper supplied from recycled sources (%)	19	13	99
Reduce the waste generated by TfL activities, by applying the principles of reduce, reuse and recycle	Total C&I waste (tonnes)	10,800	14,800	17,700
	Proportion of C&I waste recycled (%)	27	30	38
	Total C&D waste (tonnes)	134,000	132,000	457,000
	Proportion of C&D waste recycled (%)	86	82	94
	Proportion of total waste that is classified as hazardous <sup>18</sup> (%)	2	9	1
Reduce water consumption	Amount of water consumed (total m <sup>3</sup> )	749,000	794,000	842,000
	Water consumed per occupant in head office buildings (m <sup>3</sup> per person)	11.3	9.4	7.7

## > About this report



TfL is committed to managing its environmental impacts and reporting on its performance.

While TfL does not yet have Group-wide environmental targets, it is committed to delivering continual environmental improvements over time and reporting on progress. In 2008/09, TfL will be reviewing its suite of environmental KPIs and will seek opportunities to set targets at Group level.

Environmental KPIs were introduced in 2004 and data collection and reporting procedures are continuing to be developed across the TfL Group. Although KPIs are used to monitor and report performance, care should be taken when considering trends over time.

More transport modes and business units have started to report this year (notably London Overground and

construction work from the new ELL) and others have improved their data collection and management procedures, enabling TfL to report actual rather than estimated figures. London Overground data is expected to be more accurate next year.

Some data will differ from those in the 2006 and 2007 Environment Reports due to calculation processes changing since last year's report. For example, where new emission factors have been introduced, previously estimated data have been replaced by more accurate, or actual data, or reporting has been extended to take new responsibilities into account.

Figures for 2005/06 and 2006/07 have been updated to enable like-for-like comparison. For clarity, detailed data tables are included in appendix A.

TfL is working to improve the quality of data measured and reported. TfL is

committed to delivering continual environmental improvements and, in 2008/09, will be reviewing its suite of KPIs to improve the monitoring of its environmental impacts and better indicate the effectiveness of TfL's efforts to reduce them.

A significant proportion of TfL's work is delivered through contracts with suppliers or partnerships with other organisations. This is a challenge for environmental reporting, both in terms of determining the boundary of TfL's activities and in establishing reporting processes. To help overcome this TfL is, where appropriate, including environmental reporting requirements in new contracts.

Additional information on key operating facts, corporate governance, TfL's environmental approach and financial performance is provided on the TfL website at [tfl.gov.uk](http://tfl.gov.uk) and in the 2007/08 Annual Report, which can

be found at [tfl.gov.uk/annualreport](http://tfl.gov.uk/annualreport). LU produced a 2008 Environment Report, which is available at [tfl.gov.uk/tubeenvironment](http://tfl.gov.uk/tubeenvironment), and many of TfL's partners and suppliers also produce reports containing information relevant to London's transport system. The figures in this report differ slightly to those published in the LU Environment Report as it includes data on the LU head office performance, which in the main TfL report is categorised under 'head offices'.

### > Additional notes

- > All numbers in this report have been rounded to a maximum of three significant figures
- > The GLA administration and associated priorities during the financial year from April 2007 to March 2008 covered in this report, were under different leadership



## > Endnotes

<sup>1</sup> <http://www.london.gov.uk/mayor/publications/2008/docs/way-to-go.pdf>

<sup>2</sup> TfL bought Tramtrack Croydon Ltd, the company which owned the Croydon Tramlink concession and administered the network, on 27 June 2008

<sup>3</sup> Actual journey figures are provided for public transport. The figures for annual taxi, car, motorcycle, bicycle and walking journeys have been estimated, on the basis of daily average journey numbers published in the London Travel Report 2008

<sup>4</sup> Copies of the report, 'London City Airport Extension Monitoring Report year One', are available by emailing [planning@dlr.tfl.gov.uk](mailto:planning@dlr.tfl.gov.uk) or telephoning 020 7987 4244

<sup>5</sup> C40 is a group of the world's largest cities committed to tackling climate change

<sup>6</sup> ISO 14001 is the international specification for an environmental management system

<sup>7</sup> Page 50 contains a summary table of the TfL Group environmental objectives and KPIs

<sup>8</sup> A carbon budget is a set amount of carbon that can be emitted in a given amount of time, either by the whole economy, or a pre-selected sub-population or set of activities

<sup>9</sup> 'Grey fleet' refers to business miles travelled by employees in their own cars

<sup>10</sup> Ipsos MORI Annual London Survey 2007

<sup>11</sup> Passengers and service users are asked to score their experience and impressions of the transport and street environment on an 11 point scale from 0 to 10 (10 being the best). The scores are agglomerated and factored up to be reported as a score out of 100. Trained mystery travellers (including a panel of disabled assessors) also assess TfL's network. These surveys provide detailed and objective feedback to complement CSSs. In the same way, MSSs are reported as a score out of 100

<sup>12</sup> London Atmospheric Emissions Inventory 2004, GLA

<sup>13</sup> Waste water from all sources in a property other than toilets is known as greywater

<sup>14</sup> Responsible procurement is being rolled out into new contracts as tendering or re-tendering opportunities arise

<sup>15</sup> Ballast is loose material, usually stone, used to spread loading and holding railway track in the desired location

<sup>16</sup> For the first time, in 2007/08 TfL generated 0.3 million kWh from on-site renewables

<sup>17</sup> Generated on-site or from green tariffs

<sup>18</sup> The rise was due to contaminated track ballast, where the amount generated changes yearly according to the planned programme of LU's track replacement

## > Abbreviations

BREEAM	Building Research Establishment Environmental Assessment Method
CHP	Combined heat and power
CSS	Customer satisfaction survey
CO <sub>2</sub>	Carbon dioxide
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DLR	Docklands Light Railway
ELL	East London line
EU	European Union
GLA	Greater London Authority
GHG	Greenhouse gases, such as CO <sub>2</sub> , methane and ozone
FORS	Freight Operator Recognition Scheme
HGV	Heavy goods vehicle
KPI	Key performance indicator
kWh	Kilowatt hour
LDA	London Development Agency
LEQS	Local Environment Quality Survey
LEZ	Low Emission Zone
LPG	Liquefied petroleum gas
LRS	London River Services
LU	London Underground
MSS	Mystery shopper survey
NO <sub>x</sub>	Nitrogen oxides
PM <sub>10</sub>	Fine particles less than 0.01 mm in diameter
PPP	Public Private Partnership
TfL	Transport for London
TLRN	Transport for London Road Network
VCS	Victoria Coach Station

TfL welcomes feedback to help improve its environmental performance and this report. Please send your comments to:

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