

Transport for London

# Environment report 2004





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# Introduction

## Transport for London

Transport for London (TfL) aims to be a world class transport authority, delivering safe, reliable and integrated transport to all those who live in, work in, or visit London. A key aspiration underpinning TfL's vision of being a world leader is to take account of environmental impacts and opportunities in managing the transport network. TfL is accountable to the Mayor for taking full advantage of its power to alleviate environmental degradation and make real improvements to London's environment while promoting sustainable transport more broadly.

TfL, as a functional body of the Greater London Authority (GLA) is obliged to deliver its requirements as set out in the Mayoral strategies. The Mayor's Transport Strategy (July 2001), contains a number of policies and proposals which relate to environmental improvements. There are also other proposals for TfL to take forward from the Mayor's environmental strategies – Air Quality (Sept 2002), Energy (February 2004), Ambient Noise (March 2004), Biodiversity (July 2002) and Municipal Waste Management (September 2003). TfL is also taking forward a number of initiatives in addition to these to improve London's environment.

## Purpose of this report

TfL has made substantial progress in working towards an improved environment for London. This report outlines what TfL can do to influence London's environment and describes recent progress (since TfL's 2002 Environmental Action Plan) and what TfL now plans to do to improve its environmental performance still further.

## London's environment

London suffers from one of the worst air pollution levels of any major city in Europe. 58 per cent of the nitrogen dioxide (NO<sub>2</sub>) and 68 per cent of fine particle (PM<sub>10</sub>) emissions in London are from road transport. These pollutants are of the greatest health concern, particularly for the most vulnerable – the very young, older people and those with heart and lung conditions. Air pollution is also detrimental to the built and natural environment. Reducing pollution from individual vehicles and reducing overall traffic levels is therefore the focus of the Mayor's Air Quality Strategy.

Total energy consumption in London has been growing consistently during the last 40 years and transport is a major consumer. Motorised transport is responsible for about 20 per cent of all carbon dioxide (CO<sub>2</sub>) emissions in London and road traffic accounts for around 80 per cent of CO<sub>2</sub> emissions from all modes of motorised transport.

The Government has set a goal of reducing CO<sub>2</sub> emissions by 20 per cent on 1990 levels by 2010 and the Mayor is committed to ensuring that London plays its part in meeting this target. Therefore, reducing the energy consumption of transport is an important part of the Mayor's Energy Strategy.



For many Londoners, levels of noise and vibration present a very real problem. Noise can annoy, disrupt communication and disturb sleep. Noise may also contribute to inequalities in health since higher levels of traffic noise are arguably more likely to be experienced by socially deprived groups in areas which are more affected by busy roads. The 1999/2000 National Noise Attitude Survey carried out by the Building Research Establishment found that 35 per cent of respondents in outer London reported being at least 'moderately' bothered by road traffic noise compared with 22 per cent in the UK as a whole. The Mayor's Ambient Noise Strategy is a move towards more active management of long term noise, with a focus on better management of transport systems, better town planning and better design of buildings.

Two thirds of London's land area is occupied by a huge variety of green spaces and water. These provide opportunities for recreation and tranquillity but also support a remarkable variety of plants and animals: over 1,500 species of flowering plants and 300 species of birds have been seen over the last few years. Rivers in London are subject to a number of pressures including pollution, low flows and habitat degradation. Recent monitoring of rivers in London has shown that the majority are of good or fair quality. The Mayor's Biodiversity Strategy aims to protect and conserve the natural open spaces and make them more accessible.

London produces 18 million tonnes of waste every year. Most (71 per cent) of this waste is disposed to landfill outside of London, nine per cent is currently recycled and 20 per cent incinerated. The Mayor's Municipal Waste Management Strategy aims to reduce the total amount of municipal waste produced and to increase reuse and recycling.





# 1.0

## What TfL has done to improve London's environment

TfL is able to make real improvements to London's environment. This section of the report describes the main areas of activity which can influence the quality of London's environment and in each case gives an outline of the main achievements since 2002.

### 1.1 Providing and encouraging sustainable modes of transport

TfL is responsible for the capital's transport system – it manages London's buses, the Underground, the Docklands Light Railway (DLR) and London Trams, and runs London River Services, Victoria Coach Station and London's Transport Museum. TfL also manages a 580 kilometre network of main roads, all of London's 4,600 traffic lights and regulates taxis and the private hire trade.

TfL is also responsible for the network to support walking and cycling. More than 5.5 million trips a day are made on foot in London – more than are made by London Underground, DLR and national rail in London combined. However, the number of walking trips has declined by 13 per cent in the past decade. There are 300,000 trips a day by bicycle in London, although the level of cycling is low compared to other European cities: only 1.1 per cent of journeys are made by cycle compared to 10 per cent in Berlin and 28 per cent in Amsterdam. This leaves considerable scope for increasing the number of both walking and cycling trips.

Initiatives to reduce traffic congestion and increase the modal share of public transport, walking and cycling, through better infrastructure and services, integration and promotion, are providing Londoners with viable alternatives to the private car. In supporting these initiatives TfL has an inherently positive impact on London's air quality, energy use and greenhouse gas emission levels and the urban environment. The Mayor's vision is to make London one of the world's most walking friendly cities by 2015 and to achieve an 80 per cent increase in cycling by 2010. These modes are non-polluting, offering an inexpensive and healthy means of transport, thereby contributing more broadly to social inclusion and to the health and well being of London's residents, workers and visitors.





