

Transport for London

# Travel in London

Key trends and developments  
Report number 1





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## Mayor's foreword

The transport network is crucial to the daily life of this city, and for its people, its visitors and its businesses.

Transport for London and I are working ceaselessly to make this network better - through among other things building Crossrail and the East London line extension, completing the Tube upgrades, delivering huge infrastructure improvements ahead of the 2012 Games, and stimulating a cycling revolution. But in order to deliver effectively we need to know what trends are taking place, and why. Simply, this is essential if we are to avoid making the mistakes of the past.

This Travel in London report provides an excellent summary of key trends and developments affecting how people travel around London. It gives us a comprehensive basis to understand where we are now, how we have got here, and the direction that we are moving in. There is a host of information about travel at the borough level and for the five London regions, new information on the travel patterns of residents, and data that helps us understand the multitude of ways that Londoners get about, often differing hugely from one part of London to another.



I will be consulting on a new Transport Strategy later this year, and will be publishing a Statement of Intent for consultation with the Greater London Authority and other functional bodies this spring. As well as its other uses, this report provides a solid evidence base that will support the foundations of this work, which will deliver London an exemplary transport network fit for the 21st century.

A handwritten signature in black ink, which appears to read 'Boris Johnson'.

**Boris Johnson**  
Mayor of London



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# Travel in London

## Overview

“Travel in London” summarises key trends and developments relating to travel and transport in Greater London. It provides a window on to the data and intelligence underlying transport planning and operations in London, including illustrating the scope of the more local-scale data (eg borough level) that is available to Transport for London (TfL).

Previous reports in this series (London Travel Reports) have focused on the provision of data, through compendia of tables and figures on topics likely to be of widest interest, updated each year. This revised publication features several changes to more appropriately reflect, track and interpret developments in the context of wider trends affecting travel in London.

The new Mayor’s Transport Strategy and certain of his other Strategies will be revised during 2009. The data contained in this report will be a key input to this process. It will contribute to the ‘evidence base’: assessment of what has happened in the past, and why, is useful in considering the future and the most appropriate mix of policies for strategy development.

This report uses the latest available data, usually referring either to the 2007 calendar year or the 2007/08 financial year, with historical context where available. The sections that follow summarise key highlights from this report.

### Population, employment and the London economy

- Population and employment have grown strongly in London in recent years, as has London’s economic output, although we are now, of course, in a recession.
- The total resident population of Greater London was estimated at 7.6 million in 2007. Outer London accounts for 60 percent of London’s population. There were 4.7 million jobs in Greater London in both 2007 and 2008.
- London’s economy grew by 59 percent between 1993 and 2007, comfortably higher than UK economic growth of 52 percent in the same period.

### Volumes of travel

- In 2007, 23.8 million trips were made in, to or from London on an average day.
- There were about 28 million ‘journey stages’ on an average day in 2007. A trip using car, bus and Underground, for example, involves three journey stages.
- The amount of travel in Greater London has grown substantially since 1993. This is true for distance travelled, trips and journey stages.
- The number of journey stages has grown by 22 percent since 1993. This results from:
  - more people (London’s resident population is up by 10 percent over this period)

- making about the same number of trips each (trips per person per day are relatively constant at between 2.7 and 2.8 throughout the period)
- but making more complex trips (journey stages per person have increased by 8 percent since 1993, from 3.0 per day to 3.2)
- and commuting into London and the number of visitors daily in London have both increased. In total, London's employment was up 24 percent over this period.
- Looking at the position since 2000, TfL sees the following trends.
  - Total distance travelled in London has increased. Looking at all the evidence, the increase is an estimated 6 percent.
  - Likewise, the total number of trips has increased, by an estimated 5 percent.
  - Distance travelled per person has therefore been broadly constant – after taking account of increased population and changes to in-commuters and visitors.

### Mode shares

- There has been a substantial net shift away from private transport and towards public transport in London. Between 2000 and 2007, the proportion of journey stages made by public transport rose from 33 percent to 40 percent, while the proportion made by private motorised transport, principally car, has fallen from 44 percent to 38 percent.
- This is a trend that has continued since the early 1990s, although the shift has been broadly twice as fast in 2000 to 2007 than in the previous seven years.
- This net modal shift reflects both increases in public transport and falls in road traffic volumes. Bus passenger kilometres have increased by 59 percent since 2000/01, while Underground passenger kilometres increased by 9 percent to its highest ever level.
- Passengers travelled 3.5 billion more kilometres on bus, Underground, Docklands Light Railway (DLR) and London Tramlink in 2007/08 than in 2000/01. This is about three times the estimated fall in car and other private traffic on roads over the same period. Travel on National Rail also increased substantially over this period: on London and South East train operators' services (which includes travel on these services outside London), passengers travelled 4 billion more kilometres.
- Road traffic volumes in London have fallen in recent years, in contrast to aggregate traffic nationally. Whereas Great Britain's total road traffic increased by 10 percent between 2000 and 2007, total road traffic in Greater London fell by an estimated 2 percent.
- Traffic reduction was greatest in central London, in part reflecting the introduction of congestion charging in 2003. Here, traffic fell by 21 percent during weekday charging hours between 2002 and 2007, which is equivalent to an estimated 15 percent over the whole week since 2000.

- Traffic in Inner London fell by an estimated 5 percent, in part reflecting congestion charging but also a now well-established 'background' trend towards less traffic – reflecting wider mode share changes and reductions to the effective capacity of the road network.
- Traffic levels in Outer London have been broadly stable and aggregate volumes in 2007 were little different from those of 2000.
- Car ownership in London is much lower than the rest of Great Britain. About 40 percent of households do not have access to a car – this proportion remaining fairly stable over recent years.
- The mode share of cycling in London has increased considerably since 2000. Its mode share, however, continues to represent a relatively low proportion of travel. Cycling now accounts for 2 percent of trips in London, compared to 1.2 percent in 2000.
- The increase in cycling's mode share is equal to 13 percent of the fall in private motorised traffic mode share.
- While the overall number of walking trips has increased, the mode share of walking in London by residents is 21 percent, the same as 2000.

### **How travel varies between Outer, Inner and central London; and between boroughs and London regions**

- Travel patterns vary considerably between different parts of London, reflecting London's functional geography and the provision of transport networks. Public transport dominates access to the centre, but the private car is the most significant individual mode in most parts of Outer London.
- Nearly half – 48 percent – of trips by London residents both start and finish in Outer London.
- In 2007/08, half of trips wholly within Outer London were by car (as either driver or passenger), while 15 percent were by public transport, predominantly bus. In contrast, within Inner London (outside the centre), car accounted for a quarter of trips and public transport for a further quarter (bus 18 percent, rail and Underground 7 percent). Most of the remaining trips were on foot.
- Most of the journeys between central and Outer London were made by public transport: 40 percent were by Underground or DLR, 36 percent were by rail and 5 percent by bus. 16 percent of these journeys were made by car.
- Outer London's patterns of travel to work are more similar to the next largest English cities than to central or Inner London. On a consistent basis (which dates back to 2001, and covers central and Inner London combined), the mode shares for car are 21 percent for Inner London compared to 56 percent for Outer London and 57 to 63 percent for Birmingham, Manchester, Leeds, Newcastle, Sheffield and Liverpool. By contrast, the mode shares for rail and Underground were 53 percent in Inner London, 10 percent for Outer London and 4 to 11 percent in the other metropolitan cities. The mode shares for bus were closer: 10 percent in both Inner and Outer London and 14 to 22 percent in the other cities.

- This report provides new data from the London Travel Demand Survey (LTDS), broken down by the London regions and (where it is statistically viable to do so) by borough. Much of this is in Sections 3 and 9 of this report, with additional material on cycling in Section 7.
- Trip rates and, especially, travel distance are lower for residents of Inner London than for those of Outer London. There are considerable differences between boroughs. In Inner London, average travel distances per day (between 2005/06 and 2007/08) ranged from about 8 kilometres per resident in Tower Hamlets and Southwark to over 18 kilometres per resident in Hammersmith and Fulham, Wandsworth, and the City of London. In Outer London, highest daily travel distances are recorded for residents of Bromley, Richmond upon Thames and Havering, all over 19 kilometres per resident.
- Public transport has a lower mode share the further away from central London people live, with residents in the majority of the Outer London boroughs making fewer than 20 percent of trips by public transport. It is also evident that a higher proportion of public transport trips are made by residents in areas north of the Thames – reflecting the better provision of Underground services here.
- In contrast, the use of the car increases with distance from central London, but there is considerable variation by borough. Even within the less ‘car-reliant’ boroughs, over 18 percent of residents make a trip as a car driver at least twice weekly. The car therefore remains an important mode for all areas in London.
- The LTDS provides a rich source of borough level statistics, the scope of which is illustrated throughout the report. For example, residents of Southwark make the least number of trips per day, 1.7 per person per day, whereas residents of Kingston Upon Thames make the most trips on average – 3.5 per person per day.
- Looking at other data sources considered by the report, the London borough of Hammersmith and Fulham has the highest traffic delays per kilometre of road network, the lowest being found in Bromley. On the other hand, and excluding central London, the highest per capita Carbon dioxide emissions are to be found in Hillingdon, and the lowest in Redbridge.

### **How travel varies between different times of day**

- Of course, travel is much higher at peak times. Weekday peak hours have broadly twice as many trips as hours between the peak times (inter-peak).
- The peak afternoon hour for trip-making by Londoners is between 15.00 and 16.00, with over 2 million trips by Londoners starting in this hour – reflecting a sharp peak in education-related trips. On weekdays, the morning peak period reflects concentrated peaks in both work commuting and education-related trips. Shopping and personal business trips dominate during the middle part of the day, and the main journey purposes at the weekend are, unsurprisingly, shopping (Saturdays) and leisure-related trips (Sundays).
- At weekends, there is a single peak period of travel during the middle of the day. Although daily totals of trips are lower at weekends than on weekdays, the

intensity of trip making at weekends during the middle of the day actually exceeds that on weekdays at the same times.

### **The performance of the transport networks – congestion, delays and reliability**

- Despite falling travel levels this decade, road traffic congestion has been increasing in all areas of London for some years. Over the period from 1977 to the last complete survey cycle in 2003–06, average weekday Greater London main road traffic speeds fell by 14 percent in the morning peak period, to 23.7 kilometres per hour; by 12 percent during the mid-day inter-peak period, to 29.3 kilometres per hour; and by 9 percent in the weekday evening peak period, to 25.6 kilometres per hour.
- A reversal of this trend in central London initially occurred with the introduction of the central London Congestion Charging Scheme in 2003. Traffic levels fell by 18 percent and congestion fell by 30 percent. Traffic entering the original charging zone has continued to decline, but congestion has increased. This reflects an erosion of effective road capacity resulting from temporary road and development works as well as road space reallocation to improve conditions for pedestrians, cyclists, public transport and the urban realm. TfL is reviewing policies to reverse this trend and to smooth traffic flows while still benefitting other users.
- The provision of public transport in London has increased significantly. Train kilometres on London Underground (LU) have increased by 10 percent over the period 2000/01 to 2007/08, and bus kilometres increased by 31 percent, reflecting a range of service enhancements. Over 70 million Underground train kilometres and 468 million bus kilometres were operated in 2007/08.
- Reliability of the public transport networks has also improved, with around 95 percent of scheduled Underground train kilometres operated – despite the major works programme on the Underground.
- Excess journey times on the Underground (the additional time taken for a journey over and above what would be expected if all services ran as scheduled – a basic measure of service reliability) improved during 2007/08, despite the record levels of demand.
- Both ‘actual’ and ‘excess’ waiting times for buses have progressively improved over the same period – reflecting both additional buses and improved bus service reliability. 97.5 percent of scheduled bus kilometres were operated last year.
- It is estimated that around four-fifths of the bus kilometres that were scheduled but not operated in 2007/08 reflected factors relating to traffic congestion, mirroring trends in congestion for general traffic.

### **Safety and security**

- There are 14 reported crimes on the Underground and DLR for every million passenger journeys. The equivalent rate for bus is 15 crimes per million passenger journeys. Put another way, there is one reported crime for approximately every 70,000 journeys.

- Figures from the Metropolitan and British Transport Police show falling crime on the public transport networks, despite increasing passenger numbers. Bus-related crime in 2007/08 was 14 percent lower than the previous year, and crime on the Underground/DLR was down by 11 percent. These are figures for the total number of reported crimes, so the rate of crimes per million passengers is falling further.
- There have been substantial reductions to the numbers of people killed and injured on London's roads.
- Total fatalities and serious injuries were 43 percent lower in 2007 than the 1994 to 98 average (which is the baseline for a series of nationwide Government targets for 2010). The Government target was a 40 percent reduction over this period.
- Child fatalities and serious injuries were 65 percent lower in 2007 than the 1994 to 98 average. The Government target was a 50 percent reduction, and this has already been met in London.
- Slight injuries were down 37 percent: the Government's target was a 10 percent reduction in the rate per 100 million vehicle kilometres.
- During 2007, 23,210 collisions involving personal injury on Greater London's roads were reported to the Metropolitan and City of London police forces. This represented a decrease of 6.4 percent over the 24,810 collisions reported in 2006.
- In terms of reported casualties, the respective annual totals were 28,361 and 29,810 – a corresponding decrease of 4.9 percent. These decreases were proportionately larger than those for Great Britain as a whole. This relative 'over-achievement' against national targets has led the Mayor of London to specify more ambitious targets for London for 2010, against which significant progress is already being made.

### **Climate change, CO<sub>2</sub> emissions and local air quality**

- Transport emissions of CO<sub>2</sub> in London (excluding aviation) increased by 3.5 percent between 1990 and 2006, from 8.6 million tonnes to 8.9 million tonnes. This reflects a combination of factors. These include:
  - increases to road traffic in the 1990s and relatively modest reductions since 2000;
  - partly offset by a shift to more sustainable transport modes, extended public transport networks, and improvements to the fuel efficiency of vehicles.
- In addition, ground-based aviation (planes taxiing, taking off and landing) is responsible for 1.1 million tonnes of CO<sub>2</sub>. This has increased from 0.9 million tonnes in 1990.
- Ground-based transport in 2006 accounted for about 22 percent of Greater London's CO<sub>2</sub> emissions, with over three-quarters of this coming from road transport, including private cars and freight. Estimates in the previous sentence include aviation only when it is ground-based.



- CO<sub>2</sub> emitted per passenger kilometre for TfL's public transport modes is now around or below the equivalent of 80 grams. This reflects consistent improvements to TfL's carbon efficiency over the last three years. Car travel currently emits about half as much again CO<sub>2</sub> per passenger-kilometre as public transport.
- Levels of harmful local atmospheric pollutants have fallen in recent years, partly reflecting the introduction of newer, cleaner road vehicles. However, London's outdoor air quality (particularly in Inner London) continues to be the worst in the UK, and continues to breach National and European Union health-based air quality objectives.
- Long-run trends for both fine particles (PM<sub>10</sub>) and nitrogen dioxide (NO<sub>2</sub>) show only relatively slow year-on-year reductions. This is less than might be expected from the large improvements to road vehicle emissions that have featured over the same period – and poses a challenge for better scientific understanding.
- During 2008, TfL implemented two phases of the London Low Emission Zone (LEZ). This encourages operators of heavier goods vehicles, and larger buses and coaches, to comply with minimum 'Euro' emissions standards for travel in Greater London. Vehicle-based compliance rates stand at around 96 percent for heavy goods vehicles in-scope for phase 1 of the scheme, from February 2008, and at almost 95 percent for those buses and coaches in-scope for phase 2 of the scheme, from July 2008. Kilometre-based compliance figures are higher, standing at 98 percent for phase 1 affected vehicles.

### Focus on cycling

- Encouraging cycling in London is a key transport priority of the new Mayor.
- Londoners made about 70 percent more cycle trips in 2007 than in 2000. On the Transport for London Road Network, 91 percent more cyclists were observed passing selected counting points in 2007/08 than in 2000/01.
- About one-third of Londoners' cycle trips are commuting to or from work. Trips for leisure and for shopping or personal business each account for a further quarter of Londoners' cycle trips. Education-related trips account for only 5 percent of cycling trips.
- Propensity to cycle shows distinct patterns by area of London. Higher levels of cycling, in terms of trips originating, are generally to be found in south west London. However, the highest cycling mode shares are to be found for trips originating in Hackney – and this is about ten times as high as trips originating in boroughs with the lowest rates. The second highest mode share was for trips originating in Richmond upon Thames.
- The differences between boroughs in terms of shares of use of other modes generally followed particular patterns: cycling looked unlike other modes in this respect.
- No doubt there are many geographic, social and local policy factors underlying these patterns – but there is apparent scope to increase cycling levels, given appropriate local circumstances and provision.

## **The movement of goods**

- The amount of freight lifted on London's roads decreased in 2007, by 11 percent relative to 2006. However, the overall trend since the mid 1990s has been upward. 139 million tonnes were lifted in total, with 56 million of this travelling inside Greater London, 47 million entering London from outside and 36 million tonnes originating in London for other destinations.
- Rail, air and waterborne freight grew relative to the previous year – but from small freight mode shares.
- Small vans crossing the Greater London boundary in either direction increased by 25 per cent between 1999 and 2007. Longer term trends show the number of vans has doubled since 1973. It is likely that this growth in part reflects increased use of vans for personal travel as an alternative to cars. Vans at the Inner London cordon have also increased, reaching a peak in 2002, but have since declined by 6 percent to reach a similar level to the late 1990s. Van flows at the central London cordon have been almost constant since 2002.

## **How Londoners travel**

- The LTDS is a rolling sample survey of households and individuals within Greater London. It captures quantitative data representative of the diversity of both people and places in London that, over time, build up to a comprehensive picture of the travel needs and travel behaviour of Londoners. New data is available from this source that will be fundamental to understanding and tackling transport issues in London.
- The data allows full and robust profiling of the nature of travel by Londoners – where and when they travel, by which methods of transport and for what purposes. In other words, how Londoners use their transport system, the demand pressures that need to be managed or provided for and, by extension, the likely responses of Londoners to the transport policy options available. Furthermore, because the socio-demographic characteristics of respondents are also captured, it is possible to understand how peoples' travel is affected by factors such as household structure, car ownership and employment.
- LTDS provides information that is unavailable elsewhere. This includes: annual updates to key trends and indicators, such as the amount of travel by Londoners and modal shares – many of which have not been updated since 2001; detailed data on issues of contemporary policy relevance, such as cycling; and a comprehensive geographical analyses of travel behaviour and travel patterns. This report includes a selection of key findings from this survey, and features new borough and London regional-scale information from this source.

## **Taxis, private hire, Dial-a-Ride and Taxicard**

- The number of taxi drivers licensed in London has remained fairly stable since 2001. However, the number of taxis licensed is at historically high levels. Private hire vehicle and driver numbers are continuing to increase, with almost 47,000 vehicles registered in 2008.

- In 2007/08 over 1.1 million Dial-a-Ride trips were made by the 52,000 registered users using a fleet of 355 vehicles. This is a door-to-door service for people who cannot use buses, trains or the Underground. From 1 January 2008 this service has been free to members.
- Taxicard scheme members and the number of subsidised licensed taxi journeys made under this scheme continued to increase in 2007/08, with the number of journeys almost tripling since 2001.

### **Fares, expenditure and customer satisfaction**

- Bus fares in London have not followed the wider UK trend, with real fares decreasing in London since 1999/00. Bus fares in the rest of the UK are around 10 percent higher than in 1999/00. Underground fares have remained relatively stable over the same period, although fares have been increasing since 2004/05, and are now above 1999/00 levels.
- By contrast, real motoring costs have decreased steadily year on year across the UK, and are now 14 percent lower than in 1999/00. Real rail fares in the UK have increased slightly over the same period.
- Bus fares relative to Londoners' earnings are almost 60 percent lower than they were in 1971. The average fare paid on the Underground has increased since the mid-1980s, with fares over 50 percent higher, in real terms, than in 1971. Again, when Londoners' earnings are taken into account, the average Underground fare paid relative to earnings is below the 1971 level, by around 30 percent.
- Households in London spend more per week on transport than the average British household. While spending less on motoring, especially fuel, they spend over twice as much on fares and other travel costs.
- In terms of customer satisfaction with services provided by TfL, over the past 10 years the customer 'overall evaluation' of bus services has risen progressively – from a score of 75/100 in 1998/99 to 79/100 in 2007/08 – reflecting improvements to the bus service over this period.
- Over the past 10 years the customer satisfaction 'overall evaluation' score for the Underground shows a slight improvement, from 76/100 in 1998/99 to 77/100 in 2007/08, which has been achieved despite the record levels of demand (and hence congestion) and a reduction in services at weekends while works are carried out under TfL's large investment programme on the Underground.

### **Accessibility and London's interaction with its hinterland**

- All buses in London (except for Heritage buses on routes 9 and 15) are low-floor and wheelchair-accessible. There are currently 56 stations on the London Underground network with step-free access, and a further eight that are step-free in one direction. The DLR is already fully accessible, as is London Tramlink.
- London is intimately connected to extensive national and international transport networks, and is a major tourist and business destination. In 2007, there were 10.2 million domestic (ie rest of UK) overnight visitors to London, this translating

to about 64,000 people on an average night. The corresponding numbers for overseas visitors were 15.3 million and 320,000 people on an average night.

- The number of passengers travelling through London airports continued to grow in 2007. Almost 140 million non-transit passengers passed through London's five major airports (Heathrow, Gatwick, Luton, Stansted and London City), over twice as many as in 1990. This corresponds to over 380,000 people per day, almost equally split between those arriving and those departing. The trend since 1991 has been steady year on year growth, briefly interrupted in 2001 following terrorist attacks in the USA.
- Almost 800,000 people typically commuted to Greater London from outside in 2007, roughly equivalent to 13 percent of the adult resident population on a daily basis. This was an increase of 13 percent over the year 2000.
- In total, taking account of visitors and commuters, about 1 million people who do not reside in London travelled within, to or from London each day.

## 1. Introduction

### 1.1 Travel in London

The new Travel in London report is TfL's annual publication that summarises key trends and developments relating to travel and transport in London.

Previous reports, published as the annual London Travel Report, have focused on the provision of data, through compendia of tables and figures on topics that were likely to be of widest interest, updated each year. This revised publication features several changes to more appropriately reflect, track and interpret developments arising from the forthcoming Transport and other Strategies of the new Mayor of London, in the context of wider trends affecting travel in London. The Mayor's Transport Strategy will be revised during 2009. This is expected to elaborate TfL's key transport priorities, and future Travel in London reports will be one way through which progress towards these priorities can be assessed.

The contents of this first report should therefore be viewed as transitional, reflecting a move towards the following future reporting priorities:

- To provide, on an annual basis, a rounded and comprehensive assessment of travel patterns, conditions on the transport networks, contemporary transport-related developments and the factors affecting these.
- To continue to update and disseminate key time-series datasets relating to transport, providing a data resource for transport planners and others with an interest in transport in London, with appropriate interpretation, context and comparison.
- To reflect progress towards the Mayor's Transport Strategy goals by reporting and interpreting developments in relation to these.
- To provide a wider framework for additional related publications, or the dissemination of specific datasets for wider use, such as data from the London Travel Demand Survey (LTDS).

### 1.2 The Mayor of London's transport priorities

The transport vision of the new Mayor of London was outlined in his document *Way to Go !* published on 4 November 2008. These priorities were further elaborated in TfL's *Business Plan, 2009/10 - 2017/18*, published the following day.

*Way to Go !* sets out a vision of a transport system that is easier to use while delivering safer, reliable and efficient movement for people and businesses. This vision includes six delivery priorities:

- **To expand public transport capacity**, through delivering improvements to the Underground and the Crossrail project.
- **To smooth traffic flows** – making the best use of London's limited road space.
- **To lead a revolution in cycling and walking** – facilitating a step change increase in the numbers of people travelling by these modes.

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- **To deliver key 2012 transport infrastructure projects** – completing the East London Line, extensions to the London Overground rail network and to the DLR, ensuring a lasting legacy from the 2012 Olympic and Paralympic Games.
- **To improve further the safety and security of the travelling public.**
- **To dramatically improve the experience of travelling in London** through, for example, further expansion of the Oyster card, making buses safer, improving the public realm and introducing a 21<sup>st</sup>-century Routemaster bus.

Underlying these transport priorities are a series of 'guiding principles'. These are:

- Choice and accessibility for all transport users.
- Ensuring that the transport needs of Londoners today and in the future are met in an environmentally friendly way.
- Developing a truly integrated strategic approach to transport planning.
- Working in partnership with key stakeholders, such as the London boroughs, to achieve consensus.
- Delivering value for money.

This new Travel in London report reflects realignment of TfL's monitoring activity to reflect these newly articulated priorities, while preserving those established features within previous London Travel Reports that are of recognised value.

### 1.3 Tracking progress towards the Mayor's vision

TfL will be taking forward the development of the new Mayor's Transport Strategy during 2009, in part using data and trends identified in this report. An important future objective is to ensure that progress towards the Mayor's transport priorities is measured and assessed, reflecting his vision of a 'dynamic' transport strategy. The Travel in London report will be central to this objective.

The report is organised around themes that reflect the Mayor's transport priorities. The content will enable an assessment of progress that recognises the importance of long-term or background trends and non-transport influences in determining current conditions. It will also provide data and interpretation that will allow TfL and others to distinguish the impacts of specific interventions, by TfL and its delivery partners, towards improving transport conditions in London.

This will involve consideration of the following aspects:

- **Base conditions and trends:** TfL, its constituent modes and partner organisations routinely collect data, largely for operational reasons, relating to many aspects of travel and transport in London. In some cases, as reflected in previous London Travel Reports, valuable historic time-series exist that allow understanding of how current issues and pressures have developed over the past 10 to 20 years. Understanding of trends and developments, such as recent trends in car use in London, is fundamental to making projections of likely future conditions – to which TfL's transport planning efforts have to respond. Looking across these

long-term datasets and taking into account these future projections, it is possible to develop new strategic insights that will allow improved and integrated transport planning.

- **Inputs:** These are the financial and other resources assigned to progressing the Mayor's transport priorities. These are set out in TfL's Business Plans.
- **Outputs:** These are the direct interventions that TfL, the London boroughs and other agencies make in relation to the transport system. These include the provision of new infrastructure, maintenance or upgrading of existing infrastructure, and changes to transport policies, pricing and regulation
- **Outcomes:** These are the net overall changes in transport conditions in London, which reflect the impacts of both the inputs and outputs of TfL and partner agencies. They may also be influenced by other factors such as changing transport demand pressures and exogenous demographic and economic conditions and trends. To those who travel in London, changes in key transport outcomes, such as 'is it safer to travel in London?', will be of primary concern.

## 1.4 Summary of contents

This first Travel in London report is organised in 13 sections. The report structure reflects a realignment of content to more appropriately reflect and accommodate the emerging priorities outlined above, while retaining a traceable lineage to previous London Travel Reports. Key developments include:

- **Revised content:** While the established content of the London Travel Reports has been largely retained, some tables, mainly those relating to very specific aspects of transport in London, are no longer included. In most of these cases, however, data are still available via the contact point given in Section 1.5 of this report. At the same time, the content includes several new tables and data series – where these are relevant to current policy concerns.
- **Revised style:** A revised presentational style that will form a recognisable template for future reports and related material.
- **Commentary:** Future Travel in London reports will contain an interpretative commentary and this first edition moves towards this, highlighting key trends and features across the available data and its relevance to current policy concerns.
- **London Travel Demand Survey:** This major survey of travel by Londoners has completed its third year, and this report contains a selection of data from this survey that is likely to be of widest interest. These data provide a rich resource describing how Londoners travel, detailing their travel needs at the local scale – and provides material that will allow TfL and others to understand better how Londoners are likely to respond to future transport policy options. Developing and disseminating this new data source to TfL's delivery partners will be a priority for the coming year.
- **London boroughs and London regions:** Reflecting Mayoral priorities, TfL's future reporting will be more closely aligned to London's local geography. This means better data for individual London boroughs, and the London regions of which they

## I. Introduction

form part. This London regional framework is outlined, and a selection of borough-level data from the LTDS survey is provided.

In terms of the structure of this 2009 report:

- **Section 2** looks at aggregate volumes of travel in London, mode shares and trends in these indicators over time.
- **Section 3** considers at how travel in London varies by place and time – illustrating how travel relates to London’s functions and geography.
- **Section 4** sets out key indicators and trends describing the operational performance of London’s transport networks, looking at primary outcomes such as journey times and journey time reliability across all major modes.
- **Section 5** focuses on safety and security – reviewing recent trends in road casualties and recent statistics relating to crime on the transport networks.
- **Section 6** looks at emissions of CO<sub>2</sub> and key local air quality pollutants, focusing on TfL’s actions to contribute to reduction targets.
- **Section 7** focuses on cycling – an important Mayoral priority – and sets out a selection of available statistics describing how Londoners use their bicycles.
- **Section 8** sets out a range of data relating to the movement of freight.
- **Section 9** explores the new data available to TfL from the LTDS survey. This allows detailed study of how and why Londoners travel, and will be invaluable for developing solutions to transport issues going forward.
- **Section 10** looks at taxis and private hire vehicles, and considers key statistics and trends relating to two related schemes for disabled people – Dial a Ride and Taxicard.
- **Section 11** examines at trends in public transport fares, household expenditure on transport and indicators of customer satisfaction with the services provided by TfL.
- **Section 12** considers how transport facilitates accessibility within London, and then looks at how London interacts with its hinterland through the major national and international transport networks.
- **Section 13** reviews trends in population, employment and the economic output of London – the basic factors underlying transport demand.

Because the Mayor’s emerging priorities will require the development of new indicators during 2009, the data currently available are in some cases neither ideal nor complete. Therefore it is intended that this first Travel in London report both serves existing requirements for data and information, and points the way ahead in terms of how TfL plans to monitor future transport developments in London.



## **1.5 Further information**

As part of the wider realignment of this report, TfL will, during 2009, review and develop the data resource available to TfL's delivery partners through the TfL website. More detailed or disaggregate data, supporting many of the more aggregate indicators published in this report, will be made progressively available via this channel.

For specific technical queries on the contents of this report, readers are directed in the first instance to contact:

TfLenquiries@tfl.gov.uk



## 2. Volumes of travel and mode shares

### 2.1 Introduction

This section looks at travel trends in Greater London – in terms of volumes (numbers of people or vehicles) and modal shares (forms of transport used). Consideration of aggregate indicators of travel on the transport networks is followed by an exploration of mode share. Trends in patronage and service provision are then considered for each of the major public transport modes, alongside road traffic volumes.

### 2.2 Key features and trends

#### Volumes of travel

- About 28 million journey stages (parts of journeys made on a single mode of transport) were made in, to or from London on an average day in 2007. A trip using car, bus and Underground, for example, involves three journey stages.
- This average daily number of journey stages has increased from 22.9 million in 1993 to 27.8 million in 2007, a growth of 22 percent. Over the same period, the London resident population grew at a lower rate, increasing by 10 percent, so that the number of journey stages per person also increased.
- Including daily commuters and other visitors from outside Greater London, who account for about an extra 1 million people a day travelling in London, the average rate of travel, in terms of journey stages per person per day, is estimated to have increased from 3.0 in 1993 to 3.2 in 2007, an increase of 8 percent.
- On an average day in 2007, 23.8 million trips were made in, to or from London.
- Trip rates (trips per person per day) have been relatively constant at between 2.7 and 2.8 over recent years. However, an increase in journey stages per person indicates that trips are becoming more complex in terms of modal combinations used, reflecting a net switch to public transport modes.

#### Mode shares

- There has been a substantial net shift away from private towards public transport in London. Between 2000 and 2007, the proportion of journey stages made by public transport has risen from 33 percent to 40 percent, while the proportion made by private motorised transport, principally car, has fallen from 44 percent to 38 percent.
- This is a trend that has continued since the early 1990s, although the shift has been broadly twice as fast in 2000 to 2007 than in the previous seven years.
- This net modal shift reflects both increases in public transport and falls in road traffic volumes. Bus passenger kilometres have increased by almost 60 percent since 2000/01, while Underground passenger kilometres increased by 9 percent to its highest ever level.
- Comparisons with equivalent national statistics illustrate how travel in London is different to that in the Great Britain as a whole. While public transport accounts for

## 2. Volumes of travel and mode shares

one third of trips in London, in Great Britain it accounts for only 10 percent. Private transport, mainly car, accounts for 41 percent of trips in London but 65 percent for the rest of the country.

- The mode share of walking in London is similar to the Great Britain average of 24 percent, while the mode share of cycling in London, at 1.8 percent, is higher, but only marginally so, than the equivalent 1.5 percent share for Great Britain as a whole.
- Journey stages by public transport modes (defined as bus, Underground, DLR, rail, and taxis) increased in share from 30 percent in 1993 to 33 percent by 2000, and to 40 percent by 2007. This 7 percentage point increase in the share of public transport stages between year 2000 and 2007 is equivalent to a 5 percentage point increase in trip-based mode share for public transport.

### Public transport

- Public transport use in London has grown substantially in recent years, with total passenger kilometres travelled on services operated by TfL almost 60 percent higher in 2007/08 than in 1991/92. All the individual public transport modes shared in this growth, but it was especially pronounced on the bus network, which has seen patronage increase by 72 percent over this period (measured on a consistent basis that takes account of a change in methodology).
- Growth in Underground patronage has been more variable, but reached its highest recorded level in 2007/08 – 9 percent higher than 2000/01 and 38 percent higher than 1991/92.
- The increase in public transport patronage mirrors increased levels of service. Bus vehicle-kilometres operated increased by 57 percent over the period 1991/92 to 2007/08, and by 31 percent over the period since 2000/2001. For Underground train-kilometres the equivalent increases were 33 percent and 10 percent.
- Although there has been a slight tendency for people using public transport to make shorter trips, the overall medium-term picture is one of comparative stability in average public transport stage lengths.
- Patronage trends on both the DLR and London Tramlink reflect the progressive extension of these networks, as well as increased service levels. Looking at train operators defined by the Office of Rail Regulation (ORR) as 'London and the South East operators', the recent trend has been one of substantial passenger growth.

### Road traffic

- Road traffic volumes in London have fallen in recent years, a pattern also seen in other urban areas, although in contrast to aggregate traffic volume trends at the national scale. Whereas total Great Britain traffic increased by 10 percent between 2000 and 2007, much of this on inter-urban roads, London traffic fell by about 2 percent over this period.
- Further evidence of declining traffic is provided by TfL's long-standing counts of traffic crossing strategic cordons enclosing Greater London, Inner London and

central London. In 2007, traffic crossing the central London cordon, enclosing an area somewhat larger than the central London Congestion Charging Zone, was 12 percent lower than in 2001, this decline is due in part to the impact of congestion charging, introduced in 2003.

- Traffic crossing the Inner London cordon began to decline in 1999 and in 2005 was just 6 percent above its level in 1972. At the London Boundary cordon, recent years have seen only marginal traffic growth.

### 2.3 What is travel and how do we measure it?

The movement of people constitutes 'travel'. Travel may be considered from many points of view, ranging from consideration of the behaviour of individual people (or of identifiable groups of people) to measuring the totality of travel activity in aggregate. In this section the focus is mainly on the latter, addressing the questions of how much travel takes place within Greater London (or to and from Greater London), how this has varied over the last 15 years, and how the totality of travel breaks down between different methods of travel.

For the most part, the results reported here refer to the volumes of travel that may be measured (in principle, if not in practice) by counting the numbers of travellers in their course of travel. In fact, a number of different methods are used to compile statistics of volumes of travel. Some are simply based on counts, for example the number of vehicles using the road or passengers on public transport, while others are derived from sources related to the provision of transport services, such as ticket sales used to determine the number of trips made by bus and Underground.

The usual unit used to measure travel is the **trip** or **journey**. A trip is the movement of an individual person from one place to another to achieve a purpose or to undertake an activity at the destination. The activity is (usually) unrelated to the process of travel itself, and the trip finishes when the destination is reached. There may, however, be intermediate stops on the way that are necessary for the traveller to change from one method of travel to another, for example, to change from bus to train. These 'interchanges' break the trip up into separate **journey stages**. Most of the aggregate travel statistics derived from observations or transport operations are expressed in terms of journey stages, not complete trips, since each source must relate to a single mode of transport.

Data on trips, on the other hand, is best collected by interview surveys asking people about their travel (such as the LTDS – see also Section 9 of this report). Such survey data are essential for relating the observations of journey stages (ie counts of people on the transport networks in the course of travel) to the travel patterns of people in terms of trips. However, the estimates of total trips in London, reported below in Section 2.4, include trips made by non-residents, including commuters, tourists and visitors, as well as London residents.

## 2.4 Trips in London

Estimates of the daily average number of **trips** in Greater London (including trips to or from London) are given in Table 2.1 for years 1993 to 2007. Trips are classified according to 'main mode' – usually defined as the mode used for the longest distance stage of multi-stage trips.

The number of trips in London has increased steadily year by year over the period 1993 to 2007. At the same time there has been a substantial increase in the share of trips by public transport and a corresponding decline in trips by private transport, principally the private car. Public transport, which accounted for 24 percent of London trips in 1993, had increased in share to 33 percent by 2007.

The decline in numbers of trips by private transport is deduced from the trends observed in road traffic (see Section 2.11). When converted into numbers of trips, main mode car trips (including both drivers and passengers) were 10.2 million per day in 1993, rising gradually to a peak of 10.6 million per day in 1999 and subsequently declining, to 9.6 million per day in 2007. Private transport trips accounted for 50 percent of London trips in 1993 but only 41 percent in 2007 (Table 2.2).

However, overall **trip rates** have been relatively constant at between 2.7 and 2.8 trips per person per day throughout this period. Most of the increase in total numbers of trips is due to population growth. London's resident population increased by 10 percent between 1993 and 2007. This report should also define the extended population of people making trips in London by including day commuters from outside Greater London and overseas and domestic visitors to London: these add about an extra 1 million people a day travelling in London. Together with the resident population, they make up the extended 'daytime population' of London. This extended population increased at a slightly higher rate of 12 percent between 1993 and 2007. Over the same period, the daily average number of trips increased by 15 percent, which implies an increase of just 3 percent in trips per person.

Table 2.1 Daily average number of trips in Greater London, 1993 to 2007, by main mode.

Year	Millions								
	Rail	Under-ground / DLR	Bus (including tram)	Taxi	Car	Motor cycle	Cycle	Walk	All modes
1993	1.3	1.4	2.1	0.2	10.2	0.2	0.3	5.2	20.7
1994	1.3	1.5	2.1	0.2	10.3	0.2	0.3	5.2	21.0
1995	1.3	1.6	2.2	0.2	10.3	0.2	0.3	5.2	21.2
1996	1.4	1.5	2.3	0.2	10.4	0.2	0.3	5.3	21.4
1997	1.5	1.6	2.3	0.2	10.4	0.2	0.3	5.3	21.8
1998	1.5	1.7	2.3	0.2	10.5	0.2	0.3	5.3	22.0
1999	1.6	1.8	2.3	0.2	10.6	0.2	0.3	5.4	22.4
2000	1.7	2.0	2.4	0.2	10.5	0.2	0.3	5.5	22.7
2001	1.7	1.9	2.6	0.2	10.4	0.2	0.3	5.5	22.9
2002	1.7	1.9	2.8	0.2	10.2	0.2	0.3	5.5	22.9
2003	1.8	1.9	3.2	0.2	9.9	0.2	0.3	5.5	23.0
2004	1.8	2.0	3.3	0.2	9.6	0.2	0.3	5.6	23.1
2005	1.8	2.0	3.2	0.2	9.8	0.2	0.4	5.6	23.2
2006	1.9	2.1	3.2	0.2	9.7	0.2	0.4	5.7	23.3
2007	2.1	2.2	3.3	0.2	9.6	0.2	0.5	5.7	23.8

Source: TfL Planning

1. Trips are complete one-way movements from one place to another.
2. Trips may include use of several modes of transport and hence be made up of more than one journey stage.
3. In Tables 2.1 and 2.2 trips are classified by the mode that is typically is used for the longest distance within the trip.
4. Round trips are counted as two trips, an outward and an inward leg.

## 2. Volumes of travel and mode shares

Table 2.2 Trip-based mode shares – public and private transport, 1993 to 2007, by main mode.

Year	Percentage of trips			
	Public transport	Private transport	Cycle	Walk
1993	24	50	1.3	25
1994	24	50	1.3	25
1995	25	49	1.3	25
1996	25	49	1.3	25
1997	26	49	1.2	24
1998	26	48	1.2	24
1999	27	48	1.2	24
2000	28	47	1.2	24
2001	28	47	1.3	24
2002	29	46	1.3	24
2003	30	44	1.4	24
2004	32	43	1.5	24
2005	31	43	1.8	24
2006	31	43	1.9	24
2007	33	41	2.0	24

Source: TfL Planning

Comparisons with the Department for Transport's (DfT's) National Travel Survey for Great Britain – in terms of **trip-based mode share** – emphasise the extent to which travel in London is distinctive.

- Public transport trips account for 33 percent of trips in London, while in the National Travel Survey they accounts for only 10 percent of trips.
- Private transport, mainly car, accounts for 41 percent of trips in London, but 65 percent in the National Travel Survey.
- The share of trips made on foot in London is similar to the overall estimate from the National Travel Survey.
- Cycling accounts for just 2 percent of trips but this share is slightly higher in London than elsewhere – cycling accounts for 1.5 percent of all trips in the National Travel Survey.



## 2.5 Journey stages

Trips may also be broken down into their component stages. These are the segments of a trip between transport interchanges, with each stage using a single mode of transport.

Table 2.3 brings together the available data on average daily numbers of **journey stages** by all modes of transport in London, between 1993 and 2007. These are consistent with the numbers of trips, by main mode, reported in Table 2.1.

Given the variety of sources it is not possible to be wholly consistent between the different modes in the derivation of journey stages (some points of definition are noted in the footnotes). Nevertheless, the table (together with Table 2.1) gives the best available estimates of aggregate London travel, and shows a measure of the relative usage of different modes. This allows trends in **mode shares** across London at the journey stage level to be tracked over time.

About 28 million **journey stages** were made in Greater London on an average day in 2007. This includes stages of trips with either origin or destination, or both, within the Greater London area. It includes trips by both London residents and non-residents such as commuters, visitors and tourists. The most significant omission is those walk stages that are not complete trips but which are made to access, or link, stages made by other modes of transport. Most of these 'linking' walks are very short. The only walks included in Table 2.3 are trips undertaken by London residents entirely on foot.

The average daily number of journey stages increased from 22.9 million in 1993 to 27.8 million in 2007, an increase of 22 percent. Over the same period, the London resident population grew at a lower rate, increasing by 10 percent, so that the number of journey stages by residents also increased. When commuters and visitors to London are included, the average rate of travel, in terms of journey stages per person per day, is estimated to have increased from 3.0 in 1993 to 3.2 in 2007, an indicative increase of 8 percent.