Environmental improvements also need to be placed in the context of sustainable development and therefore should, where possible, contribute to social progress and economic growth. Sustainable development is a cross-cutting theme in the Mayor's Transport Strategy and the five environmental strategies.

Since 2002 TfL has undertaken the following initiatives to provide and encourage sustainable modes of transport:

- The introduction of congestion charging on 17 February 2003 was a groundbreaking step in the reduction of traffic in central London. Motorists are charged £5 to drive within an eight square mile zone in central London between 07.00 and 18.30 from Monday to Friday. After the first year of operation, traffic entering the zone during charging hours is consistently down by 18 per cent and congestion down by around 30 per cent.

Thousands switched their journey to public transport, primarily buses, and other modes such as bicycles, scooters and car sharing. The scheme encompasses an incentive to those who continue to use private cars to switch to cleaner fuels: a number of alternative fuel vehicles receive a 100 per cent discount from the charge. Approximately 4,300 vehicles are registered to take advantage of this discount. TfL also contributed just over £33 million towards the cost of congestion charging complementary measures such as 20 mph zones in boroughs between 2002/03 to 2004/05.

Emissions of PM<sub>10</sub> and nitrogen oxide (NO<sub>x</sub>) on major roads within the charging zone are estimated to have reduced by 16 per cent and CO<sub>2</sub> by 19 per cent, although this has not translated directly to detectable changes in ambient air quality, owing to the unusual weather

conditions of 2003. Qualitative assessments indicate that this has contributed to a cleaner, more pleasant environment with less pollution alongside improvements in bus reliability.

- TfL launched the London Traffic Control Centre in August 2002. This involves working in partnership with the Metropolitan Police and bus controllers to ensure quick responses to traffic incidents and better management of the road network to enable potential difficulties to be tackled at an earlier stage to minimise congestion.
- TfL has introduced considerable bus service improvements across the whole of London. Approximately 300 extra buses were brought into service in 2003/2004. Articulated 'bendy' buses with cashless and open boarding arrangements have been introduced to speed up boarding: these carry up to 140 people, about 60 more than a double deck bus. By the end of 2003 bus fares had remained frozen for four years, ensuring their affordability. As a consequence of these and other improvements, buses have experienced the fastest rate of passenger growth since 1945. Bus usage increased by 11 per cent over the course of 2003/2004 to 1.7 billion passenger journeys.



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- London Underground has introduced more measures to facilitate payment, ensure affordability and improve access to information on the Underground. Examples include an increase in the number of queue buster pay machines that accept credit/debit cards, a Retail Price Index cap on fares, an update of the website to improve its ease of use and the production of information leaflets to encourage trips to theatres and markets.
- In 2002/2003 the Mayor's Transport Policing Initiative became fully operational on 20 key bus corridors when the Transport Operational Command Unit (TOCU) established a new partnership between police officers, traffic wardens, police community support officers and civil staff. The unit focuses on improving the personal security of passengers on bus services and taxi/private hire vehicles. £50 million is being invested in transport policing and enforcement in 2004/2005 which includes provision for the development of TfL's Transport Policing and Enforcement Directorate (TPED) to concentrate all enforcement activities in one division and enhance the work of the TOCU.
- To enable more people to travel by rail, TfL has undertaken detailed exploratory work with the Strategic Rail Authority (SRA) and Train Operating Companies into increasing capacity through longer trains or more frequent services. TfL has also been working with the SRA to increase the overall capacity of London's transport system by promoting major new cross London rail links such as the Crossrail and East London Line Extension projects.
- The DLR has been extended progressively and work is underway to extend to London City Airport (due to open in 2005). The Government has also given the go ahead for an extension to Woolwich Arsenal, which will be a continuation of the London City Airport extension. The number of passengers on DLR has been increasing and is expected to reach 60 million per annum by 2006.
- TfL has developed walking and cycling action plans, identifying practical means of encouraging walking and cycling in London. TfL's Walking Plan for London addresses the barriers to walking – high traffic volumes, poor air quality, road safety, personal security problems or the lack of information. The London Cycle Action Plan identifies four priority areas: improving cycle infrastructure; the marketing and promotion of cycling; encouraging public transport-cycle links; and optimising other traffic schemes to the benefit of cycling. Review panels have been established to support the implementation of these plans.

- TfL's Travel Awareness Team was established in April 2002, to work in partnership with the boroughs and other stakeholders to promote sustainable modes of transport. Work includes engaging in campaigns and initiatives such as 'Don't Choke London' and 'Safe Routes to School'. The team also encourages TfL employees to use sustainable transport and has written a travel plan for the GLA, and will develop one for all key TfL office buildings by March 2005. The travel plans include cycle facilities, video conferencing and opportunities for flexible and home working for staff.