## 2. Volumes of travel and mode shares

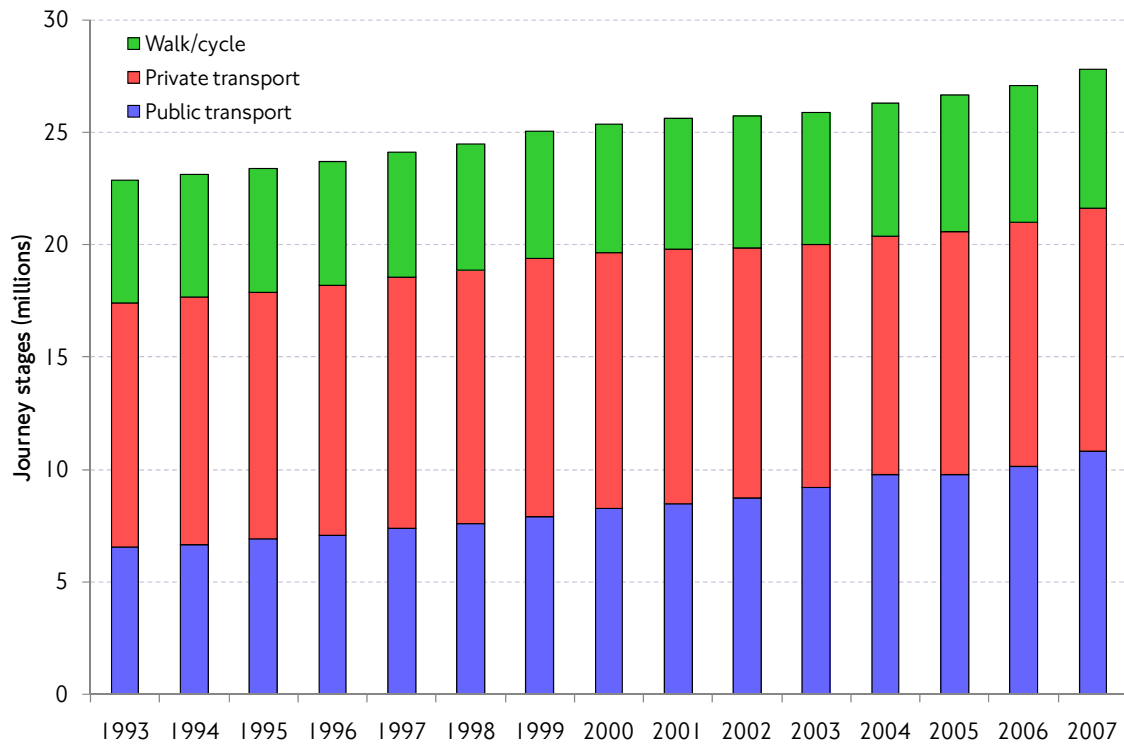
Table 2.3 Aggregate travel volumes in Greater London. Estimated daily average number of journey stages by mode, 1993 to 2007.

Year	Millions of journey stages									
	Rail	Under-ground	DLR	Bus (incl tram)	Taxi	Car	Motor cycle	Cycle	Walk	All modes
1993	1.4	2.0	0.0	3.1	0.2	10.5	0.2	0.3	5.2	22.9
1994	1.4	2.1	0.0	3.1	0.2	10.6	0.2	0.3	5.2	23.1
1995	1.5	2.1	0.0	3.3	0.2	10.6	0.2	0.3	5.2	23.4
1996	1.5	2.1	0.0	3.4	0.2	10.7	0.2	0.3	5.3	23.7
1997	1.6	2.2	0.1	3.5	0.2	10.8	0.2	0.3	5.3	24.1
1998	1.7	2.4	0.1	3.5	0.2	10.8	0.2	0.3	5.3	24.5
1999	1.8	2.5	0.1	3.5	0.2	11.1	0.2	0.3	5.4	25.0
2000	1.8	2.6	0.1	3.7	0.2	10.9	0.2	0.3	5.5	25.4
2001	1.8	2.6	0.1	3.9	0.2	10.9	0.2	0.3	5.5	25.6
2002	1.9	2.6	0.1	4.2	0.2	10.6	0.2	0.3	5.5	25.7
2003	1.9	2.6	0.1	4.6	0.2	10.3	0.2	0.3	5.5	25.9
2004	2.0	2.7	0.1	5.0	0.3	10.1	0.2	0.4	5.6	26.3
2005	2.0	2.6	0.1	5.0	0.3	10.3	0.2	0.4	5.6	26.7
2006	2.1	2.7	0.2	5.2	0.3	10.3	0.2	0.5	5.7	27.1
2007	2.3	2.9	0.2	5.4	0.3	10.3	0.2	0.5	5.7	27.8

Source: TfL Planning

1. A journey stage is a part of a trip made by a single mode of transport.
2. Rail interchanges between train operating companies start a new journey stage.
3. Bus journey stages are counted as starting a new journey stage each time a new bus is boarded.
4. Underground journey stages are counted by station entries; interchanges within stations are ignored.
5. Walks are counted only when they form complete trips (ie walking all the way), not when they are part of trips using other modes of transport.

Figure 2.1 Aggregate travel volumes in Greater London. Estimated daily average number of journey stages, 1993 to 2007.



Source: TfL Planning

## 2.6 Mode shares – journey stage-based estimates

From Table 2.3 it is possible to estimate **stage-based mode shares**. Table 2.4 shows how total travel in London is distributed between the principal modes of transport.

In 2007, just over 40 percent of all journey stages were made by the public transport modes. This compared to just under 38 percent made by private transport – principally private cars. Walk (‘walk all the way’ trips) accounted for just over one fifth of all journey stages, with bicycles accounting for 1.8 percent of all journey stages.

Looking at how these trends have developed over time, and bearing in mind the technical caveats applying to these data (see table footnotes), it is clear that there has been a substantial net shift away from private transport to the public modes. In the early 1990s public transport accounted for just under 30 percent of all journey stages, and the latest value for 2007 suggests an aggregate net shift of around 10 percentage points. The share of all journey stages accounted for by private transport has fallen by a corresponding amount over the same period. Cycling has progressively increased its mode share over the period – by up to one half overall – but is still very much a minority mode.

Journey stages by public transport modes (defined as bus, Underground, DLR, rail, taxis and private hire vehicles) increased in share from 30 percent in 1993 to 33 percent by 2000, and to 40 percent by 2007. This 7 percentage point increase in the share of public transport stages between year 2000 and 2007 is equivalent to the 5 point increase in **trip-based mode share** in London (see also Table 2.2).

## 2. Volumes of travel and mode shares

Table 2.4 Percentage shares of journey stages by type of transport, 1993 to 2007.

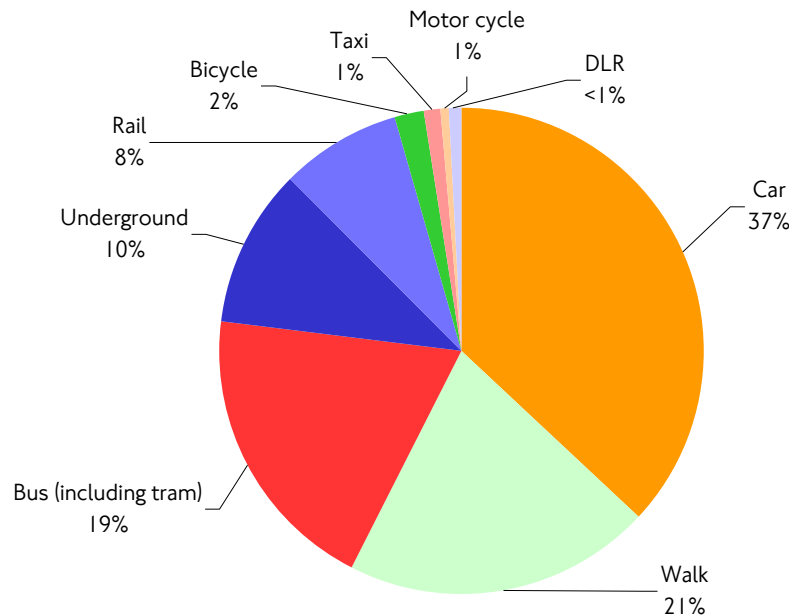
Year	Percentage of journey stages			
	Public transport	Private transport	Cycle	Walk
1993	30	47	1.2	23
1994	30	47	1.2	22
1995	31	46	1.2	22
1996	31	46	1.2	22
1997	32	45	1.2	22
1998	32	45	1.2	22
1999	32	45	1.1	22
2000	33	44	1.2	21
2001	34	43	1.3	22
2002	35	42	1.3	22
2003	37	41	1.3	21
2004	38	39	1.4	21
2005	38	40	1.6	21
2006	39	39	1.7	21
2007	40	38	1.8	21

Source: TfL Planning

These shifts in stage-based mode share have taken place against a backdrop of increased aggregate travel volumes, reflecting among other things population and employment growth (see also Section 13 of this report). Thus, within the context of increased overall travel, the net mode shift towards public transport simultaneously achieved in London has contributed to travel overall becoming more sustainable. Further details of aspects of the environmental impact of transport in London can be found in Section 6 of this report.

Figure 2.2 illustrates the journey stage-based mode share for 2007, based on Table 2.3.

Figure 2.2 Modal shares of daily journey stages in London, 2007.



Source: TfL Planning

## 2.7 Travel by London residents

Alternative estimates of the daily travel by London household residents only are available from a series of household interview sample surveys. Such surveys have previously been carried out, as components of the London Area Transport Survey (LATS), at 10-yearly intervals to coincide with the national Censuses of Population. The latest surveys in this series were the 1991 and 2001 LATS. A new survey of similar design, the London Travel Demand Survey (LTDS), was initiated by TfL in 2005/06 and is intended to be a rolling annual survey to replace the decennial LATS household surveys. LTDS is planned on a financial year basis, so that each annual survey gives complete coverage of London in the year, allowing key annual trends in Londoners' travel statistics to be monitored. To date, results are available for the first three years of the survey, from 2005/06 to 2007/08. Further details and results from LTDS are given in Sections 3 and 9 of this report.

Table 2.5 summarises the results for total Londoners' trips and mode shares for each LTDS year and, for 1991 and 2001 from previous LATS surveys for comparison. These comparisons are for **weekdays only** because the earlier surveys did not cover weekend travel. They also use a distance-based definition of main mode. Some of the differences between years are likely to be due to minor differences in survey methodology rather than actual changes in travel patterns: in particular, the 1991 LATS under-recorded short walks (under 200 metres) which accounts for the upward step-change in the recorded mode share for walk between 1991 and 2001. Nevertheless, the series show a consistent increasing trend in total numbers of trips, as the London population has increased. As a result, total trips per weekday by London household residents increased from about 16 million in 1991 to 18 million in 2001, and by 2005/06 had increased further to over 19 million trips per day. The total number of trips has broadly stabilised at that level since 2005/06.

## 2. Volumes of travel and mode shares

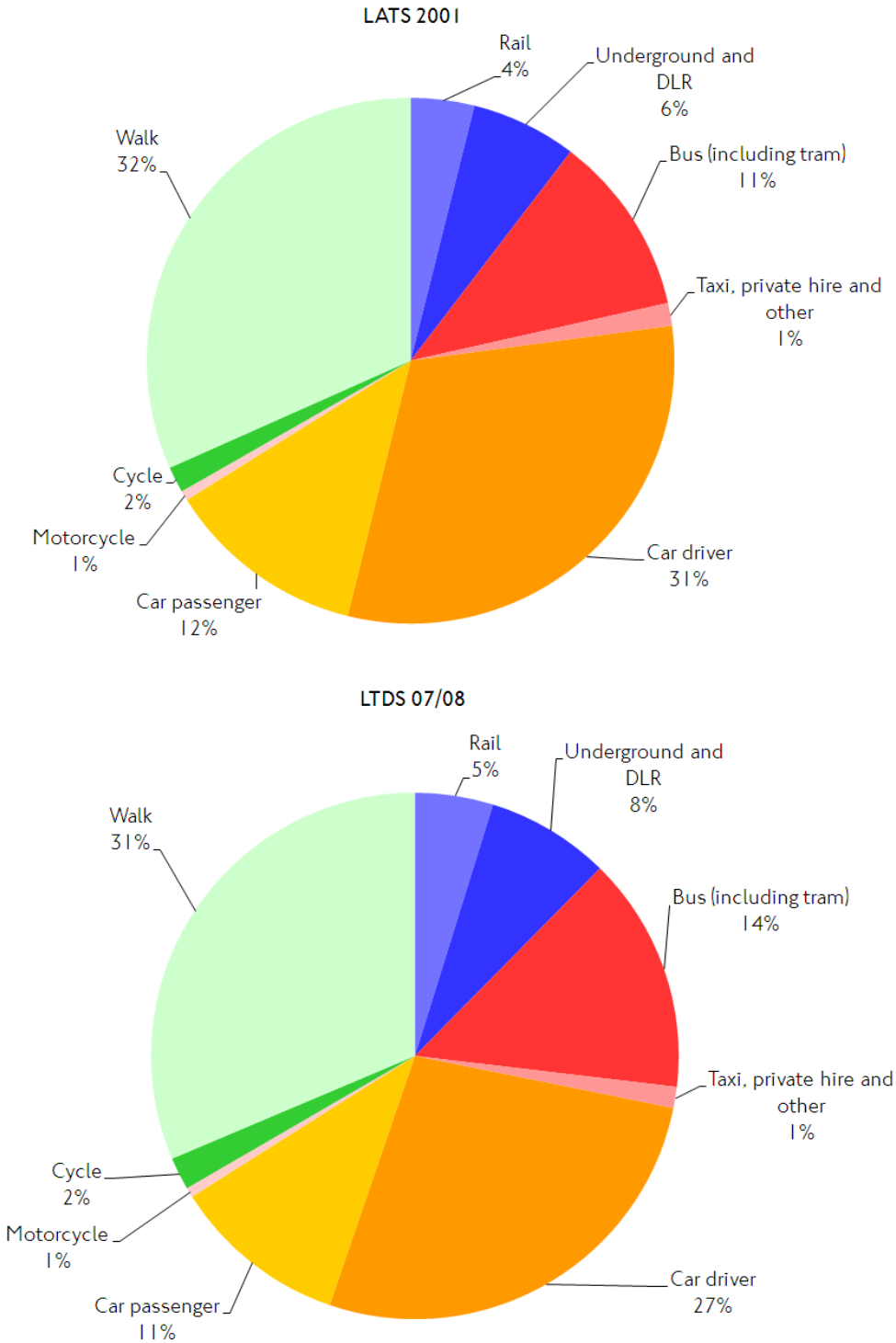
In terms of mode shares, the most noticeable change between 2001 and 2007/08 has been the increase in the share of bus trips, from 11 percent of all trips by London residents in 2001 to between 14 and 15 percent each year since 2005/06. The shares for other public transport modes also increased, confirming for London residents a similar growth in public transport use to that seen from Table 2.1 for all trips in London, including trips by non-residents. Figure 2.3 illustrates these mode share changes graphically.

**Table 2.5** Weekday trips per day by London residents: LATS 1991 and 2001, LTDS 2005-2008. Percentage mode shares by main mode.

Main mode (distance based)	1991	2001	2005/06	2006/07	2007/08
Rail	3.8	3.9	4.8	4.6	4.8
Underground and DLR	6.9	6.5	7.2	7.3	7.6
Bus (including tram)	11.6	11.1	14.5	14.6	14.5
Taxi, private hire and other	1.3	1.4	1.0	1.4	1.3
Car driver	35.4	31.0	29.4	27.6	27.1
Car passenger	13.5	12.3	10.9	11.0	10.8
Motorcycle	0.6	0.6	0.6	0.8	0.6
Cycle	1.7	1.6	1.5	1.7	2.0
Walk	25.1	31.7	30.1	30.9	31.4
<b>All modes</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>Number of trips (millions)</b>	<b>15.9</b>	<b>18.1</b>	<b>19.2</b>	<b>19.5</b>	<b>19.3</b>

Source: TfL Planning

Figure 2.3 Weekday trips per day by London residents: LATS 2001 and LTDS 2007/08 compared.



Source: TfL Planning, LATS 2001 and LTDS 2007/08

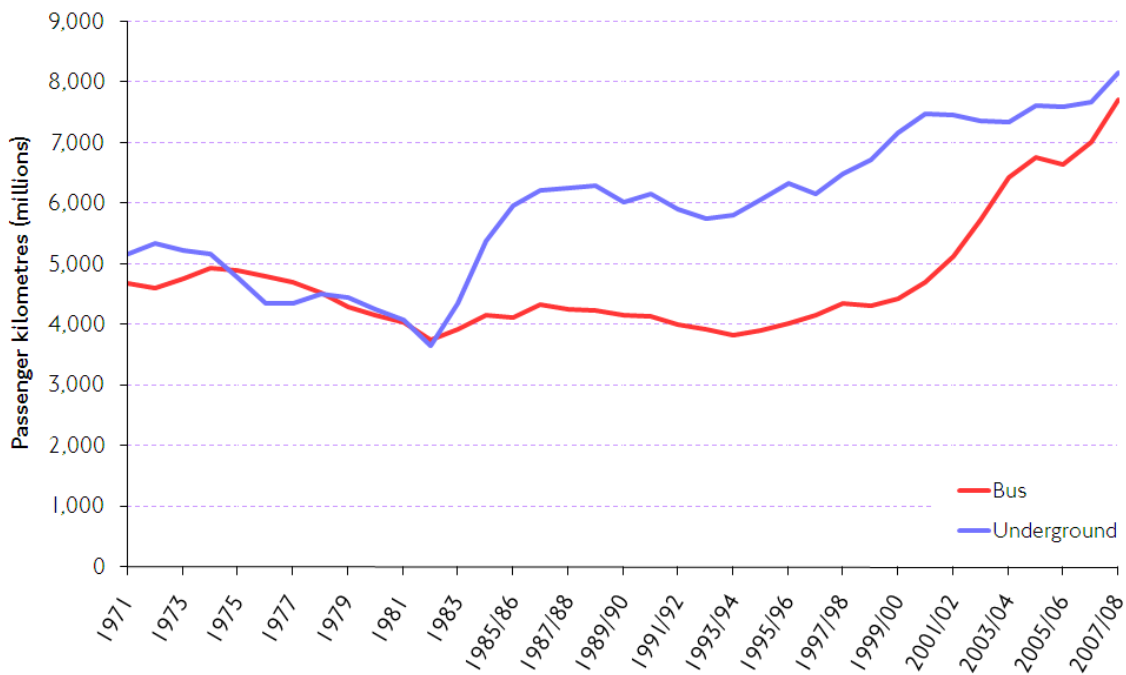
## 2.8 Public transport patronage

Public transport use in London has grown substantially in recent years, with total passenger kilometres travelled on services operated by TfL almost 60 percent higher in 2007/08 than in 1991/92 (Table 2.6).

- All the individual public transport modes shared in this growth, but it was especially pronounced on the bus network, which has increased patronage by 88 percent over this period.
- Between 2000/01 and 2007/08, bus passenger kilometres increased by 59 percent. This is a 'best available' estimate on a consistent basis, taking account of a method change between 2006/07 and 2007/08 – see also technical note beneath Table 2.7.
- The DLR has also featured consistent growth since it opened in 1987, with large increases partly reflecting successive extensions to the network. Patronage of London Tramlink has also increased steadily year-on-year since its first full year of operation in 2001/02.
- Underground patronage has seen steady growth, reaching its highest ever recorded level in 2007/08 – 9 percent higher than in 2000/01.

Figure 2.4 illustrates these growth trends graphically.

Figure 2.4 Bus and Underground passenger kilometres.



Source: TfL Service Performance data



Table 2.6 Annual passenger kilometres travelled by public transport (millions), 1991/92 to 2007/08.

Year	Million passenger kilometres				
	Bus	Underground	DLR	Tramlink	Total
1991/92	3,996	5,895	32	-	9,923
1992/93	3,922	5,758	33	-	9,713
1993/94	3,819	5,814	39	-	9,672
1994/95	3,912	6,051	55	-	10,018
1995/96	4,018	6,337	70	-	10,425
1996/97	4,159	6,153	86	-	10,398
1997/98	4,350	6,479	110	-	10,939
1998/99	4,315	6,716	139	-	11,169
1999/00	4,429	7,171	152	-	11,753
2000/01	4,709	7,470	195	-	12,374
2001/02	5,128	7,451	207	97	12,883
2002/03	5,734	7,367	232	100	13,432
2003/04	6,431	7,340	235	103	14,110
2004/05	6,754	7,606	243	113	14,717
2005/06	6,653	7,586	257	117	14,613
2006/07	7,014	7,665	301	129	15,109
2007/08	7,714	8,155	327	138	16,007

Source: TfL Service Performance data

*Note: Figures include travel on bus and Underground services operated by TfL beyond the Greater London boundary. Note also re-estimation of bus data series in 2007/08, affecting quoted change percentages. See also methodological note following Table 2.7.*

Table 2.7 shows trends in public transport patronage in terms of **journey stages**. Substantial and consistent increases are seen across all public transport modes, with the overall number of public transport stages increasing by over 70 percent since the early 1990s, and by almost 40 percent since 2000/01. These increases reflect a variety of factors, including provision of new infrastructure (DLR and London Tramlink), increased services on existing networks, notably substantial enhancements to the bus network, and more general economic trends affecting travel. Figure 2.5 shows these trends graphically.

## 2. Volumes of travel and mode shares

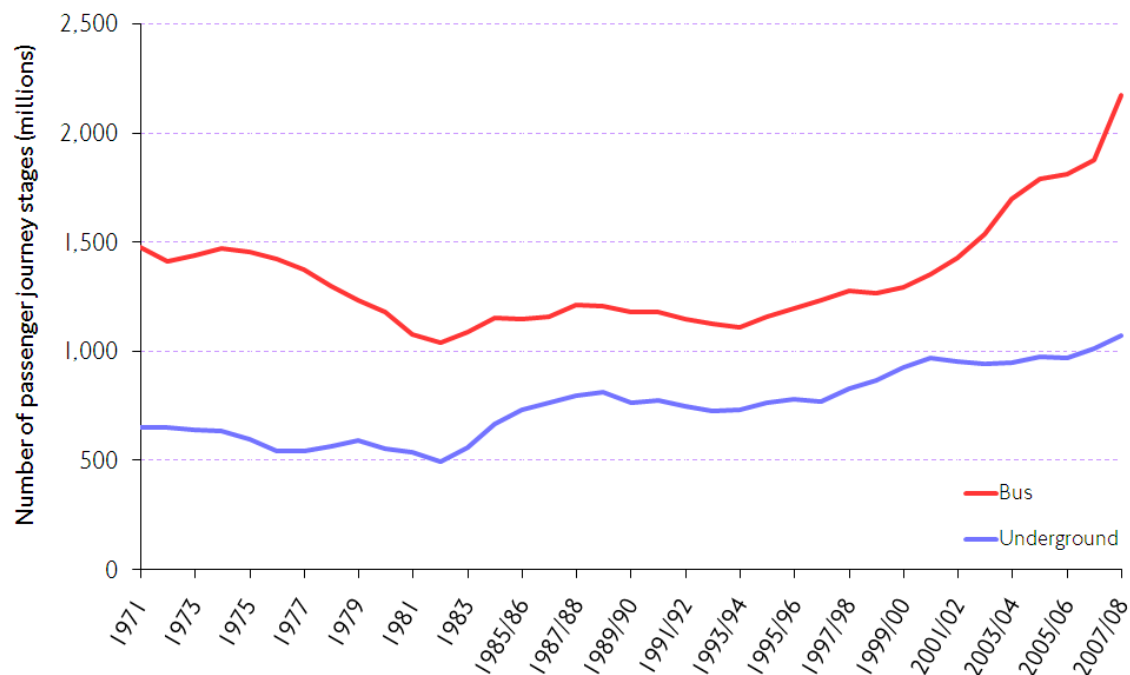
Table 2.7 Annual journey stages by public transport (millions), 1991/92 to 2007/08.

Year	Million journey stages				
	Bus	Underground	DLR	Tramlink	Total
1991/92	1,149	751	8	-	1,908
1992/93	1,127	728	7	-	1,862
1993/94	1,112	735	8	-	1,855
1994/95	1,159	764	12	-	1,935
1995/96	1,198	784	15	-	1,997
1996/97	1,234	772	17	-	2,023
1997/98	1,277	832	21	-	2,130
1998/99	1,267	866	28	-	2,161
1999/00	1,296	927	31	-	2,254
2000/01	1,354	970	38	-	2,362
2001/02	1,430	953	41	19	2,443
2002/03	1,534	942	46	19	2,543
2003/04	1,702	948	49	20	2,718
2004/05	1,793	976	50	22	2,840
2005/06	1,816	971	53	22	2,862
2006/07	1,880	1,014	61	25	2,981
2007/08	2,176	1,072	67	26	3,275

Source: TfL Service Performance data

Note: From 2007/08 TfL changed the methodology used to estimate annual bus journeys. Before 2007/08 the statistics were based on ticket sales (supplemented by survey data used to estimate the rate of use of period tickets). From 2007/08 onwards the estimates are derived from Oyster card validations wherever appropriate. The new series also includes some bus journeys not previously counted, including journeys using staff and police passes and bus travel by under five-year-olds. It is estimated that the net effect of these changes was to increase the estimates of bus journey stages by about 10 percent and passenger kilometres by about 3 percent. The pre-2007/08 series has not been revised. According to the new methodology, journey stages by bus in 2006/07 are estimated at 2,069 million, with a total distance travelled of 7,215 million passenger kilometres, compared to 1,880 million journey stages using the previous method.

Figure 2.5 Bus and Underground passenger journey stages.



Source: TfL Service Performance data

## 2.9 River Services

Table 2.8 Tickets sold at London River Services' piers.

Piers <sup>1</sup>	Thousands							
	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Bankside	3	5	45	80	109	114	104	114
Blackfriars <sup>2</sup>	25	28	67	13	24	29	-	-
Embankment	357	395	345	310	255	190	216	193
Festival	15	18	9	10	9	6	8	11
Greenwich	177	185	162	197	184	194	209	233
Millbank	-	-	-	59	83	75	93	74
Tower	237	224	235	207	289	272	332	359
Waterloo <sup>3</sup>	291	178	272	171	-	-	-	-
Westminster	468	706	634	636	745	721	796	808
All Piers	1,574	1,739	1,767	1,682	1,699	1,601	1,759	1,792
Percentage change 1 year	-	10.5	1.6	-4.8	1.0	-5.7	9.9	1.9
Thames Clippers <sup>4</sup>	-	-	-	183	367	525	662	704

Source: TfL London River Services

1. Excludes charter ticket sales.
2. From 2006, Blackfriars is served only by Thames Clippers and all passengers at this pier are included in the Thames Clippers total.
3. Waterloo Pier was managed by LRS and data collected only until 31/07/03.
4. Thames Clippers run under contract to LRS. Passengers have not been counted in LRS totals.

## 2. Volumes of travel and mode shares

TfL London River Services (LRS) manages piers on the Thames that serve passenger ferry services. Total annual ticket sales by pier are shown in Table 2.8. These exclude charter tickets. Passengers on the Thames Clipper services, also run by LRS, are shown separately and not included in the totals for individual piers. A total of almost 1.8 million tickets were sold at piers in 2007/08, 2 percent more than in the previous year, and 14 percent more than in 2000/01.

### 2.10 National Rail

Basic statistics of National Rail patronage are compiled by the Office of Rail Regulation from information derived from ticket sales via the LENNON database. These do not currently give a clear spatial definition of trips into or within Greater London. However, as is made clear by Table 2.9, reflecting patronage on all trains operated by train operating companies defined by the Office of Rail Regulation as 'London and the South East operators', the trend has been one of substantial passenger growth. Over the period 2000/01 and 2007/08, passenger kilometres (all services by these operators, whether in London or outside) grew by 22 percent. Passenger journeys grew by 26 percent over the same period.

Table 2.9 National Rail: London and the South East operators, passenger kilometres and journeys, 1998/99 to 2007/08.

Year	Passenger kilometres (billions)	Passenger journeys (millions)
1998/99	17.1	616
1999/00	18.4	639
2000/01	19.2	664
2001/02	19.3	663
2002/03	19.8	679
2003/04	20.1	690
2004/05	20.5	704
2005/06	20.7	720
2006/07	22.2	773
2007/08	23.5	834

Source: Office of Rail Regulation, National Rail Trends Yearbook, [www.rail-reg.gov.uk](http://www.rail-reg.gov.uk)

### 2.11 Road traffic – aggregate traffic volumes in London and recent trends

The preceding sections of this chapter have looked at trends in travel on the main public transport networks operated by TfL. The following sections look at equivalent trends for the road network in Greater London.

A major source of statistics of road traffic in London is provided by the DfT's National Road Traffic surveys. This is a large-scale annual programme of manual classified traffic counts which allow the main vehicle types (cars, vans, lorries etc) to be separately identified. These are supplemented with data from automatic traffic counters. Observed flows of vehicles are converted into estimates of traffic (vehicle kilometres) by aggregating the product of flows and road lengths across the links of the road network. The main purpose of the survey is to provide estimates of trends in main road traffic to contribute to estimates for Great Britain. The estimates are naturally less robust when broken down by area and road type, including estimates for London. In looking specifically at London, TfL has reworked the DfT source data to provide estimates for London traffic that do not rely on trends occurring in other parts of Great Britain (see Notes and Definitions for further details).

TfL's estimates of London traffic are presented in Tables 2.10 and 2.11 and Figures 2.6 and 2.7. They differ from estimates produced by the DfT, for the reasons set out above and in Notes and Definitions. The tables show estimates for two different definitions of Outer and Inner London. The Outer London Commission, tasked by the Mayor with assisting the revision of the London Plan, include Haringey and Newham in Outer London and places Greenwich in Inner London. The Office for National Statistics (ONS) definition of Outer London includes Greenwich but excludes Haringey and Newham. The ONS definition is used for the majority of tables in this report and for analyses of the London Travel Demand Survey. It is notable that the different definitions show very similar trends for traffic volumes for Inner and Outer London, respectively.

Table 2.10 Index of London road traffic (year 2000 = 100) by central, Inner and Outer London. Motor vehicles only.

Year	Index (2000=100)						
	National Statistics definition			GLA / Outer London Commission definition		Greater London	Great Britain
	Central London	Inner London	Outer London	Inner London	Outer London		
2000	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2001	101.7	101.2	99.8	101.3	99.8	100.3	101.6
2002	98.2	99.0	100.5	99.7	100.2	100.0	104.2
2003	89.2	98.3	101.3	99.1	100.9	100.0	105.0
2004	87.8	94.6	100.6	95.7	100.1	98.4	106.7
2005	86.3	94.3	98.4	94.6	98.2	96.8	106.9
2006	85.4	96.8	98.9	96.3	99.1	97.8	108.6
2007	85.2	95.3	99.7	95.1	99.7	97.9	109.8

Source: TfL estimates derived from data provided by the Department for Transport

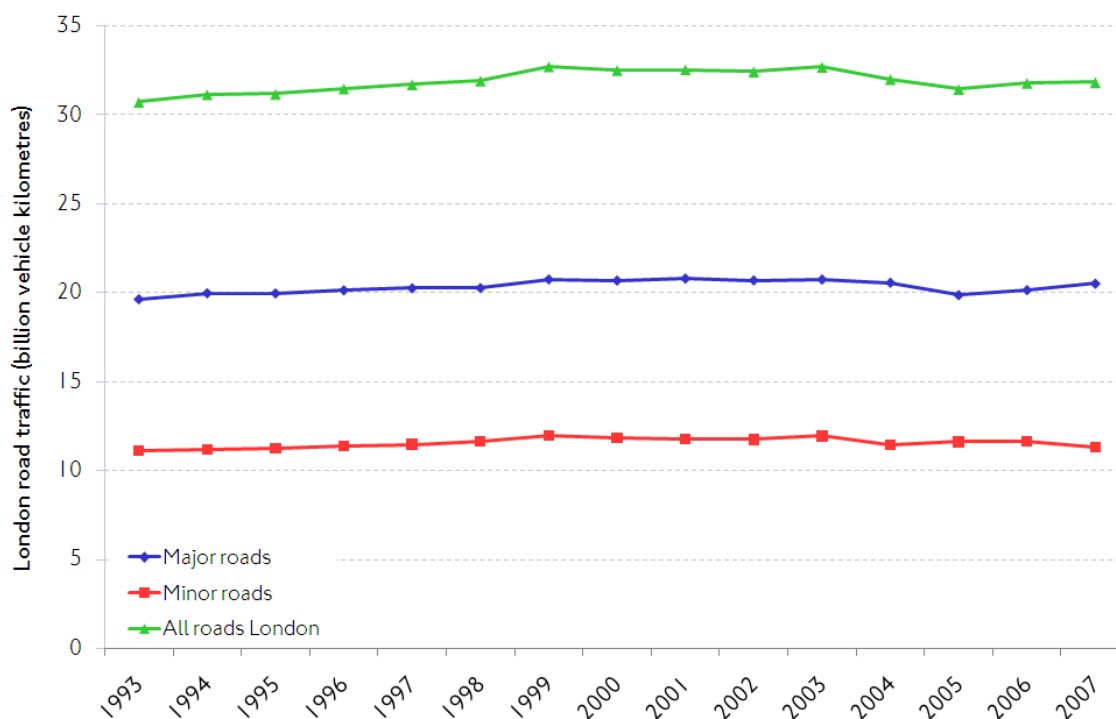
## 2. Volumes of travel and mode shares

Table 2.11 London road traffic (billion vehicle kilometres) by central, Inner and Outer London. Motor vehicles only.

Year	billion vehicle kilometres						
	National Statistics definition			GLA /Outer London Commission definition		Greater London	Great Britain
	Central London	Inner London	Outer London	Inner London	Outer London		
1993	1.3	8.7	20.7	8.4	21.1	30.7	412.3
1994	1.3	8.8	21.0	8.4	21.4	31.1	421.5
1995	1.3	8.9	21.0	8.5	21.4	31.2	429.7
1996	1.3	8.9	21.3	8.5	21.7	31.5	441.1
1997	1.3	8.9	21.5	8.5	21.9	31.7	450.3
1998	1.3	8.9	21.7	8.5	22.1	31.9	458.5
1999	1.3	9.1	22.3	8.7	22.7	32.7	467.0
2000	1.3	9.0	22.2	8.6	22.6	32.5	467.1
2001	1.3	9.1	22.1	8.7	22.5	32.6	474.4
2002	1.3	8.9	22.3	8.6	22.6	32.5	486.5
2003	1.1	8.9	22.5	8.5	22.8	32.5	490.4
2004	1.1	8.6	22.3	8.3	22.6	32.0	498.4
2005	1.1	8.5	21.8	8.2	22.2	31.4	499.5
2006	1.1	8.7	21.9	8.3	22.4	31.8	507.5
2007 (provisional)	1.1	8.6	22.1	8.2	22.5	31.8	513.0

Source: TfL estimates derived from data provided by the Department for Transport

Figure 2.6 London road traffic (billion vehicle kilometres) by road class.



Total road traffic in London fell by an estimated 2 percent between 2000 and 2007. This is different to the trend for Great Britain, where total road traffic increased by 10 percent over this period.

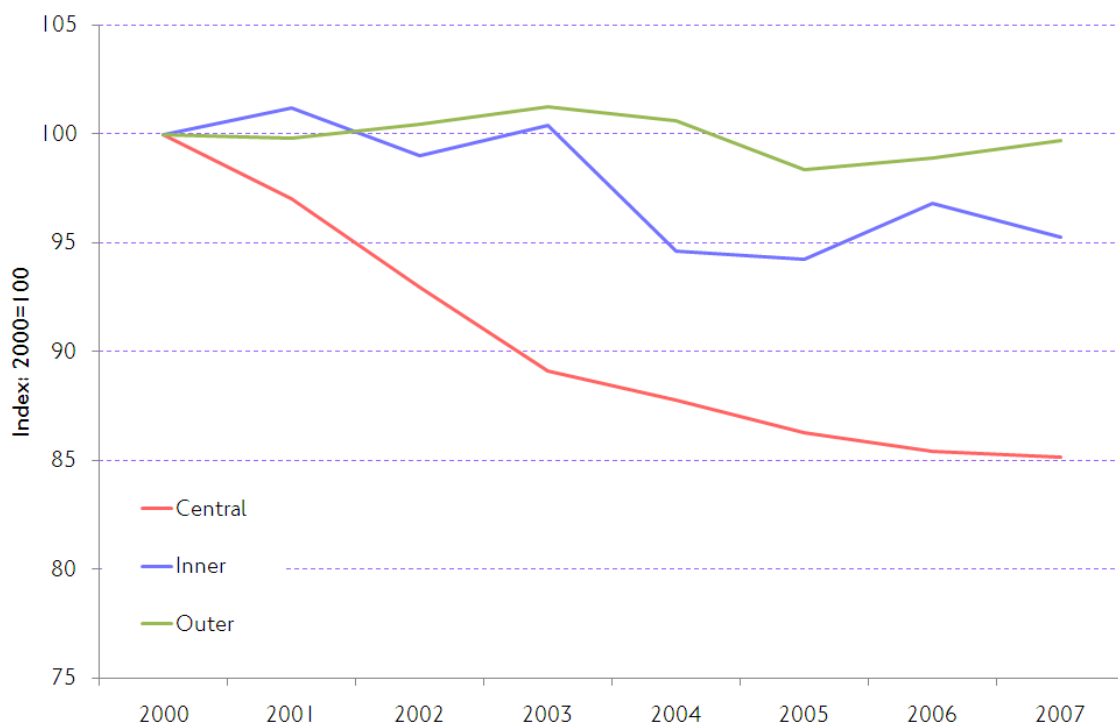
The change in traffic also varies between central, Inner and Outer London. Table 2.11 and Figure 2.7 illustrate these different trends.

Traffic reduction was greatest in central London, in part reflecting the introduction of congestion charging in 2003. Here, between 2002 and 2007, traffic fell by 21 percent during weekday charging hours, which is equivalent to an estimated 15 percent over the whole week since year 2000.

Traffic in Inner London, outside central London, fell by an estimated 5 percent, in part due to congestion charging, but also a now well-established ‘background’ trend towards less traffic – reflecting wider mode share changes and reductions to the effective capacity of the road network.

Traffic levels in Outer London have fluctuated from year to year – but aggregate volumes in 2007 were little different from those of 2000.

Figure 2.7 Traffic volume trends – central, Inner and Outer London.

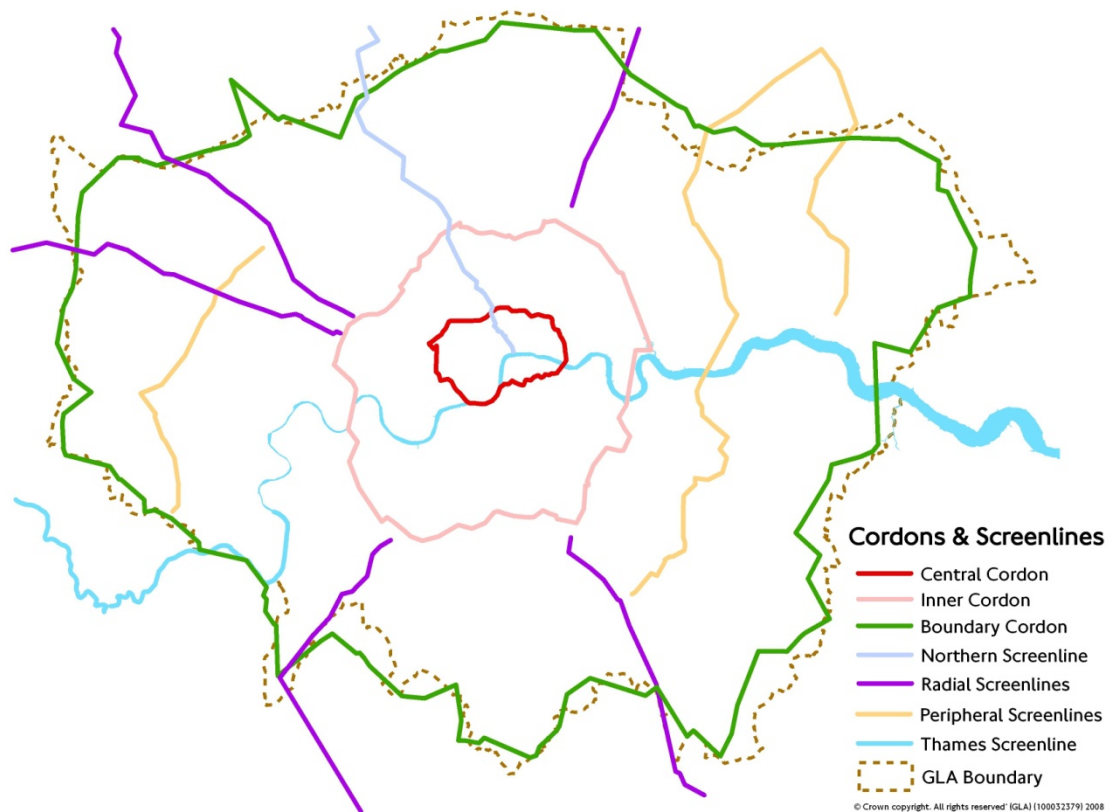


Source: TfL estimates derived from data provided by the Department for Transport

A second indicator of trends in traffic volumes is provided by London’s long-standing strategic traffic counts. These are organised along a system of key traffic counting cordons and screenlines, shown by Figure 2.8.

## 2. Volumes of travel and mode shares

Figure 2.8 Locations of London road traffic cordons and screenlines.



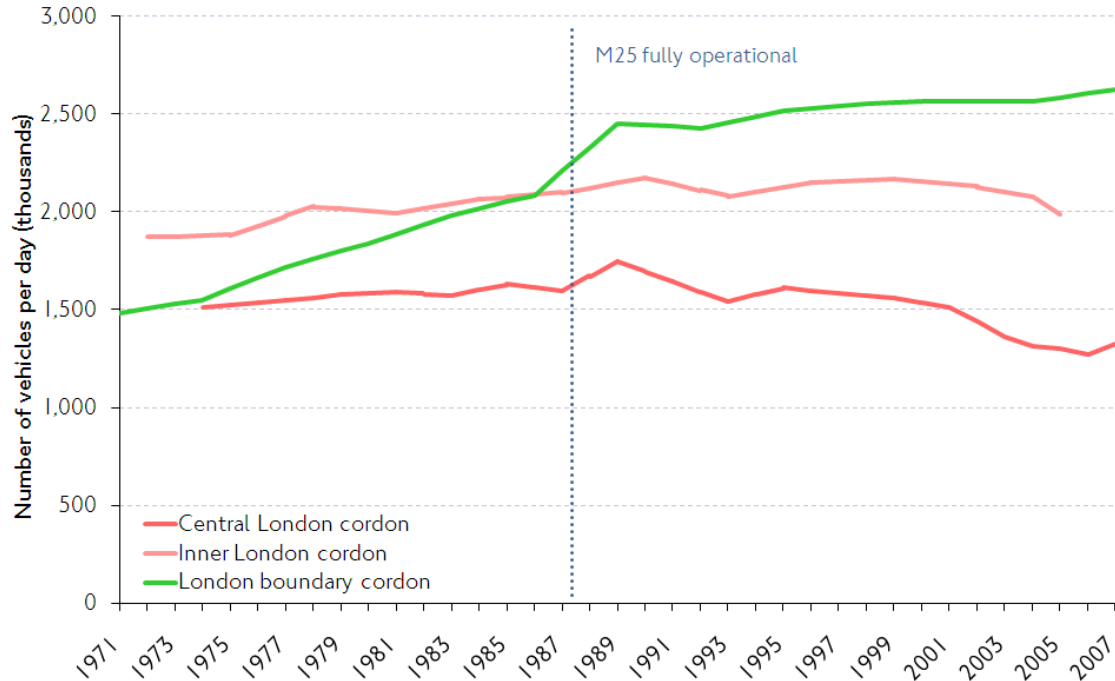
Looking at the long-term traffic volume trends across the three concentric cordons (enclosing, respectively, areas corresponding to central, Inner and Outer London – the ‘London boundary cordon’), there is clear evidence of reductions in traffic volumes entering central and Inner London since 2000 (Figure 2.9).

- Volumes of traffic crossing into and out of central London started to reduce during the 1990s, and this steady and consistent year-on-year decline has continued, except for a slight upturn in 2007. The introduction of congestion charging in central London in 2003 is visible, although clearly other factors have been at work (note that the area enclosed by the central London cordon is larger than the original central London Congestion Charging Zone). Weekday traffic in 2007 here was 88 percent of that in 2001, 81 percent of that in 1991, and 88 percent of that in 1974.
- The picture for traffic crossing the Inner London cordon is not dissimilar, although the tendency towards reduced volumes began later than that for the central London cordon. Traffic increased between 1993 and 1996, then levelled off before beginning to decline in 2000. The aggregate weekday traffic volumes in 2005 were just 6 percent higher than they had been in 1972, and 8 percent down on their 1999 level.
- Traffic crossing the London boundary cordon displays a different although related trend. During the 1980s and 1990s the trend was for relatively strong year-on-year growth. The influence of the M25 motorway, fully-opened in 1986, is clearly visible as a step-change increase in the series. Since 2000, however, the annual rate of increase has slowed so the trend for recent years has been for only very marginal



year-on-year growth. This is not inconsistent with the estimates above of broadly constant traffic in Outer London.

Figure 2.9 Long term traffic trends across three strategic cordons in London, 24-hour weekdays, both directions.



Source: TfL Road Network Performance

## 2.12 Commuting to central London

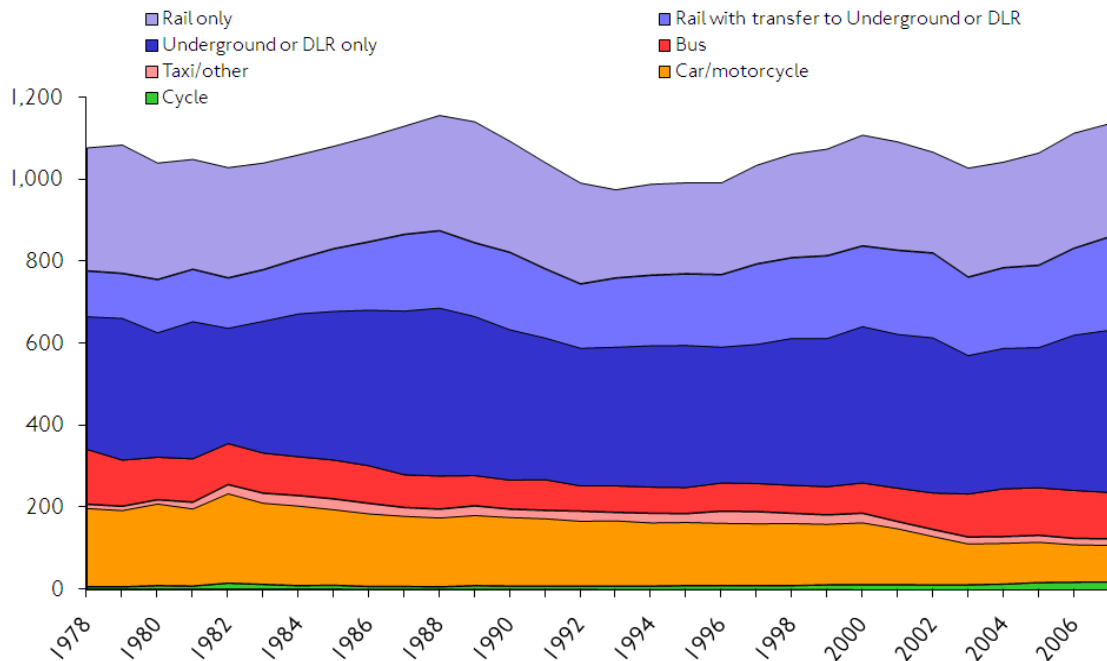
The shift towards increased use of public transport has been most pronounced in relation to commuting to central London. TfL’s Central Area Peak Count (CAPC) survey is an established annual count of the number of people entering central London during the weekday morning peak period (07:00 to 10:00). Estimates are derived from a series of count surveys covering all modes of transport apart from walking. Figure 2.10 shows the long-run time series for aggregate inflows to central London by mode, in this case going back to the late 1970s.

Perhaps the most striking feature over the 30-year period covered by this figure is the general long-run stability in the numbers of people entering central London, generally lying in the range 1.0 to 1.15 million. Nevertheless, over the shorter-term, the daily numbers of people entering Central London during the weekday morning peak have been rising since 2003 and in 2007 reached 1.14 million, more than in any year since 1989. Historically, the series shows a cyclical pattern following the economic cycle of employment in central London, and it may be expected to dip again in 2008 as the UK economy enters a period of recession.

Looking at the mode share for 2007, 90 percent of people entering central London in the morning peak did so by public transport and only 10 percent by private transport. In other words, public transport is overwhelmingly the dominant ‘commuting’ mode to central London. In this respect London differs from most other English cities.

## 2. Volumes of travel and mode shares

Figure 2.10 People entering central London in the weekday morning peak, 1978 to 2007 (thousands).



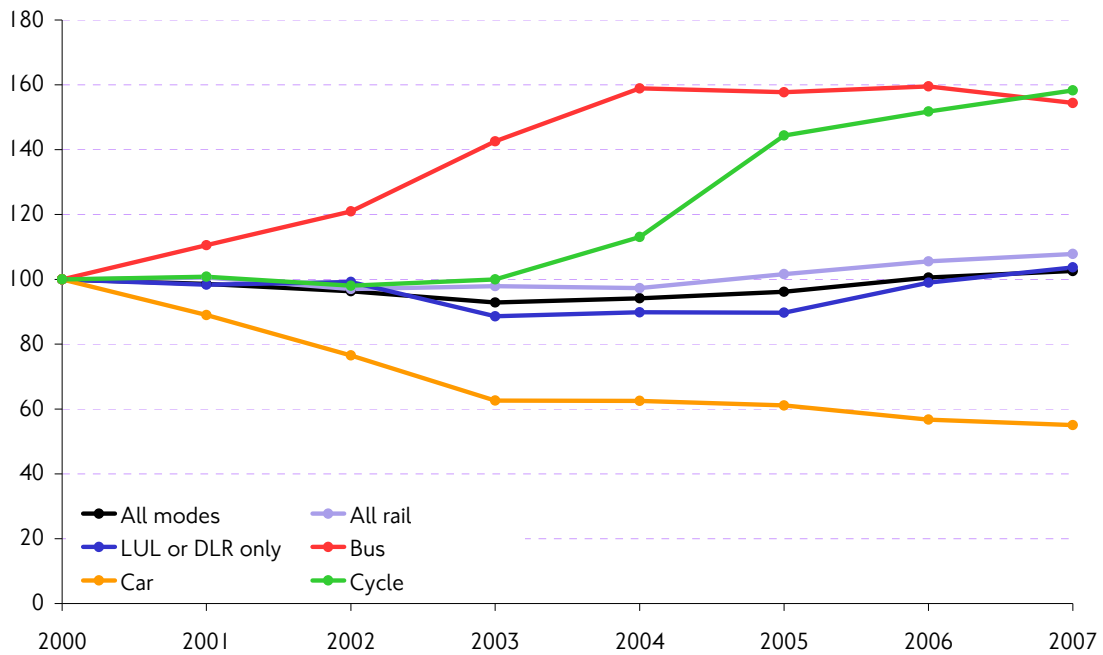
Source: TfL Planning, CAPC survey

Car (including minicab) accounted for 7 percent of travellers in 2007, down from 11 percent in 2001. Although cycling into central London increased by almost 60 percent since 2001, it still accounted for less than 2 percent of all trips in 2007. Of the major modes, bus showed the highest growth, increasing by 40 percent between 2001 and 2007 despite a slight decrease in 2007. Both rail and Underground were about 7 percent higher in 2007 than in 2001, having recovered from a dip between 2003 and 2005. Underground in particular was affected by the London bombings in July 2005, and although services were fully-restored by the time of the autumn CAPC counts, patronage remained depressed until the year end. People travelling to central London by rail who transferred to Underground at the rail terminus are separately identified in the series. They increased slightly between 2006 and 2007, as a share of total rail travel, from 43 to 45 percent.

The key trends since 2000 have been a sharp decline in the number and share of people entering central London by car, while numbers using public transport, particularly buses, have increased by a similar, although not necessarily by a directly-corresponding, amount. The reduction in morning peak car commuting to central London was accentuated by the introduction of congestion charging in 2003, although numbers of car-borne commuters had already begun to fall at least two years earlier. The increase in bus use mirrors substantial enhancements to bus network capacity and reliability over the period since 2001.

Figure 2.11 expands the view given by the previous figure, looking at the period since year 2000 only, and allows individual mode changes to be more clearly discerned. Changes in the number of people using each mode are expressed in terms of an index, where year 2000 equals 100, so that proportionate changes to all modes can be seen on a comparable basis.

Figure 2.11 Relative trends in people entering central London during the weekday morning peak, by mode, 07:00-10:00. Index: 2000=100.



Source: TfL Planning

Table 2.12 is a reference table of the CAPC data series since 1991, giving absolute numbers of people entering central London during the weekday morning peak. Table 2.13 is an equivalent table giving mode shares for these trips. Looking at the trends in mode shares over time, increased shares for both rail and Underground are notable, as is the large reduction in car mode share. Although cycling has seen increased, the absolute mode share for morning peak commuting to central London is still only 1.7 percent.

## 2. Volumes of travel and mode shares

Table 2.12 People entering central London in the weekday morning peak, 1991 to 2007.

Year	Thousands of people										
	All modes	Rail only	Rail with transfer to LUL/DLR	All rail	LUL or DLR only	Bus	Coach/minibus	Car	Taxi	Two-wheeled motor vehicles	Cycle
1991	1,042	258	168	426	347	74	20	155	-	12	9
1992	992	245	156	401	337	61	24	150	-	11	9
1993	977	214	168	382	340	64	20	150	-	11	9
1994	989	221	171	392	346	63	23	145	-	11	9
1995	993	221	174	395	348	63	21	145	-	11	10
1996	992	223	176	399	333	68	20	143	9	11	10
1997	1,035	240	195	435	341	68	20	142	9	11	10
1998	1,063	252	196	448	360	68	17	140	8	13	10
1999	1,074	259	201	460	363	68	15	135	8	15	12
2000	1,108	269	196	465	383	73	15	137	8	17	12
2001	1,093	263	204	468	377	81	10	122	7	16	12
2002	1,068	245	206	451	380	88	10	105	7	15	12
2003	1,029	265	191	455	339	104	10	86	7	16	12
2004	1,043	256	196	452	344	116	9	86	7	16	14
2005	1,065	273	200	473	344	115	9	84	8	16	17
2006	1,113	279	212	491	379	116	8	78	7	15	18
2007	1,137	275	227	502	397	113	9	75	6	15	19

Source: TfL Planning, CAPC survey

Table 2.13 Mode shares of people entering central London in the weekday morning peak, 1991 to 2007.

Year	Percentage										
	All modes	Rail only	Rail with transfer to LUL/DLR	All rail	LUL or DLR only	Bus	Coach/minibus	Car	Taxi	Two-wheeled motor vehicles	Cycle
1991	100	24.8	16.1	40.9	33.3	7.1	1.9	14.9	0.0	1.2	0.9
1992	100	24.7	15.7	40.4	34.0	6.1	2.4	15.1	0.0	1.1	0.9
1993	100	21.9	17.2	39.1	34.8	6.6	2.0	15.4	0.0	1.1	0.9
1994	100	22.3	17.3	39.6	35.0	6.4	2.3	14.7	0.0	1.1	0.9
1995	100	22.3	17.5	39.8	35.0	6.3	2.1	14.6	0.0	1.1	1.0
1996	100	22.5	17.7	40.2	33.6	6.9	2.0	14.4	0.9	1.1	1.0
1997	100	23.2	18.9	42.0	32.9	6.6	1.9	13.7	0.9	1.1	1.0
1998	100	23.7	18.4	42.1	33.9	6.4	1.6	13.2	0.7	1.2	1.0
1999	100	24.1	18.7	42.8	33.8	6.3	1.4	12.6	0.7	1.4	1.1
2000	100	24.3	17.7	42.0	34.6	6.6	1.4	12.4	0.7	1.5	1.1
2001	100	24.1	18.7	42.8	34.5	7.4	0.9	11.2	0.6	1.5	1.1
2002	100	22.9	19.3	42.2	35.6	8.3	0.9	9.8	0.6	1.4	1.1
2003	100	25.7	18.5	44.3	33.0	10.1	1.0	8.3	0.6	1.5	1.2
2004	100	24.6	18.8	43.4	33.0	11.1	0.8	8.2	0.7	1.5	1.3
2005	100	25.6	18.8	44.4	32.3	10.8	0.8	7.9	0.7	1.5	1.6
2006	100	25.0	19.0	44.1	34.0	10.5	0.7	7.0	0.6	1.4	1.6
2007	100	24.2	19.9	44.1	34.9	9.9	0.8	6.6	0.6	1.4	1.7

Source: TfL Planning, CAPC survey

## 2.13 Travel to work: comparisons with other English cities

Table 2.14 and Figure 2.12 show the modes people usually use to travel to work in six English cities, and compares this with Inner London, as reported in the national Census of Population in 1991 and 2001. Outer London data for 2001 are also shown. Mode shares in Inner London are very different to other English cities, with rail (including Underground and DLR) accounting for over half of all travel in 2001. Correspondingly, car use is much higher outside Inner London, with most cities having almost three times the share of Inner London. Given the comprehensive rail and Underground networks, Londoners are also less likely to travel to work by bus, in terms of mode share, however the decline in bus use that has occurred in other English cities has not occurred in Inner London and, on the contrary, bus use in London has grown strongly.

## 2. Volumes of travel and mode shares

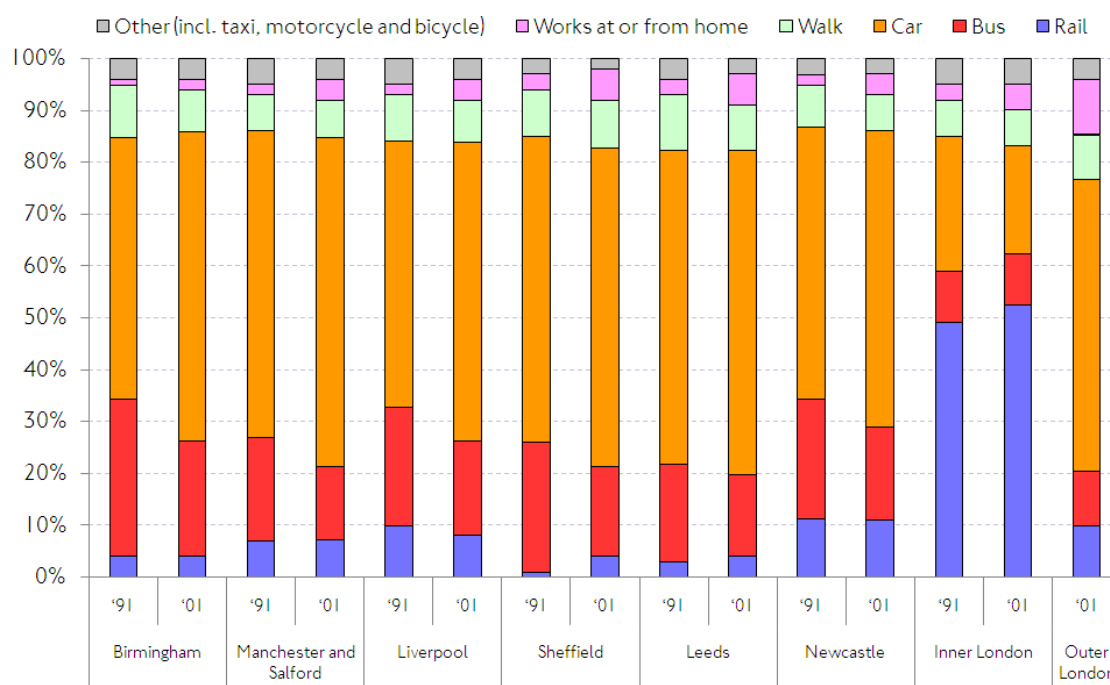
The pattern for Outer London reflects greater car use and, in this respect, travel to work in Outer London is broadly similar to that in other English cities.

Table 2.14 Travel to work mode shares of cities in former English metropolitan areas, 1991 and 2001.

Mode	Birmingham		Manchester and Salford		Liverpool		Sheffield		Leeds		Newcastle		Inner London		Outer London
	'91	'01	'91	'01	'91	'01	'91	'01	'91	'01	'91	'01	'91	'01	'01
Rail	4	4	7	7	10	8	1	4	3	4	11	11	49	53	10
Bus	30	22	20	14	23	18	25	17	19	16	23	18	10	10	10
Car	50	59	59	63	52	57	59	61	61	63	52	57	26	21	56
Walk	10	8	7	7	9	8	9	9	11	9	8	7	7	7	9
Other	4	4	5	4	5	4	3	2	4	3	3	3	5	5	4
Works at or from home	1	2	2	4	2	4	3	6	3	6	2	4	3	5	11
All modes	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: Census of population

Figure 2.12 Travel to work mode shares of cities in former English metropolitan areas, 1991 and 2001.



Source: Census of Population

In terms of mode share for the journey to work, Outer London features higher car use and lower public transport, and is therefore unlike Inner London, sharing many similarities with other English metropolitan regions.

### 2.14 Summary of key travel trends in London since 2000

The material presented in this section allows us to draw some general conclusions about how key features of travel in London have evolved between 2000 and 2007. In summary:

- **Total distance travelled in London has increased.** Taking all of the evidence together, TfL estimates that total distance travelled in London has increased by 6 percent. There are uncertainties in the available data and estimates vary in the range of 4 percent to 8 percent.
- Likewise, **the total number of trips has increased**, by an estimated 5 percent.
- London's population and employment have grown, while commuting into London from outside and visitors travelling daily in London have grown faster.
- **Distance travelled per person has therefore been broadly constant. The number of trips per person has likewise been broadly stable:** people are making a broadly unchanged number of trips - on average 2.8 trips per day.
- There are signs that **trips are becoming more complex, with an increase in journey stages per person per day.** Public transport trips involve more journey stages – changing for instance from bus to Underground during the course of a single trip.

Turning from overall distance travelled to mode share and other issues:

- **There has been a significant change in the shares of the different modes used for travel since 2000.** Between 2000 and 2007, the proportion of journey stages made by public transport has risen from 33 percent to 40 percent, while the proportion made by private motorised transport, principally car, has fallen from 44 percent to 38 percent.
- This is a trend that has continued since the early 1990s, although the shift has been broadly twice as fast in 2000 to 2007 than in the previous seven years.
- The increase in travel by bus and London Underground is about three times the reduction in car travel. In addition, rail travel has increased too.
- **This change in mode share reflects a combination of factors**, including increased and improved public transport, attracting people to these modes, and increased congestion, reduced capacity, and initiatives such as congestion charging on the road network.
- **The purposes for which Londoners travel have remained stable.** While there is some evidence that fewer London workers travel to the same workplace every day, and more to different work-related destinations, the overall trip purpose split for Londoners in 2007/08 was similar to that in 2001.





## 3. How travel varies by place and time

### 3.1 Introduction

This section looks in more detail at how the aggregate volumes of travel and mode share patterns considered in Section 2 vary – in terms of sub-areas within London and by time of day and day of the week. Much of the material in this Section reflects new data arising from TfL's LTDS. This survey is explained further in Section 9 of this report.

### 3.2 Key features and trends

- The typical modes of transport used by London residents vary considerably between the Inner and Outer areas of London, reflecting the provision of transport networks and London's functional geography.
- In 2007/08, over half of trips within Outer London were by car and only 15 percent by public transport, predominantly bus. In contrast, within Inner London (outside the centre), car accounted for a quarter of trips and public transport for a further quarter (bus 18 percent, rail and Underground 7 percent). Most of the remaining trips were walks.
- Travel to and from work accounted for 51 percent of trips between central and Outer London, and 33 percent between central and Inner London. In addition, other work trips made up 11 to 15 percent of trips to or from central London.
- At the London regional level, commuting has a higher share for trips between regions than trips within regions. For trips within regions, shopping (with personal business) was the most common trip purpose, accounting for about a third of trips within each region.
- Trip rates and, especially, travel distance are lower for residents of Inner London than for those of Outer London. There are considerable differences between boroughs. In Inner London, average travel distances per resident per day (between 2005/06 and 2007/08) ranged from about 8 kilometres per person in Tower Hamlets and Southwark to over 18 kilometres per person in Hammersmith and Fulham, Wandsworth, and the City of London. In Outer London, highest daily travel distances are seen for residents of Bromley, Richmond upon Thames and Havering, all over 19 kilometres per person.
- Public transport has a lower mode share the further away from central London people live, with residents in most Outer London boroughs making fewer than 20 percent of trips by public transport. It is also evident that a higher proportion of public transport trips are made by residents in areas north of the Thames – mainly reflecting the better provision of Underground services here compared with boroughs south of the river, where bus is equally well-provided.
- In contrast, the use of the car increases with distance from central London, but there is considerable variation by borough. Even within the less 'car-reliant' boroughs, over 18 percent of residents make a trip as a car driver at least twice weekly. The car therefore remains an important mode for all areas in London.

### 3. How travel varies by place and time

- There are characteristic hourly profiles of travel during the day, with substantial differences between weekdays and weekends. On weekdays, the morning peak period is clearly recognisable, reflecting concentrated peaks in both work commuting and, perhaps more notably, education-related trips. Shopping and personal business trips dominate during the middle part of the day. The peak afternoon hour for trip making by Londoners, however, is that starting at 15:00, with over 2 million trips by Londoners starting in this hour – reflecting a sharp peak in education-related trips.
- At weekends, the emphasis is on shopping (Saturdays) and leisure-related trips (Sundays), with a single peak period of activity during the middle of the day. Although daily totals of trips are lower at weekends, the intensity of trip making during the middle of the day actually exceeds that on weekdays at the same times.

### 3.3 London geographies

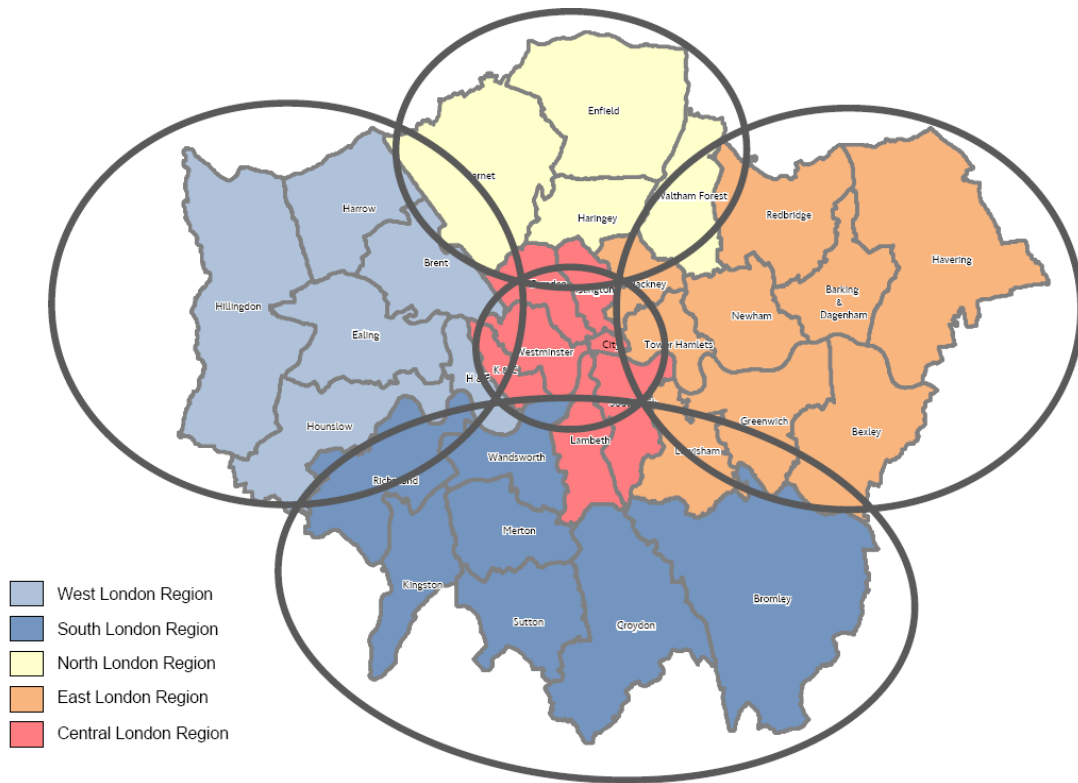
Three ‘standardised’ forms of geographic referencing are conventionally used by TfL. Results are shown for each in this document:

- **Central, Inner and Outer London.** These ‘statistical areas’ or ‘sectors’ have been used in previous London Travel Reports.
- **London regions.** London regions are a new frame of reference, intermediate between boroughs and Greater London, which is being given greater weight in Mayoral and TfL policy priorities. TfL’s approach is that regions have flexible boundaries, and boroughs will be in more than one region where that makes sense to them. For statistical purposes only, in order to ensure that journeys are only captured once, each region is defined in this document as a group of contiguous boroughs, as shown in Figure 3.1.
- **The 33 London boroughs.**

In this report, annual results for key travel trends are shown both for regions and for central, Inner and Outer London.

Note that two different definitions of Outer and Inner London are used in this report. The National Statistics definition of Outer London includes Greenwich but excludes Haringey and Newham. The National Statistics definition is used for the majority of tables in this report and for analyses of the LTDS. The Outer London Commission, tasked by the Mayor with assisting the revision of the London Plan, include Haringey and Newham in Outer London and places Greenwich in Inner London.

Figure 3.1 The London regions (overlapping rings), with illustrative borough groupings for analysis purposes.



### 3.4 Aggregate origin and destination patterns

Table 3.1 shows the spatial distribution and mode share of trips in terms of origins and destinations by functional sector of London in 2007/08.

Trips starting or finishing in central London account for 15 percent of trips by London residents (4 percent both start and finish in central London, and 11 percent are between central and other parts of London).

The largest share of London trips is within Outer London; 48 percent of Londoners' trips both start and finish in Outer London (this figure is an average of 2005 to 2008; 46 percent in 2007/08 alone). Nearly a quarter both start and finish in Inner London and 9 percent were between Inner and Outer London.

### 3. How travel varies by place and time

Table 3.1 Londoners' trips by functional sector (central, Inner, Outer) of trip origin and destination, by main mode, 2007/08. 7-day week.

	Trips per day (000s)	Main mode of trip							All modes
		Rail	Under-ground / DLR	Bus	Taxi / other public	Car / other private	Cycle	Walk	
Within central London	742	0%	9%	7%	3%	5%	2%	74%	100%
Within Inner London	4,481	2%	5%	18%	1%	26%	2%	46%	100%
Between central and Inner London	1,247	9%	33%	27%	2%	13%	4%	11%	100%
Within Outer London	8,449	1%	1%	12%	1%	51%	2%	33%	100%
Between central and Outer London	718	36%	40%	5%	2%	16%	1%	1%	100%
Between Inner and Outer London	1,732	8%	12%	16%	1%	55%	1%	6%	100%
Between Greater London and rest of GB	1,046	8%	1%	5%	2%	81%	0%	2%	100%
<b>All areas</b>	<b>18,414</b>	<b>4%</b>	<b>7%</b>	<b>14%</b>	<b>1%</b>	<b>41%</b>	<b>2%</b>	<b>31%</b>	<b>100%</b>

Source: TfL Planning, LTDS survey

A single trip may use several methods or **modes** of transport, which divide the trip into its separate stages. In this way, trip rates can be analysed by **trip main mode**, based on distance: the main mode of a trip is the mode on which the greatest proportion of the total trip distance is travelled.

The typical modes of transport used vary considerably between the Inner and Outer sectors of London. Within Outer London, half of trips (50 percent for 2005-2008 average, 51 percent in 2007/08) by residents were by car and only 15 percent by public transport, predominantly bus. In contrast, within Inner London (outside the centre), car accounted for a quarter of trips and public transport for a further quarter (bus 18 percent, rail and Underground 7 percent).

Walking (46 percent) accounted for most of the remaining trips within Inner London, and cycling contributed 2 percent. In central London, walking is the dominant means of getting about, making up 74 percent of trips wholly within central London. National Rail and Underground were mainly used for radial trips into the centre: Underground with DLR accounted for 40 percent of trips between central and Outer London, and rail for 36 percent.

In terms of the distribution of trips by residents among the London regions (Table 3.2), trips wholly within regions (ie relatively local trips) accounted for 80 percent of Londoners' trips. Of the remaining 20 percent, largely those between pairs of regions, the majority, 15 percent, were trips to or from the Central region (an area significantly larger than the central London statistical area used in Table 3.1). Trips between other pairs of neighbouring regions varied between 1 and 2 percent as a proportion of total London residents' travel. With the exception of the Central region, therefore, 'orbital'

interaction between regions by residents is not a common feature of Londoner's travel.

**Table 3.2** London residents' trips by London regions of origin and destination, by main mode, 2007/08. 7-day week.

	Trips per day (000s)	Main mode of trip							All modes
		Rail	Under-ground / DLR	Bus	Taxi / other public	Car / other private	Cycle	Walk	
Within Central	3,030	1%	10%	17%	2%	17%	3%	49%	100%
Within North	1,832	1%	1%	14%	1%	46%	1%	37%	100%
Within East	3,414	1%	3%	14%	1%	43%	1%	38%	100%
Within South	2,884	1%	0%	11%	1%	51%	2%	34%	100%
Within West	2,623	0%	2%	14%	1%	45%	2%	36%	100%
Between Central and North	421	7%	38%	19%	2%	29%	1%	3%	100%
Between Central and East	771	17%	29%	18%	3%	21%	5%	7%	100%
Between Central and South	681	34%	11%	14%	1%	34%	2%	5%	100%
Between Central and West	605	6%	38%	14%	3%	28%	3%	8%	100%
Between North and East	274	5%	8%	16%	1%	62%	1%	7%	100%
Between North and South	24	33%	31%	0%	0%	36%	0%	0%	100%
Between North and West	198	2%	9%	18%	2%	59%	2%	7%	100%
Between East and South	255	10%	6%	13%	0%	65%	0%	7%	100%
Between East and West	79	7%	53%	0%	0%	39%	0%	1%	100%
Between South and West	273	12%	7%	16%	2%	54%	4%	5%	100%
<b>All trips within London (only)</b>	<b>17,365</b>	<b>4%</b>	<b>7%</b>	<b>14%</b>	<b>1%</b>	<b>39%</b>	<b>2%</b>	<b>32%</b>	<b>100%</b>

Source: TfL Planning, LTDS survey

In terms of mode share, the highest share of walking was in the Central region where it accounted for almost half of all trips. In other regions, walking was highest in the East and North (38 and 37 percent, respectively, of internal trips). Use of car and other private modes of transport was highest in the South region, with 51 percent, and lowest in the East region, at 43 percent.

### 3. How travel varies by place and time

Table 3.3 Estimated total number of trips by London residents, 2005–2008 average values, millions.

Mode	No. of trips – weekday	No. of trips – Saturday	No. of trips – Sunday	No. of trips – average day
Rail	0.9	0.4	0.2	0.8
Underground or DLR	1.4	1.0	0.6	1.2
Bus	2.8	2.2	1.4	2.5
Taxi and other public	0.2	0.3	0.1	0.2
Car driver	5.6	4.9	4.1	5.2
Car passenger	2.1	3.2	3.2	2.4
Cycle	0.3	0.2	0.3	0.3
Walk	6.0	5.2	4.0	5.6
<b>All modes</b>	<b>19.3</b>	<b>17.4</b>	<b>13.8</b>	<b>18.3</b>

Source: TfL Planning, LTDS survey

### 3.5 Mode shares for Londoners' weekday travel

Tables 3.4 and 3.5 give more details of the proportional modal shares of weekday trips by London residents (as opposed to the seven-day 'weekly averages' considered above). These results, comparing recent LTDS surveys with historic LATS surveys, extend those given for London as a whole in Table 2.5, giving a breakdown by functional area (Inner with central, and Outer, London), based on the areas of residence of the trip makers. Because of the relatively small number of people who live in central London, the samples of central London residents are generally insufficient to support analysis of annual trends for this group. For this reason, central and Inner London are combined in Table 3.4. Note that mode shares here are defined in terms of 'main mode' – defined by the mode used for the longest (distance) stage of the trip.

The results clearly show the higher levels of public transport use by Inner London residents. This is accentuated in recent years as a result of higher growth in public transport use, particularly in the share of bus travel, by residents of Inner London compared with Outer London residents. There have been complementary downward shifts in the share of private transport, especially car driving which has decreased in all areas but most significantly for Inner London residents. Bus and tram use, as a proportion, has also risen in Outer London, although the 'main mode' definition used here means that growth in bus use as a 'feeder' mode, for example to suburban rail stations, is not included in these figures.

The results for walking are affected by the under-recording of short walks in the 1991 LATS survey. Highest shares of walking were recorded in 2001, followed by a dip in 2005/06 in Inner London (which may have been affected by the timing of survey

fieldwork in that year) and some recovery in the following two years. The recorded share for cycling in 2005/06 also appears anomalous; both walking and cycling tend to be seasonal and sensitive to weather conditions. Cycling in Inner London in both 2006/07 and 2007/08 showed substantial increases over the 2001 level.

**Table 3.4** Weekday trips per day by London residents of Inner and central London, by main mode. Mode share percentage.

<b>Main mode</b>	<b>1991</b>	<b>2001</b>	<b>2005/06</b>	<b>2006/07</b>	<b>2007/08</b>
Rail	3.4	3.6	5.5	4.1	4.6
Underground and DLR	10.7	9.4	11.8	10.7	11.2
Bus (including tram)	15.8	13.7	20.3	19.4	18.2
Taxi and other	2.2	2.2	1.4	2.0	2.0
Car driver	24.0	20.6	17.8	16.7	15.7
Car passenger	9.5	8.3	7.2	7.3	7.6
Motorcycle	0.6	0.7	0.7	0.9	0.6
Cycle	2.2	2.2	2.4	2.9	2.9
Walk	31.6	39.4	32.9	35.9	37.2
<b>All modes</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Number of trips (millions)</b>	<b>5.3</b>	<b>6.5</b>	<b>6.6</b>	<b>7.3</b>	<b>7.4</b>

Source: TfL Planning, LATS 1991 and 2001, LTDS 2005-2008

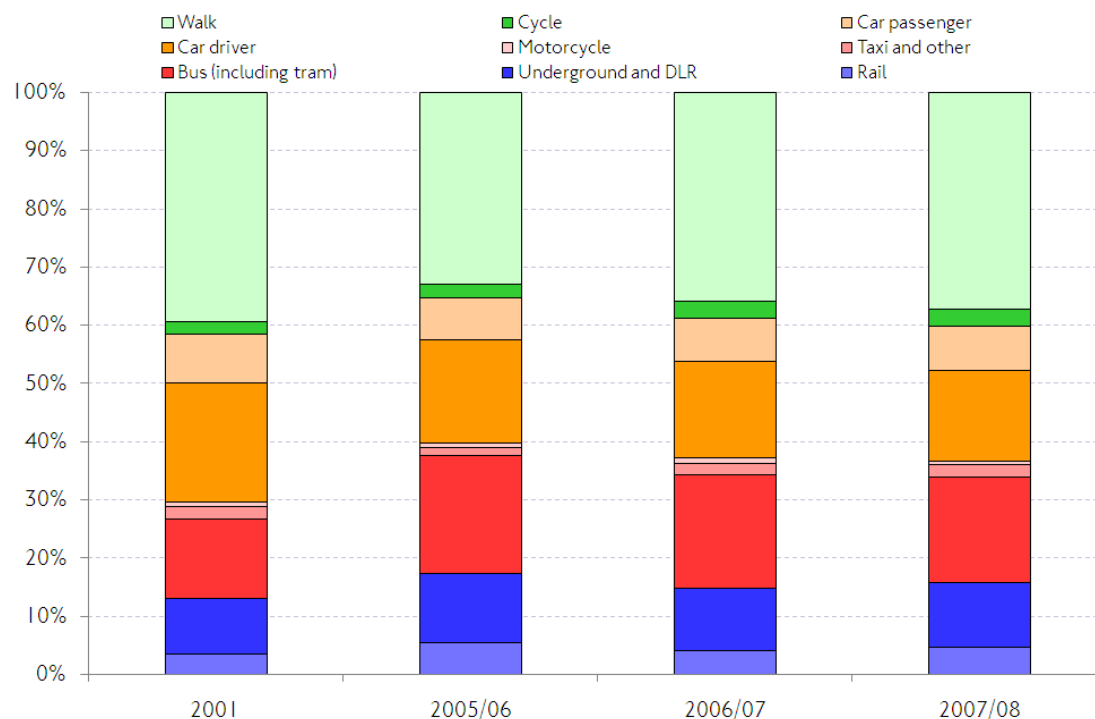
### 3. How travel varies by place and time

**Table 3.5** Weekday trips per day by London residents of Outer London, by main mode. Mode share percentage.

Main mode	1991	2001	2005/06	2006/07	2007/08
Rail	4.0	4.1	4.5	5.0	4.9
Underground and DLR	5.0	4.8	4.7	5.3	5.3
Bus (including tram)	9.5	9.6	11.5	11.8	12.1
Taxi and other	0.9	1.0	0.8	1.1	0.8
Car driver	41.2	36.8	35.5	34.1	34.3
Car passenger	15.5	14.5	12.9	13.2	12.8
Motorcycle	0.6	0.5	0.5	0.7	0.6
Cycle	1.5	1.2	1.0	1.1	1.4
Walk	21.8	27.4	28.7	28.0	27.8
<b>All modes</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Number of trips (millions)</b>	<b>10.6</b>	<b>11.6</b>	<b>12.6</b>	<b>12.3</b>	<b>11.9</b>

Source: TfL Planning, LATS 1991 and 2001, LTDS 2005-2008

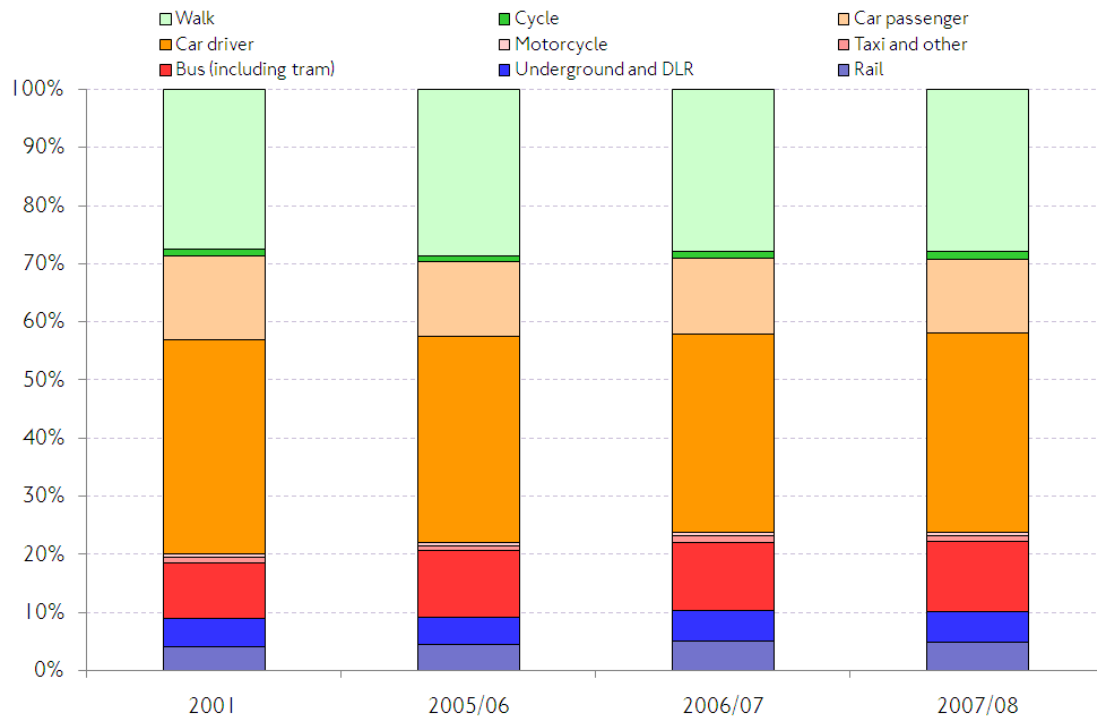
**Figure 3.2** Mode share of weekday trips by London residents of central and Inner London.



Source: TfL Planning, LATS 2001, LTDS 2005-2008



Figure 3.3 Mode share of weekday trips by London residents of Outer London, LATS 2001, LTDS 2005 to 2008.



Source: TfL Planning, LATS 2001, LTDS 2005 to 2008

The same survey data may also be analysed in terms of the areas where the trips originate, rather than the areas of residence of the trip makers. Tables 3.6 to 3.8 show the mode shares for weekday trips by London residents where the trip origins are in central, Inner and Outer London, respectively. In this case it is possible and useful to show central London separately because of its importance as a location of trip origins. Central London accounts for about a quarter of the trip origins in the whole of Inner London despite its covering less than 10 percent of the land area.

Tables 3.6, compared with 3.7 and 3.8, shows the distinctive distribution of mode shares for trips starting in central London. Rail accounts for about 12 percent, over three times the share that it has in the rest of London. Underground, too, has its highest share for trips starting in central London, 23 percent compared with 10 percent for trips starting in the rest of Inner London and under 4 percent in Outer London.

It is again evident that car travel is most significant for trips in Outer London, where it accounts for half the trip origins, 35 percent as drivers and 14 percent passengers in 2007/08.

The time series trends in mode shares of public transport show similar variation by area of trip origins to those already seen by area of residence (Tables 3.4 and 3.5). The share of main mode bus trips increased from 9 percent in 2001 to 15 percent in 2005/06 for trips starting in central London, and from 14 percent to 20 percent for trips starting in the rest of Inner London. There was also an increase in Outer London, from 10 percent to 12 percent.

### 3. How travel varies by place and time

Over the same period, the share of car driver trips declined from 9 percent to 6 percent for central London origins, from 23 percent to 21 percent for origins in the rest of Inner London, and from 38 percent to 36 percent in Outer London. It appears that, in Inner London, car continued to decline in percentage terms at least until 2007/08, whereas the trends in central and Outer London are less clear, with both showing an increase in 2007/08 over 2006/07.

**Table 3.6** Weekday trips per day by London residents, by area of trip origin central London, by main mode. Mode share percentage.