## 1.2 Reducing the negative environmental impact of operations

TfL recognises that the public transport network has some negative environmental impacts:

Despite being the cleanest fleet in the UK, London's buses make a considerable contribution to road vehicle emissions, resulting in 21 per cent of NO<sub>x</sub> emissions from transport sources in central London. This is principally due to their very large numbers (8,000 vehicles in the current fleet). London's 20,000 plus taxi fleet is also a significant road vehicle source, contributing to one quarter of PM<sub>10</sub> emissions in central London.

Large amounts of energy are used to fuel TfL's transport services. The Underground alone is responsible for about 3.5 per cent of London's total energy consumption: approximately 90 per cent of this is used to power the trains and the remainder is used for heating, lighting and other electrical equipment.

Public transport and freight – on road, water, rail and Underground – is a contributor to ambient noise levels and vibration in London.

TfL produces waste directly at a corporate level in its offices, in the operation of its different transport modes and in its transport interchanges. Litter waste is also left by customers on TfL trains, buses, trams and stations.

TfL uses large quantities of water, both in its operations and in its corporate offices. For example in 2002, London Underground used a total of 638 million litres of water. This includes water used in offices, stations, workshops and train washing in depots and equates to 1.75 million litres per day. Bus operators and taxi operators also use considerable amounts of water in cleaning vehicles.

Since 2002 TfL has undertaken the following actions to reduce the negative and enhance the positive impacts of its operations:

**Air quality** – TfL has encouraged the adoption of cleaner technologies and fuels, non-fossil fuels and zero emission technologies for road vehicles. TfL has also researched new ways of reducing traffic pollution and supports local measures to reduce transport emissions.

- TfL has continued to clean London's bus fleet. At present, 90 per cent of the fleet meet Euro II or III standards compared with 78 per cent in 2002. 79 per cent of the bus fleet is fitted with particulate traps today compared with 39 per cent in 2002.
- TfL is part of the European trial of zero emission Hydrogen Fuel Cell (HFC) buses. Three HFC buses are being introduced in nine European cities as part of the CUTE project (Clean Urban Transport for Europe). London's trial started in January 2004.



- A trial of water-diesel emulsion fuel in 240 buses was initially promising and reduced NO<sub>x</sub> emissions by about 12 per cent. However, some operational difficulties have been experienced when using this fuel in new buses and TfL is investigating the underlying problems, in addition to looking to trial other new technologies that may be more effective in reducing harmful exhaust emissions.
- TfL is a member of the London Hydrogen Partnership (LHP), established in April 2002. The LHP's aims include; supporting the development of a hydrogen economy for London and the UK, improve air quality and reduce greenhouse gases and noise in London.
- TfL participated in the London Low Emission Zone (LEZ) feasibility study in partnership with the Association of London Government, GLA, Department of Environment Food and Rural Affairs (DEFRA), the Department for Transport (DfT) and the London Boroughs. LEZs aim to reduce pollution by preventing access to high-polluting vehicles in certain areas. The study provided information on the nature, feasibility and potential impact of a London LEZ. Phase II of the study was managed by TfL and was undertaken by environmental consultants. It recommended a London-wide LEZ for heavy-duty vehicles (lorries, coaches and buses) with an entry standard of Euro II and a Reduced Pollution Certificate (RPC – vehicles with modifications or particulate traps fitted to reduce particulate matter to benefit from reduced vehicle excise duty) or equivalent by 2007.

The LEZ would be extended to include vans in 2010 and the standard raised to Euro III plus RPC or equivalent. It is estimated that the LEZ would achieve a 23 per cent reduction in total London PM<sub>10</sub> emissions in 2010. It would also achieve a 43 per cent reduction in the area of London exceeding the relevant PM<sub>10</sub> air quality target in 2010, and a 19 per cent reduction in the area of London exceeding the relevant NO<sub>2</sub> air quality target in 2010.

- Most local authorities in London have declared Air Quality Management Areas within their boundaries and are now introducing Action Plans to address poor air quality. To assist boroughs, TfL has contributed funds towards borough air quality improvement measures; £780,000 in 2003/2004 and £1 million in 2004/2005. Examples of projects funded include: air quality monitoring equipment, electric vehicle recharging points, vehicle emissions testing and Camden's Clear Zone.

**Energy** – TfL monitors its energy use and is continually striving to achieve energy savings across all its activities.

- TfL has increased its purchase of renewable energy from 9 per cent in 2001/2002 to 12 per cent of total electricity requirements in 2002/2003 and 14 per cent in 2003/2004. London Underground has five main electricity contracts covering high demand areas from trains to smaller supplies such as underpass lighting and street furniture. These five contracts have the following levels of renewable energy:





Energy contract	% of energy from renewable sources
<b>Bulk supply</b> <i>(mostly trains and London Underground internal supplies)</i>	10%
<b>Greater than 100kW sites</b> <i>(mostly offices, depots and large stations)</i>	100%
<b>Sub 100kW sites</b> <i>(mostly small supplies, pumps, fans, stations etc.)</i>	100%
<b>Unmetered</b> <i>(mostly street furniture)</i>	100%
<b>Unmetered</b> <i>(mostly traffic signals and CCTV)</i>	100%

- London Underground runs an ‘Energy Challenge’ which encourages stations, groups and lines to bring energy savings through good energy housekeeping, such as making sure lights are switched off when not required and turning off escalators outside peak hours. In the first year of the challenge (2001) energy use was reduced by 11 per cent, and in 2003/2004 this increased to 20.9 per cent, exceeding the target of 17.5 per cent.

- Over 40 per cent of the Underground train fleet uses regenerative braking which recovers energy as the train brakes are applied: the recovered energy is then used to power other trains. Regenerative braking typically saves 20-25 per cent of the train's electricity requirement and is now specified on all new rolling stock.
- TfL has encouraged the use of solar power for lighting bus stops and bus shelters not connected to the national grid. Trials of the shelters were undertaken at seven sites and were completed in March 2003. Roll out of 270 shelters began in September 2003 and was completed in March 2004. On-street trials of 50 bus stop timetables lit by solar power were completed in March 2003. Two solar powered roadside ticket machines are on trial.
- A new transport interchange has been built at Vauxhall Cross, one of London's busiest road and rail junctions following sustainable design principles. "Hybrid" solar modules (photovoltaic cells) are mounted on a cantilevered section of the canopy to generate sufficient electricity to supply up to 30 per cent of the interchange's annual energy requirements. Photovoltaic cells have also been installed on the roof of Walworth bus depot.
- TfL is a member of the London Climate Change Partnership (LCCP) which is working to understand the likely impacts of climate change on transport, identify possible adaptation options and ensure that climate change is incorporated into planning. The frequency and intensity of flooding and other extreme weather events are expected to increase and London's transport system will be increasingly vulnerable to disruption from flooding and other extreme weather events that are expected to increase in frequency and intensity. Hotter summers will lead to passenger discomfort and may damage elements of transport infrastructure, causing buckled rails and rutted roads, with their attendant disruption and repair costs.
- In January 2003 TfL introduced a BTEC training programme for bus drivers with the aim of improving driving standards. The course should result in more efficient driving, leading to reduced fuel consumption, harmful emissions and noise. 3,700 drivers have already completed the course.
- TfL is involved in a number of initiatives which aim to transport goods more efficiently and in doing so reduce harmful vehicle emissions and noise. TfL is also seeking a shift of road freight to more sustainable modes such as rail and water. To achieve this, TfL is contributing to a diesel-electric technology trial for delivery vehicles in London and also chairs the London Sustainable Distribution Partnership (LSDP). This body reviews progress on developing and delivering a freight strategy, agrees a programme of freight forum events and oversees working groups derived from the freight strategy.



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**Noise and vibration** – TfL is taking steps to reduce the negative impacts of its services on London’s ambient noise and vibration levels. Examples are:

- DLR has developed a Noise and Vibration Policy that specifies targets, noise monitoring and maintenance procedures for the network. Noise mitigation measures will also be used during DLR's extension projects, in line with its noise policy.
- London Underground co-ordinates a comprehensive European research project – Control of Noise and Vibrations from Underground Rail Traffic (CONVURT) – on improvements to the level of noise generated by underground systems.
- TfL is currently contributing to the work being undertaken by DEFRA on noise mapping of London’s main roads.

**Waste** – TfL strives to reduce waste and increase recycling from TfL's offices and from the capital's transport system.

- TfL is a signatory to the Mayor's Green Procurement Code launched in March 2002. London Remade (a strategic partnership between the business sector, London boroughs and regional government, waste management companies and the non-profit sector) is responsible for the Code on behalf of the Mayor. The main objective is to develop and promote new markets and secondary industries based on the reprocessing and reuse of London's recycled materials. Signing up to level B1 of the Code commits TfL to contribute to discussions on recycled products, including experience of their use and opportunities for specifying and purchasing them and to provide baseline data about recycled purchases.
- In October 2003, TfL joined with London Remade to test the use of recycled materials when repairing roads in two pilot schemes. The first scheme uses "Ecoblend", a new recycled aggregate, as a foundation layer on the footpath reconstruction project on Clapham Common Southside. This aggregate uses a mixture of crushed concrete taken from previous road projects and primary aggregates. The second is the Streatham Streetscene Refurbishment Project, which will refurbish the road, footpaths and street lighting between Tooting Bec Gardens and Beckmead Avenue. "Foamix" (recycled bitumen) is being used as the footpath foundation with recycled glass replacing traditional dredged sand in forming the base for the paving.
- London Underground has worked to increase the quantity and types of goods it purchases that are produced from sustainable or recycled sources. In 2003/2004, 27 per cent of total solid waste produced was recycled. Re-manufactured toner cartridges are available for most of the printer units and paper from recycled paper, or wood produced from a sustainable source is available. London Underground purchased almost 15,000 reams of recycled paper, this equates to a saving of 417 trees. A programme of renewing desktop computers was undertaken and over 2,000 units have been sent to 'Tools for Schools' for reuse.

### **1.3 Making improvements to the built and natural environment**

London's special historic character and diversity makes an important contribution to people's quality of life and the capital's economy. As one of the biggest landowners in the capital, owning and managing a considerable number of properties, roads, pavements, bridges and tunnels, TfL is integral to this. In 1999 English Heritage listed 45 Underground stations as Grade II because of their 'particular importance, outstanding features and special interest value'. In addition, the Department of Culture, Media and Sport also classified 16 non-listed stations as being of significant design and architectural value.