Main mode	1991	2001	2005/06	2006/07	2007/08
Rail	12.8	11.2	13.3	11.2	12.2
Underground and DLR	25.4	22.0	24.7	23.6	23.4
Bus (including tram)	11.4	9.0	15.4	14.4	13.3
Taxi and other	4.3	3.7	3.5	4.1	2.8
Car driver	16.2	9.2	6.4	5.4	7.0
Car passenger	5.5	3.5	2.8	2.3	1.9
Motorcycle	1.0	1.2	0.7	0.5	0.8
Cycle	1.9	1.7	3.2	3.5	2.6
Walk	21.6	38.5	30.1	34.9	36.1
<b>All modes</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Number of trips (millions)</b>	<b>1.5</b>	<b>1.8</b>	<b>1.8</b>	<b>1.9</b>	<b>2.1</b>

Source: TfL Planning, LATS 1991 and 2001, LTDS 2005 to 2008

**Table 3.7** Weekday trips per day by London residents, by area of trip origin Inner London, by main mode. Mode share percentage.

Main mode	1991	2001	2005/06	2006/07	2007/08
Rail	2.9	3.2	5.0	4.1	4.3
Underground and DLR	8.7	8.1	10.1	9.1	9.6
Bus (including tram)	15.2	13.8	19.7	19.1	18.4
Taxi and other	1.5	1.7	1.1	1.6	1.6
Car driver	27.7	23.2	20.5	19.4	18.0
Car passenger	9.8	8.9	7.8	8.3	8.5
Motorcycle	0.6	0.6	0.6	0.9	0.6
Cycle	2.0	2.1	1.9	2.4	2.7
Walk	31.6	38.4	33.4	35.1	36.2
<b>All modes</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Number of trips (millions)</b>	<b>4.6</b>	<b>5.5</b>	<b>5.8</b>	<b>6.1</b>	<b>6.3</b>

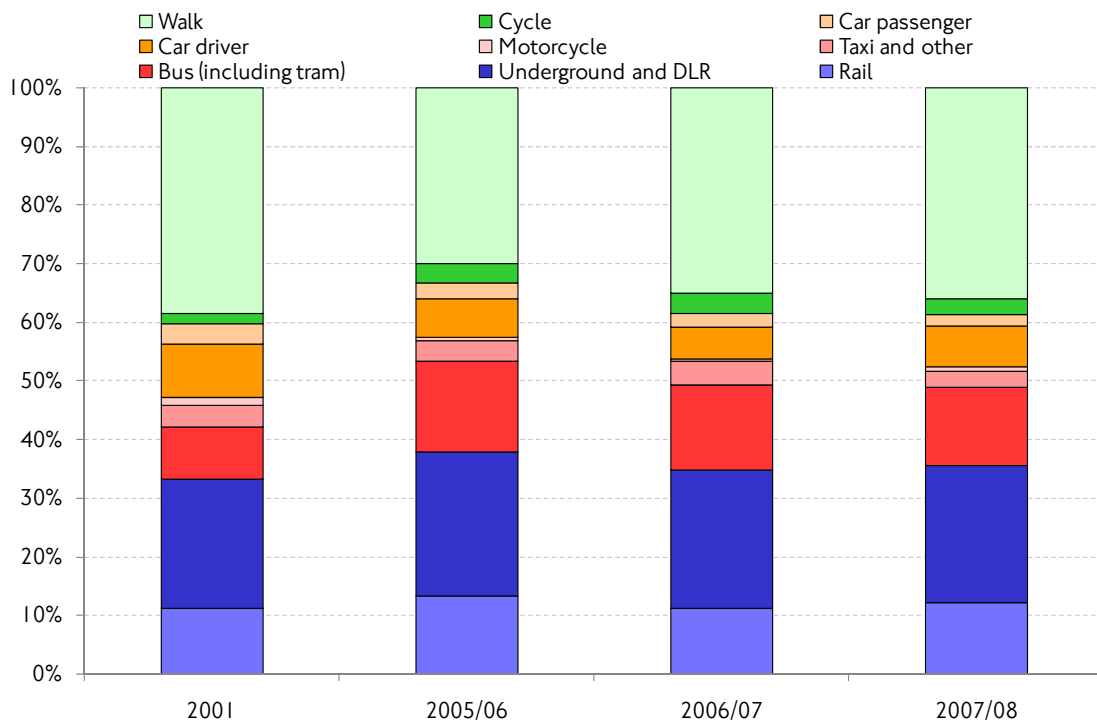
Source: TfL Planning, LATS 1991 and 2001, LTDS 2005 to 2008

Table 3.8 Weekday trips per day by London residents, by area of trip origin Outer London, by main mode. Mode share percentage.

Main mode	1991	2001	2005/06	2006/07	2007/08
Rail	2.7	2.8	3.2	3.4	3.3
Underground and DLR	3.4	3.2	3.2	3.7	3.5
Bus (including tram)	10.3	10.4	12.3	12.8	12.7
Taxi and other	0.8	0.8	0.6	0.9	0.7
Car driver	40.9	37.6	36.1	34.5	35.1
Car passenger	16.1	15.3	13.6	13.5	13.6
Motorcycle	0.5	0.4	0.4	0.4	0.4
Cycle	1.7	1.3	1.1	1.0	1.5
Walk	23.7	28.2	29.5	29.6	29.1
<b>All modes</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>Number of trips (millions)</b>	<b>9.2</b>	<b>10.2</b>	<b>11.1</b>	<b>10.7</b>	<b>10.4</b>

Source: TfL Planning, LATS 1991 and 2001, LTDS 2005 to 2008

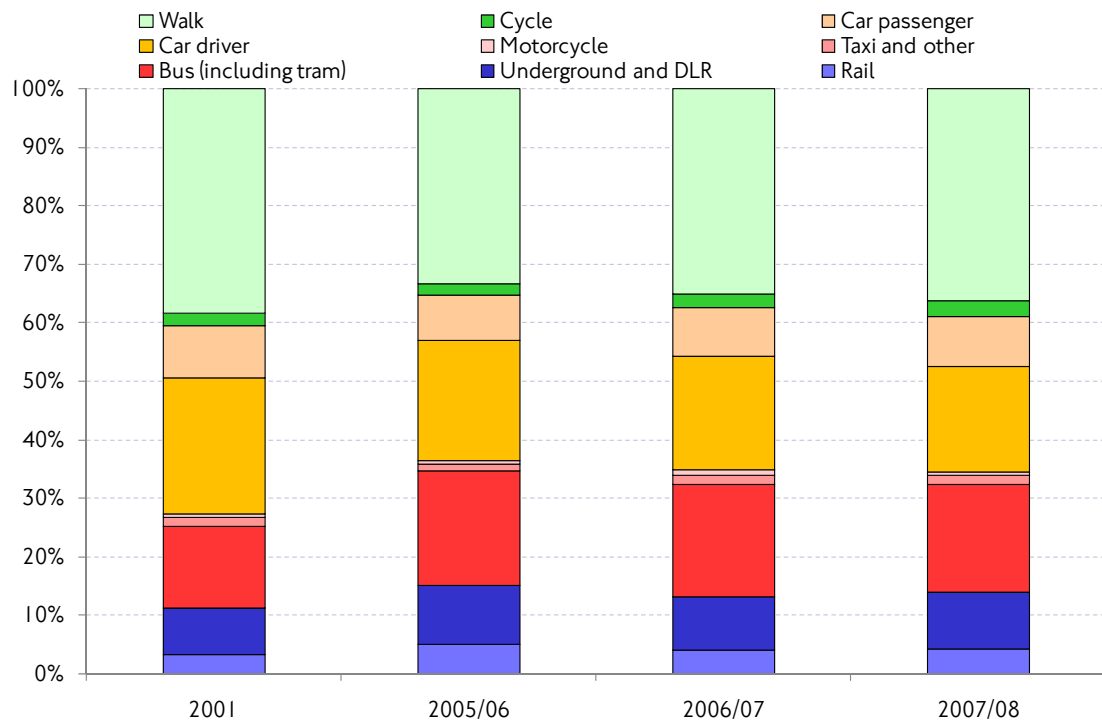
Figure 3.4 Mode share of weekday trips by London residents, by area of trip origin central London, LATS 2001, LTDS 2005 to 2008.



Source: TfL Planning, LATS 2001, LTDS 2005 to 2008

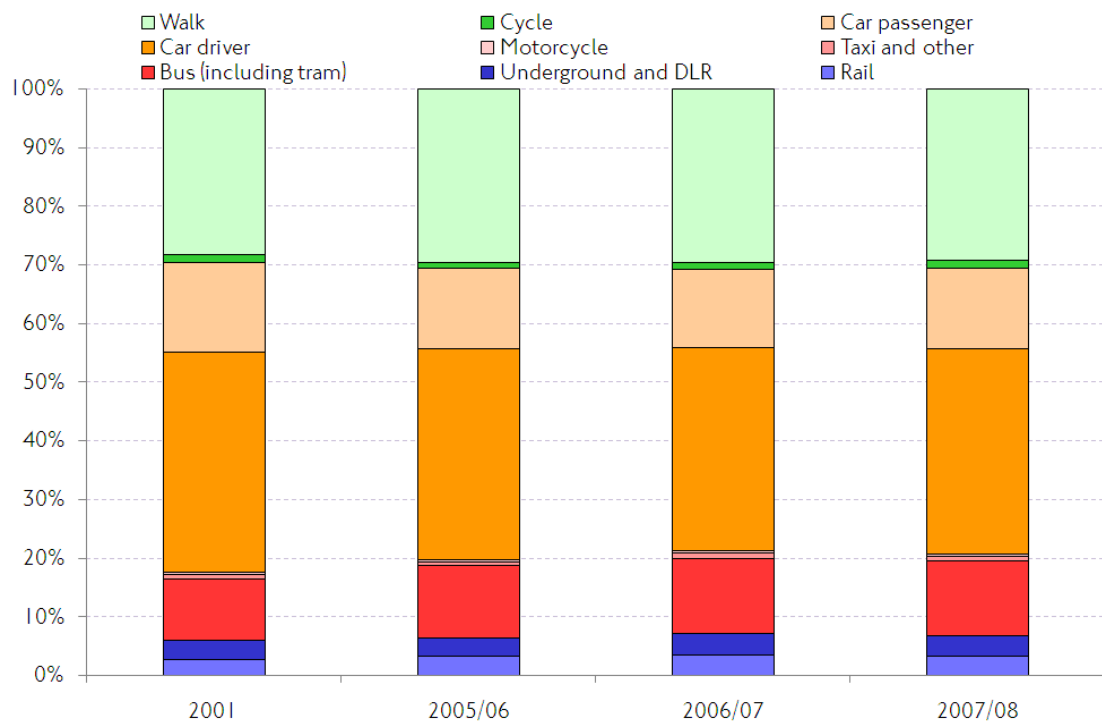
### 3. How travel varies by place and time

Figure 3.5 Mode share of weekday trips by London residents, by area of trip origin Inner London.



Source: TfL Planning, LATS 2001, LTDS 2005 to 2008

Figure 3.6 Mode share of weekday trips by London residents, by area of trip origin Outer London.



Source: TfL Planning, LATS 2001, LTDS 2005 to 2008

### 3.6 Trip purposes

Tables 3.9 and 3.10 show the distributions of trips by purpose broken down by functional sectors and regions, respectively, of origins and destinations. The significance of central London for commuting is evident, with travel to and from work accounting for 51 percent of residents' trips between central and Outer London, and 33 percent between central and Inner London. In addition, other work trips made up 11 to 15 percent of trips to or from central London. About 16 percent of residents' trips between London and the rest of Great Britain were also commuting trips.

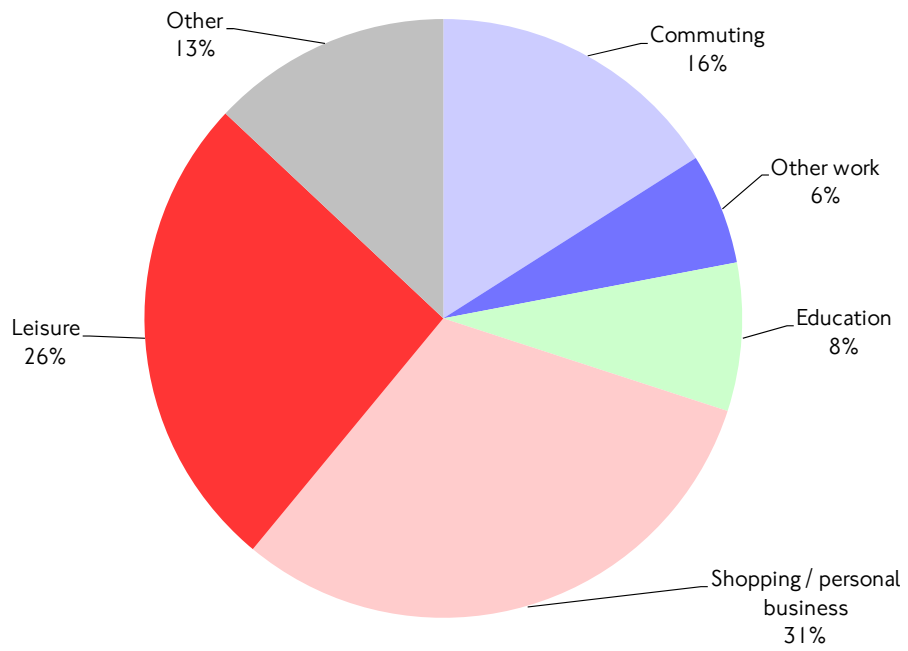
Table 3.9 London residents' trips by functional sector (central, Inner, Outer) of origin and destination, by trip purpose, 2007/08, 7-day week.

	Trips per day (000s)	Trip purpose						All purposes
		Commuting	Other work	Education	Shopping / personal business	Leisure	Other	
Within central London	742	20%	8%	2%	32%	32%	6%	100%
Within Inner London	4,481	11%	5%	9%	35%	26%	14%	100%
Between central and Inner London	1,247	33%	11%	7%	23%	20%	6%	100%
Within Outer London	8,449	11%	4%	9%	35%	25%	17%	100%
Between central and Outer London	718	51%	15%	3%	11%	17%	3%	100%
Between Inner and Outer London	1,732	22%	11%	6%	20%	31%	9%	100%
Between Greater London and rest of GB	1,046	16%	14%	4%	18%	40%	8%	100%
<b>All areas</b>	<b>18,414</b>	<b>16%</b>	<b>6%</b>	<b>8%</b>	<b>31%</b>	<b>26%</b>	<b>13%</b>	<b>100%</b>

Source: TfL Planning, LTDS survey

### 3. How travel varies by place and time

Figure 3.7 London residents' trips by trip purpose, 2007/08, 7-day week.



Source: TfL Planning, LTDS survey

Table 3.10 London residents' trips by London regions of origin and destination, by trip purpose, 2007/08, 7-day week.

	Trips per day (000s)	Trip purpose						All purposes
		Commuting	Other work	Education	Shopping/ personal business	Leisure	Other	
Within Central	3,030	15%	7%	7%	34%	27%	10%	100%
Within North	1,832	9%	3%	9%	35%	27%	17%	100%
Within East	3,414	12%	4%	11%	35%	21%	17%	100%
Within South	2,884	11%	4%	8%	34%	29%	15%	100%
Within West	2,623	12%	3%	8%	35%	25%	16%	100%
Between Central and North	421	35%	11%	5%	19%	23%	7%	100%
Between Central and East	771	40%	13%	5%	19%	19%	4%	100%
Between Central and South	681	32%	13%	5%	15%	26%	10%	100%
Between Central and West	605	30%	11%	7%	21%	24%	7%	100%
Between North and East	274	25%	9%	5%	20%	27%	14%	100%
Between North and South	24	20%	33%	5%	17%	19%	5%	100%
Between North and West	198	19%	9%	5%	36%	18%	14%	100%
Between East and South	255	24%	10%	6%	17%	27%	16%	100%
Between East and West	79	40%	17%	2%	10%	29%	2%	100%
Between South and West	273	21%	13%	5%	23%	32%	6%	100%
<b>All trips within London</b>	<b>17,365</b>	<b>16%</b>	<b>6%</b>	<b>8%</b>	<b>31%</b>	<b>25%</b>	<b>14%</b>	<b>100%</b>

Source: TfL Planning, LTDS survey

At the regional level, commuting has a higher share for trips **between** regions than trips **within** regions. For trips within regions, shopping (with personal business) was the most common trip purpose, uniformly accounting for about a third of trips within each region.

### 3.7 Personal trip characteristics

Table 3.11 shows population totals by borough of residence (excluding children under five, whose trips are not individually recorded in the LTDS survey), their trips on an average day and their total travel distance (based on straight line distance per trip).

These results are derived from combining the three years of the LTDS survey results, 2005/06 to 2007/08, to give a sufficient sample at the borough level. From the totals, it is possible to derive trip rates in terms of trips per person per day and travel distance per person per day, by borough of residence.

### 3. How travel varies by place and time

Table 3.11 London residents' trip characteristics by borough or region of residence, 2005 to 2008 average, 7-day week.

London borough or region	People (aged 5 and over) (000s)	Trips per day (000s)	Travel distance per day (000 km)	Trips per person per day	Straight line travel distance per person per day (km)
Camden	190	546	2,643	2.9	13.9
City of London	9	31	182	3.3	19.8
Hackney	196	404	2,098	2.1	10.7
Hammersmith and Fulham	163	483	2,977	3.0	18.2
Haringey	209	520	3,063	2.5	14.6
Islington	177	373	2,046	2.1	11.6
Kensington and Chelsea	157	449	1,984	2.9	12.6
Lambeth	260	601	2,943	2.3	11.3
Lewisham	241	539	2,612	2.2	10.9
Newham	234	555	2,595	2.4	11.1
Southwark	248	421	2,044	1.7	8.3
Tower Hamlets	206	419	1,633	2.0	7.9
Wandsworth	264	737	4,934	2.8	18.7
Westminster	200	626	2,820	3.1	14.1
<b>Inner London</b>	<b>2,754</b>	<b>6,702</b>	<b>34,576</b>	<b>2.4</b>	<b>12.6</b>
Barking and Dagenham	155	374	2,123	2.4	13.7
Barnet	301	952	5,195	3.2	17.2
Bexley	204	465	3,004	2.3	14.7
Brent	253	665	3,182	2.6	12.6
Bromley	282	882	5,818	3.1	20.6
Croydon	310	779	4,227	2.5	13.6
Ealing	288	784	4,800	2.7	16.7
Enfield	263	704	4,464	2.7	16.9
Greenwich	214	457	3,608	2.1	16.8
Harrow	201	553	3,147	2.8	15.7
Havering	214	547	4,183	2.6	19.5
Hillingdon	228	659	4,125	2.9	18.1
Hounslow	205	549	3,122	2.7	15.2
Kingston upon Thames	143	500	2,777	3.5	19.5
Merton	178	530	2,975	3.0	16.7
Redbridge	230	613	3,944	2.7	17.1
Richmond upon Thames	167	538	3,173	3.2	19.0
Sutton	169	451	2,610	2.7	15.5
Waltham Forest	205	588	3,262	2.9	15.9
<b>Outer London</b>	<b>4,212</b>	<b>11,590</b>	<b>69,739</b>	<b>2.8</b>	<b>16.6</b>
<b>All London boroughs</b>	<b>6,966</b>	<b>18,292</b>	<b>104,315</b>	<b>2.6</b>	<b>15.0</b>
Central London Region	1,241	3,045	14,663	2.5	11.8
North London Region	1,894	4,373	25,800	2.3	13.6
East London Region	979	2,764	15,984	2.8	16.3
South London Region	1,514	4,416	26,515	2.9	17.5
West London Region	1,338	3,693	21,353	2.8	16.0

Source: TfL Planning, LTDS survey



The results show that trip rates and, especially, travel distance are lower for residents of Inner London than for those of Outer London. In Inner London, average travel distances per day range from about 8 kilometres per person in Tower Hamlets and Southwark to over 18 kilometres per person in Hammersmith and Fulham, Wandsworth, and the City of London. In Outer London, highest daily travel distances are seen for residents of Bromley, Richmond upon Thames and Havering, all over 19 kilometres per person.

### **3.8 Mode shares by borough of residence**

Table 3.12 shows mode shares for residents of each borough. Looking across this table the previously identified tendency for mode shares to reflect transport network provision (eg the higher availability of National Rail south of the Thames) is clear.

### 3. How travel varies by place and time

Table 3.12 Mode shares (main mode of trip) by borough of residence, 2005 to 2008 average, 7-day week.

London borough	Percentage of residents' trips by main mode							
	Rail	Under-ground / DLR	Bus / tram	Taxi / other public	Car / motor-cycle	Cycle	Walk	All modes
Camden	4%	13%	17%	3%	19%	3%	41%	100%
City of London	2%	36%	4%	2%	14%	0%	42%	100%
Hackney	3%	5%	28%	1%	19%	8%	35%	100%
Hammersmith and Fulham	1%	15%	16%	3%	24%	3%	37%	100%
Haringey	3%	12%	20%	1%	31%	1%	31%	100%
Islington	3%	11%	30%	1%	15%	3%	37%	100%
Kensington and Chelsea	1%	12%	13%	3%	28%	3%	41%	100%
Lambeth	5%	9%	22%	2%	32%	2%	28%	100%
Lewisham	10%	3%	17%	1%	41%	1%	26%	100%
Newham	3%	12%	16%	2%	33%	1%	34%	100%
Southwark	5%	7%	28%	1%	26%	3%	30%	100%
Tower Hamlets	1%	18%	16%	1%	20%	2%	42%	100%
Wandsworth	11%	8%	13%	2%	31%	3%	33%	100%
Westminster	2%	11%	14%	3%	20%	3%	47%	100%
<b>Inner London</b>	<b>4%</b>	<b>10%</b>	<b>19%</b>	<b>2%</b>	<b>27%</b>	<b>3%</b>	<b>36%</b>	<b>100%</b>
Barking and Dagenham	4%	5%	12%	1%	45%	1%	33%	100%
Barnet	1%	6%	10%	2%	50%	1%	30%	100%
Bexley	6%	0%	9%	1%	60%	1%	24%	100%
Brent	2%	10%	15%	1%	39%	1%	32%	100%
Bromley	8%	0%	8%	0%	58%	0%	25%	100%
Croydon	7%	0%	14%	1%	54%	1%	23%	100%
Ealing	2%	9%	13%	1%	49%	2%	25%	100%
Enfield	3%	5%	14%	1%	50%	1%	27%	100%
Greenwich	9%	3%	19%	1%	43%	1%	24%	100%
Harrow	1%	7%	8%	0%	50%	1%	32%	100%
Havering	5%	2%	9%	2%	62%	1%	20%	100%
Hillingdon	1%	3%	10%	1%	60%	1%	24%	100%
Hounslow	3%	5%	12%	1%	49%	2%	27%	100%
Kingston upon Thames	6%	1%	8%	1%	49%	2%	33%	100%
Merton	7%	5%	12%	1%	40%	1%	34%	100%
Redbridge	2%	8%	9%	1%	54%	1%	25%	100%
Richmond upon Thames	7%	4%	9%	2%	41%	4%	34%	100%
Sutton	5%	2%	8%	1%	60%	1%	24%	100%
Waltham Forest	3%	9%	11%	2%	45%	1%	30%	100%
<b>Outer London</b>	<b>4%</b>	<b>5%</b>	<b>11%</b>	<b>1%</b>	<b>51%</b>	<b>1%</b>	<b>28%</b>	<b>100%</b>
<b>All London boroughs</b>	<b>4%</b>	<b>7%</b>	<b>14%</b>	<b>1%</b>	<b>42%</b>	<b>2%</b>	<b>30%</b>	<b>100%</b>

Source: TfL Planning, LTDS survey

Table 3.13 shows the equivalent mode share information at the London regional level. Again, with the exception of the Central region and bearing transport provision in mind, the most notable feature is the similarity of mode shares across the London regions.

Table 3.13 Mode shares (main mode of trip) by London region of residence, 2005 to 2008 average, 7-day week.

London region	Percentage of trips by main mode							
	Rail	Under-ground / DLR	Bus / tram	Taxi / other	Car / motor-cycle	Cycle	Walk	All modes
Central London	3%	11%	20%	2%	24%	3%	38%	100%
North London	2%	8%	13%	1%	45%	1%	30%	100%
East London	5%	6%	15%	1%	43%	2%	29%	100%
South London	7%	3%	11%	1%	48%	2%	29%	100%
West London	2%	8%	12%	1%	46%	2%	29%	100%
Greater London	4%	7%	14%	1%	42%	2%	30%	100%

Source: TfL Planning, LTDS survey

### 3.9 Mode shares by borough of trip origin

As an alternative to comparing boroughs in terms of the trips made by residents of each borough, Tables 3.14 and 3.15 show the distribution between boroughs and regions of trip origins and the breakdown of these trips by main mode of transport. The total population of trips is the same as in Table 3.7, namely London residents' trips with either origin or destination (or both) within Greater London, taking daily averages for the combined three years, 2005/06 to 2007/08. However, the trip origins and mode shares reflect the locations where these trips are made rather than the home addresses of the trip makers.

Here, 'functional' differences between the different London boroughs are much more visible, aggregating to clear differences between central, Inner and Outer London. At the regional level, however, these distinctions are again much less apparent, reflecting an artificial degree of homogeneity introduced by geographical groupings that cut across, and subsume, the diverse 'functional' parts of London.

### 3. How travel varies by place and time

Table 3.14 Londoners' trips by borough of origin: trips per day and shares by main mode, 2005 to 2008 average, 7-day week.

London borough	Trips per day (000s)	Percentage of trips by main mode							All modes
		Rail	Under-ground / DLR	Bus / tram	Taxi / Other	Car / motor-cycle	Cycle	Walk	
Camden	678	6%	17%	16%	3%	19%	3%	37%	100%
City of London	240	18%	28%	8%	4%	6%	2%	35%	100%
Hackney	360	3%	5%	27%	1%	22%	6%	37%	100%
Hammersmith and Fulham	449	2%	16%	16%	2%	24%	3%	38%	100%
Haringey	454	2%	8%	22%	1%	33%	1%	33%	100%
Islington	417	5%	12%	25%	1%	16%	3%	36%	100%
Kensington and Chelsea	527	1%	13%	13%	3%	28%	3%	39%	100%
Lambeth	545	6%	9%	21%	1%	33%	2%	29%	100%
Lewisham	447	7%	3%	19%	1%	42%	1%	27%	100%
Newham	532	3%	8%	16%	1%	36%	1%	35%	100%
Southwark	510	7%	8%	22%	1%	30%	3%	30%	100%
Tower Hamlets	483	4%	18%	14%	1%	21%	1%	40%	100%
Wandsworth	619	8%	5%	14%	2%	37%	2%	32%	100%
Westminster	1,139	7%	19%	15%	3%	14%	3%	38%	100%
<b>Inner London</b>	<b>7,398</b>	<b>5%</b>	<b>12%</b>	<b>18%</b>	<b>2%</b>	<b>26%</b>	<b>2%</b>	<b>35%</b>	<b>100%</b>
Barking and Dagenham	317	2%	4%	12%	1%	43%	1%	37%	100%
Barnet	825	1%	4%	11%	1%	53%	1%	30%	100%
Bexley	405	4%	0%	11%	0%	59%	1%	25%	100%
Brent	576	2%	8%	16%	1%	41%	1%	32%	100%
Bromley	779	5%	0%	10%	0%	59%	0%	26%	100%
Croydon	696	5%	0%	15%	1%	54%	1%	24%	100%
Ealing	674	1%	6%	13%	1%	51%	1%	27%	100%
Enfield	610	2%	3%	14%	1%	51%	1%	29%	100%
Greenwich	414	5%	3%	18%	1%	45%	1%	26%	100%
Harrow	458	1%	5%	9%	0%	50%	1%	33%	100%
Havering	474	4%	1%	10%	1%	60%	1%	23%	100%
Hillingdon	663	1%	4%	11%	1%	58%	1%	24%	100%
Hounslow	539	3%	4%	12%	1%	50%	2%	28%	100%
Kingston upon Thames	444	5%	1%	10%	1%	48%	2%	34%	100%
Merton	452	5%	4%	12%	1%	43%	1%	34%	100%
Redbridge	545	2%	5%	10%	1%	54%	1%	28%	100%
Richmond upon Thames	463	6%	2%	10%	1%	41%	5%	35%	100%
Sutton	384	3%	1%	10%	1%	58%	1%	26%	100%
Waltham Forest	502	2%	6%	11%	2%	47%	1%	31%	100%
<b>Outer London</b>	<b>10,221</b>	<b>3%</b>	<b>3%</b>	<b>12%</b>	<b>1%</b>	<b>51%</b>	<b>1%</b>	<b>29%</b>	<b>100%</b>
<b>All London boroughs</b>	<b>17,619</b>	<b>4%</b>	<b>7%</b>	<b>14%</b>	<b>1%</b>	<b>41%</b>	<b>2%</b>	<b>31%</b>	<b>100%</b>

Source: TfL Planning, LTDS survey

Table 3.15 Londoners' trips by London region of origin: trips per day and shares by main mode, 2005/06 to 2007/08 average, 7-day week.

London region	Trips per day (000s)	Percentage of trips by main mode							
		Rail	Under-ground / DLR	Bus / tram	Taxi / Other	Car / motor-cycle	Cycle	Walk	All modes
Central London	4,055	6%	15%	17%	2%	21%	3%	35%	100%
North London	3,976	4%	5%	15%	1%	43%	1%	31%	100%
East London	2,390	2%	5%	14%	1%	47%	1%	31%	100%
South London	3,838	5%	2%	12%	1%	49%	2%	30%	100%
West London	3,359	2%	7%	13%	1%	47%	2%	30%	100%
Greater London	17,619	4%	7%	14%	1%	41%	2%	31%	100%

Source: TfL Planning, LTDS survey

### 3.10 Regional variations in frequency of modal use

This type of analysis can usefully be extended to look at geographical variations in people's use of the different transport modes. The following figures map selected mode use patterns by individual London boroughs in terms of frequency of use of the different modes.

They show that there are some clear variations in relation to the use of different modes of transport depending on the borough of residence of travellers. Some of these variations can be related to the levels of transport infrastructure and service provision, although in other cases the factors at work are more complex.

Figure 3.8 shows the mode share for public transport modes in aggregate for London residents by borough of residence. The figure shows how public transport has a lower mode share the further away from central London people live, with residents in the majority of the Outer London boroughs making fewer than 20 percent of their trips by public transport. It is also evident that a higher proportion of public transport trips are made by residents in areas north of the Thames – reflecting the better provision of Underground services here compared with boroughs south of the river – where bus public transport is equally well-provided.

### 3. How travel varies by place and time

Figure 3.8 Aggregated public transport mode share by borough of residence, LTDS 2007/08.

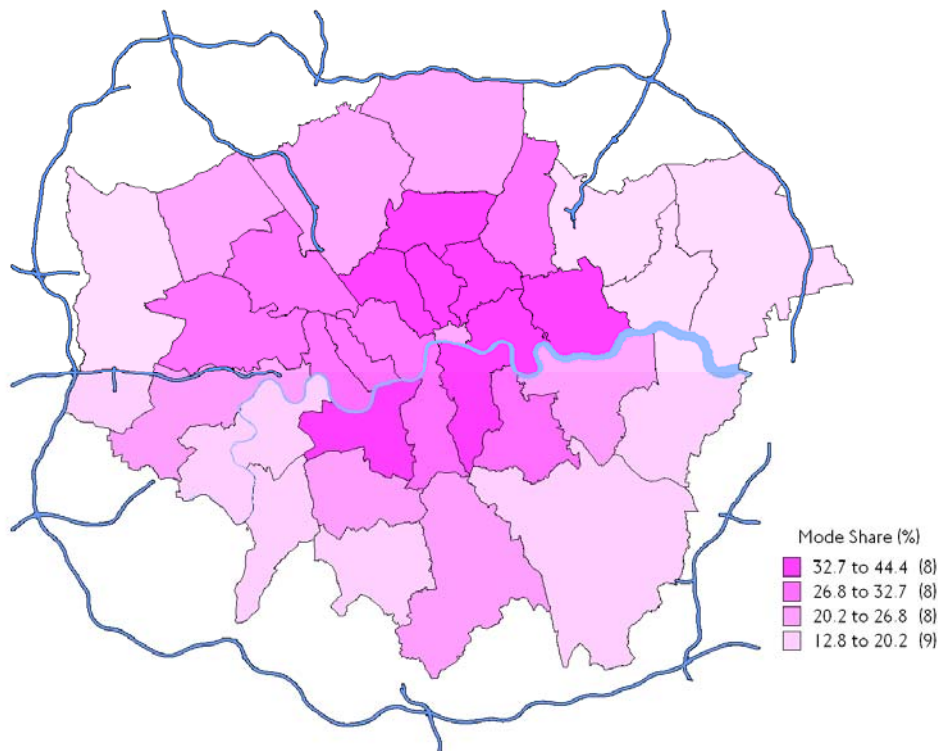


Figure 3.9 Frequent bus users, by borough of residence: percentage of residents who use bus on at least two days a week, LTDS 2007/08.

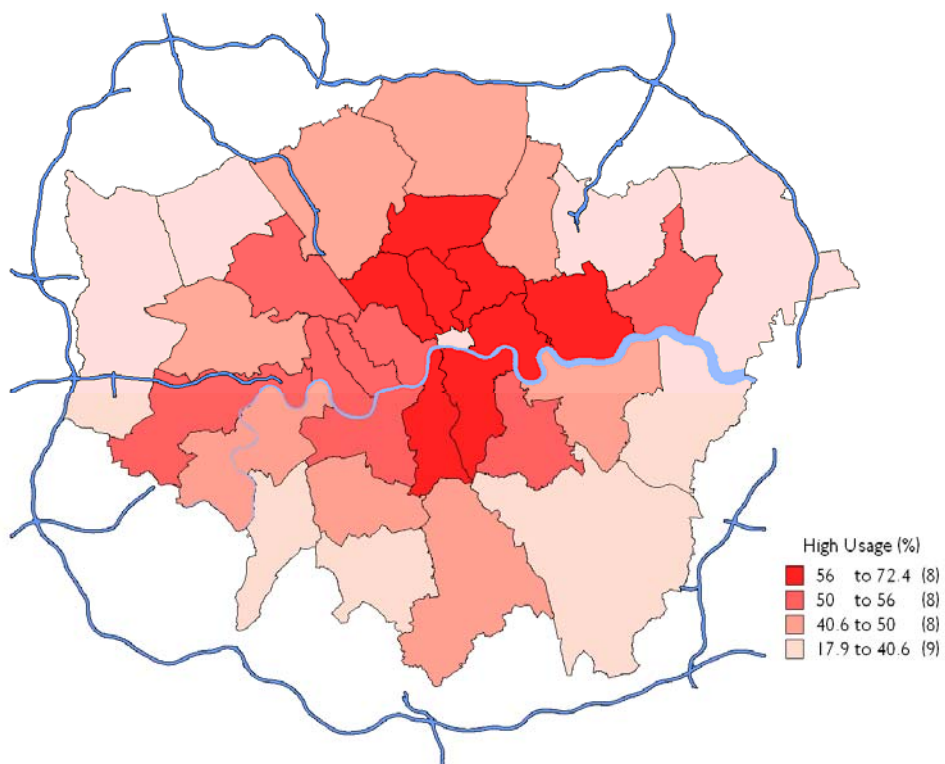
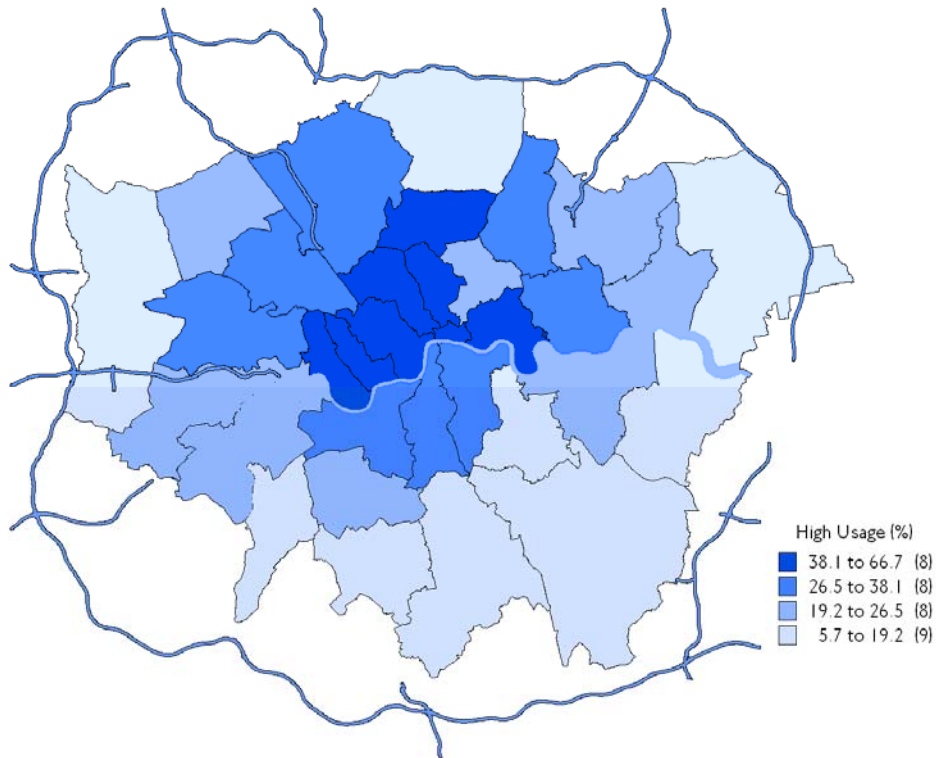


Figure 3.9 shows the percentage of residents who travel by bus on at least two days per week. A similar pattern to that shown by Figure 3.8 emerges – with more residents in the central and Inner London boroughs making trips by bus on a frequent basis. In the outer ring of boroughs, Hillingdon and Harrow in the west, Kingston and Sutton in the south and Redbridge, Havering, Bexley and Bromley in the east, fewer than two out of five people used the bus at least twice a week.

Figure 3.10 Frequent Underground users, by borough of residence: percentage of residents who use Underground on at least two days a week, LTDS 2007/08.



Figures 3.10 and 3.11 show similar analyses for Underground and National Rail, respectively. It is notable that the boroughs with the highest use of the Underground are in central and Inner London and north of the Thames, reflecting the areas where the Underground network is most dense. In the Outer London boroughs, fewer than one in five residents travel on the Underground at least twice a week.

The pattern for National Rail is quite different, with residents of most of the south London boroughs showing a higher use of rail travel. In the north and west, residents of Barnet, Harrow and Hillingdon, do not make National Rail trips on a frequent basis – reflecting the comparatively lower National Rail service provision in that part of London.

### 3. How travel varies by place and time

Figure 3.11 Frequent rail users, by borough of residence: percentage of residents who use rail on at least two days a week, LTDS 2007/08.

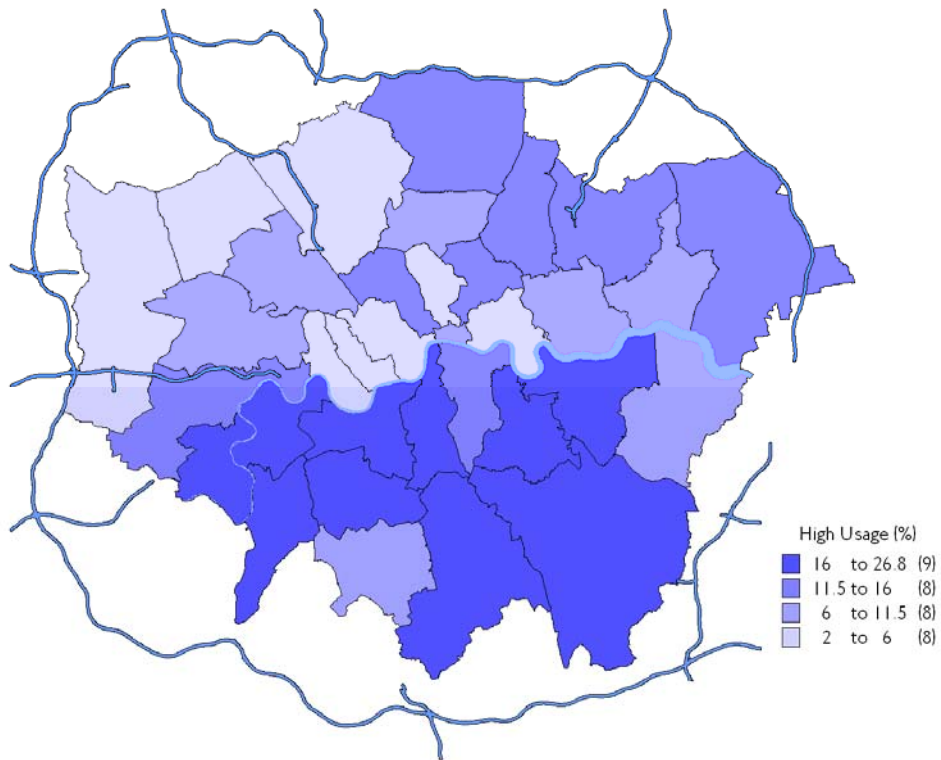


Figure 3.12 Frequent car drivers, by borough of residence: percentage of residents who drive on at least two days a week, LTDS 2007/08.