TfL aims to ensure a pleasant streetscape and built environment and to maintain and, where possible, enhance the quality of London's built environment in town centres and areas around key stations or interchanges.



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TfL owns many assets of ecological importance. For example, over half of the Underground network is actually above ground and around 220km of trackside property is available as a potential wildlife habitat or corridor. In 1999, the London Ecology Unit undertook a survey to assess the biodiversity and the wildlife potential of the Underground. Most of the 4,000 hectare area of lineside habitat was identified as wildlife habitat and much of it was recommended as wildlife sites under the criteria now adopted by the Mayor in his Biodiversity Strategy. A large variety of habitats were identified, from ancient woodlands such as Croxley Hall Wood on the Metropolitan line to areas of open grassland and tall herbs. Over 500 species were recorded across the network.

TfL has to address the problems of groundwater seepage in the Underground. Also, run-off from road and river transport has the potential to negatively affect land and water quality.

Since 2002 TfL has made improvements to the built and natural environment through the implementation of a number of initiatives:

- The redevelopment of Trafalgar Square was completed in summer 2003 as part of the 'World Squares for All' scheme. This is concerned with transforming key heritage spaces into world class spaces to be enjoyed by everyone. Traffic has been re-routed from the north side and the road replaced with a grand piazza. A staircase has been built from the terrace in front of the National Gallery down into the Square itself. The extensive improvements to Trafalgar Square have benefited visitors and Londoners alike and have reduced noise and increased the open feel of the Square by directly linking it with the National Gallery.
- TfL has contributed funds towards borough town centre improvements: £5.2 million in 2003/2004 and £6.5 million in 2005/2005. Examples of the improvements funded are: new paving in Angel town centre to enhance the character; in Kilburn providing new paving, street furniture, replanting and lighting improvements.
- The Underground's trackside standards ensure that native trees, shrubs and flowers that are planted are compatible with the operation of the railway, encourage species diversity, and enhance the landscape. As well as contributing positively to the biodiversity, growing trees and sowing wild flowers on embankments help to maintain their stability and can help reduce noise for neighbouring properties. Over 30,000 trees have been planted on the Underground train network and tree planting is set to continue.
- TfL is currently undertaking biodiversity surveys on the Transport for London Road Network (TLRN). To date, one network area is complete and the four remaining areas are waiting to be completed when funding allows. The pilot biodiversity survey in the North Central area unsurprisingly showed that the main biodiversity interest is the range of street trees. There are few grass verges on this part of the TLRN but considerably more on the outer London parts of the network.



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## 1.4 Managing its organisation in an environmentally responsible way

Taking account of environmental impacts and taking an effective approach to environmental performance also has important benefits to TfL as an organisation, for example in the savings arising from resource efficiency and in enhancing TfL's reputation with transport users and Londoners more generally.

TfL seeks compliance with relevant environmental legislation. The Mayor's Transport Strategy requires that TfL must lead by example in adopting and promoting cost-effective environmental best practice in the areas of air quality, energy, noise, biodiversity and waste management. Furthermore, TfL seeks to promote best practice in its procurement of goods, services and facilities and to encourage other organisations to follow environmental best practice in their transport plans and initiatives.

In many cases, environmental improvements can most effectively be achieved by working in partnership with other organisations such as the boroughs. Partnership and collaboration increases TfL's overall capacity to effect change and enables information and ideas to be shared.

The London Assembly Environment Committee monitors the Mayor's environmental strategies and scrutinises the work of the functional bodies, including TfL, in this respect. TfL prepares an annual report to the scrutiny committee setting out progress in achieving environmental improvements.

Since 2002 TfL has undertaken the following actions to manage the organisation in an environmentally responsible way:

- From 2004 onwards, environmental performance management will be included in the TfL Business Plan. This is to ensure the environment is fully integrated into mainstream activities, to develop a more co-ordinated and strategic approach to managing environmental performance and to identify new initiatives to help deliver environmental improvement.
- A number of measures are in place to improve the way TfL manages its environmental performance effectively in different parts of the organisation. These include signing up to voluntary codes of conduct, incorporating environmental considerations in procurement and contract management and assessing the environmental impacts of new projects. TfL has an Environmental Liaison Group involving key individuals from across the organisation with responsibility for the environment. The group meets at regular intervals to update on progress and share information on best practice.
- The usage of accredited management systems has increased to ensure a structured and systematic approach is taken in the management of the environment. London Underground has launched an updated Health Safety and Environmental (HSE) Management System based on the model of continuous improvement and which is closely aligned to the requirements of ISO14001 and OHSAS 18001. At TfL corporate level a new system, in line with the London Underground system, was implemented during the first quarter of 2004/2005.



In parallel to this, work is underway with those modes that do not currently have integrated health, safety and environmental management systems to develop these based on the high level requirements of the group management system. The Crossrail project is also developing an Environmental Management System which will be based on ISO14001.

- At the project level, TfL ensures compliance with environmental legislation and ensures environmental considerations are taken into account over the entire project lifecycle. Projects worth over £2 million are subject to an appraisal similar to that required by the Department for Transport, which requires information on various environmental issues including noise, local air quality and greenhouse gases.



- TfL also requires commitments in environmental performance from sub-contractors through guidance and contractual clauses requiring them to work in accordance with the Mayor's strategies. For example, Streetscape guidance is in development for use by TLRN contractors, stewards and TfL operations teams. London Underground uses a quality, environment, safety and health manual and audit process as a tool for managing contractors.
- TfL is striving to source sustainably produced goods, For example, London Underground is a significant user of wood and about 50 per cent of its timber purchases are hardwood and softwood sleepers. All of these are bought from sources certified to Forest Stewardship Council (FSC) standards, which means that the forest is managed in an environmentally and socially responsible manner.
- Some of the important partnerships TfL is involved in include the London Hydrogen Partnership, the London Climate Change Partnership, the London LEZ Steering Group and London Remade. In 2003, TfL signed up to the International Association of Public Transport's (Union Internationale de Transports Publics – UITP) Charter for Sustainable Development. The Charter sets out UITP's and its members' commitment to explicitly incorporate sustainable development as a strategic objective and to play a leading role in this area.



# 2.0

## TfL's environmental objectives

Having reviewed the Mayor's environmental strategies, TfL's potential influence and actual impact on the environment, TfL's environmental objectives for moving forward have been developed. The remainder of this report is structured around these objectives – these are prioritised into three tiers that reflect the degree to which TfL has an environmental impact, the level of influence and control TfL has and the extent to which an impact occurs across TfL.

### Tier one environmental objectives

- Reduce pollutant emissions to air
- Reduce energy consumption, implement efficiency measures and increase the use of renewable energy to reduce greenhouse gas emissions
- Reduce noise and vibration by promoting the use of quieter travel modes and vehicles, reduce the noise generated by vehicle use and control the levels of transport noise impacts on sensitive locations

### Tier two environmental objectives

- Reduce consumption of resources, implement efficiency measures and recognise where resources are consumed, to reduce the adverse effect on the environment through environmentally preferable procurement and trading
- Maintain and where possible enhance the quality of London's built environment
- Reduce the impacts of waste generated from TfL and contractor activities through minimising consumption and promoting re-use and recycling
- Promote the sustainable transport of waste

### Tier three environmental objectives

- Maintain and where possible enhance the quality of London's natural environment
- Reduce pollutant emissions to water and land
- Reduce consumption of water resources and implement efficiency measures



# 3.0

## TfL's plan for the future

Although considerable progress has been made, there remains much to be done. TfL is therefore looking ahead to ensure that its efforts are well informed, co-ordinated and best directed to have the greatest effect.

In addition to the more general initiatives which will continue to be led by TfL to provide and encourage sustainable modes of transport, some targeted actions aimed at meeting TfL's environmental objectives will be progressed. These are outlined below:

### Tier one environmental objectives

#### 3.1 Reduce pollutant emissions to air

TfL is reducing pollutant emissions from vehicle fleets under its control.

- TfL's aim is to progressively reduce harmful emissions from the bus fleet. The short-term goal is to make existing diesel buses in the fleet as clean as possible, hence TfL's target of all London buses to be a minimum of Euro II and fitted with a particulate trap by the end of 2005. TfL already has the cleanest bus fleet in the UK but new fuels and technologies are constantly being assessed to find ways of reducing emissions even further. In the medium-term TfL is looking to reduce emissions of nitrogen oxides (NO<sub>x</sub>) through retrofitting NO<sub>x</sub> abatement technology, as well as trialling diesel-electric hybrid vehicles in 2005 which will have low emissions and be more energy efficient. The long-term strategy is to move to cleaner, low carbon fuels and technologies such as hydrogen fuel cells, and TfL is currently operating three zero emission hydrogen fuel cell buses as part of a two year European trial which is due for completion by January 2006.

- TfL is continuing to investigate the scope and contents of a taxi emissions strategy to reduce harmful emissions by licensed London taxis. Guidelines are expected by the end of 2004.
- TfL is working with partners to ensure bus services operated under the London Local Service Agreement (LLSA) will comply with Euro II engine standards or better by March 2005. LLSA services are routes that operate across the Greater London boundary and are run under contract to the appropriate local authority or commercially.

TfL is encouraging the adoption of cleaner technologies and fuels, non-fossil fuels and zero emission technologies for road vehicles

- TfL is now investigating the use of Selective Catalytic Reduction (SCR) and Exhaust Gas Recirculation (EGR) which are usually used in conjunction with a particulate trap, to further reduce emissions of NO<sub>x</sub> from buses. TfL intends to trial these new technologies in autumn 2004 and if successful, develop a roll out policy from March 2005.
- TfL is involved in the 'Transport Applications' task group of the London Hydrogen Partnership, which is investigating hydrogen and hybrid buses, London regulatory incentives for hydrogen transport, fuel cell taxis and ultra-light trams.



- TfL has started preparations for a London LEZ to come into force in 2007.
- TfL will continue to operate a 100 per cent discount for certain alternative fuel vehicles for the Central London congestion charge that meet strict emissions standards. TfL and the Energy Saving Trust will keep the discount under review to maintain the effectiveness of the discount, whilst ensuring that the scheme's primary objective of reducing congestion is also preserved. TfL will also continue to report on the environmental impacts of the congestion charge in the 'Monitoring Impacts Annual Report'.