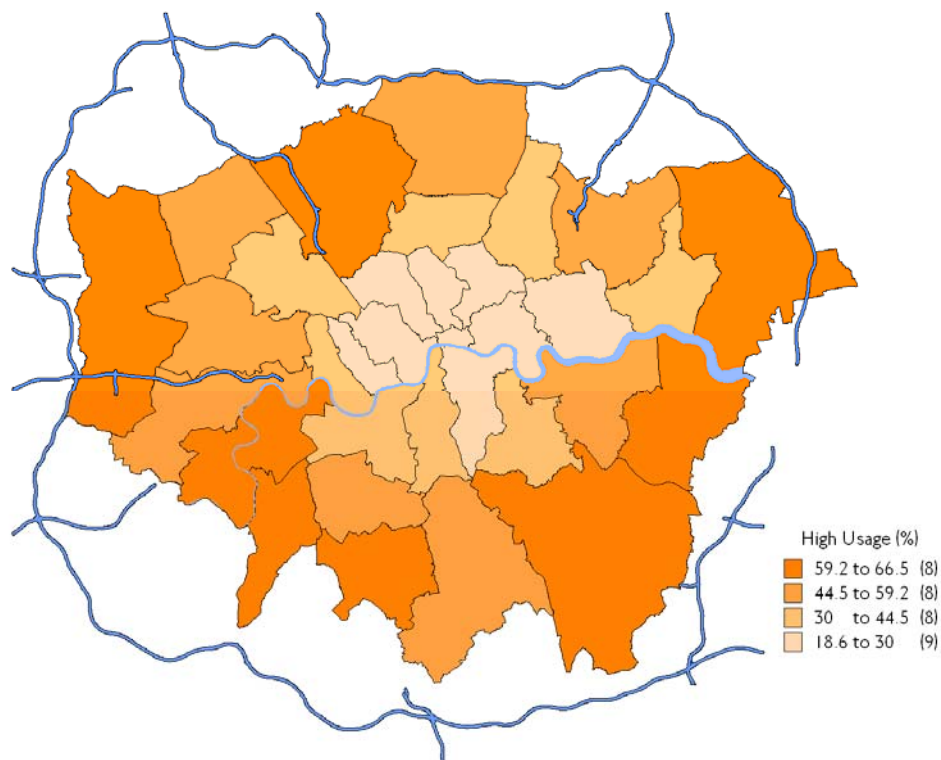




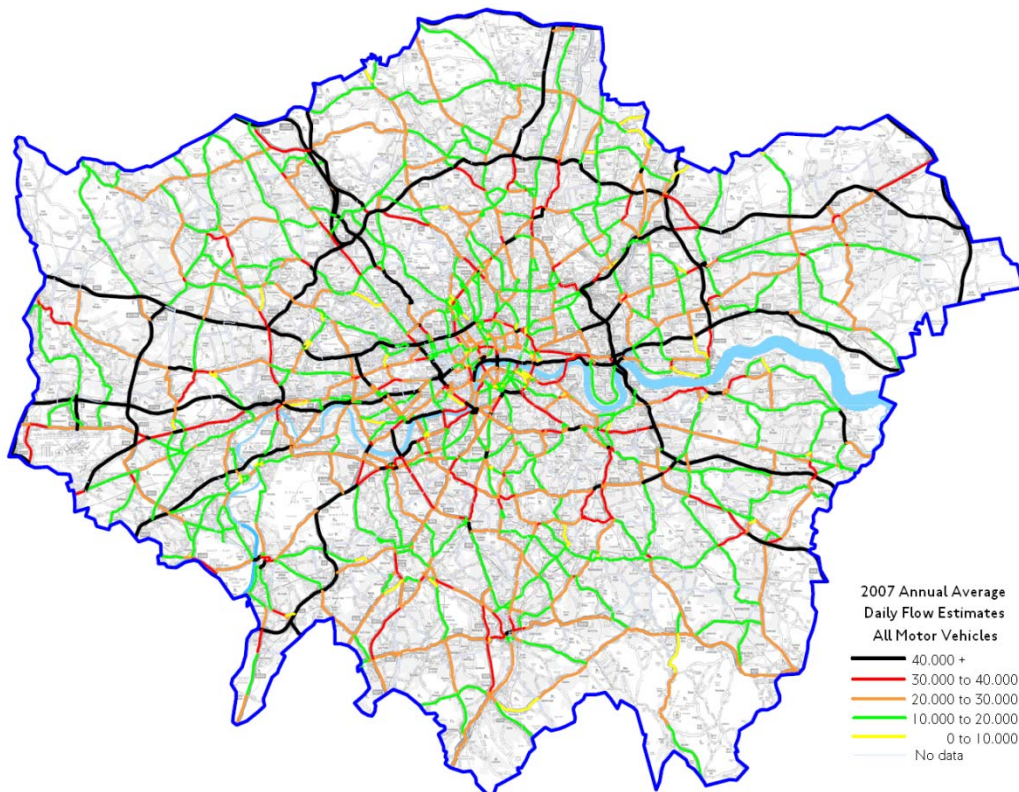
Figure 3.12 shows how frequency of car-driving varies by borough of residence. A characteristic pattern emerges with the use of the car increasing as distance from central London increases. Note that, even within the less 'car-reliant' boroughs, over 18 percent of residents make a trip as a car driver at least twice weekly. The car therefore remains an important mode of travel for all areas in London.

### 3.1.1 Road traffic – spatial variation in traffic density

London's 15,000 kilometres of road carried an estimated 32 billion vehicle kilometres of traffic during 2007, giving a mean flow at an average point on the network of 2.2 million vehicles in the year. At the national (Great Britain) scale the equivalent figure is 1.3 million. In London, 88 percent of the road network consists of minor roads (classified B and C or unclassified), comparable to the national figure of 87 percent.

Figure 3.13 is a visual representation of traffic densities on the main London road network. The highest traffic flows, ie annual average daily flows in excess of 40,000 vehicles per day, are associated with major radial routes. These include the M1, A1 and A10 from the north, A12 and A13 from the east, the A2 and A102 (Blackwall Tunnel) from the south east, A3 and A316 from the south west, and M4 and M40 from the west, as well as the A406 North Circular Road, the major orbital route in Inner London.

Figure 3.13 Annual average daily vehicle flows on major road links in London, 2007.

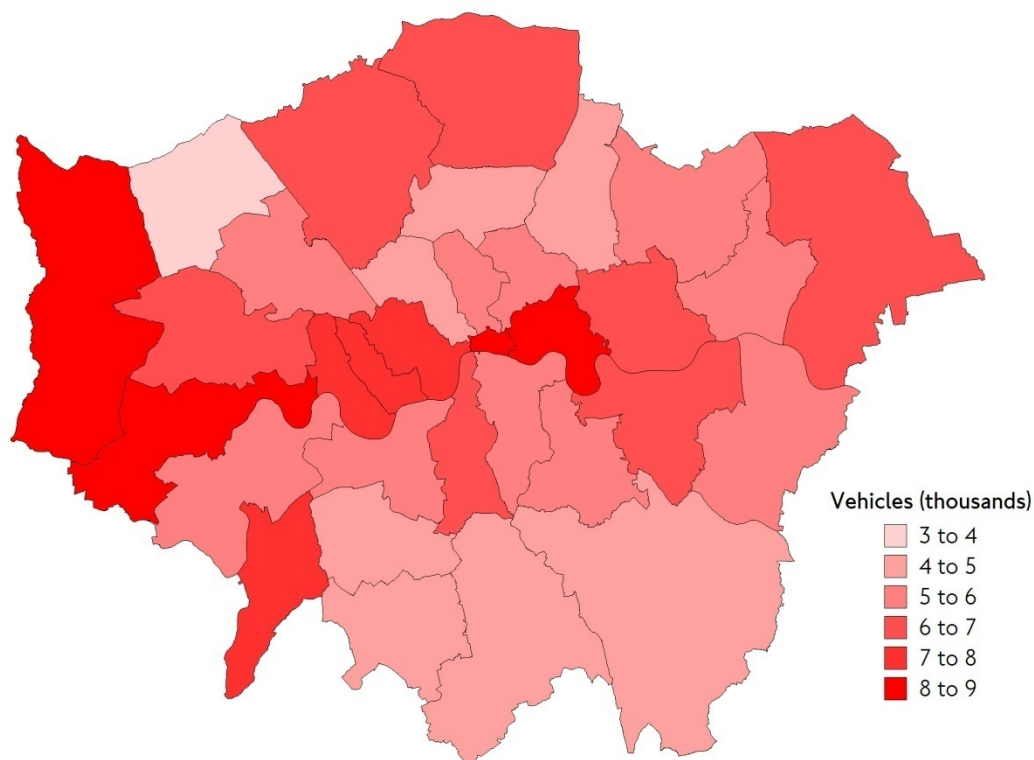


Source: TfL Road Network Performance, based on DfT National Road Traffic Counts

### 3. How travel varies by place and time

Figure 3.14 extends this representation to show average traffic flows at the borough level, in terms of mean annual average daily vehicle flows across the road network in each borough. Although the picture shown is somewhat mixed, with some Outer London boroughs, particularly in the west, showing the highest average traffic flows, the overall pattern is nevertheless traceable to the highest flow links in Figure 3.13, some of which are the ends of motorways or similar high-volume trunk roads.

Figure 3.14 Mean annual average daily traffic flows: borough-level analysis for 2007.



Source: TfL traffic estimates, based on Table 2.10

### 3.12 Trip making by time of day and day of week

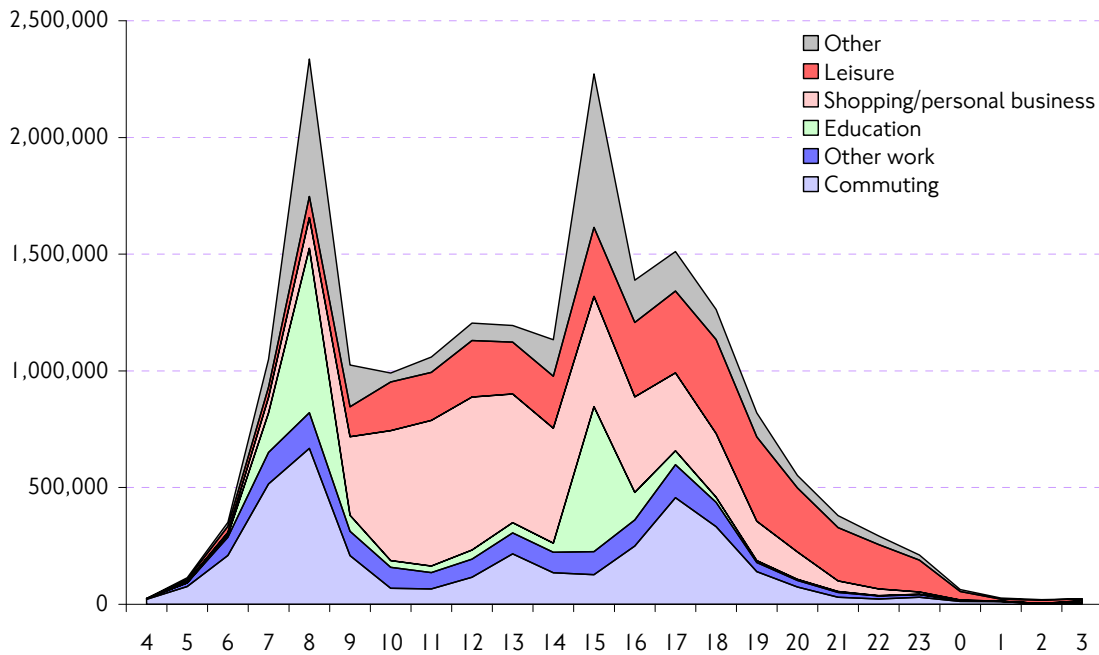
Figures 3.15 to 3.17 show the intensity of trip making (in terms of trip starts by all residents of Greater London) by the different trip purposes at different hours of the day (for weekdays, Saturdays and Sundays respectively). The tendency towards fewer trips being made at the weekends is evident comparing the three graphics, but there is much of additional interest here.

On weekdays, the morning peak period is clearly recognisable, reflecting concentrated peaks in both work commuting and, notably, education-related trips. Shopping and personal business trips dominate during the middle part of the day. The peak afternoon hour for trip making by Londoners starts at 15:00, with over 2 million trips starting at this time. The graphic shows clearly that this reflects a sharp peak in education-related trips, as well as a similar peak in trips for 'other' purposes.

Total trip making by Londoners in the more conventionally-recognised evening peak period is at a significantly lower intensity than during the earlier part of the afternoon. Trip making during the weekday 16:00 to 19:00 period is characterised by a peak in work to home commuting trips, a virtual absence of education-related trips, and an

increase in trips for leisure purposes (for example, social activities after working hours). Although this analysis is limited to travel by London residents, and consequently does not accurately reflect aggregate travel demand on the networks (which will include, in the afternoon peak period, a significant number of longer-distance rail commuters, for example), it does highlight the relatively greater importance of trips unrelated to work by Londoners across a typical weekday.

Figure 3.15 Trips by journey purpose by hour of departure, Greater London residents, weekdays, LTDS 2007/08.

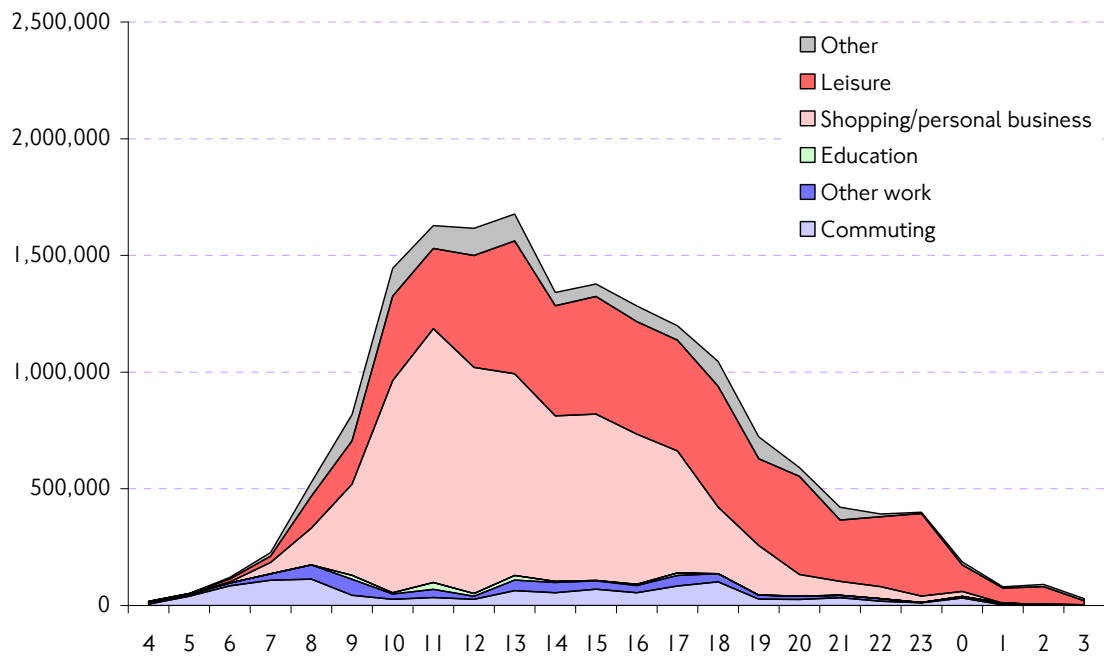


Source: TfL Planning, based on LTDS survey

Looking at Saturdays and Sundays, the most obvious comparison is the absence of the twin morning and afternoon peaks. This reflects lower levels of commuting between home and work and an absence of education-related trips. Instead, the emphasis is on shopping (Saturdays) and leisure-related trips (Sundays), with peak periods of activity during the middle part of the day. It is notable that the intensity of trip making at weekends during the middle of the day actually exceeds that on weekdays at the equivalent times.

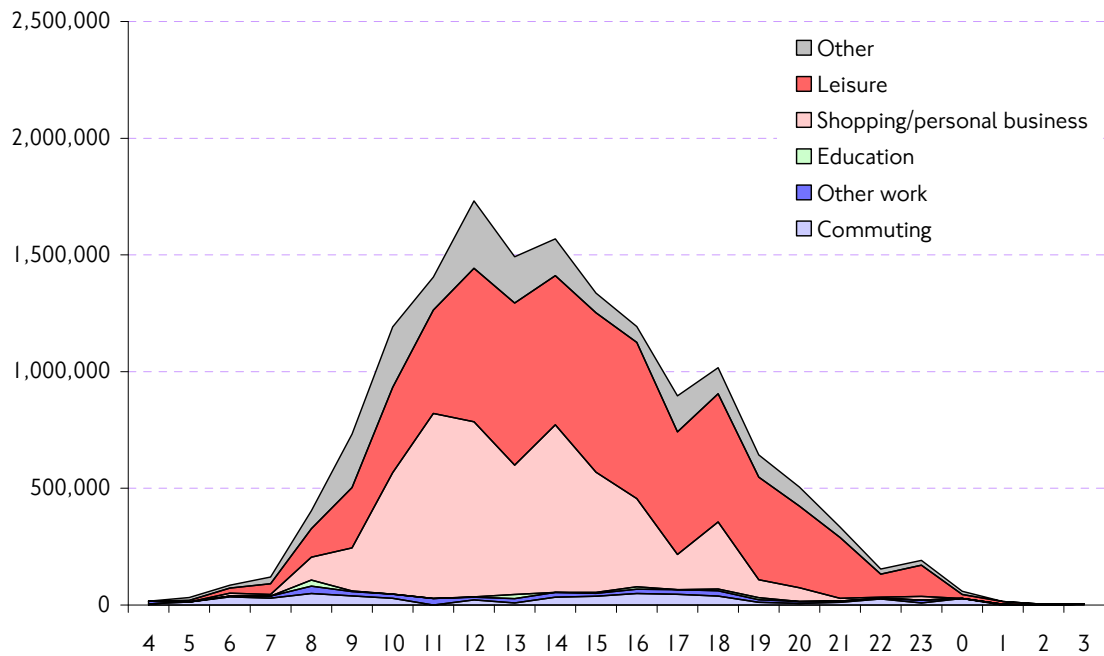
### 3. How travel varies by place and time

Figure 3.16 Trips by journey purpose by hour of departure, Greater London residents, Saturdays, LTDS 2007/08.



Source: TfL Planning, based on LTDS survey

Figure 3.17 Trips by journey purpose by hour of departure, Greater London residents, Sundays, LTDS 2007/08.



Source: TfL Planning, based on LTDS survey

## 4. Performance of the transport networks

### 4.1 Introduction

This section looks at the performance of the transport networks in London. A range of established measures and time series are set out. These demonstrate a clear trend of improvement on the public transport modes, alongside a picture of long-term decline in the performance of the road network in London.

### 4.2 Key features and trends

#### Road network

- Despite falling travel levels this decade, road traffic congestion has been increasing in all areas of London for some years. Over the period from 1977 to the last complete survey cycle in 2003 to 2006, average weekday Greater London main road traffic speeds fell by 14 percent in the morning peak period, to 23.7 kilometres per hour; by 12 percent during the mid-day inter-peak period, to 29.3 kilometres per hour; and by 9 percent in the weekday evening peak period, to 25.6 kilometres per hour.
- Morning peak traffic speeds in central London ended the review period 24 percent slower than in 1977, at 14.9 kilometres per hour, with inter-peak speeds 23 percent slower, at 15.0 kilometres per hour, and evening peak speeds 16 percent slower, at 16.3 kilometres per hour. Although congestion charging in central London temporarily reversed the long-run trend towards slower traffic speeds, the most recent survey cycle suggests that this has reasserted itself.
- New measures – based on recently available Global Positioning Systems (GPS) and anonymised Automatic Number Plate Recognition (ANPR) cameras are being developed by TfL to meet the need for increased and more detailed information on road network performance going forward, for example, in relation to the new Mayor's aspirations to smooth traffic flow. One such analysis – using satellite data – suggests that Londoners spend over 10 billion minutes (equivalent to almost 20,000 person-years) in traffic queues on the major roads in London every year.

#### Public transport networks

- Since 2000, the provision of public transport in London has increased significantly. Scheduled train kilometres on London Underground have increased by around 25 percent over the period 1995/96 to 2007/08, reflecting a range of service enhancements. Over 70 million train kilometres were operated in 2007/08.
- Scheduled bus kilometres operated by TfL have increased by over 40 percent since 1995/96, with particularly strong growth over the period between 2001 and 2005. During 2007/08 480 million bus kilometres were scheduled.
- The percentage of scheduled kilometres actually operated on the Underground has remained around 94-95 percent over recent years, at higher levels than in the early years of the decade despite the increase in scheduled train kilometres.

#### 4. Performance of the transport networks

- The percentage of scheduled bus kilometres that are operated has generally been above 95 percent over the past 10 years, with the recent trend being towards increased reliability. A figure of 97.5 percent was achieved during 2007/08.
- Excess journey times for the Underground (the additional time taken for a journey over and above what would be expected if all services ran as scheduled – a basic measure of service reliability) improved over the last year.
- Both ‘actual’ and ‘excess’ waiting times for buses have progressively reduced over the same period – reflecting both additional buses and improved bus service reliability. However, during 2007/08, 80 percent of the approximately 12 million scheduled bus kilometres that were not operated reflected traffic congestion-related factors, mirroring trends in congestion for general traffic.
- The picture for service reliability on the DLR is one of continuous and strong improvement. During 2007/08, 99.1 percent of scheduled trains ran, and 97.2 percent of trains were punctual. London Tramlink displayed similar levels of reliability, operating 99 percent of their scheduled services.

### 4.3 Performance of the road network

#### Measuring the performance of the road network

Performance of the road network can be measured in terms of average speeds, congestion, and journey time reliability. Much of the following material considers average traffic speeds – which although the most immediate measure of road network performance is unsatisfactory in some respects. During 2009, TfL will be developing new London-wide measures of congestion and journey time reliability, optimised towards monitoring the Mayoral objective to ‘smooth’ the traffic flow.

#### Long-run trends in average traffic speeds

Moving car observer surveys of average traffic speeds have been carried out in London since the 1970s. These make use of an instrumented vehicle, driven over the more major roads according to certain rules that are designed to emulate – so far as is possible – the general traffic flow. In this way, weighted to account for the fact that different roads carry different volumes of traffic, the surveys return a representative average traffic speed for each surveyed time period. The resultant speeds include time spent in traffic queues and so are different from ‘driving speeds’ when vehicles are moving.

Table 4.1 shows the available time-series of average speed measurements from these surveys of the more major road network. It is immediately clear that the long-term trend across all parts of the network is towards slower traffic speeds. Over the period from 1977 to the last complete survey cycle in 2003 to 2006, average weekday Greater London speeds fell by 14 percent in the morning peak period, by 12 percent during the mid-day inter-peak period, and by 9 percent in the weekday evening peak period.

Morning peak traffic speeds in central London ended the review period 24 percent lower than in 1977. Inter-peak speeds were 23 percent lower, and evening peak speeds 16 percent lower. Although congestion charging in central London temporarily reversed the long-run trend towards slower traffic speeds here, the most recent survey cycle suggests that this has reasserted itself. See also TfL's: *Congestion Charging, Sixth Annual Monitoring Report, July 2008*, which describes the measurement of road network congestion in more detail and is available at: <http://www.tfl.gov.uk/roadusers/congestioncharging/6722.aspx>.

Table 4.1 Average traffic speeds in Greater London, weekdays.

Year	Area of Greater London (kilometres per hour)				
	Central area	Rest of inner area	All inner	Outer area	All areas
<b>Morning peak period</b>					
1977-1982	19.5	22.6	21.8	30.7	27.5
1983-1990	18.7	20.3	19.8	29.8	26.4
1990-1997	17.0	21.3	19.8	27.5	25.1
1997-2000	16.0	19.2	18.2	29.1	25.4
2000-2002	15.8	18.6	17.8	27.0	24.0
2003-2006	17.0	18.7	18.2	26.1	23.7
2006-2009	14.9	17.9	17.1	-	-
<b>Daytime off-peak period</b>					
1977-1982	19.4	27.7	24.5	40.0	33.3
1983-1990	18.4	24.8	22.6	38.4	31.8
1990-1997	17.1	24.6	21.9	36.3	30.7
1997-2000	16.0	23.7	20.8	35.0	29.6
2000-2002	14.4	21.9	19.2	34.2	28.3
2003-2006	16.8	22.6	20.6	34.1	29.3
2006-2009	15.0	21.9	19.7	-	-
<b>Evening peak period</b>					
1977-1982	19.4	22.1	21.3	32.5	28.2
1983-1990	18.1	19.8	19.4	32.0	27.0
1990-1997	17.0	20.8	19.5	30.9	26.9
1997-2000	16.3	18.2	17.6	30.6	25.9
2000-2002	15.4	18.1	17.3	29.4	25.1
2003-2006	17.0	19.7	19.0	28.6	25.6
2006-2009	16.3	19.5	18.7	-	-

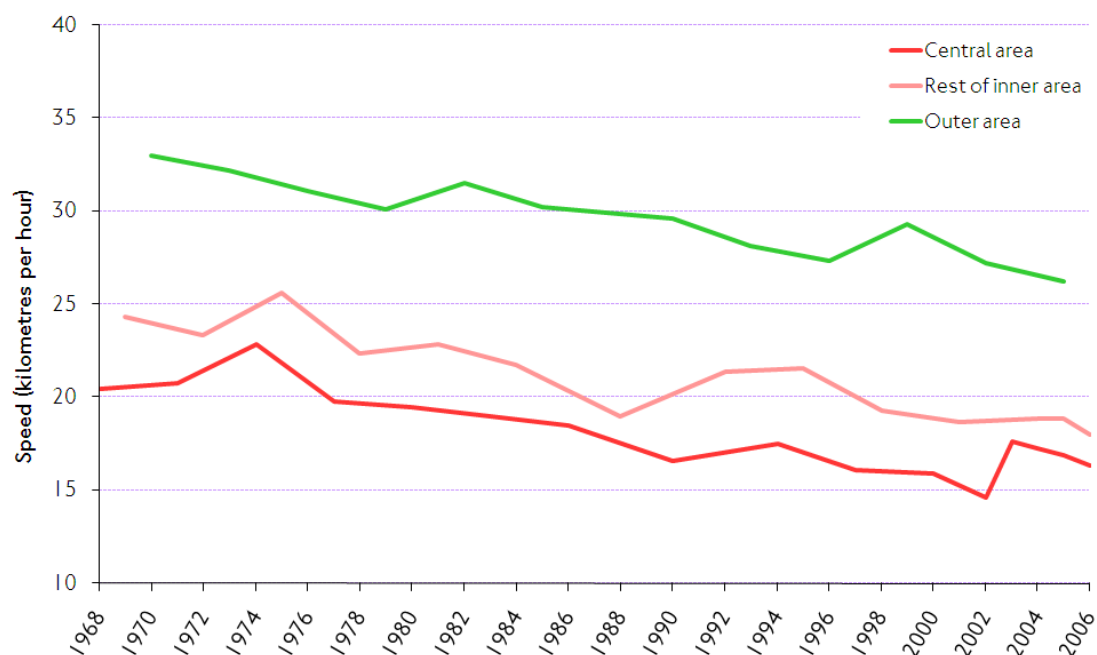
Source: TfL Road Network Performance

#### 4. Performance of the transport networks

Figure 4.1 shows these trends graphically for the weekday morning peak period. The persistent long-term trend towards reduced speeds and hence increasing congestion is clear.

Research undertaken by TfL in connection with the congestion charging monitoring programme suggests that, during the 1970s and 1980s, reduced traffic speeds were primarily a function of increasing traffic volumes. From the late 1990s, however, traffic volumes in central and Inner London have tended to stabilise and, latterly, reduce (see also Section 2.11 of this report). Recent increases to congestion are thought to reflect a range of interventions on the road network, such as road safety measures and increased road and street works. These interventions have combined to reduce the effective capacity of the road network for general traffic.

Figure 4.1 London traffic speeds in the weekday morning peak.



Sources: TfL Road Network Performance; TfL Planning



### **Technology-based methods for measuring traffic speeds and congestion**

The primary limitation of TfL's moving car observer surveys of average traffic speeds is that the achievable 'sample size' (repeated measurements on the same roads) is very limited. This means that they are not able to track short-term variations in traffic speed, or to return statistics that are meaningful at small spatial scales. They are therefore not optimal for understanding the smoothing of traffic or measuring change.

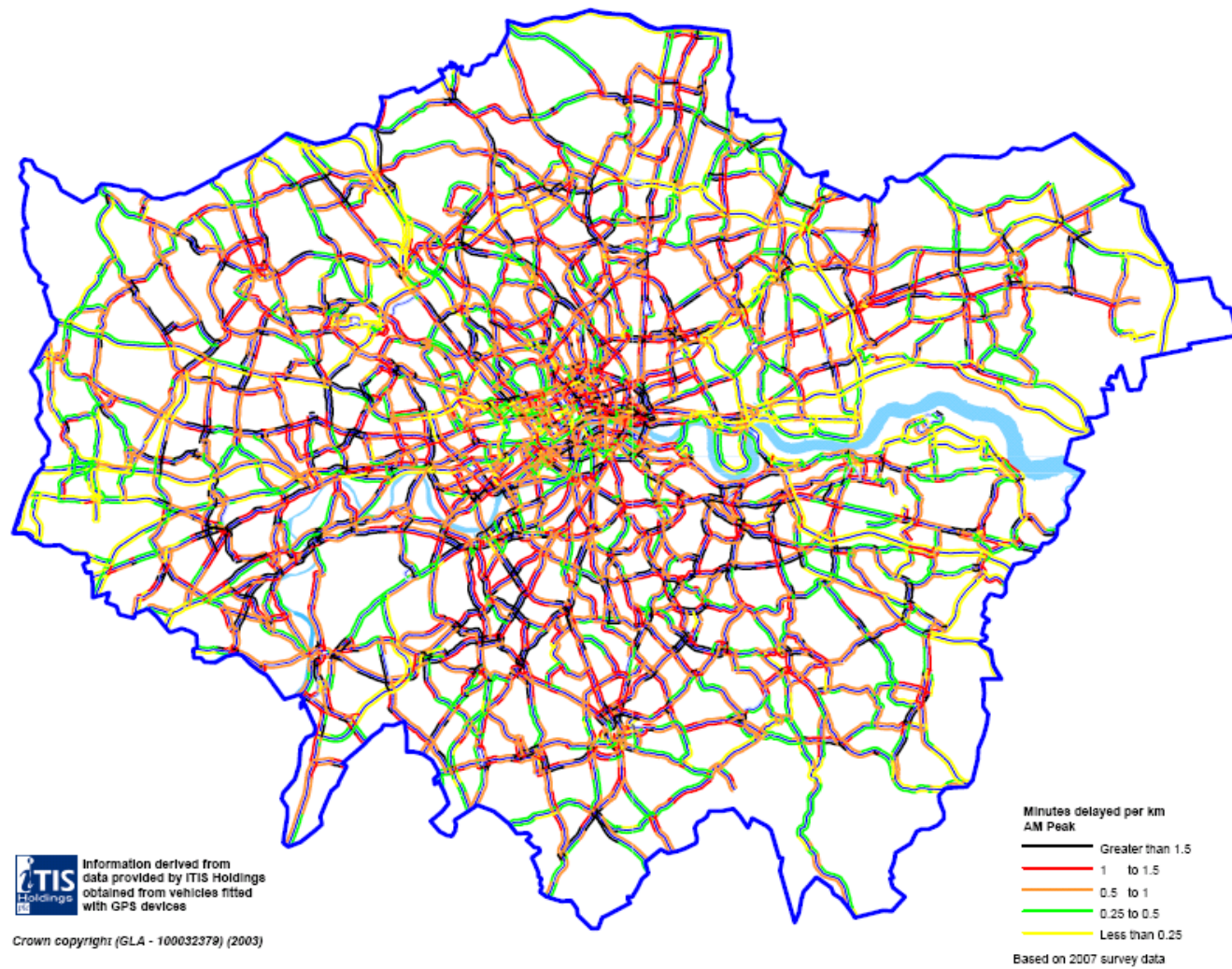
However, new technologies have recently become available with the potential to overcome this limitation. These technologies include GPS-based methods, and ANPR camera-based systems. TfL has been working to apply these methods to the measurement of congestion and journey time reliability, and this work will continue during 2009 to develop a more appropriate set of measurements for understanding smoothing of traffic.

Using GPS-based data provided by ITIS Holdings Ltd., Figure 4.2 gives an overview of the intensity of congestion (expressed as minutes of delay over and above nominal 'free-flow' conditions, per kilometre travelled). The overall pattern for the weekday morning peak period is a characteristic one, with highest delays in the inner ring, particularly around major junctions between key radial and orbital routes. Interestingly, central London shows relatively modest levels of congestion, reflecting the relatively slow build-up of traffic here during the morning peak period.

#### 4. Performance of the transport networks

Figure 4.2 Weekday morning peak road network congestion, illustrative plot for 2007.

Source: TfL, Road Network Performance



GPS satellite tracking data returns measurements continuously and provides a very large sample size as sectors of the vehicle fleet increasingly become equipped with this technology. It can therefore be used to make detailed comparisons of congestion between time periods, and between small spatial areas in London.

Table 4.2 shows how this information can be used to quantify the total amount of delay on the various parts of London's road network – in this case TfL's 'Network of Interest', comprising approximately 2,300 kilometres of the busier roads in London, albeit based on data relating to 2003 (the most recently processed year).

**Table 4.2** Estimated total daily vehicle delay, TfL's 'Network of Interest', by time period and day of week (daytime hours only), 2003.

		Representative daily total vehicle delay (000's vehicle minutes)			
		07:00-10:00 AM peak per hour	10:00-16:00 Inter peak per hour	16:00-19:00 PM peak per hour	12 hour total (07:00-19:00)
Average weekday	Central	171	191	209	2,283
	Inner	722	616	876	8,491
	Outer	2,035	1,343	2,258	20,934
	<b>Total</b>	<b>2,927</b>	<b>2,150</b>	<b>3,342</b>	<b>31,709</b>
Average Saturday	Central	51	100	129	1,141
	Inner	197	505	606	5,441
	Outer	629	1,347	1,502	14,476
	<b>Total</b>	<b>877</b>	<b>1,952</b>	<b>2,237</b>	<b>21,058</b>
Average Sunday	Central	47	136	213	1,597
	Inner	107	425	630	4,760
	Outer	429	1,024	1,230	11,118
	<b>Total</b>	<b>583</b>	<b>1,585</b>	<b>2,072</b>	<b>17,474</b>

Source: TfL, Road Network Performance

Representative daily delays on the Network of Interest were 31.7 million minutes per weekday (equivalent to 22,000 person-days), with values 34 percent and 45 percent lower on Saturdays and Sundays (daytime hours only). In total, annual vehicle delay on the Network of Interest was 10,250 million vehicle minutes (equivalent to 19,500 person-years). As expected, the highest proportion of annual vehicle delay occurred within Outer London which makes up the majority of the network in terms of kilometres driven. However, when the length of network in each area is taken into account, Inner London shows the highest annual rate of vehicle delay per kilometre, at 5.7 million vehicle minutes. Table 4.3 is a borough-level presentation of these data, showing the comparative intensity of road network delays.

#### 4. Performance of the transport networks

**Table 4.3** Estimated total annual vehicle delay on TfL's 'Network of Interest' by London borough.

Borough	Total annual vehicle delay (million vehicle minutes)					Length of network (km)
	AM peak per hour	Inter peak per hour	PM peak per hour	12 hour total (07:00-19:00)	12 hour total (per km)	
Barking and Dagenham	15	11	17	162	3.6	45
Barnet	52	42	69	619	5.1	120
Bexley	20	16	20	220	2.8	79
Brent	28	29	40	376	5.2	72
Bromley	29	26	35	350	2.7	128
Camden	20	24	33	305	4.7	66
City of London	7	6	6	75	3.5	21
Croydon	31	30	41	392	3.9	100
Ealing	49	37	60	550	6.3	87
Enfield	39	31	49	453	4.5	100
Greenwich	35	22	35	343	3.8	90
Hackney	15	19	27	238	5.6	43
Hammersmith and Fulham	21	22	35	298	7.6	39
Haringey	22	20	29	269	4.8	56
Harrow	17	15	24	214	3.6	60
Havering	20	17	30	252	3.0	83
Hillingdon	34	18	37	322	2.8	115
Hounslow	40	23	41	384	4.3	90
Islington	20	21	25	259	6.1	42
Kensington and Chelsea	17	22	27	262	6.9	38
Kingston upon Thames	21	14	20	206	3.9	53
Lambeth	27	24	33	325	5.1	64
Lewisham	22	24	32	307	5.2	59
Merton	22	21	26	269	4.6	58
Newham	20	21	27	269	4.9	54
Redbridge	22	21	34	294	4.0	73
Richmond upon Thames	28	23	38	335	4.7	71
Southwark	24	23	32	305	4.6	67
Sutton	18	15	21	207	4.5	46
Tower Hamlets	21	21	35	293	6.4	46
Waltham Forest	19	18	32	258	4.2	61
Wandsworth	36	32	41	426	6.3	68
Westminster	27	34	40	409	4.2	97

Source: TfL Road Network Performance

The borough of Hammersmith and Fulham shows the highest annual vehicle delay per kilometre of network, with 7.6 million vehicle minutes, followed by Kensington and

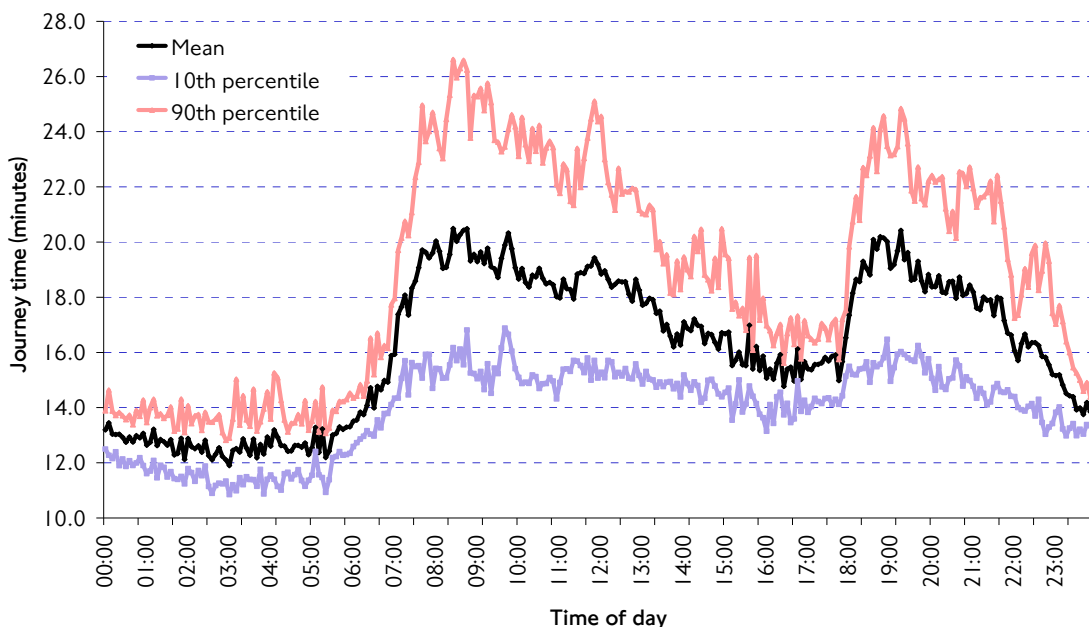
Chelsea with 6.9 million vehicle minutes. Bromley shows the lowest annual vehicle delay per kilometre with 2.7 million vehicle minutes, closely followed by Bexley and Hillingdon, both 2.8 million vehicle minutes. Note that these variations by borough partly reflect variations in the total volume of traffic in each. In this context, the pattern shown by Table 4.3 makes an interesting comparison with the traffic density values shown in Figure 3.14.

### Measuring journey time reliability on the road network

Traffic congestion does not just slow journeys down. It also makes them less reliable and less predictable, and improving these is a principal objective of the new Mayor's vision for transport in London. TfL is therefore developing new methods of measuring road network journey time reliability, making use of the potential offered by new technologies. Figure 4.3 shows an example analysis from camera-based data of journey times on a major section of the road network – between Chiswick Roundabout and Hyde Park Corner through inner west London, in the eastbound direction only.

Here, the 10<sup>th</sup> and 90<sup>th</sup> percentiles of average journey times are shown across the hours of a typical weekday. The spread between the quickest 10 percent of journeys (purple line) and the slowest 10 percent of journeys (pink line) is seen to widen as the average journey time increases, with the difference between minimum and maximum journey times (as percentiles) on different days being as much as 10 minutes – or 40 percent. TfL will be developing this analysis, in relation to smoothing the traffic flow, for fuller treatment in future editions of this report.

Figure 4.3 Measuring road network journey time reliability using cameras – example corridor analysis.



Source: TfL Road Network Performance

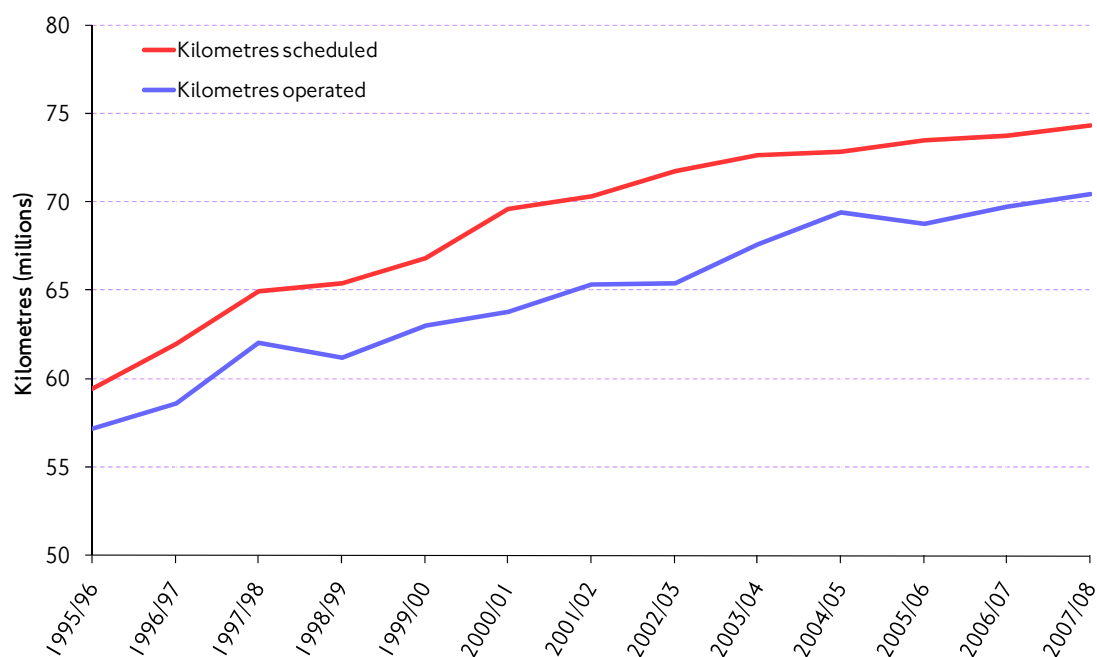
## 4. Performance of the transport networks

### 4.4 Public transport networks

#### London Underground service supply

Scheduled train kilometres on London Underground (LU) have increased by around 25 percent over the period 1995/06 to 2007/08 (Figure 4.4), reflecting a range of service enhancements.

Figure 4.4 Scheduled and operated train kilometres by Underground.



Source: TfL service performance data

#### London Underground service reliability

The percentage of scheduled kilometres operated on LU (Table 4.4) has been around 94 to 95 percent for the past four years; higher than in previous years despite the substantial increase in train kilometres operated. Over 70 million train kilometres were operated in 2007/08, the highest ever total.

Excess journey time – the additional time taken for a journey over and above what would be expected if all services ran as scheduled – improved over the last year although it was still slightly higher than in the years 2003/04 to 2005/06. The way that excess journey time is calculated was revised in 2006/07, to be weighted to take account of how customers value time. As a percentage of the average weighted journey times, known as generalised journey time, the excess journey time fell from 18.0 percent to 17.4 percent, well below the peak of 20.7 percent in 2002/03.

Table 4.4 London Underground service reliability and journey times.

Year	Percentage of scheduled kilometres operated	Average actual journey time (minutes)	Average generalised (weighted) journey time (minutes)	Excess journey time (weighted) (minutes)	Excess as % of generalised journey time
1998/99	93.6	27.7	43.5	7.1	16.4
1999/00	94.3	27.8	43.9	7.5	17.1
2000/01	91.6	28.6	45.7	8.6	18.9
2001/02	92.9	28.3	45.2	8.1	18.0
2002/03	91.1	29.1	46.7	9.7	20.7
2003/04	93.1	27.9	44.3	7.4	16.8
2004/05	95.3	27.7	44.0	7.2	16.4
2005/06	93.6	27.8	44.3	7.5	16.9
2006/07	94.5	28.0	44.7	8.1	18.0
2007/08	94.8	27.8	44.5	7.8	17.4

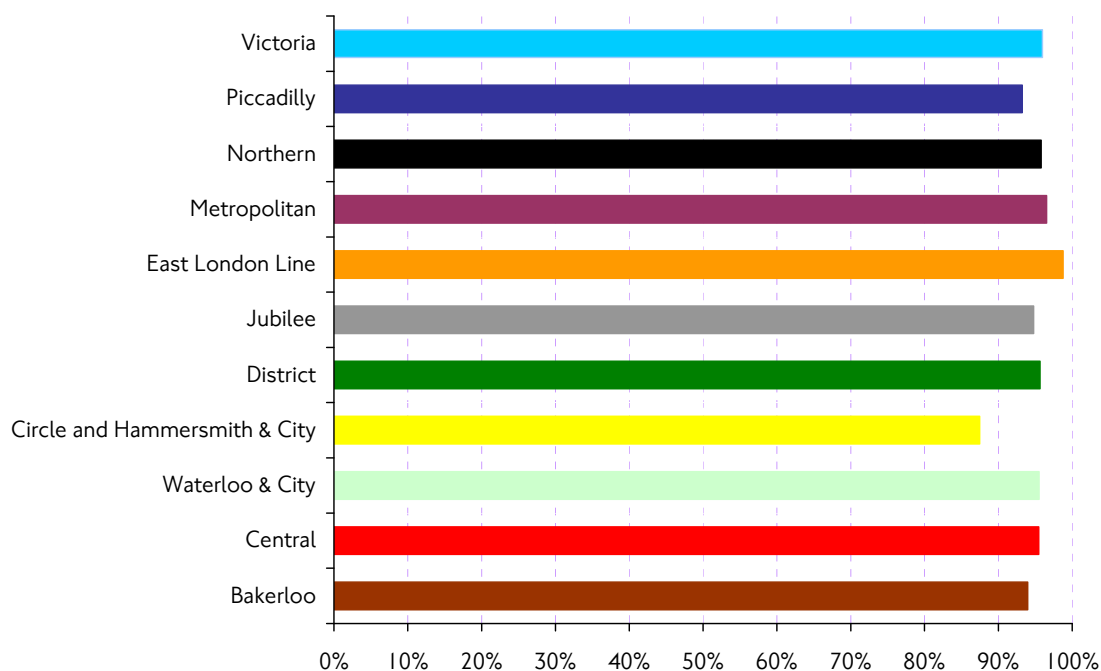
Source: Transport for London

I. Excess journey time is the difference between actual journey time and that expected if services run to time, and weighted to reflect how customers value time. Data not collected prior to 1998/99.

Service reliability differs between the different Underground lines. The East London line was the most reliable during the 2007/08 period, running 98.8 percent of the scheduled service. This however partly reflected its isolated character in the network, and the line closed in December 2007 for major upgrade work as part of the London Overground network. The Metropolitan, Victoria and Northern lines were also above average in terms of reliability. The worst performing lines were the Circle and Hammersmith & City lines, with less than 90 percent of scheduled kilometres operated (Figure 4.5).

#### 4. Performance of the transport networks

Figure 4.5 London Underground service reliability by line, 2007/08. Percentage of scheduled kilometres operated.



Source: Transport for London

#### London Underground: crowding

A further indicator of the balance between public transport supply and demand is trends in average vehicle occupancy, as shown by Table 4.5. In interpreting these trends, it is again necessary to take account of developments to infrastructure and public transport vehicle technology over the period covered.

The overall trend for bus occupancies is an increase of 19 percent in the average number of passengers per vehicle since 1991/92 (20 percent over the period 2000/01 to 2007/08). However, over this period there has been a move towards both larger and smaller capacity buses. Either way, average occupancy levels do not indicate systematic overcrowding, although a progressively higher 'per vehicle' utilisation has been achieved.

Train occupancy rates on LU have been broadly constant over the review period, despite substantially increased patronage. This indicates that increased service provision is generally keeping pace with increased demand as well as contributing to it.



Table 4.5 Balance between public transport supply and demand – average number of passengers per bus or train.

Year	Passengers			
	Bus	Underground	DLR	London Tramlink
1991/92	13.4	111.2	32.4	-
1992/93	12.4	108.6	29.5	-
1993/94	12.1	109.7	35.8	-
1994/95	12.3	110.0	36.7	-
1995/96	12.4	111.2	35.0	-
1996/97	12.7	104.3	37.2	-
1997/98	12.9	104.5	45.8	-
1998/99	12.7	109.7	55.5	-
1999/00	12.7	113.7	58.5	-
2000/01	13.2	117.1	67.3	-
2001/02	13.7	114.0	71.3	40.2
2002/03	14.4	112.6	72.5	40.4
2003/04	14.7	108.5	69.1	41.7
2004/05	15.0	109.4	74.0	46.9
2005/06	16.0	110.8	71.5	48.0
2006/07	16.3	109.9	69.9	50.9
2007/08	15.9	115.7	74.2	53.7

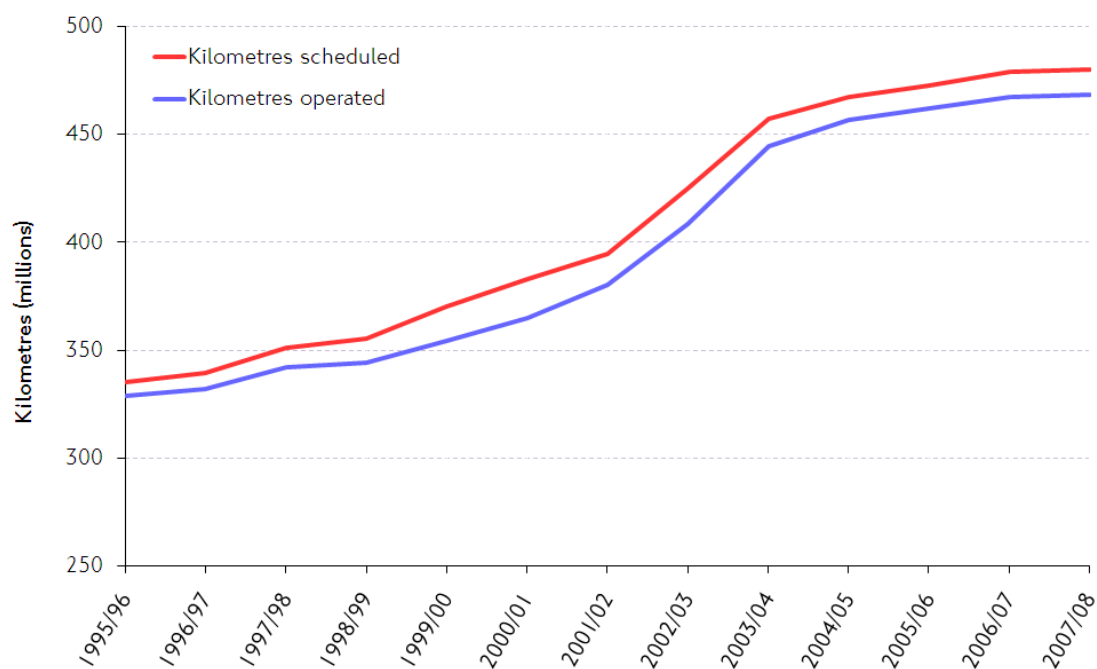
Source: Transport for London

### Bus service reliability

Scheduled bus kilometres operated by TfL have increased by almost 40 percent over the period since 1995/96 (Figure 4.6), with particularly strong growth between 2001 and 2005. This increase reflects substantial enhancements to the bus network made by TfL since 2000. During 2007/08, 480 million bus kilometres were scheduled.

#### 4. Performance of the transport networks

Figure 4.6 Scheduled and operated kilometres by bus.



Source: TfL service performance data

Key network-level bus service reliability statistics are shown in Table 4.6. The percentage of scheduled kilometres that are operated has generally been above 95 percent. Notable is the proportion of scheduled kilometres that are lost due to traffic congestion – for example, where late-running buses are turned back before reaching their intended destination. This peaked in 2002/03, reflecting large-scale infrastructure works in central and Inner London, fell back with the introduction of congestion charging, but has risen again in recent years. During 2007/08, 80 percent of all scheduled bus kilometres lost were due to traffic congestion.

Two further measures of reliability are provided for 'high-frequency' routes (see footnote). Both 'actual' and 'excess' waiting times have consistently reduced – reflecting additional buses and significantly improved bus service reliability. A major factor in this improved reliability has been the introduction of Quality Incentive Contracts for bus operators.

Table 4.6 Bus service reliability.

Year	Percentage of scheduled kilometres			High frequency services <sup>1</sup>		Low frequency services <sup>2</sup>
	Operated	Lost due to traffic congestion <sup>4</sup>	Lost due to other causes	Average wait time (minutes)		Percentage of timetabled services on time <sup>3</sup>
				Actual	Excess	
1993/94	96.9	0.8	2.3	6.6	1.9	66.7
1994/95	98.0	1.1	0.9	6.5	1.8	69.7
1995/96	98.2	1.0	0.8	6.5	1.7	71.4
1996/97	97.9	1.2	0.9	6.4	1.8	70.3
1997/98	97.4	1.3	1.3	6.4	1.8	70.0
1998/99	96.9	1.6	1.5	6.6	2.0	69.0
1999/00	95.7	1.8	2.5	6.7	2.1	67.8
2000/01	95.3	2.1	2.6	6.8	2.2	67.7
2001/02	96.4	2.0	1.6	6.6	2.0	69.4
2002/03	96.1	2.6	1.3	6.4	1.8	70.5
2003/04	97.2	1.7	1.1	5.8	1.4	74.6
2004/05	97.7	1.6	0.8	5.6	1.1	77.1
2005/06	97.7	1.7	0.6	5.6	1.1	77.2
2006/07	97.5	1.9	0.6	5.5	1.1	78.1
2007/08	97.5	2.0	0.5	5.5	1.1	79.1
<b>Percentage change</b>						
1 year	-	-	-	0	0	-
10 years	-	-	-	-14	-40	-

Source: Transport for London

1. High frequency services are those operating with a frequency of five or more buses per hour.
2. Low frequency services are those operating with a frequency of not more than four buses per hour.
3. Buses are defined as 'on time' if departing between two and a half minutes before and five minutes after their scheduled departure times.
4. Also includes other non-deductible lost kilometres

## London Rail

TfL has managed the London Overground concession since November 2007, prior to that the services formed part of the Silverlink Metro National Rail franchise. London Overground had a Public Performance Measure of 92 percent of trains arriving within five minutes of scheduled time in its first five months of operation during 2007/08. This compares with 90.6 percent for all London and South East train operating companies in 2007/08.

#### 4. Performance of the transport networks

##### Docklands Light Railway and London Tramlink

The picture for service reliability on the DLR is one of continuous and strong improvement. During 2007/08, 99.1 percent of scheduled trains ran, and 97.2 percent of trains were punctual (Table 4.7).

Table 4.7 DLR service reliability.

Year	Percentage of scheduled services operated	Percentage of trains on time
1997/98	95.6	89.6
1998/99	97.5	92.0
1999/00	97.8	93.7
2000/01	98.2	96.3
2001/02	98.3	96.6
2002/03	98.1	96.3
2003/04	98.2	96.6
2004/05	98.5	97.1
2005/06	98.7	97.3
2006/07	99.2	97.8
2007/08	99.1	97.2

Source: Docklands Light Railway

London Tramlink displayed similar levels of reliability, operating 99 percent of their scheduled services (Table 4.8).

Table 4.8 London Tramlink service reliability.

Year	Scheduled kilometres (thousands)	Operated kilometres (thousands) <sup>1</sup>	Percentage of scheduled service operated
2001/02	2.44	2.41	99.1
2002/03	2.49	2.46	98.9
2003/04	2.50	2.48	99.0
2004/05	2.49	2.42	97.2
2005/06	2.50	2.44	97.4
2006/07	2.57	2.54	98.7
2007/08	2.60	2.57	99.0

Source: London Tramlink

1. Operated kilometres exclude replacement bus services operated during periods of track repair works.

### Public transport operated kilometres

Table 4.9 summarises the trend for service provision – in this case in terms of public transport vehicle kilometres operated by the major public transport modes. Bus vehicle kilometres operated increased by 57 percent over the period 1991/92 to 2007/08, and by 31 percent over the period since 2000/01. For Underground train kilometres, the equivalent increases were 34 percent and 10 percent. Trends for both DLR and London Tramlink reflect the progressive extension of these networks. For example, on the DLR, the extension to Lewisham opened in 1999, and that to London City Airport in 2005.

Table 4.9 Public transport bus and train kilometres operated.

Year	Millions			
	Bus	Underground	DLR	London Tramlink
1991/92	299	53	1	-
1992/93	317	53	1	-
1993/94	315	53	1	-
1994/95	319	55	2	-
1995/96	325	57	2	-
1996/97	327	59	2	-
1997/98	336	62	2	-
1998/99	340	61	3	-
1999/00	348	63	3	-
2000/01	357	64	3	-
2001/02	373	65	3	2
2002/03	397	65	3	3
2003/04	437	68	3	3
2004/05	450	70	3	2
2005/06	454	69	4	2
2006/07	458	70	4	3
2007/08	468	71	4	3

Source: TfL Service Performance data



## 5. The safety and security of Londoners

### 5.1 Introduction

This section sets out available indicators dealing with the Mayor's key transport theme to further improve the safety and security of Londoners when using the transport networks.

Although still too high, there have been significant reductions in recent years in the numbers of people killed and injured on London's roads, reflecting concerted action by TfL to meet Government road casualty reduction targets, which have been comfortably exceeded in London. Crime and disorder can be major deterrents to travel, and this section looks at some established crime statistics: crimes on LU, DLR and bus are falling and average at 14 to 15 reported crimes for every million passenger journeys.

### 5.2 Key features and trends

- There have been significant reductions in the numbers killed and injured on London's roads, reflecting concerted action by TfL to meet Government reduction targets, which have already been comfortably exceeded in London.
- During 2007, 23,210 collisions involving personal injury on Greater London's roads were reported to the Metropolitan and City of London police forces. This represented a decrease of 6.4 percent over the 24,810 collisions reported in 2006.
- In terms of casualties, the respective annual totals were 28,361 and 29,810 – a corresponding decrease of 4.9 percent. These recent decreases were proportionately larger than those for Great Britain as a whole, where the total number of collisions decreased by 3.7 percent, and the total number of casualties by 4.1 percent.
- This relative 'over-achievement' against national targets has led the Mayor of London to specify more ambitious targets for London for 2010, against which significant progress is already being made.
- In 2007/08, no people were killed in accidents on the Underground, the first time this has happened in over 15 years. The number of people injured, at 125, also decreased compared with the previous year. However, the total number of injuries was still higher than two of the previous three years.
- In 2007, total casualties involving bus and coach occupants fell by 16 percent compared with 2006, to 1,408. This is 38 percent down on the 1994–1998 average. There was only one fatality amongst bus and coach occupants in 2007, down from four in 2006.
- Figures from the Metropolitan and British Transport Police show continued reductions in reported levels of crime on the transport network despite increasing passenger numbers. The risk of becoming a victim of crime whilst travelling is therefore falling.
- The level of crime on or near the bus network in 2007/08 was 14 percent lower than in 2006/07 – with a rate of crime for the bus network of 15 crimes per million passenger journeys.

## 5. The safety and security of Londoners

- Crime on London Underground and the Docklands Light Railway was also down, 11 percent lower in 2007/08 compared with the previous year with the rate of crime also falling to 14 crimes per million passenger journeys.

### 5.3 Road safety

#### Background and road safety targets

During 2007, 23,210 collisions involving personal injury on London's roads were reported to the Metropolitan and City of London police forces. This represented a decrease of 6.4 percent over the 24,810 collisions reported in 2006. In terms of casualties, the respective annual totals were 28,361 and 29,810 – a corresponding decrease of 4.9 percent. These recent decreases were larger than those for Great Britain as a whole, where the total number of reported collisions decreased by 3.7 percent, and the total number of casualties by 4.1 percent.

These recent reductions should be seen in the context of current national and London-wide casualty reduction targets. The national targets, applicable to 2010 and in relation to the period 1994 to 1998, are for:

- a 40 percent reduction in the number of people killed or seriously injured in road collisions;
- a 50 percent reduction in the number of children killed or seriously injured; and,
- a 10 percent reduction in the 'slight' casualty rate, expressed as the number of people slightly injured per 100 million vehicle kilometres.

The previous Mayor of London produced his London Road Safety Plan in 2001. This endorsed national targets and additionally applied the 40 percent reduction target to pedestrians, pedal cyclists and users of powered two wheeled vehicles – recognising that particular conditions apply in London for these groups of road user.

#### Early achievement of national targets in London and tougher targets for the future

By 2004 these targets had largely been achieved in London. The previous Mayor therefore announced new and more challenging targets in 2006, to be achieved by 2010, and again relative to the 1994 to 1998 period. These targets, reaffirmed by the new Mayor in 2008, were:

- a 50 percent reduction in the number of people killed or seriously injured;
- a 50 percent reduction in the number of cyclists and pedestrians killed or seriously injured;
- a 40 percent reduction in the number of powered two wheeled vehicle users killed or seriously injured (target unchanged);
- a 60 percent reduction in the number of children killed or seriously injured; and
- a 25 percent reduction in the 'slight' casualty rate.



By the end of 2007:

- Slight casualties were 37 percent below the 1994 to 1998 average, following a decrease of 5 percent, to 24,577 in 2007.
- Fatal and serious casualties were 43 percent below the 1994 to 1998 average. Following a 4 percent decrease in 2007 to 3,784.
- Child fatalities or serious casualties were 65 percent below the 1994 to 1998 average, following a decrease of 16 percent, to 331, in 2007.
- Pedestrian fatalities or serious casualties were 40 percent below the 1994 to 1998 average, following a decrease of 1 percent in 2007 to 1,292.
- Pedal cycle fatalities or serious casualties were 19 percent below the 1994 to 1998 average, following an 18 percent increase to 461 in 2007.
- Powered two wheel user fatalities or serious casualties were 12 percent below the 1994 to 1998 average, after a 3 percent decrease to 819 in 2007.

Comparing London's performance towards the year 2010 national targets with that for Great Britain:

- Fatal or serious casualties had fallen by 36 percent in Great Britain compared to a fall of 43 percent in London.
- Child fatalities or serious casualties had fallen by 55 percent in Great Britain, compared to a fall of 65 percent in London.
- Slight casualties in Great Britain had fallen by an estimated 20 percent, compared with a fall of 37 percent in London.

## 5. The safety and security of Londoners

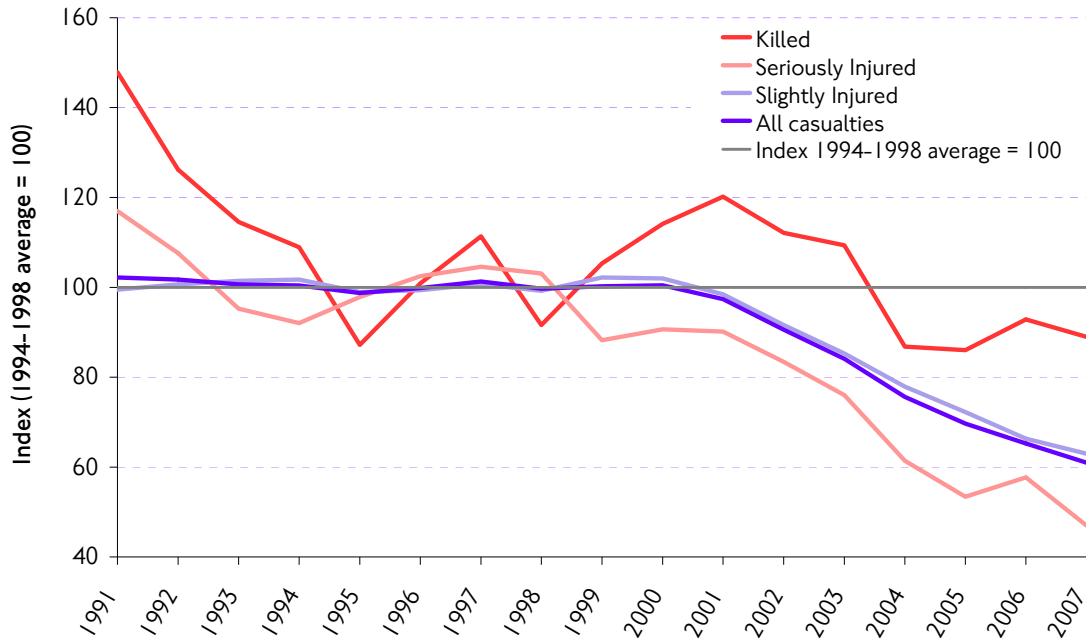
Table 5.1 Road casualties in Greater London and Great Britain by type. Index: 1994 to 1998 average = 100.

Year	Index							
	Killed		Seriously injured		Slightly injured		All casualties	
	London	GB	London	GB	London	GB	London	GB
1994-1998 average	100	100	100	100	100	100	100	100
1991	148	128	117	117	99	94	102	97
1992	126	118	108	112	101	94	102	97
1993	115	107	95	102	101	95	101	96
1994	109	102	92	106	102	97	100	99
1995	87	101	98	103	99	96	99	97
1996	101	101	102	101	99	100	100	100
1997	111	101	105	98	101	103	101	102
1998	92	96	103	93	99	103	100	102
1999	105	96	88	89	102	102	100	100
2000	114	95	91	87	102	102	100	100
2001	120	96	90	84	98	100	97	98
2002	112	96	83	82	92	97	91	95
2003	109	98	76	76	85	93	84	91
2004	87	90	61	71	78	91	76	88
2005	86	89	53	66	72	88	70	85
2006	93	89	58	65	66	83	65	81
2007	89	82	55	63	63	80	62	77
2007 number of casualties	222	2,943	3,562	27,777	24,577	217,060	28,361	247,780

Source: TfL London Road Safety Unit, DfT Transport Statistics Bulletin, Road Casualties in Great Britain Main Results: 2007

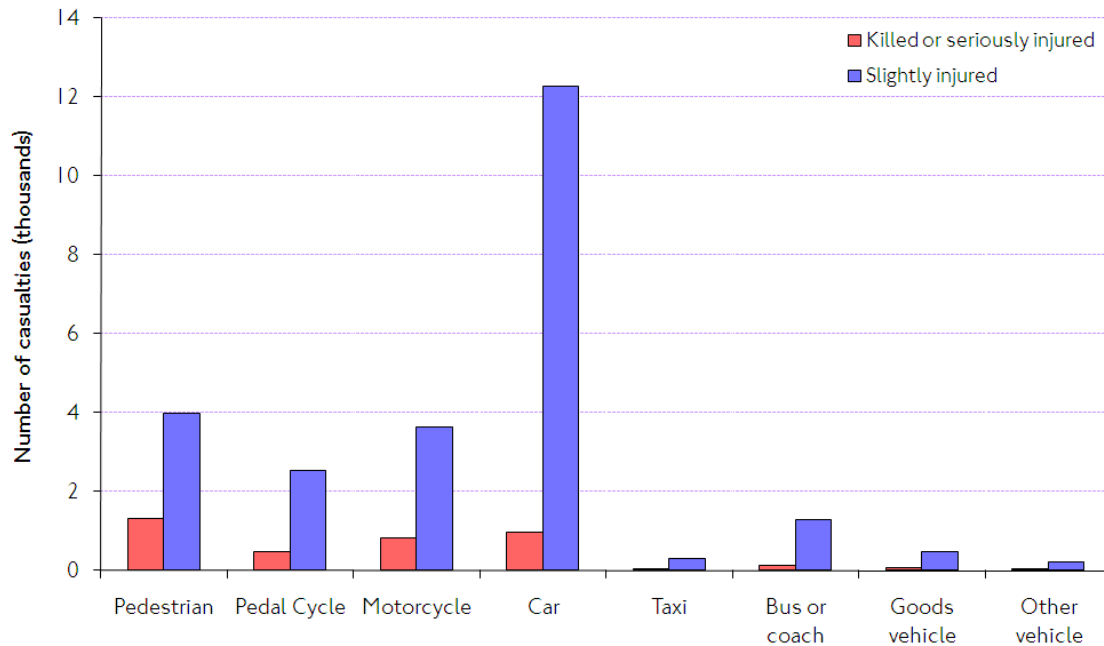
Table 5.1 compares long-run trends for road casualties in London against the equivalent series for Great Britain, while Figure 5.1 displays the London trends graphically. Figure 5.2 looks at the modal distribution of casualties, and the relative proportions of those killed, seriously or slightly injured in relation to each.

Figure 5.1 Road casualties in Greater London by type.



Source: TfL, London Road Safety Unit

Figure 5.2 Total road casualties by type and mode, 2007.

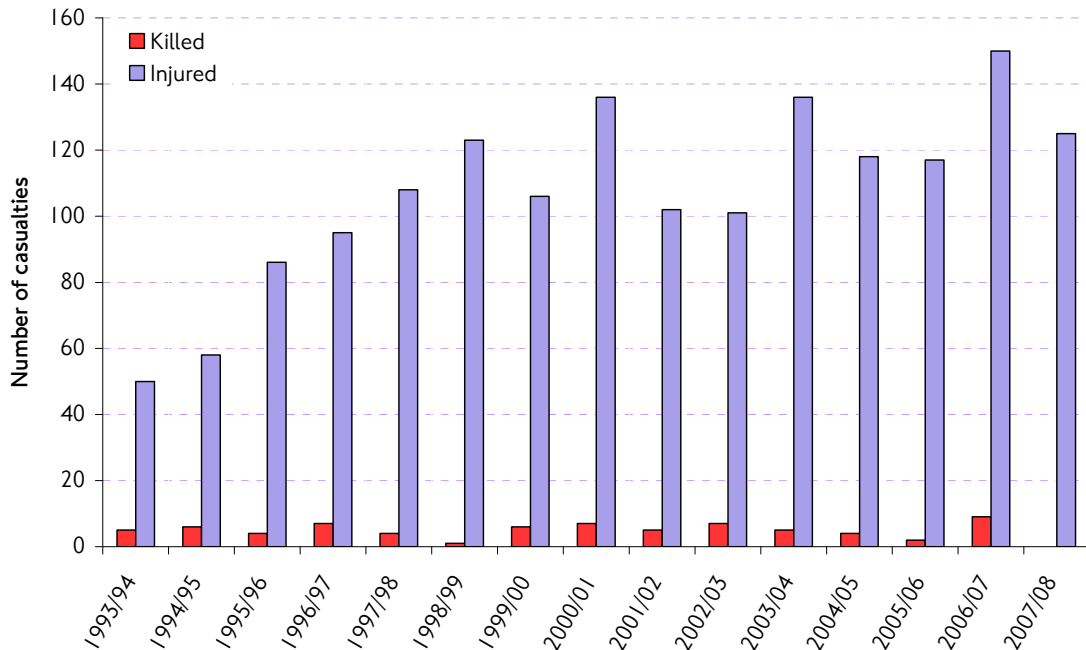


Source: TfL, London Road Safety Unit

## 5.4 Passenger safety on the Underground and buses

In 2007/08, no people were accidentally killed on the Underground, the first time this has happened in 15 years. The number of people injured, at 125, also decreased compared with the previous year, despite the growing use of the Tube.

Figure 5.3 Number of people accidentally killed or injured on London Underground.



Source: Transport for London

1. Excludes suicides and victims of assault or terrorist activity.

In 2007, total casualties involving bus and coach occupants fell by 16 percent compared with 2006, to 1,408. This is 38 percent down on the 1994 to 1998 average. There was only one fatality among bus and coach occupants in 2007, down from four in 2006. Fatal and serious casualties among bus occupants fell by 16 percent to 134, 48 percent down on the 1994 to 1998 average figure. Likewise, slight casualties also fell by 16 percent, to 1,274 people.

## 5.5 Crime on the public transport networks

Public transport in London continues to offer a low crime environment. Currently, over 10 million passengers travel on TfL's public transport services each day with very few ever experiencing or witnessing crime. Figures from the Metropolitan and British Transport Police show continued reductions in levels of crime on the transport network despite increasing passenger numbers. The risk of becoming a victim of crime while travelling is therefore falling.

- The level of crime on or near the bus network in 2007/08 was 14 percent lower than in 2006/07 – with a rate of crime for the bus network of 15 crimes per million passenger journeys.

- Crime on London Underground and the Docklands Light Railway was also down, 11 percent lower in 2007/8 compared with the previous year, with the rate of crime also falling to 14 crimes per million passenger journeys.
- The rates of crime for both the bus and London Underground and Docklands Light Railway networks (rate of offending per million passenger journeys) are at the lowest levels since recording began four years ago.

These reductions in crime have been driven by a range of initiatives undertaken by TfL in partnership with the police forces in London. TfL's Community Safety Plan provides more information on TfL's activities to enhance safety and security across the transport system (see: <http://www.tfl.gov.uk/assets/downloads/corporate/community-safety-plan-2008-2009.pdf>).

Table 5.2 shows key statistics relating to crime on or near the bus network, with a time-series going back to 2004/05. Absolute numbers for most types of crime vary between years. However when increased journeys are taken into account, the general trend for rates of crime is downwards.

Table 5.2 Crime on or near the bus network. Rate per million passenger journeys.

Crime Type	2004/05		2005/06		2006/07		2007/08	
	Crimes	Rate	Crimes	Rate	Crimes	Rate	Crimes	Rate
Burglary	528	n/a	156	n/a	115	n/a	104	<1
Criminal damage	5,422	3	7,624	4.2	7,710	4.1	5,846	2.7
Drugs	357	<1	504	<1	430	<1	683	<1
Fraud / forgery	464	<1	549	<1	330	<1	414	<1
Other notifiable offences	215	<1	226	<1	298	<1	233	<1
Robbery	3,799	2.1	5,297	2.9	6,214	3.3	4,266	2.0
Sexual offences	505	<1	521	<1	481	<1	480	<1
Theft and handling	14,372	8	15,707	8.6	14,623	7.8	12,699	5.8
Violence against the person	7,712	4.3	8,558	4.7	8,281	4.4	8,400	3.9
<b>Total</b>	<b>33,374</b>	<b>18.6</b>	<b>39,142</b>	<b>21.6</b>	<b>38,482</b>	<b>20.5</b>	<b>33,125</b>	<b>15.0</b>

Source: TfL Community Safety, Enforcement and Policing Directorate based on official crime figures provided by the Metropolitan Police Service Performance Information Bureau and the British Transport Police

Table 5.3 shows comparable statistics relating to London Underground. Again, the picture is one of considerable variability in year-on-year absolute numbers and rates, although the general trend is downwards when increasing passenger usage is taken into account.

## 5. The safety and security of Londoners

**Table 5.3** Crime on London Underground and the Docklands Light Railway. Rate per million passenger journeys.

Crime Type	2004/05		2005/06		2006/07		2007/08	
	Crimes	Rate	Crimes	Rate	Crimes	Rate	Crimes	Rate
Violence against the person	2,622	2.6	2,796	2.7	2,494	2.3	2,215	1.9
Sexual offences	352	<1	342	<1	393	<1	332	<1
Criminal damage	1,470	1.4	1,975	1.9	2,704	2.5	1,921	1.7
Line of route (eg trespass)	205	<1	231	<1	135	<1	142	<1
Theft of passenger property	8,734	8.5	7,929	7.7	7,988	7.4	7,481	6.6
Motor vehicle / cycle offences	465	<1	373	<1	390	<1	342	<1
Robbery	357	<1	506	<1	399	<1	192	<1
Theft of railway property / burglary	1,343	1.3	1,295	1.3	819	<1	592	<1
Serious public order	1,205	1.2	1,550	1.5	2,050	1.9	1,981	1.7
Serious fraud	138	<1	200	<1	167	<1	264	<1
Drugs	978	1	824	<1	687	<1	881	<1
Other serious offences	530	<1	863	<1	260	<1	102	<1
<b>Total notifiable offences</b>	<b>18,399</b>	<b>17.9</b>	<b>18,884</b>	<b>18.4</b>	<b>18,486</b>	<b>17.2</b>	<b>16,445</b>	<b>14.4</b>

Source: TfL Community Safety, Enforcement and Policing Directorate based on official crime figures provided by the Metropolitan Police Service Performance Information Bureau and the British Transport Police

## 6. Climate change, CO<sub>2</sub> emissions and local air quality

### 6.1 Introduction

Carbon dioxide (CO<sub>2</sub>) is a primary cause of climate change. The new Mayor of London has reaffirmed his commitment to reduce emissions of CO<sub>2</sub> in London by 60 percent from 1990 levels by 2025. This section looks at some available indicators relating to CO<sub>2</sub> emissions in London, in the context of the Mayor's strategy. It then reviews trends in the air pollutants of primary concern in London – fine particles (PM<sub>10</sub>) and nitrogen dioxide (NO<sub>2</sub>).

### 6.2 Key features and trends

- Transport emissions of CO<sub>2</sub> in London (excluding aviation) increased by 3.5 percent between 1990 and 2006, from 8.6 million tonnes to 8.9 million tonnes. This reflects a combination of factors. These include:
  - increases to road traffic in the 1990s and relatively modest reductions since 2000;
  - partly offset by a shift to more sustainable transport modes, extended public transport networks, and improvements to the fuel efficiency of vehicles.
- In addition, ground-based aviation (planes taxiing, taking off and landing) is responsible for 1.1 million tonnes of CO<sub>2</sub>. This has increased from 0.9 million tonnes in 1990.
- Ground-based transport (including ground-based aviation) in 2006 accounted for about 22 percent of Greater London's CO<sub>2</sub> emissions, with over three-quarters of this coming from road transport, including private cars and freight, and over a tenth from aviation.
- Carbon dioxide emitted per passenger kilometre for TfL's public transport modes are now around or below the equivalent of 80 grams. This reflects consistent improvements to TfL's carbon efficiency over the last three years. Car-based modes typically emit up to half as much again as the CO<sub>2</sub> per passenger kilometre for public transport.
- Levels of harmful local atmospheric pollutants have fallen in recent years, partly reflecting the introduction of newer, cleaner road vehicles. However, London's air quality (particularly in Inner London) is the worst in the UK, and continues to breach National and European Union health-based air quality objectives.
- Long-run trends for both fine particles (PM<sub>10</sub>) and nitrogen dioxide (NO<sub>2</sub>) show only relatively slow year-on-year reductions – less than expected from the large improvements to road vehicle emissions that have featured over the same period.
- During 2008 TfL implemented the first two phases of the London Low Emission Zone (LEZ). This encourages operators of heavier goods vehicles, and larger buses and coaches, to comply with minimum 'Euro' emissions standards for travel in Greater London. Vehicle-based compliance rates stand at around 96 percent for those heavy goods vehicles in-scope for phase 1 of the scheme (from February 2008), and at almost 95 percent for those buses and coaches in-scope for phase 2 of the scheme, from July 2008. Kilometre-based compliance figures are higher, standing at 98 percent for phase 1 affected vehicles.

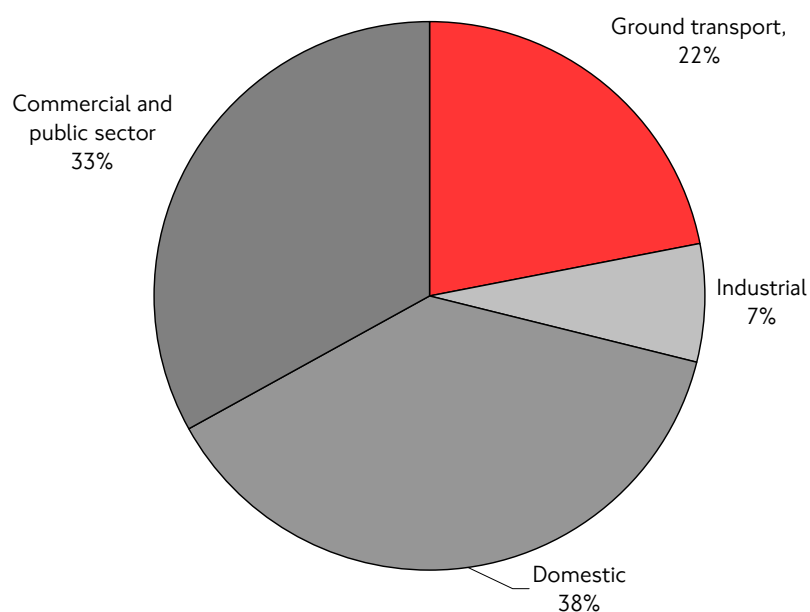
## 6. Climate change, CO<sub>2</sub> emissions and local air quality

- TfL measures the contribution to emissions of local air quality pollutants from its own activities on an annual basis, reflecting established initiatives under the Air Quality Strategy of the Mayor of London. Since 2005/06 the trend across most indicators has been one of progressive improvement.

### 6.3 Sources of carbon dioxide

Figure 6.1 shows the principal sources of CO<sub>2</sub> in London. In 2006, total local emissions from all sources, excluding aeroplanes in flight, were estimated at 44 million tonnes. Some 22 percent came from ground-based transport (including ground-based aviation).

Figure 6.1 Principal sources of carbon dioxide emissions in London, excluding non-ground-based aviation, 2006.



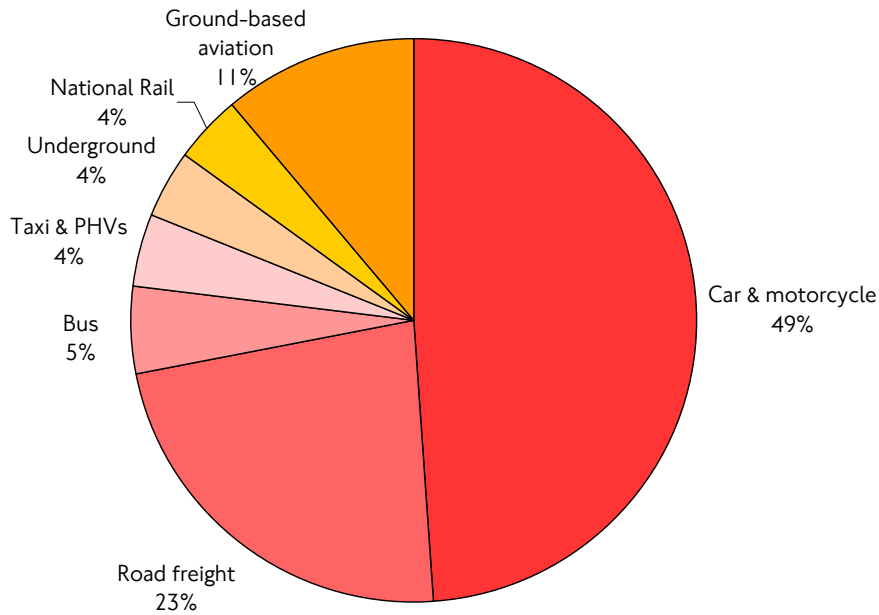
Source: TfL Environment Report

Figure 6.2 shows how CO<sub>2</sub> emissions from ground-based transport in 2006 breaks down across the various sources. About half comes from cars and motorcycles on London's roads. A further 23 percent arises from lorries and vans. Eleven percent comes from ground-based activities associated with aviation. The remaining 17 percent comes from taxis and the various public transport operations.

New estimates of carbon dioxide emissions will be available in the summer, using an updated version of the London Greenhouse Gas Emissions Inventory.

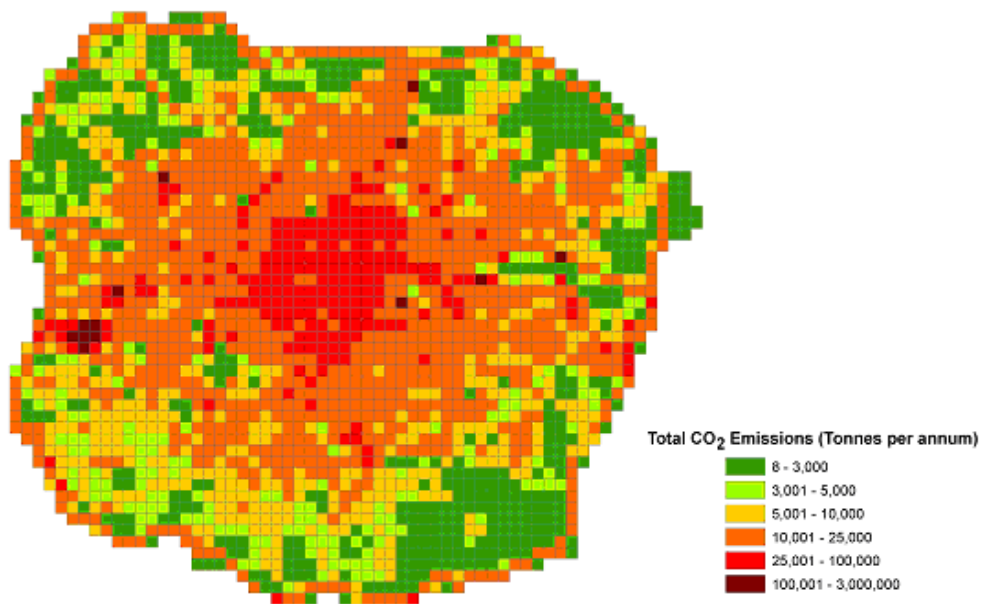


Figure 6.2 Principal sources of carbon dioxide emissions in London from ground-based transport, 2006.



Source: TfL Environment Report

Figure 6.3 Intensity of carbon dioxide emissions across London. All sources, 2006.



Source: London Atmospheric Emissions Inventory (GLA)

Figure 6.3 shows how CO<sub>2</sub> emissions are spatially distributed across Greater London, in this case extending outwards to include the M25 orbital motorway. As expected, the intensity of emissions reflects the density of buildings and population, the major road network and Heathrow Airport. Maps such as these, which can be 'zoomed in' to look in detail at specific locations, or 'sliced horizontally' to look at the spatial emissions

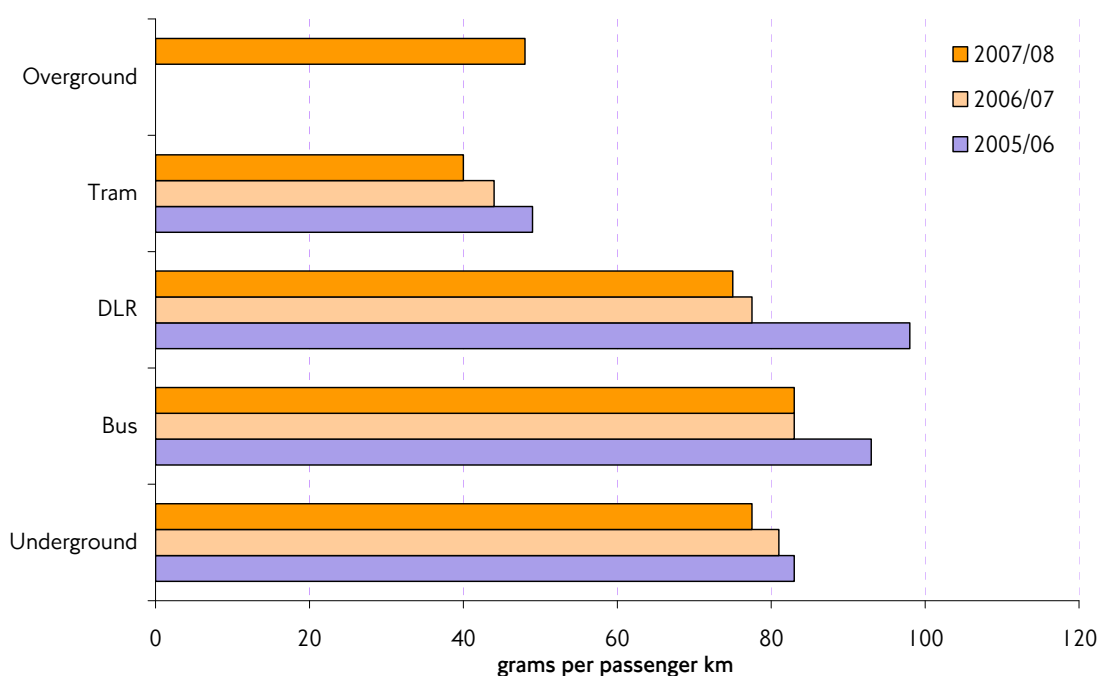
## 6. Climate change, CO<sub>2</sub> emissions and local air quality

patterns associated with particular sources (such as road traffic), are a key tool in designing and assessing future pollution abatement initiatives.