Other initiatives TfL is pursuing are:

- TfL will continue to fund Borough air quality improvement measures where they meet the published Borough Spending Process (BSP) criteria and subject to funds being made available through the BSP process. TfL has broadened the environmental categories for which bids are received from the 2005/2006 bidding round to include energy, noise, waste and biodiversity.
- TfL in conjunction with the GLA will produce an Atmospheric Emissions Inventory for Greater London.
- TfL will review the air quality impacts of deliveries at Heathrow and assess the scope for the use of priority lanes for use by freight vehicles by March 2005.
- TfL will fund Borough and sub-regional Freight Quality Partnerships where they meet the published BSP criteria and subject to funds being made available through the BSP process.

### 3.2 Reduce energy consumption

- During 2004/2005, TfL will develop action plans to reduce energy consumption across its modes. These areas include street furniture, traffic systems and bus accommodation under TfL's control. TfL is also aiming to ensure all of its office buildings achieve Government energy efficiency targets.
- London Underground will continue to run their 'Energy Challenge'. For 2004/2005 the station energy reduction target against baselines has increased to 20 per cent.
- TfL is undertaking considerable efforts to improve the fuel efficiency of its buses and is working with a number of manufacturers to introduce trials of diesel-electric hybrid buses during 2005. These buses will use less fuel and have much lower emissions and be quieter compared to a standard diesel bus. TfL is also implementing a programme of bus priority measures and driver training whereby all bus drivers will have undergone a new BTEC training programme by December 2005 which should improve the energy efficiency of buses.
- TfL is trialling Light Emitting Diode (LED) traffic signals which are more energy efficient than conventional signals. Testing of different types will continue for the next three to four years. To date LED use has shown reduced energy demand at the same time as improving road safety through their sharper image.
- TfL is continuing to increase the energy purchased from renewable sources. As and when new supplies are identified, TfL aims to add these to the most suitable contract, and if available, sourced from renewable sources. It is also TfL's intention to align the end dates of both unmetered supply contracts to create one unmetered contract. TfL has set a target of 17 per cent from renewables to be achieved during 2004/2005.
- If the review of solar powered lighting at bus stops concludes the trials have been successful, and assuming funding is available, TfL aims to upgrade 70 per cent of bus stops from 2005.
- TfL will continue to play an active part in the London Hydrogen Partnership, the Energy Partnership and the Climate Change Partnership.





  
**BUS STOP**  
**New Scotland Yard**

Towards Pimlico,  
Sloane Square or Victoria

11

24 hour  
24

24 hour  
148

211

Night Bus  
N2

Night Bus  
N11

Night Bus  
N36

All night buses  
stop here on request

Buy tickets before  
boarding on all routes

### 3.3 Reduce noise and vibration

- TfL is working to ensure that all its managed fleets use the quietest practicable alternatively fuelled vehicles and is encouraging all contractors to make use of the quietest vehicle technologies where this does not compromise other environmental objectives.
- London Underground is developing a predictive monitoring tool to assess the deterioration of rail and to enable better noise prediction.
- As an on-going commitment, London Underground will lead the EU CONVURT project to achieve a greater understanding of underground rail noise and vibration with the aim of limiting its impacts. Initial findings from the project should be available by the end of 2004.
- Once the noise mapping of London's main roads is completed, TfL will respond with an appropriate programme of actions on noise on the TLRN, provided sufficient funding is available. TfL already has a limited noise monitoring programme in place and a proposal to develop a more comprehensive monitoring and action plan is being considered.
- The DLR extensions to London City Airport and Woolwich Arsenal will include noise abatement measures within their specifications.
- TfL will check whether current maintenance levels on the TLRN and borough roads exempted from the London Lorry Control Scheme is adequate for noise and vibration minimisation and revise maintenance programmes accordingly.
- TfL will be encouraging all contractors to make use of the quietest vehicle technologies where this does not conflict with other environmental objectives.

### Tier two environmental objectives

#### 3.4 Reduce consumption of resources

- TfL will continue to work within the Mayor's Green Procurement Code to encourage more green procurement across the organisation. For example, in 2004/2005 London Underground will consider the use of FSC hardwoods for a range of new purposes, such as crossings.
- TfL will continue to trial recycled materials as part of the London Remade project, such as recycled plastic temporary road barriers and recycled glass as a drainage layer around trees, to increase the use of recycled materials.

#### 3.5 Maintain and where possible enhance the quality of London's built environment

- TfL will continue to preserve TfL buildings of special interest.
- TfL will continue to fund through the BSP process Borough town centre improvements where they meet the published BSP criteria and subject to funds being made available.
- TfL will develop and implement Streetscape Guidance for use on the TLRN which will require commitments in environmental performance from sub-contractors through a use of measures including contractual clauses requiring them to work in accordance with the Mayor's strategies and providing them with appropriate guidance.