### 6.4 Comparative carbon dioxide emissions from different modes of transport

Carbon dioxide emitted per passenger or person kilometre is one measure of the carbon efficiency of different modes of transport. Figure 6.4 shows this statistic for the principal public transport modes operated by TfL. The recent trends for CO<sub>2</sub> per passenger kilometre show reductions across each of the main public transport modes over the past three years. Note that emissions from the London Overground rail network were only reported from 2007/08.

Figure 6.4 Emissions of carbon dioxide per passenger kilometre from the principal public transport modes.

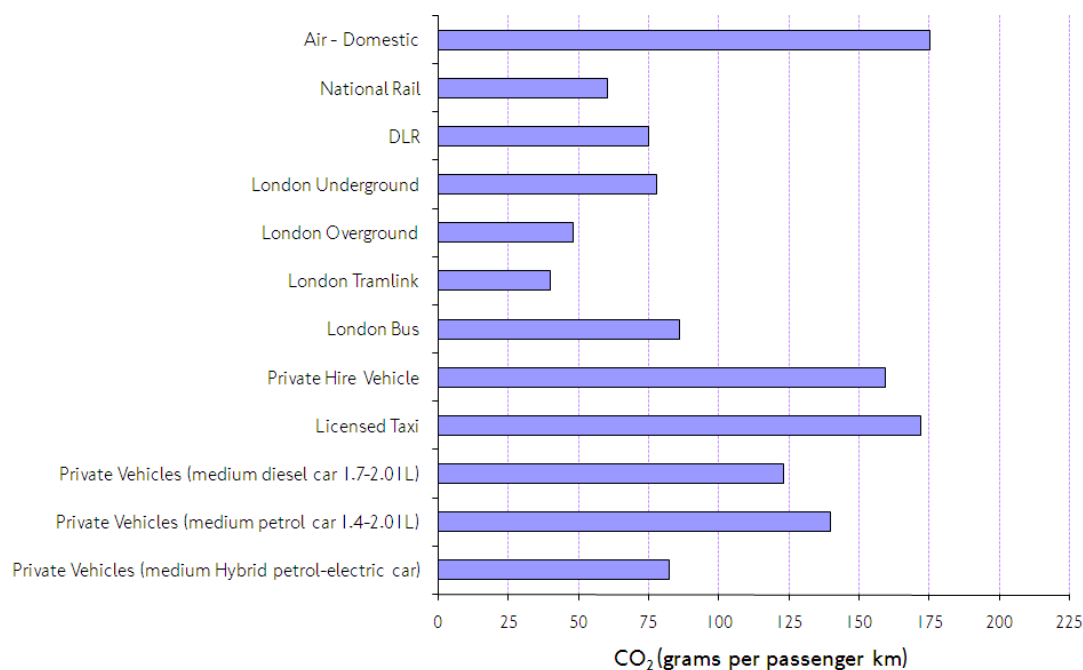


Source: TfL Environment Report

Figure 6.5 shows equivalent figures for public and non-public transport modes for comparison. The value for cars is indicative, based on the emissions characteristics of the London registered car fleet, and adjusted to reflect a representative average vehicle occupancy of 1.5 people. Also, note that values for private vehicles are expressed in terms of person kilometres. Journeys by bicycle and on foot have no locally-attributable CO<sub>2</sub> emissions.

The difference in comparative carbon efficiency is clear – cars typically emit half as much again CO<sub>2</sub> per passenger kilometre as surface public transport modes.

Figure 6.5 Comparative emissions of carbon dioxide by mode of transport, 2007/08 (per passenger kilometre for public transport and person kilometre for car).



Source: TfL Environment Report

## 6.5 How is TfL working to tackle climate change?

TfL is working to tackle climate change in four main ways: by changing the ways that people travel; by encouraging people to operate their vehicles more efficiently; by investing in lower carbon fuels and technology; and by looking at the way it manages its business activities.

- In recent years Londoners have started to change the way they travel, with London becoming the only major world city to have recorded a five percentage point net modal shift away from the use of cars toward public transport, walking and cycling. The improvements to public transport, congestion charging in central London and TfL's Smarter Travel programmes have played their parts.
- TfL works with bus, Underground, train and taxi drivers, as well as the general public, to encourage them to drive in more fuel-efficient ways, helping to cut CO<sub>2</sub> emissions from routine journeys. The two-year Smarter Driving campaign encourages people to lower their costs and emissions by making simple changes to the way they drive.
- 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 those highlighted in TfL's Business Plan. To date, the fund has allocated £14.7m to seven programmes. This includes supporting the introduction of 56 hybrid buses. These vehicles can deliver energy efficiency improvements of around 30 percent. A progressive introduction programme will mean a saving of 5,000 tonnes of CO<sub>2</sub> in 2012.

## 6. Climate change, CO<sub>2</sub> emissions and local air quality

- On the Underground, energy-saving measures include regenerative braking on trains, which can save up to 25 percent of electricity. This is also being trialled on the Docklands Light Railway.
- TfL seeks to promote sustainability in both its role as a transport provider and as an employer.

### **6.6 Smarter Travel – an example of TfL’s actions to reduce carbon dioxide emissions**

Smarter travel measures aim to raise awareness of the scope of travel choices available to all London residents, employees and visitors. This is done through a range of programmes, including school travel plans, car club development, and area-based initiatives – the latter in both Richmond and Sutton. The programmes use a blend of information, incentives and small-scale infrastructure improvements, delivered in partnership with a range of stakeholders.

These programmes are delivering tangible benefits. The two biggest programmes (working with 70 percent of London’s schools and 10 percent of London’s workforce) have demonstrated:

- Around a 7 percent decrease in car usage for travel to or from schools with a travel plan in place.
- Around a 14 percent decrease in business-related car use across the initial range of businesses that have implemented and reviewed a travel plan.

Examples of how TfL is working with businesses to encourage smarter travel can be found at: <http://www.tfl.gov.uk/assets/downloads/corporate/guide-to-the-corporate-scheme.pdf>.

### **6.7 Carbon dioxide emissions at the local scale**

Effective progress towards CO<sub>2</sub> reduction targets requires comprehensive action across all sources in all parts of London. This means better understanding sources of CO<sub>2</sub> at the local level, the factors underlying these patterns, and the scope for reductions.

Quantities of greenhouse gases from fuel and energy consumption in each London borough are reported in the London Energy and Greenhouse Gas Inventory (LEGGI). Table 6.1 summarises the most recently-available borough-level data from this source. Greenhouse gas emissions are expressed as the equivalent amount of CO<sub>2</sub>, which is the most abundant greenhouse gas.

6. Climate change, CO<sub>2</sub> emissions and local air qualityTable 6.1 Greenhouse gas emissions for individual London boroughs, showing principal sources and per capita emissions for resident population, 2005. CO<sub>2</sub> equivalent.

London Borough	2005 CO <sub>2</sub> eq kilotonnes							Population (000s)	per capita emissions (tonnes)
	Industrial and Commercial	Domestic	Domestic Aviation	Domestic Shipping	Railways	Road Transport	Total		
Barking and Dagenham	312	320	0	2	1	152	787	166	4.75
Barnet	473	823	0	0	10	394	1,701	326	5.21
Bexley	448	521	4	1	1	241	1,215	221	5.50
Brent	539	584	0	0	13	221	1,358	270	5.02
Bromley	369	749	1	0	1	316	1,437	298	4.82
Camden	892	350	0	0	10	150	1,402	223	6.29
City of London	1,134	31	0	0	0	41	1,207	8	156.76
Croydon	574	800	0	0	2	294	1,670	336	4.97
Ealing	575	584	47	0	50	304	1,560	306	5.10
Enfield	445	617	0	0	3	366	1,432	283	5.05
Greenwich	456	450	2	1	0	237	1,147	222	5.17
Hackney	334	390	0	0	2	130	855	207	4.13
Hammersmith and Fulham	577	409	0	1	11	132	1,129	171	6.60
Haringey	312	526	0	0	4	159	1,001	224	4.47
Harrow	314	494	0	0	5	170	982	214	4.59
Havering	318	551	2	0	1	369	1,242	226	5.49
Hillingdon	1,120	565	1,128	0	35	432	3,281	248	13.23
Hounslow	696	491	42	0	0	328	1,557	217	7.19
Islington	674	398	0	0	2	132	1,205	184	6.54
Kensington and Chelsea	666	341	0	0	8	112	1,128	176	6.42
Kingston	225	318	0	0	1	186	729	154	4.74
Lambeth	520	548	0	1	2	184	1,254	270	4.64
Lewisham	373	565	0	0	1	206	1,144	253	4.52
Merton	321	454	0	0	3	178	955	195	4.89
Newham	629	441	24	1	2	180	1,276	250	5.11
Redbridge	245	542	0	0	1	258	1,046	249	4.20
Richmond	370	475	96	0	0	212	1,153	178	6.48
Southwark	1,353	490	1	0	1	226	2,071	264	7.84
Sutton	245	398	0	0	0	131	773	183	4.22
Tower Hamlets	1,456	378	7	1	1	192	2,035	209	9.72
Waltham Forest	307	484	0	0	3	185	978	220	4.44
Wandsworth	569	582	0	0	4	209	1,365	276	4.94
Westminster	2,488	515	1	0	12	295	3,311	229	14.48
<b>Greater London Total</b>	<b>20,325</b>	<b>16,183</b>	<b>1,357</b>	<b>7</b>	<b>192</b>	<b>7,321</b>	<b>45,385</b>	<b>7,456</b>	<b>6.09</b>

Source: Greater London Authority, London Energy and Greenhouse Gas Inventory (LEGGI) 2004/05 (December 2008), for further information: <http://www.london.gov.uk/mayor/publications/2008/12/leggi.jsp>. Note that the source of the above data is different to that used for calculating the total tonnage estimates in Section 6.2.

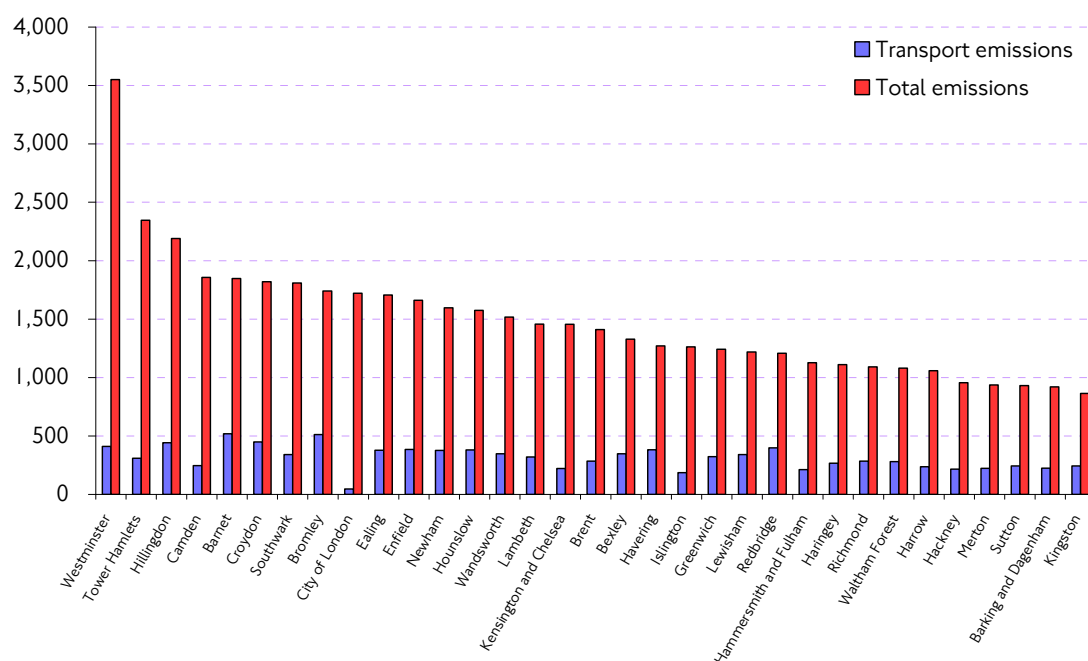
## 6. Climate change, CO<sub>2</sub> emissions and local air quality

By far the highest **per capita** resident emission rates are in the City of London, although this must be regarded as an anomaly with this indicator – reflecting a very low resident population coupled with a very high concentration of commercial activity. **Per capita** emissions rates for most other boroughs lie in the range four to seven tonnes per resident per year, although there is little evidence of pattern, for example comparing Inner London boroughs with Outer London ones.

Currently available indicators such as these are not ideal, firstly in relying on resident populations as an indicator of intensity of emission-generating activity and, secondly, by not reflecting more locally-refined emissions estimates that are potentially available for London using the London Atmospheric Emissions Inventory. For 2009 TfL will work to refine the borough-level estimates of CO<sub>2</sub> emissions to reflect conditions in London more appropriately.

Finally, Figure 6.6 demonstrates how local-scale emissions statistics can be used to understand the relative scale of the contribution from different activities to total CO<sub>2</sub> emissions. It shows ground transport CO<sub>2</sub> emissions as a proportion of total CO<sub>2</sub> emissions. Of interest here is the degree of variation about the overall 22 percent contribution of ground-based transport to CO<sub>2</sub> emissions at the London-wide level. The City of London is again a clear outlier – reflecting the characteristics of non-transport based activity here.

Figure 6.6 Comparison between total carbon dioxide emissions and transport emissions by borough (tonnes), 2006.



Source: Greater London Authority, London Energy and Greenhouse Gas Inventory (LEGGI) 2004/05 (December 2008), for further information: <http://www.london.gov.uk/mayor/publications/2008/12/leggi.jsp>

## 6.8 Local air quality

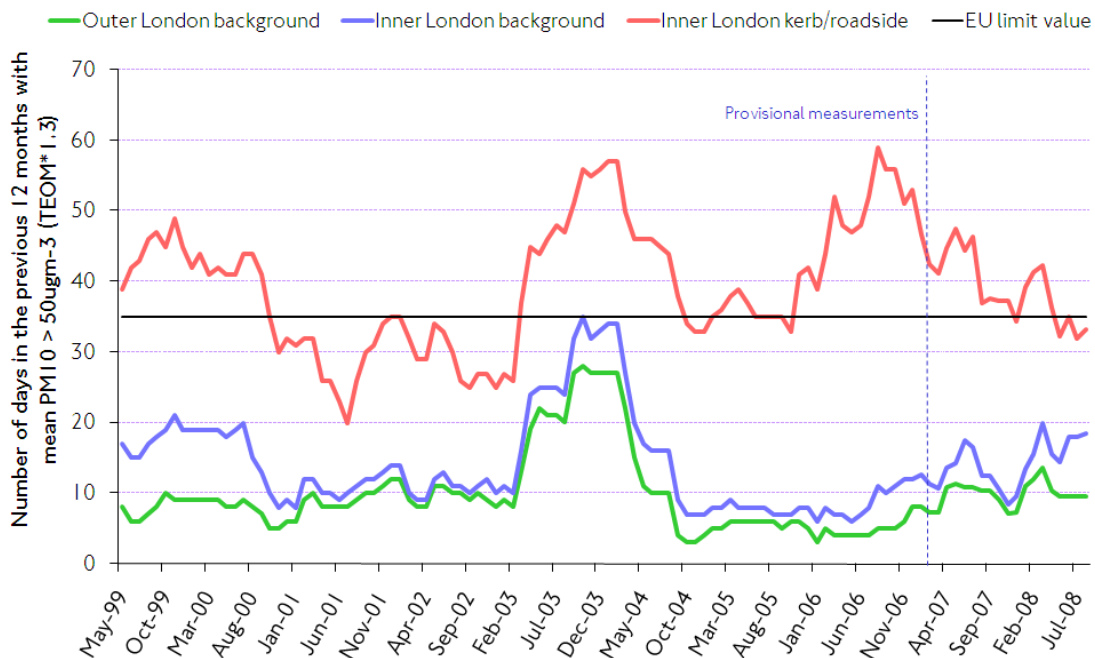
### Fine particles – PM<sub>10</sub>

The National Air Quality Strategy has a health-based objective for PM<sub>10</sub> of 50µgm<sup>-3</sup>, measured as a daily mean not to be exceeded on more than 35 days per year, applicable from the end of 2005. This is also the European Union limit value.

Some locations, particularly in central and Inner London close to major roads, still exceed this objective, and the trend since year 2000 has been variable. Figure 6.7 shows PM<sub>10</sub> ‘exceedence days’ expressed as a running annual mean, as an average for representatively-located groupings of air quality measurement sites (see also London Air Quality Network: <http://www.londonair.org.uk/>).

As is to be expected with this particular statistic, the influence of differing weather between the years is apparent, with particularly hot, dry summers in 2003 and 2006 leading to prolonged anticyclonic air pollution ‘episodes’. Although, when expressed as an average across several sites, most of Inner and Outer London records exceedence values that comply with the air quality objective, there is much variability at individual sites and, at roadsides and kerbsides in Inner London, there are still exceedences of the objective. Furthermore, it is difficult from the figure to discern a clear long-run trend of improvement in PM<sub>10</sub> exceedences at all London site groupings.

Figure 6.7 Annual number of days when PM<sub>10</sub> exceeded 50µgm<sup>-3</sup>, representative London air quality monitoring site groupings.



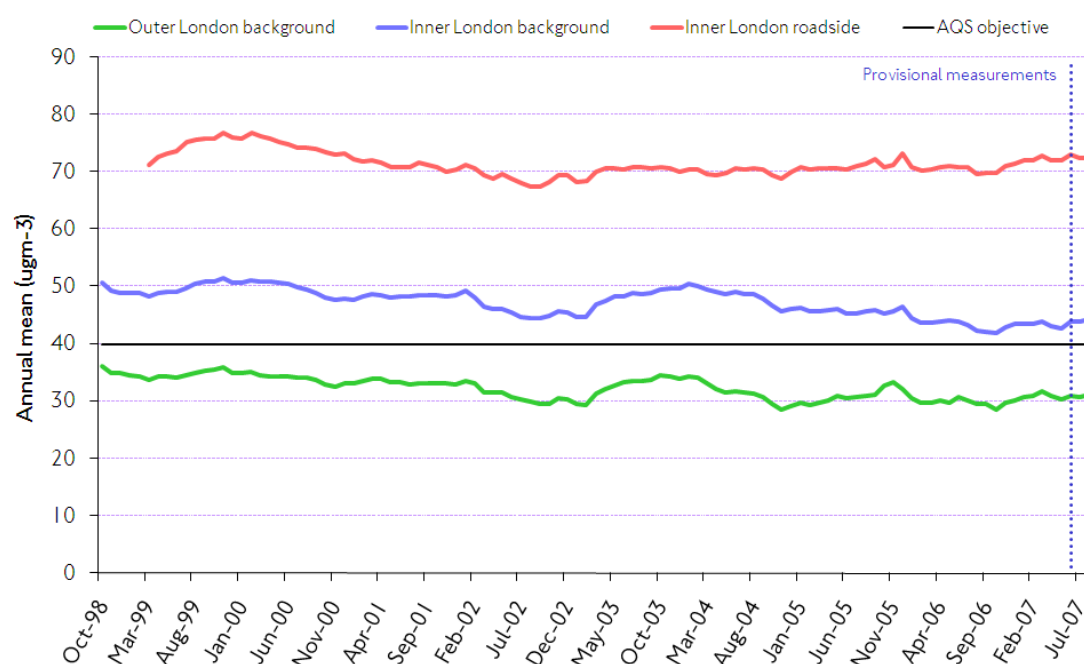
Source: London Air Quality Network and King's College London

## Nitrogen dioxide – NO<sub>2</sub>

The National Air Quality Strategy stipulates an annual mean NO<sub>2</sub> objective of 40µgm<sup>-3</sup>. Figure 6.8 shows the long-run trend in concentrations, as running annual mean average concentrations, for the same geographical monitoring site groupings as used for PM<sub>10</sub> (above).

The annual mean NO<sub>2</sub> objective has been exceeded consistently at both Inner London background and roadside sites, while at Outer London background sites the annual mean NO<sub>2</sub> objective has been achieved since 1998. While it is possible to discern a slow long-run trend towards reduced NO<sub>2</sub> concentrations, these have not reduced as far or as fast as would have been expected, given substantial reductions to emissions of nitrogen oxide (NO<sub>x</sub>) over the same period. This is thought to be primarily due to increased ‘direct’ emissions of NO<sub>2</sub> from diesel-engined vehicles, whereas most NO<sub>2</sub> arises from chemical conversion of NO<sub>x</sub> in the atmosphere. As with PM<sub>10</sub>, continued exceedences of air quality objectives for NO<sub>2</sub> remain an area of concern.

Figure 6.8 Running annual mean nitrogen dioxide (NO<sub>2</sub>) levels, representative London air quality monitoring site groupings.



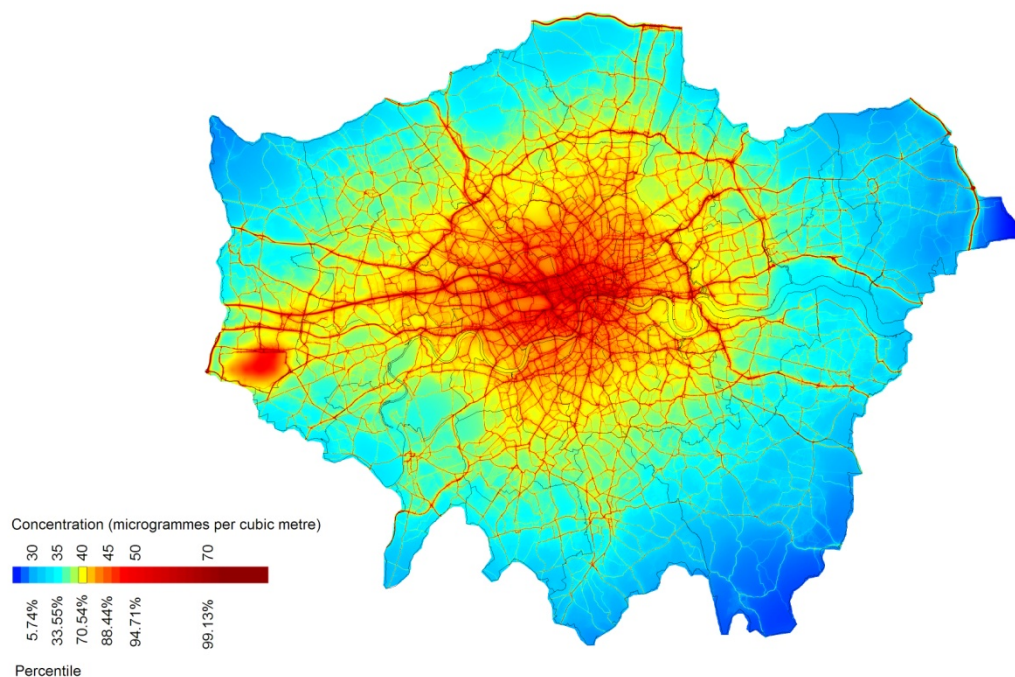
Source: London Air Quality Network and King's College London



Figure 6.9 shows how concentrations of NO<sub>2</sub> vary across Greater London. On the basis of this indicative projection for 2004, reflecting meteorological conditions in 2003 (which gave rise to several notable pollution ‘episodes’, and which might be considered a ‘worst case’ meteorological scenario), areas in yellow and red exceeded the UK National Air Quality Strategy Objective. This affected much of central and Inner London, reflecting the road network, and the area around Heathrow airport.

Figure 6.9 Indicative NO<sub>2</sub> concentrations for 2004. London Atmospheric Emissions Inventory (2004 release). 2003 meteorology.

Modelled 2004 Annual Mean NO<sub>2</sub> Concentration (microgrammes per cubic metre), based on 2003 Meteorology and the LAEI 2004



Source: London Atmospheric Emissions Inventory, Greater London Authority

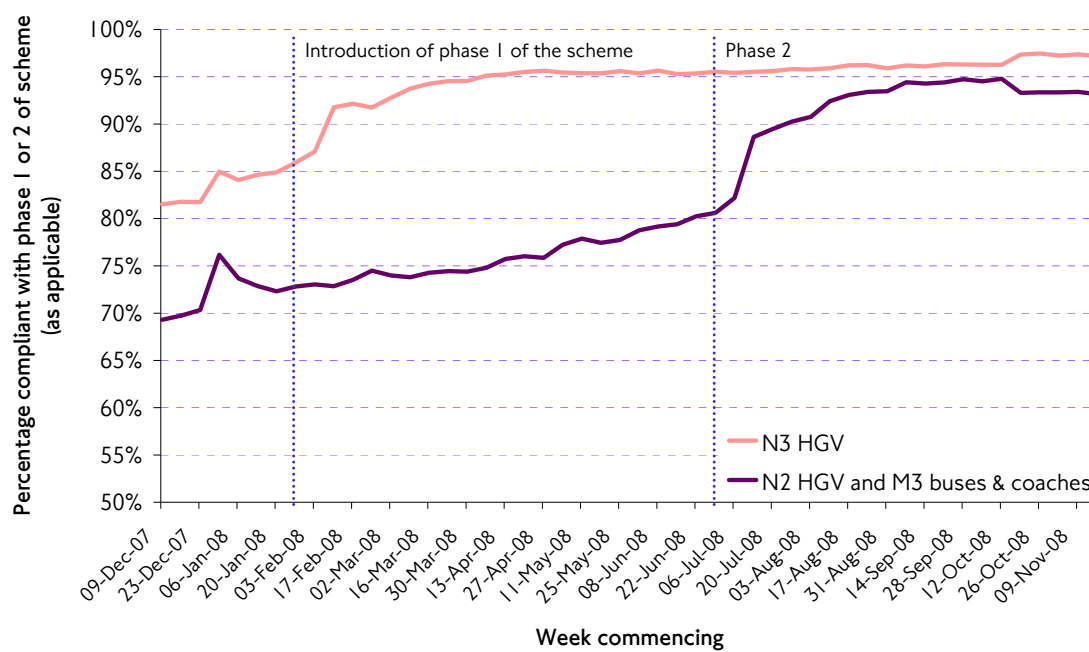
## 6.9 The London Low Emission Zone

During 2008 TfL implemented the first two phases of the London Low Emission Zone (LEZ). This scheme, covering the large majority of the Greater London area, is aimed at helping London move towards meeting national and European local air quality objectives for fine particulate matter (PM<sub>10</sub>) and nitrogen dioxide (NO<sub>2</sub>). The scheme requires operators of heavier goods vehicles and larger buses and coaches, to meet minimum emissions standards – based on the ‘Euro’ emissions classification. Compliance with the requirements of the scheme is measured through a network of number plate reading cameras. A full description and impacts assessment of the initial stages of the scheme was produced by TfL in July 2008 (*London Low Emission Zone: Baseline Monitoring Report*).

## 6. Climate change, CO<sub>2</sub> emissions and local air quality

Figure 6.10 below updates the trend in vehicle compliance with the scheme, covering the settled implementation of the second phase of the scheme (buses and coaches) from July 2008. Further details relating to this scheme can be found at: <http://www.tfl.gov.uk/roadusers/lez/default.aspx>.

Figure 6.10 London Low Emission Zone, trend in the proportion of affected vehicles that are compliant with requirements of scheme.



Compliance levels for vehicles ‘in-scope’ for the first phase of the scheme climbed to above 95 percent shortly following implementation in February 2008. Equivalent compliance based on kilometres travelled is higher – consistently at 98 percent of in-scope vehicles. Vehicle-based compliance rates for those vehicles in-scope for the second phase of the scheme from July 2008 also climbed rapidly after implementation, settling at just below 95 percent.

### 6.10 TfL’s contribution to emissions of local air quality pollutants

TfL measures the contribution to emissions of local air quality pollutants from its own activities on an annual basis. A summary of these recent measurements is given in Table 6.2. The overall trend for most of these measures is steadily downwards, reflecting established initiatives under the Air Quality Strategy of the Mayor of London.

Table 6.2 Recent trend for emissions of local air quality pollutants from TfL's activities.

Mode or business unit	NO <sub>x</sub>			PM <sub>10</sub>		
	Total emissions (tonnes)			Total emissions (tonnes)		
	2005/06	2006/07	2007/08	2005/06	2006/07	2007/08
London Underground	29.3	7.22	8	1.06	-	-
London bus network	6,356	6,293	6,288	12	11	12
Bus permits and agreements	123	137	146	3	2	2
Taxis	854	722	698	89	74	51
Private hire vehicles	711	651	635	49	45	44
Dial-a-Ride	36	36	37	1	1	1
London River Service	298	265	295	32	29	32
Victoria Coach Station	0.11	0.1	0.11	0.02	-	-
London Streets	4.31	-	-	0.27	-	-
London Overground	-	-	17	-	-	0.46

Source: TfL Environment Report

- PM<sub>10</sub> emissions in 2007/08 have reduced by 12 percent across TfL networks from the previous year. Taxis, which account for around one-third of TfL's attributable PM<sub>10</sub> emissions, recorded a 30 percent reduction. This was a result of older vehicles being replaced or retrofitted with pollution abatement equipment, such as particle filters, to meet higher European emissions standards.
- Across the TfL group, total NO<sub>x</sub> emissions in 2007/08 were similar to the previous year but there was a 1 percent decrease in emissions per bus passenger kilometre. This is largely due to improvements to the emissions performance of the bus fleet, which accounts for more than three quarters of TfL's total attributable NO<sub>x</sub> emission.



## 7. Focus on cycling

### 7.1 Introduction

Encouraging more Londoners to use bicycles is a key element of the new Mayor's transport vision for London. This section looks at some available statistics describing pedal cycle volumes and trends, and also exemplifies some indicators through which the propensity of Londoners to use their bicycles can be better understood.

### 7.2 Key features and trends

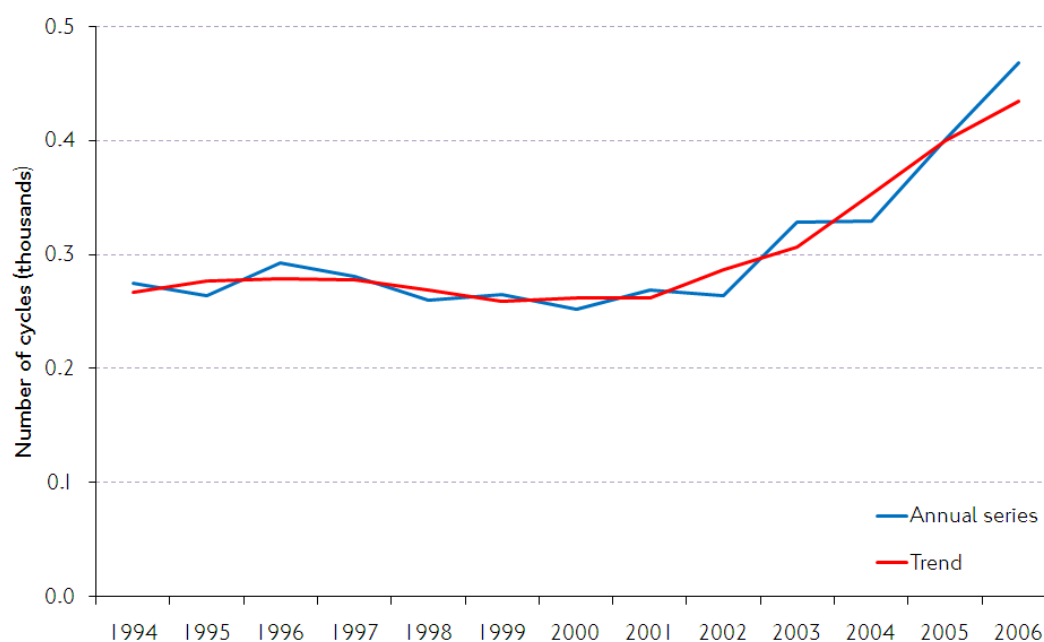
- The mode share of cycling in London has increased considerably since 2000. Its mode share, however, continues to represent a relatively low proportion of travel. Cycling now accounts for 2 percent of trips in London, compared to 1.2 percent in 2000.
- The increase in cycling's mode share is equal to 13 percent of the fall in private motorised traffic mode share. This is based on the mode share information for trips in Tables 2.1 and 2.2.
- On the TfL road network between 2000/01 and 2007/08, 91 percent more cyclists were observed passing selected counting points.
- About one-third of Londoners' cycle trips are to or from work. Trips for leisure and for shopping or personal business each account for a further quarter of Londoners' cycle trips. Education-related trips, including escort, account for about 10 percent of cycling trips.
- Propensity to cycle shows distinct patterns by area of London. Highest levels of cycling, in terms of trips per resident, are generally to be found in south west London.
- However, the highest cycling trip rates are to be found among trips starting in the London borough of Hackney. In the London Travel Demand Survey of 2005 to 2008 this was found to be about ten times as high as trips starting in boroughs with the lowest rates.
- No doubt there are many geographic, social and local policy factors underlying these patterns – but there is apparent scope to increase cycling levels, given appropriate local circumstances and provision.

### 7.3 Cycle volumes

This section looks at data relating to trends in cycle use on the London road network. Figure 7.1 shows average daily two-way cycle flows on London's major roads since 1994. The trend was effectively flat between 1994 and 2001, but then increased such that average daily flows in 2006 were about 70 percent higher than at the turn of the millennium.

## 7. Focus on cycling

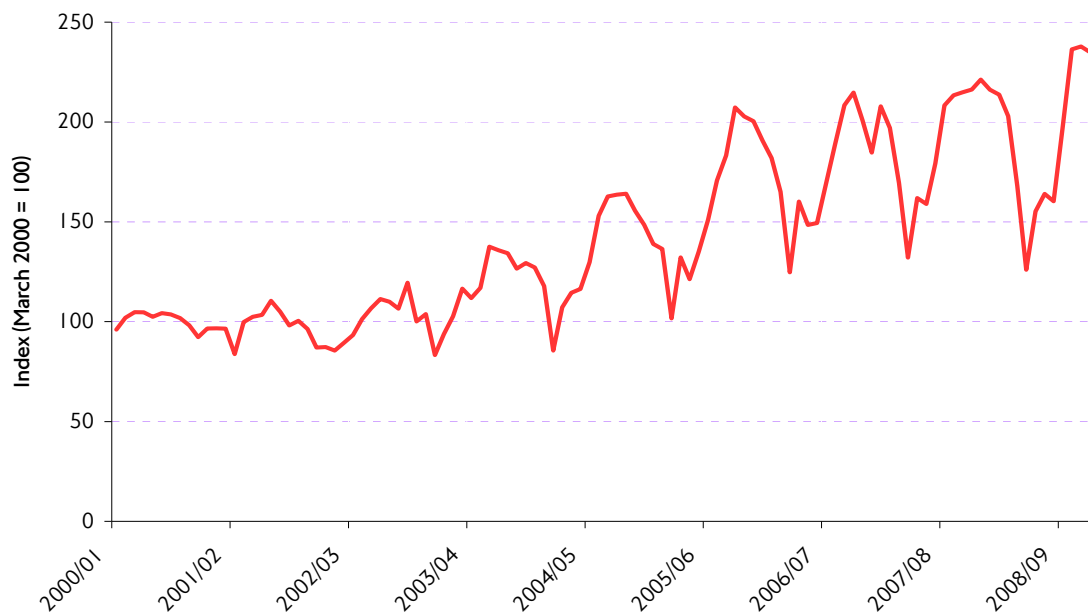
Figure 7.1 Average daily cycle flows on major roads in London.



Source: National Road Traffic Survey, DfT  
1. Major roads include trunk and principal roads.

Higher increases have been recorded by TfL's permanent automatic cycle counters on selected sections of the TfL road network. Average flows here were 91 percent higher in 2007/08 compared to 2000/01 (Figure 7.2). One feature of these continuous data is that seasonal variations in cycle volumes can be clearly appreciated – cycling choice is clearly influenced by seasonal weather and flows during the winter are typically 25 percent lower than in summer.

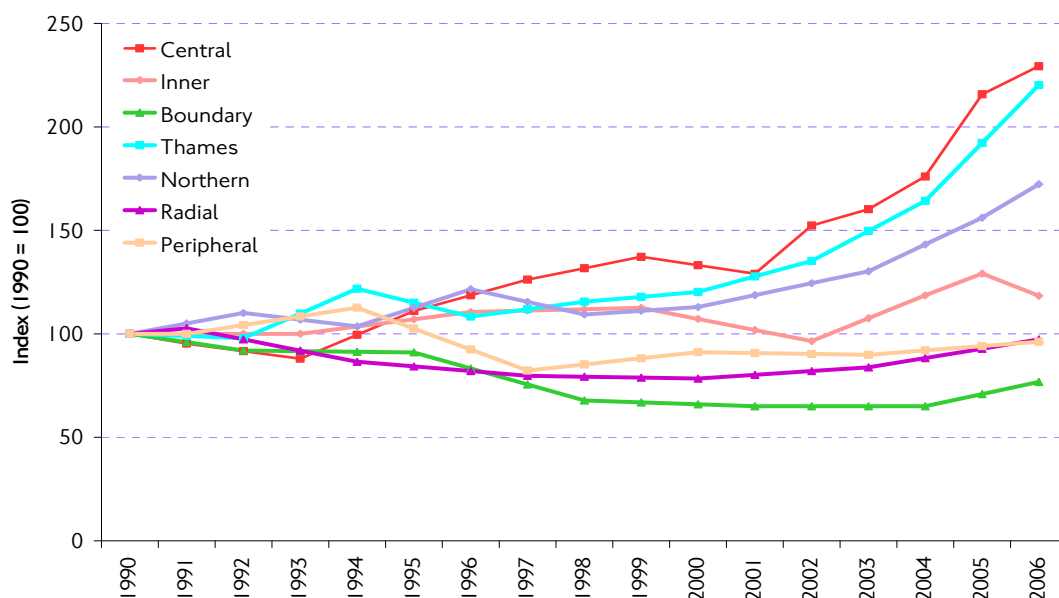
Figure 7.2 Cycle flows at selected sites on the Transport for London Road Network.



Source: TfL Road Network Performance automatic cycle counters

Returning to TfL's strategic cordon and screenline counts (see also Figure 2.8), Figure 7.3 shows long-run trends for numbers of pedal cycles, indexed to 1990. The picture here is somewhat variable, with strong increases seen over the central cordon and Thames screenline (the latter including all river crossings within Greater London). However, indicators of cycle volumes in Outer London (radial and peripheral screenlines, and the Outer London 'Boundary' cordon) show a declining trend throughout the 1990s, with compensating growth over more recent years.

Figure 7.3 Trend in pedal cyclist flows across TfL strategic cordons and screenlines. Index values based on 1990 = 100.



## **7.4 How and why do Londoners use their bicycles ?**

The London Travel Demand Survey (LTDS – see also Section 9 of this report) covers all modes of transport. At the level of the specific mode of transport, it can be used to answer questions such as ‘who typically uses it and why?’. At the level of the individual, it can be used to answer questions such as ‘what characteristics do I have that are associated with use of this specific mode?’ or, more pertinently, not using this mode.

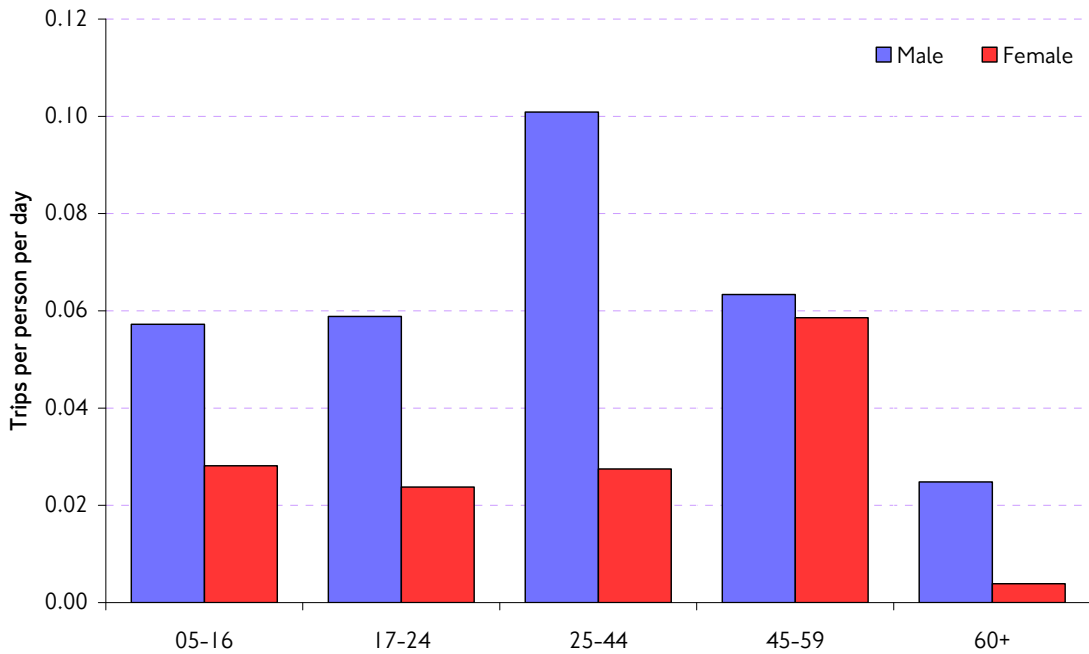
In pursuing the transport priorities of the new Mayor of London, with his emphasis on increasing cycling by Londoners, it is of interest to exemplify the range of insights that can be gained from LTDS relating to how London residents currently use their bicycles. The LTDS database can also be analysed to add detail on the characteristics of people who cycle and their patterns of cycle use.

### **Men and women, young and old?**

Figure 7.4 shows the average daily number of cycle trips made by Londoners of different gender and age groups. Men make more cycle trips than women, with the highest rates found among men of working age.



Figure 7.4 Average number of cycle trips by gender and age group.