### 3.6 Reduce the impacts of waste generated from TfL and contractor activities

- TfL will investigate the potential for the recycling of litter on the Underground, trains and other modes. Tubelines Distribution Services continues to work towards a target of 18 per cent recycling of mixed municipal waste by 2005/2006.
- TfL is working with the London boroughs, the Strategic Rail Authority and other partners to encourage the movement of waste by rail and water.
- TfL is seeking to identify opportunities to reuse materials and purchase recycled products where quality and price allow. London Underground aims to implement a battery recycling scheme at LU office sites by December 2004.
- London Underground will be implementing a pilot project to recycle office paper and newspapers at stations. LU will also establish costs for a cardboard separation scheme at offices.

### 3.7 Promote the sustainable transport of waste

- TfL is working via the LSDP with the London boroughs, business and the freight, distribution and servicing industries, and other relevant organisations to ensure the needs of business and Londoners for the movement of goods (including waste) and services are met. By promoting a progressive shift of freight from road to more sustainable modes such as rail and water, where economical and practicable, will reduce the impact of freight movements in London, help minimise congestion, and consequently improve air quality.



## Tier three environmental objectives

### 3.8 Maintain and where possible enhance the quality of London's natural environment

- TfL aims to maintain and, where possible, enhance the quality of London's natural environment through the protection of areas of existing biodiversity and the management of land. TfL will continue to undertake biodiversity surveys on the TLRN. Over time TfL also intends to extend these surveys out to all land it owns. TfL will liaise with the Mayor's biodiversity team, the London Biodiversity Partnership and Greenspace information for Greater London, in undertaking this work.
- LU plans to continue its tree planting programme and plans to use waste wood from depots to make bird boxes for the Underground network.

### 3.9 Reduce pollutant emissions to water and land

- Over the course of 2004/2005, TfL will establish dialogue with relevant stakeholders to identify measures to reduce the environmental impact of services licensed by London River Services.
- A particular concern for London Underground is coping with the problems of underground seepage as the water table in London continues to rise. It is currently pumping out over 30 million litres of water from its system every 24 hours. This is achieved using a network of 1,030 pumps at 630 locations. The water has been tested at the points where it is pumped into sewers and there was found to be very little contamination. London Underground continues to be involved in the General Aquifer Research, Development & Investigation Team (GARDIT) which addresses issues surrounding the rising water table and the potential for grey water use. LU will utilise GARDIT modelling predictions to assess the likely future impacts on the Underground network.



### 3.10 Reduce consumption of water resources and implement efficiency measures

- As with other resources, TfL is working to reduce its consumption of water resources through encouraging the prudent use of water and implementing efficiency measures. Over the course of 2004/2005, TfL will develop a water consumption/efficiency awareness campaign to encourage TfL staff to think about the implications of their water use and ways in which this might be reduced.
- London Underground is working to adopt industry best practice regarding the conservation of water in buildings. It has a programme to install waterless urinals, which saves up to 46,000 litres of water per year compared to traditional urinals. Waterless urinals and low volume flush toilets are installed as part of on-going refurbishment works.

# 4.0

## What next?

TfL is proud of the broad range of activities and initiatives underway and planned for the future. However, there is much more to be done. TfL will continue to strive to deliver improvements to the public transport system and to encourage a modal shift away from private car use and to deliver broader environmental benefits. TfL will also continue to identify, design and implement new actions to help deliver improvements to its environmental performance to meet the requirements of the Mayor's transport and environmental strategies.

To enhance its corporate level commitment to environmental issues, an integrated HSE policy has been written that sets clear, high level commitment to achieving, and continually improving, good environmental performance. This policy will be implemented along with the TfL group health, safety and environmental management system. TfL is also developing an appraisal tool to be used for projects under £2 million, which takes into consideration environmental impacts of projects. TfL is reviewing environmental improvement proposals as part of the annual business planning round.

TfL recognises that the current scope of its environmental objectives is broad and needs further prioritisation. To refine its objectives and provide guidance to the business planning process, TfL needs to undertake a baseline review of its environmental impacts to ensure that resources are most effectively deployed, and primary concerns are being addressed. TfL is developing a set of key performance indicators to review year-on-year changes in performance and progress towards meeting its objectives.

Finally TfL aims to continue to improve the processes and capacity it has in place to deliver these improvements. TfL recognises the need to ensure that guidance and training are in place to enable all its staff to contribute to caring for the environment. TfL also recognises the need to inform its stakeholders of its environmental performance and seeks their help where appropriate in achieving these objectives for London.



# 5.0

## Image references

1. Queuing traffic at Euston underpass
2. Houses on the A40 at Hanger Lane
3. Cycling through London Parks
4. Congestion Charge roadmarkings
5. London Traffic Control Centre
6. East London Line extension at Dalston
7. Dedicated cycle lanes
8. Hydrogen Fuel Cell bus
9. Route 453 bendy bus
10. Changing brakes at a London Underground train depot
11. DLR extension at Pontoon Dock
12. Laying recycled aggregate at Clapham Common
13. Hounslow West Underground station
14. Resting on the steps at Trafalgar Square
15. Tree lined streets in Notting Hill
16. Biodiversity on Central Line embankments
17. Metropolitan Line at Croxley Wood
18. Collecting waste from Underground stations
19. Testing taxis at PCO in Penton Street
20. LED traffic signals on Great Smith Street
21. Solar powered bus stop on Victoria Street
22. River freight on the Thames
23. Pumping out water from the Underground

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