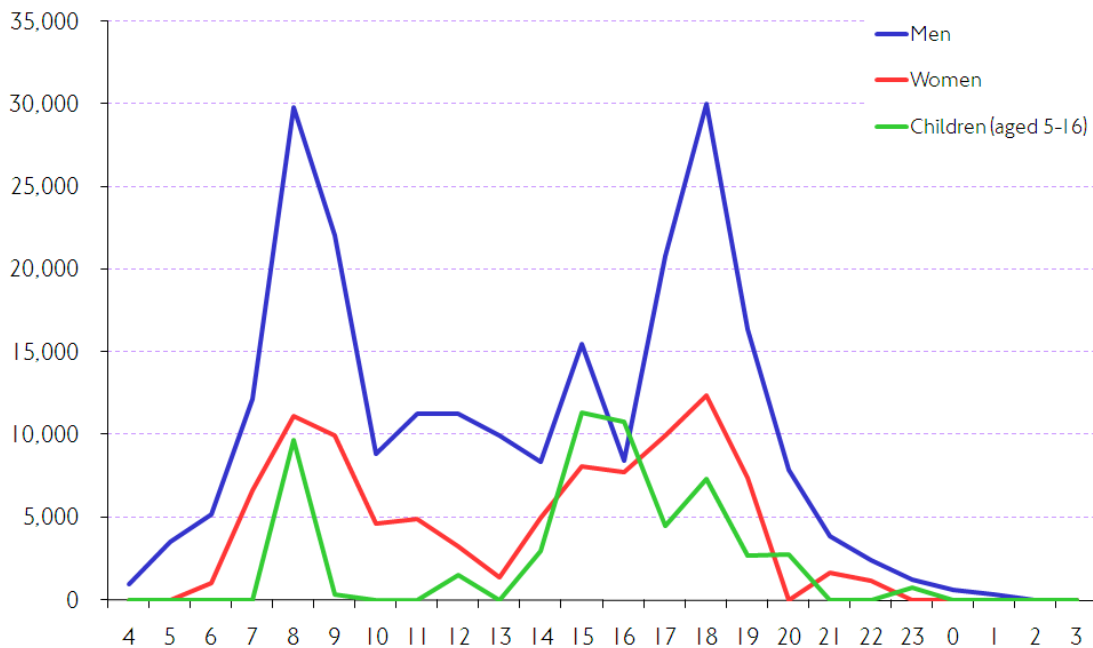


Source: LTDS 2007/08 Household Survey

### When do people ride their bicycles?

Figure 7.5 is an hourly profile (for weekdays) of Londoners' trips by bicycle. The gender differences referred to above are clearly visible, and distinct peaks in bicycle use correspond to the times when people make trips to and from work – highlighting the importance of cycling as a commuting mode. The morning and afternoon peaks for children also correspond to the journey to and from school.

Figure 7.5 Weekday trips by bicycle by hour of day.



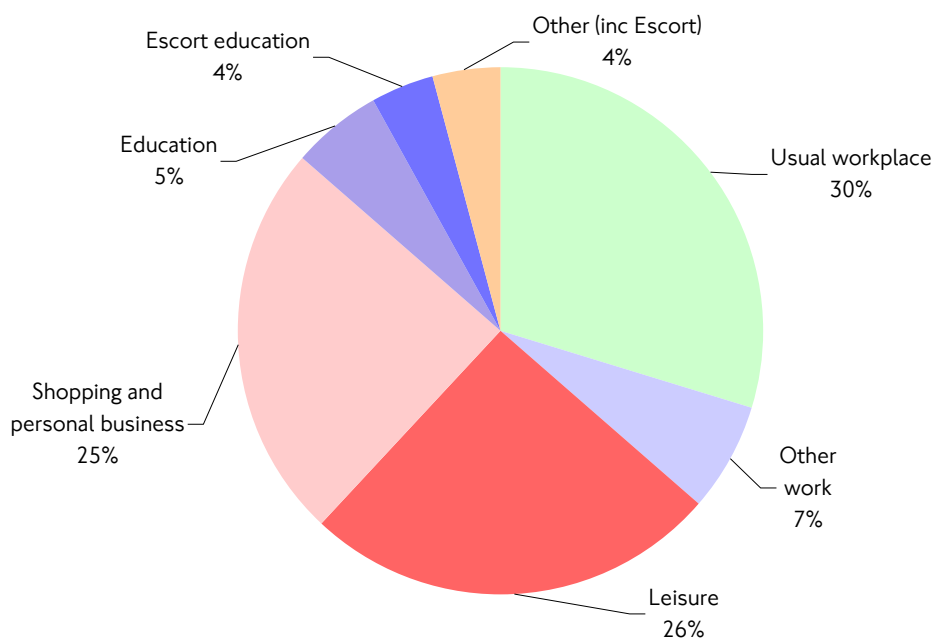
Source: LTDS 2007/08 Household Survey

## 7. Focus on cycling

### Trip purposes

Figure 7.6 shows the purpose split for cycle trips. The three key purposes for which Londoners cycle, each accounting for between one quarter and one third of all cycle trips are: commuting between home and work, leisure, and shopping/personal business. Across all Londoners aged five or over, only 5 percent of cycle trips are for education, although this rises to almost 10 percent when escort-education trips are taken into account.

Figure 7.6 Distribution of cycle trips by purpose (7-day week).



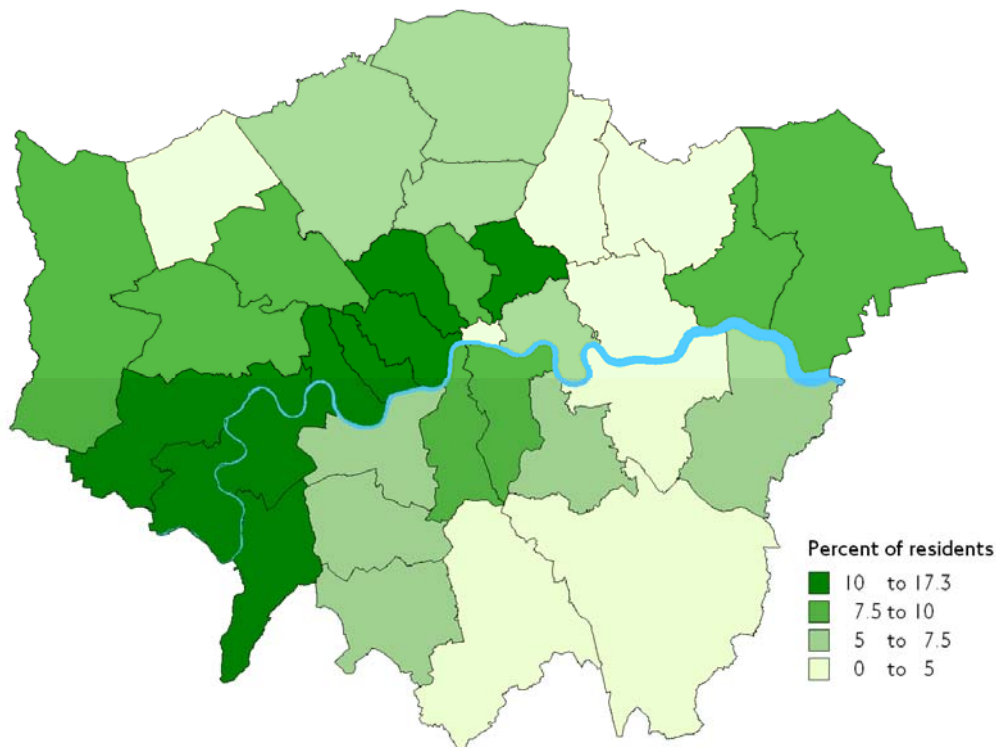
Source: LTDS 2007/08 Household Survey

### How do individual boroughs compare?

Figure 7.7 shows, by borough, the percentage of residents who cycle on at least two days per week. Frequency of cycling is highest for residents of some Inner London boroughs – especially Hammersmith and Fulham, Hackney, Westminster, Kensington and Chelsea and Camden – and, in Outer London, Richmond, Kingston and Hounslow.

The tendency to cycle seems to follow a geographical sector pattern, with the higher levels towards the south west of London, rather than a clear division between Inner and Outer London. It is the case, however, that overall cycling trip rates are higher in Inner London than Outer London. Even within boroughs with the highest levels of cycling, fewer than one in five residents cycles more than twice a week.

Figure 7.7 Percentage of residents who cycle on at least 2 days a week by borough of residence, 2007/08.



Source: LTDS 2007/08 Household Survey

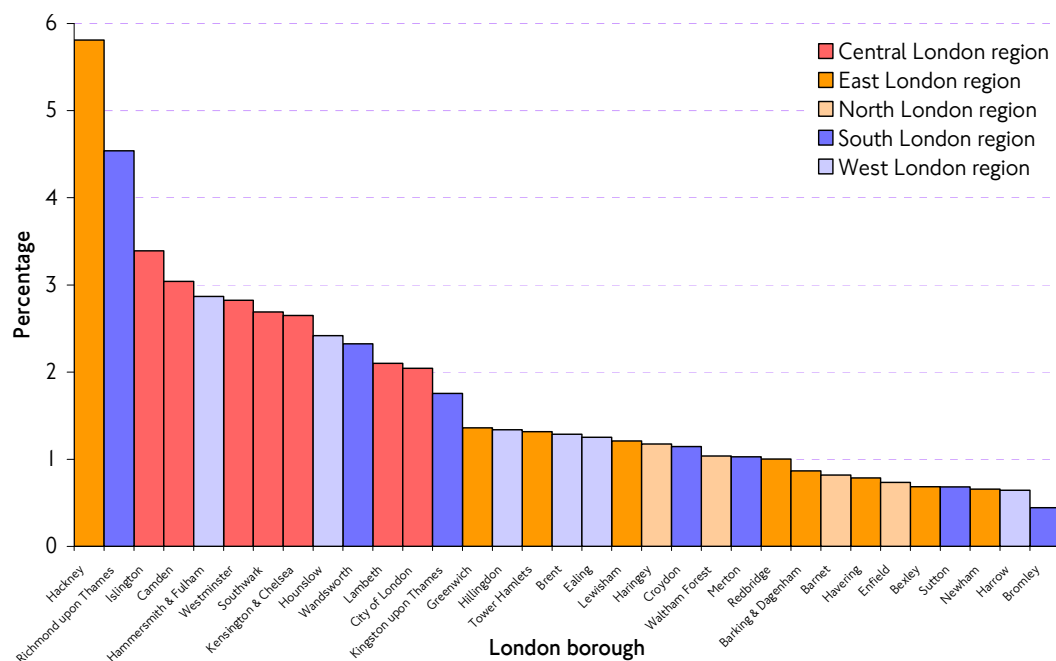
Figure 7.8 shows boroughs ranked from left to right in terms of the percentage share of all trips that originate in that borough which are made by bicycle. Bars are also colour-coded by London region (see Section 3.3 for definitions). The highest proportionate share of cycle trips in the survey period are for trips originating in Hackney (5.8 percent of all trips). The lowest proportionate share is to be found in Bromley (0.4 percent of all trips).

In terms of London regions, boroughs comprising the central London region tend to occupy the higher end of the distribution – generating comparatively high cycle mode shares. Boroughs comprising the East and North regions, by contrast, tend to be found towards the lower end of the distribution. Boroughs comprising South and West regions are more evenly spread throughout the distribution, reflecting a greater diversity among these groupings in terms of cycle mode shares.

Most striking however, from Figure 7.8, is that cycling mode shares for trips generated in boroughs at the highest end of the distribution are about ten times as high as those boroughs at the other extreme – suggesting clear scope to increase cycle mode share in these ‘low share’ boroughs, though there are many geographical, social and local policy factors underlying these patterns.

## 7. Focus on cycling

Figure 7.8 Cycling trips as percentage of all London residents' trips by borough of trip origin, 2005/06 to 2007/08.

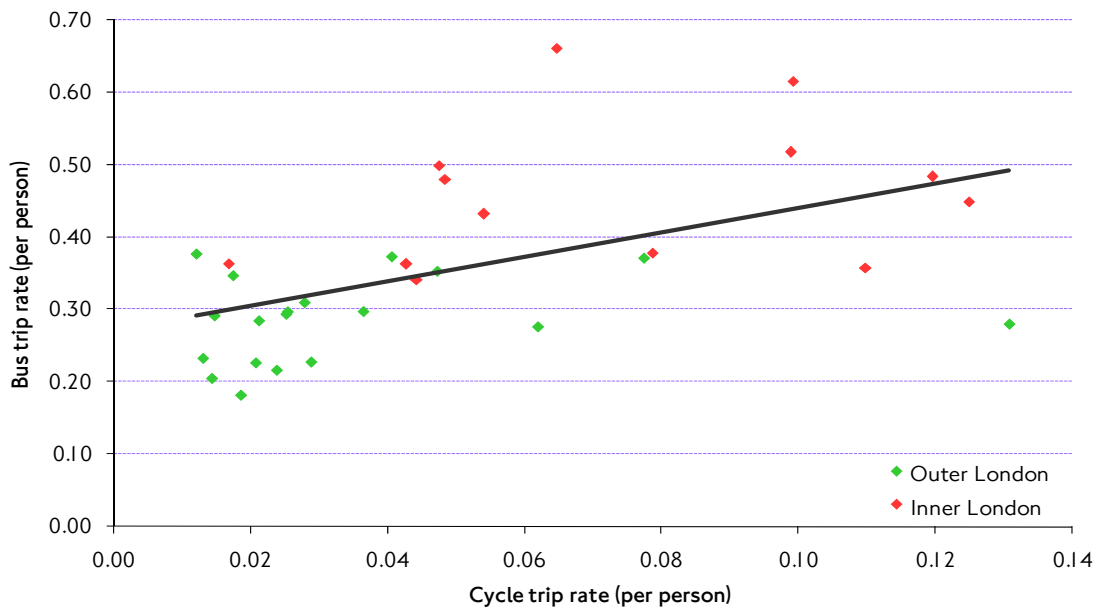


Source: LTDS 2007/08 Household Survey

### Relationship of cycling to wider travel behaviour – bus use and household car ownership

Figure 7.9 shows how propensity to make cycle trips compares to that for bus trips for residents of individual London boroughs. Boroughs are colour-coded to reflect Inner and Outer London. A simple 'best fit' trend line is also shown. This is one of many possible exploratory analyses using LTDS data. It shows clear groupings of boroughs – relatively low bus and cycle use in Outer London, and an opposing pattern for Inner London. Notable is the degree of scatter for Inner London boroughs – suggesting a loose overall relationship to bus trip rates here, with other factors being primarily responsible for variability between boroughs.

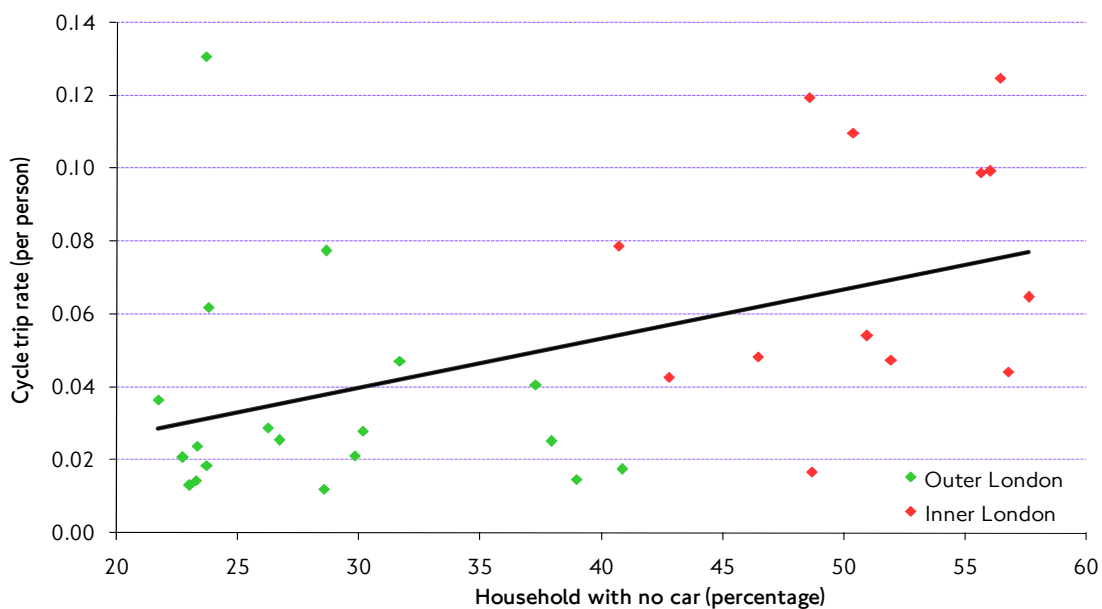
Figure 7.9 Borough bus trip rates by cycle trip rates, LTDS analysis for 2005/06 to 2007/08.



Source: LTDS Household Survey

Figure 7.10 shows the cycle trip rate per person by London boroughs with respect to the percentage of households without access to a car in that borough. Although this suggests – in a very simplistic sense – a close correlation between propensity to own a car and to make cycle trips, there are many other factors at work – such as different average household sizes and public transport provision between Inner and Outer London – that will also have a role in ‘explaining’ this relationship.

Figure 7.10 Borough cycle trip rate by car ownership, LTDS analysis for 2005/06 to 2007/08.



Source: LTDS Household Survey



## 8. The movement of goods

### 8.1 Introduction

This section looks at selected indicators of freight movement in London.

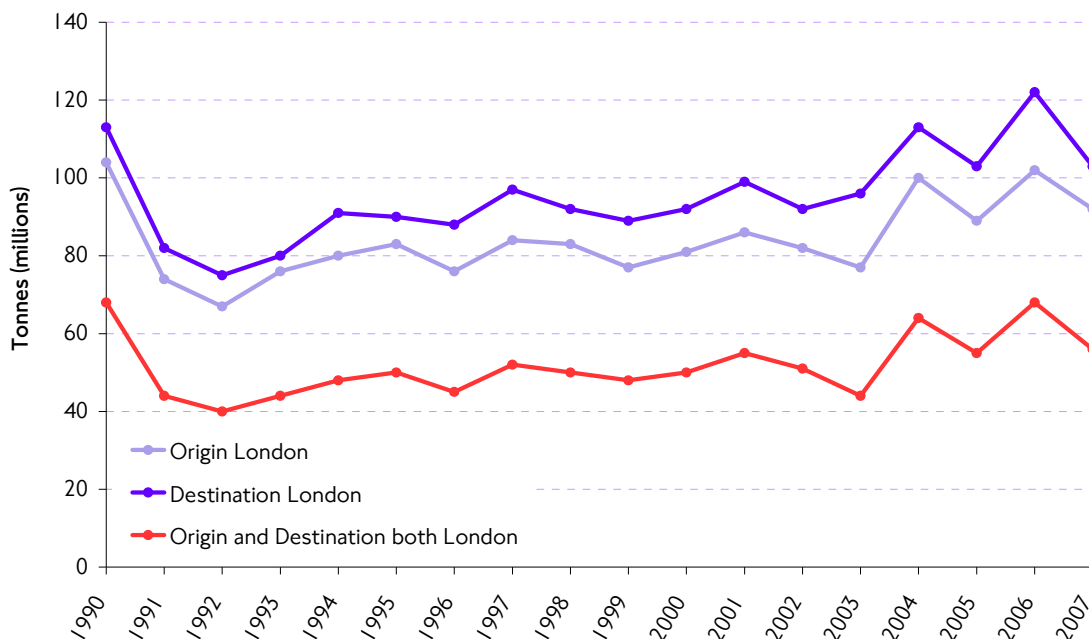
### 8.2 Key features and trends

- The amount of freight lifted on London's roads decreased in 2007, by 11 percent relative to 2006. However, the prevailing trend over recent years has been for a gradual increase in road freight volumes. In total, 139 million tonnes were lifted, with 56 million of this moving wholly inside London, 47 million entering London from outside and 36 million tonnes originating in London for other destinations.
- The trend for road freight vehicle kilometres operated in London has broadly followed that for tonnage lifted, but with a move towards lighter goods vehicles.
- Waterborne freight handled at the Port of London amounted to 53 million tonnes in 2007. London was the second highest ranking port in the UK in terms of weight of cargo handled, although much of this traffic passes through the port of Tilbury, which is outside the Greater London boundary.

### 8.3 Road freight

The amount of freight lifted on London's roads decreased in 2007, following a peak in 2006 (Figure 8.1). In total, 139 million tonnes were lifted, with 56 million of this moving wholly inside London, 47 million entering London from outside and 36 million tonnes originating in London for other destinations.

Figure 8.1 London road freight lifted.

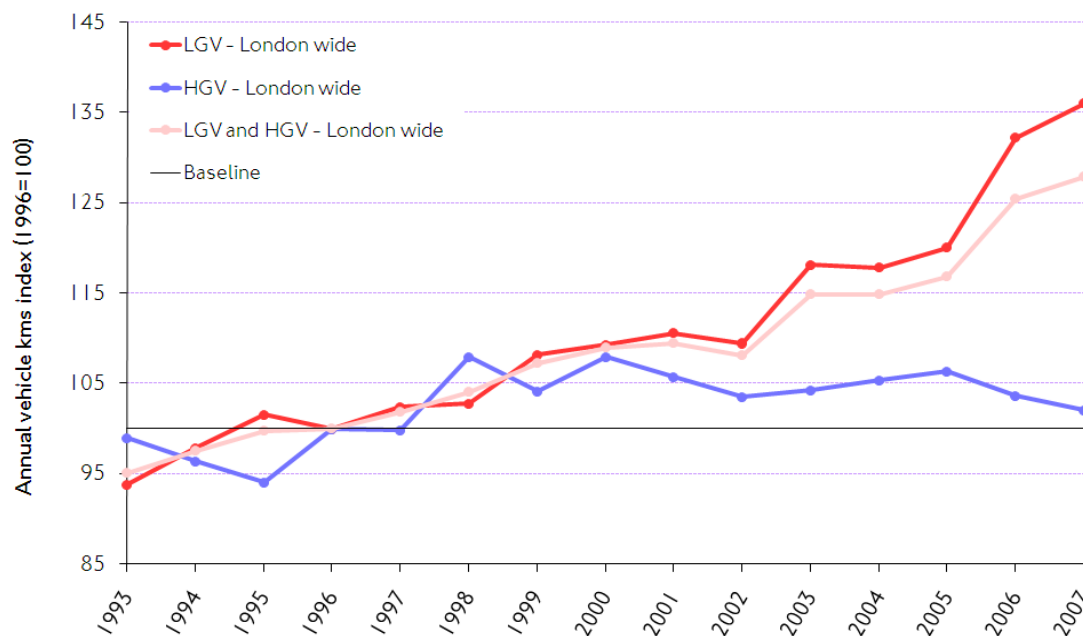


Source: DfT Continuing Survey of Road Goods Transport

## 8. The movement of goods

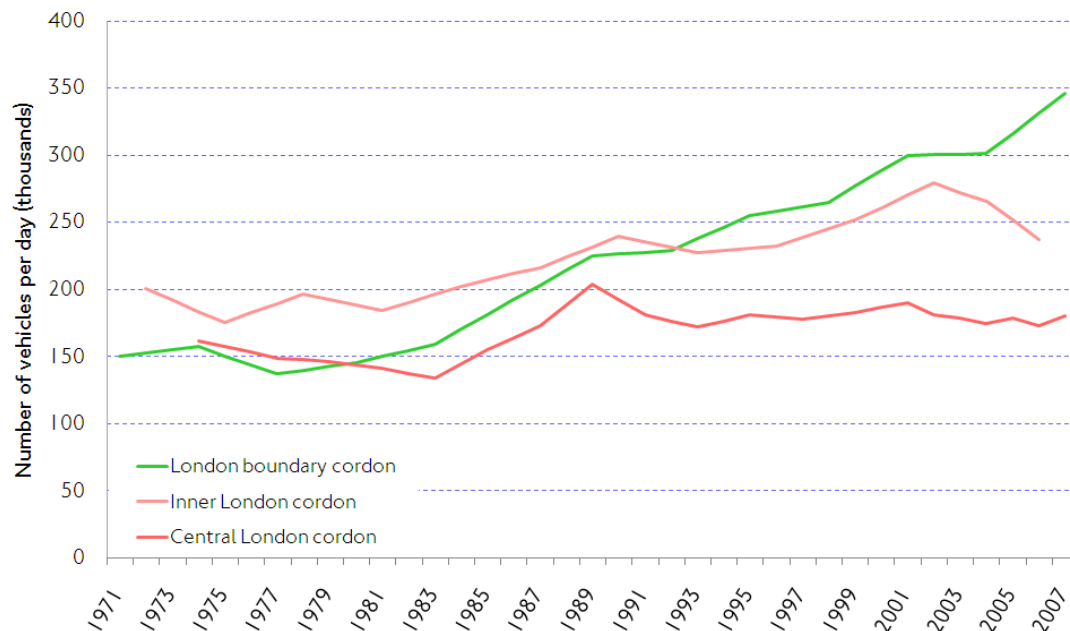
The trend for road freight vehicle kilometres operated in London has broadly followed that for freight tonnage, as shown by Figure 8.2, although there has been a move towards greater use of lighter goods vehicles.

Figure 8.2 Goods vehicle total annual kilometres travelled.



Source: Based on data from the Department for Transport

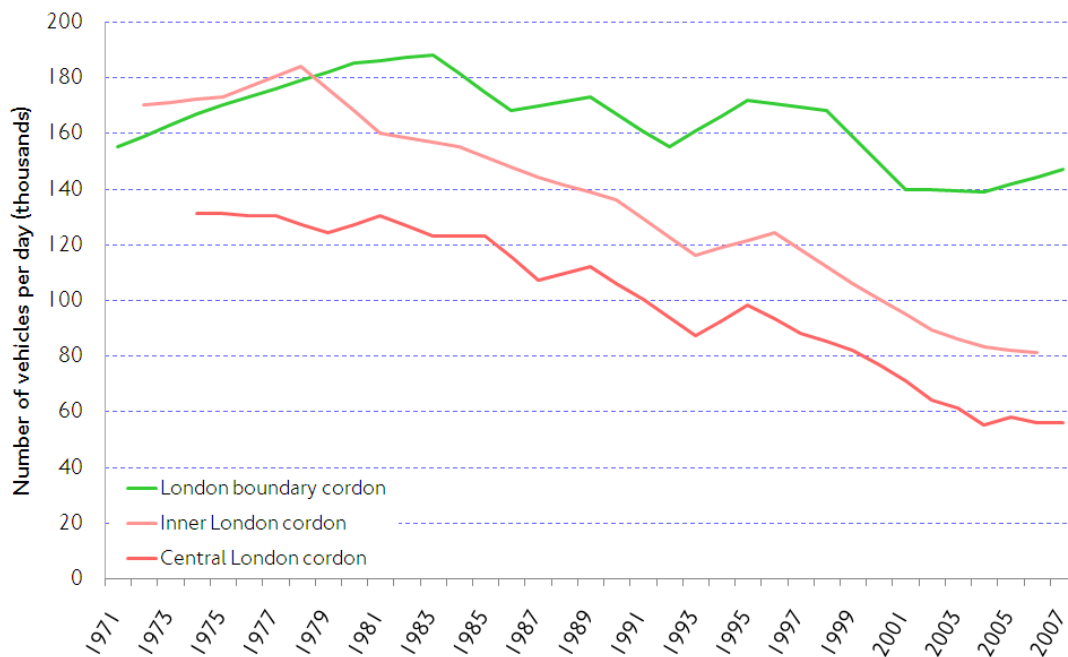
Figure 8.3 Long-term trends in goods vehicles across three strategic cordons in London: light goods vehicles (24-hour weekdays, both directions)



Source: TfL cordon counts



Figure 8.4 Long-term trends in goods vehicles across three strategic cordons in London: heavy and medium goods vehicles (24-hour weekdays, both directions)



Source: TfL cordon counts

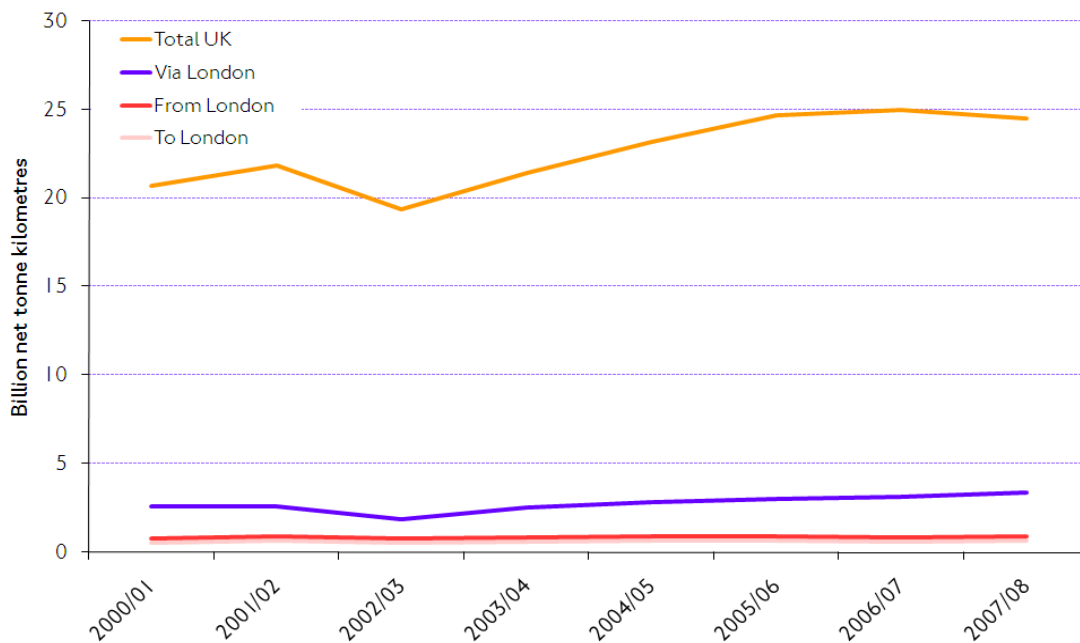
Similar trends are shown by the counts of goods vehicles crossing the strategic cordons in London (defined in Section 2.11, and Figure 2.8). These show (Figure 8.3) that vans, defined as light goods vehicles under 3.5 tonnes gross vehicle weight, crossing the London boundary cordon have doubled since 1973 and increased by 25 percent between 1999 and 2007. Flows of vans also increased at the Inner London cordon until 2002, but have since declined in line with the trend in Inner London traffic.

At the central London cordon van flows have been almost constant since the early 1990s, despite the decline in car traffic over the same period especially since the introduction of congestion charging in 2003. In contrast, medium and heavy goods vehicles have declined at all three cordons over the period since the early 1980s. It is likely that these trends reflect a switch by operators to using smaller vehicles more suited to London traffic conditions and restrictions on daytime deliveries by heavy vehicles. Some growth in van traffic is also due to increased use of vans for personal travel as alternatives to household cars.

## 8.4 Rail freight

Rail freight is conveyed by privately-owned companies who do not publish detailed data regarding freight lifted or moved. However, the Office of Rail Regulation (ORR) publishes data covering the whole of the UK, by commodity. Furthermore, it is possible to estimate the traffic to, from and via London by using data from the London Freight Study and applying it to ORR totals by commodity. Generally, 10 percent of all rail freight moved travels via London, with only 3 percent of this reflecting goods with a destination in London, and 1 percent with an origin in London. The amount of rail freight moving through London has recently grown at around 10 percent per annum.

Figure 8.5 Rail freight trends in London.



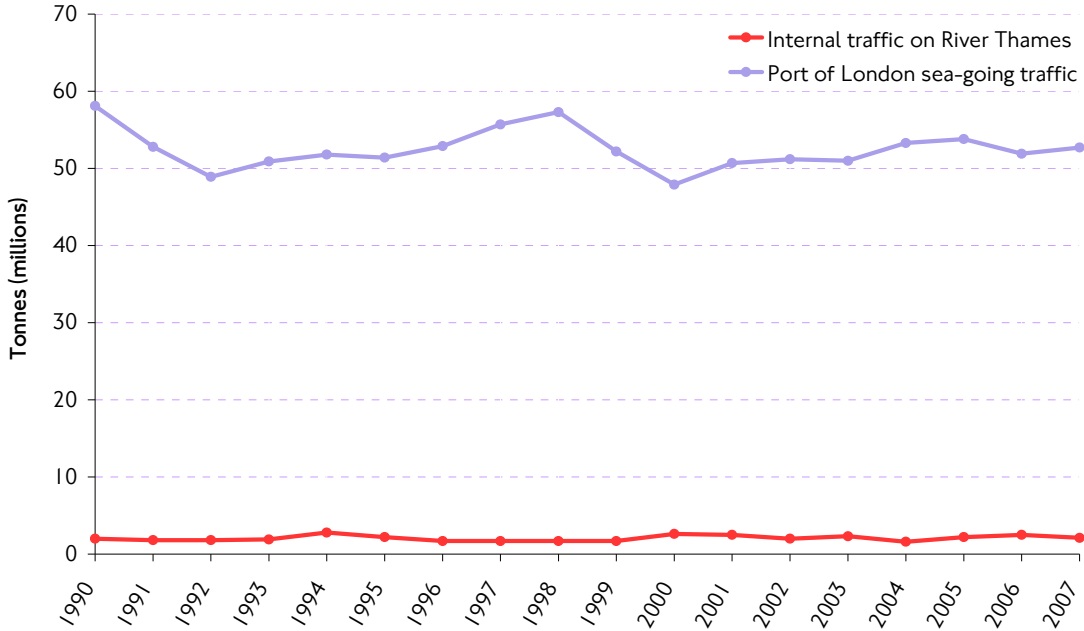
Source: TfL, based on data from the Office of Rail Regulation

## 8.5 Waterborne freight

By contrast, volumes of waterborne freight have remained relatively stable (Figure 8.6). Freight carried by water is of two distinct kinds, sea-going freight handled in the Port of London and inland waterway freight on the Thames. While the former is much greater in terms of weight of cargo handled, the latter is also important because it relates to the use of the Thames as a transport network for the movement of goods within London and the surrounding area. Internal inland waterway freight lifted amounted to 2.1 million tonnes in 2007, down from 2.5 million tonnes in 2006.

Water freight handled at the Port of London amounted to 52.7 million tonnes in 2007. In terms of tonnes of freight, London was the second highest ranking port in the UK, after Grimsby/Immingham. About two-thirds (in terms of tonnage) of sea-going freight consists of bulk cargoes, of which 14.5 million tonnes was dry bulk, 12.9 million oil products and 6.4 million other liquid bulk. Unitised freight amounted to 15.9 million (7.0 million in containers and 8.9 million in roll on/roll off vehicles and trailers). Much of this traffic passes through the port of Tilbury outside the Greater London boundary or through terminals further downstream in the Thames estuary.

Figure 8.6 London water freight lifted.

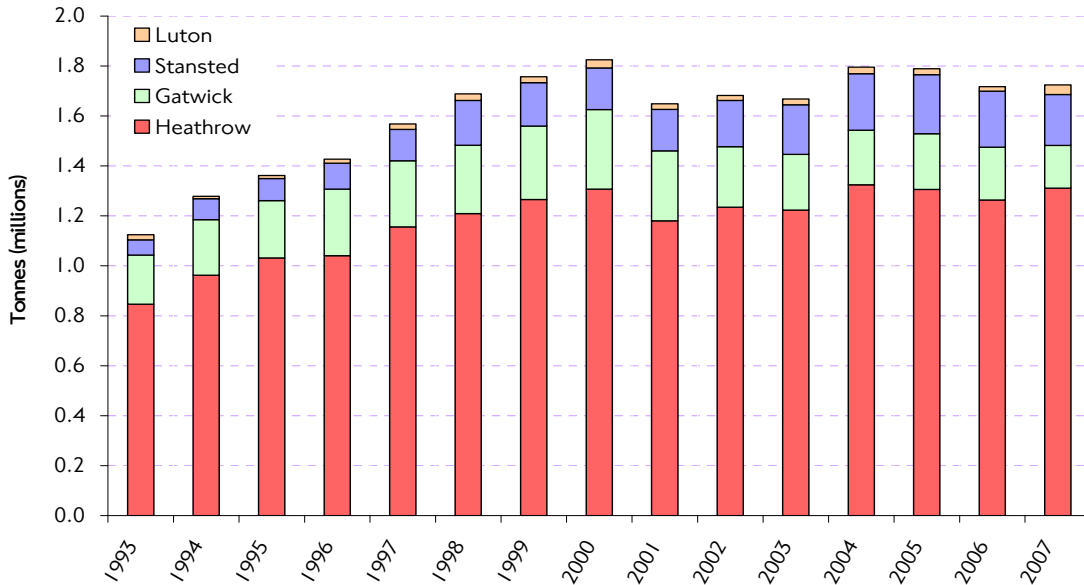


Source: Port of London Authority

### 8.6 Air freight

By its nature air freight accounts for a much smaller proportion of freight by tonnage in London. Less than 2 million tonnes per year passes through London’s airports. Over three quarters of this is handled at Heathrow, with Stansted and Gatwick making up most of the remainder (Figure 8.7).

Figure 8.7 London air freight lifted.



Source: Civil Aviation Authority



## 9. How Londoners travel

### 9.1 Background

The following section sets out a summary of key findings from TfL's LTDS. This major initiative provides a unique window on the travel of London residents and combines key features that will be invaluable in understanding and tackling the transport challenges of the next few years.

This dataset is intended for wide dissemination and use among TfL's partners and stakeholders. The real value of this resource is its adaptability and applicability to a wide range of contemporary transport issues. During 2009, TfL will publish the full dataset on its website, and will work with partners to explain and promote the use of LTDS by all those involved with transport planning in London.

### 9.2 What is the London Travel Demand Survey (LTDS) and what can it do?

The LTDS is a rolling sample survey of households and individuals residing within Greater London. It captures quantitative data representative of the diversity of both people and places in London that, over time, builds up to a comprehensive picture of the travel needs and travel behaviour of Londoners.

This allows full and robust profiling of the nature of travel by London residents – where and when they travel, by which methods of transport and for what purposes. In other words, how Londoners use their transport system, the demand pressures that need to be managed or provided for and, by extension, the likely responses of Londoners to the transport policy options available. Furthermore, because the socio-demographic characteristics of respondents are also captured, it is possible to understand how people's travel is affected by factors such as household structure, car ownership and employment.

The survey works on a continuous rolling annual basis with a target annual sample size of 8,000 households. It has been running since 2005/06, and this report includes an overview of some results from the first three years of the survey that are likely to be of widest interest. Results for larger areas such as Inner or Outer London may be derived annually, and this allows effective monitoring of travel trends over time. However, some results, in particular those for individual London boroughs, require three years' sample to be combined to give a statistically-reliable indicator.

### 9.3 What does LTDS provide that is unavailable elsewhere?

- Annual updates to key trends and indicators, such as the amount of travel by Londoners and modal shares – many of which had not been comprehensively updated since 2001.
- Detailed information on issues of contemporary policy relevance, such as cycling.
- Detailed socio-demographic profiling of trip makers.

## 9. How Londoners travel

- Comprehensive geographical analyses of travel behaviour and travel patterns are possible – and increasingly relevant as the London regions and individual London boroughs feature more prominently in TfL policy thinking.
- New information on travel at non-peak times of day and at weekends.
- A dataset containing upwards of 70 variables, each of which can be cross-tabulated against combinations of others, and examined at different spatial and temporal scales – the true importance of this dataset is its ability to bring unique information to bear on the whole diversity of current and future transport policy issues in London.

### 9.4 Key findings

The following sections consider some basic features of travel by Londoners, the purposes for which they travel and the modes of transport that they use. Some **key findings** are:

- Between 2005/06 and 2007/08 London residents on average made 2.8 trips per weekday, the annual estimates varying by survey year between 2.4 to 2.7 trips per person for residents of Inner London, and 2.8 to 3.0 trips per person for residents of Outer London.
- By mode of transport, the largest share of trips made by Londoners is by car, 41 percent in total.
- Trips entirely on foot account for around 30 percent of all trips made by Londoners.
- Trips by bus, Underground and National Rail account for about one quarter of all trips – just over half of these being by bus.
- In 2007/08, 20 percent of trips by Londoners on an average weekday were for commuting, 8 percent for travel in course of work or on employers' business. Some 27 percent were for shopping or personal business, 21 percent for leisure purposes, 10 percent for education and the remaining 14 percent for other purposes.
- The peak weekday afternoon hour for trip making by Londoners starts at 15:00, with over 2 million trips by Londoners starting in this hour. This reflects a sharp peak in education-related trips, as well as a similar peak in trips for 'other' purposes.
- The total number of trips made by Londoners on a Saturday is 90 percent that of an average weekday, while the equivalent figure for Sundays is 71 percent.
- The intensity of trip making at weekends during the middle of the day actually exceeds that on weekdays at the equivalent times – ie fewer people are at work at weekends.
- Almost 40 percent of London households do not have a car, compared with less than a quarter in the rest of Great Britain. Another difference occurs in households owning two or more cars; over a third of households in the rest of Great Britain own two or more cars, twice the proportion of London households.

- Almost half of Londoners (49 percent) in 2007/08 used buses on at least two days a week, 26 percent used the Underground, and 13 percent used National Rail with the same frequency.
- On average Londoners travel around 15 kilometres per day.
- 90 percent of trips under half a kilometre 'crow-fly' distance were by walking or cycling, with the remaining 10 percent by car. Bus was used more than Underground for trips between 1 and 5 kilometres, whereas Underground use was greater for trips between 5 and 30 kilometres.
- On weekdays, London residents spend an average of 74 minutes per day travelling. This is the same for Inner and Outer London residents, but Outer London residents travel about 30 percent further.
- On any one weekday, about 20 percent of Londoners travel for over two hours.

### 9.5 Personal trip rates

A basic measure of travel activity is the trip rate. This is simply the average number of trips made by a person (or specific groups of people) over a given time period. A trip is defined as a one-way movement from an origin to a destination to achieve a single purpose (eg a trip from home to usual workplace for the purpose of going to work, or 'commuting'). In 2007 London's 7.6 million residents made 18.4 million trips on an average day (seven-day week).

Results from the LTDS, between 2005/06 and 2007/08, show that on average Londoners make 2.8 trips per weekday, varying between (typically) 2.4 to 2.7 trips per person for residents of Inner London, and 2.8 to 3.0 trips per person for residents of Outer London (Table 9.1). At the London-wide level for recent years the picture is one of stability in these rates.

Equivalent broadly comparable data for 1991 and 2001 (from the London Area Transport Surveys) are also given. Trip rates for the more recent years are comparable to those of 2001, but show slight increases over those of 1991. However, the 1991 survey understated the number of short walk trips.

At the level of the London region the picture is more variable, reflecting different household structures and other factors. Lower levels of trip making are characteristic of residents of Central and East London regions. Residents of North, West and – especially – South regions make more trips on average.

## 9. How Londoners travel

Table 9.1 Trips per person per weekday, by area of residence, all modes.

Area of residence	1991	2001	2005/06	2006/07	2007/08
Greater London	2.5	2.8	2.8	2.8	2.8
Central and Inner London	2.3	2.7	2.4	2.6	2.7
Outer London	2.7	2.9	3.0	2.9	2.8
<b>London region</b>					
- Central	2.3	2.7	2.3	2.7	2.7
- North	2.5	2.8	2.9	3.0	2.9
- East	2.4	2.7	2.4	2.4	2.6
- South	2.8	3.1	3.3	3.2	2.9
- West	2.7	2.8	3.0	2.9	2.8

Source: LTDS Household Survey

Walk trips typically account for around one-third of trips, and tend to reflect a seasonal pattern during the year. Trip rates by non-walk methods of transport (bearing in mind that walk **stages** are often required at the start and end of such trips) show greater stability between years (Table 9.2), although trip rates for residents of Inner London appear to have increased since 1991.

Table 9.2 Trips per person per weekday, by area of residence, all modes except walk.

Area of residence	1991	2001	2005/06	2006/07	2007/08
Central and Inner London	1.5	1.7	1.6	1.7	1.7
Outer London	2.1	2.1	2.1	2.1	2.0
<b>All London</b>	<b>1.9</b>	<b>2.0</b>	<b>1.9</b>	<b>1.9</b>	<b>1.9</b>

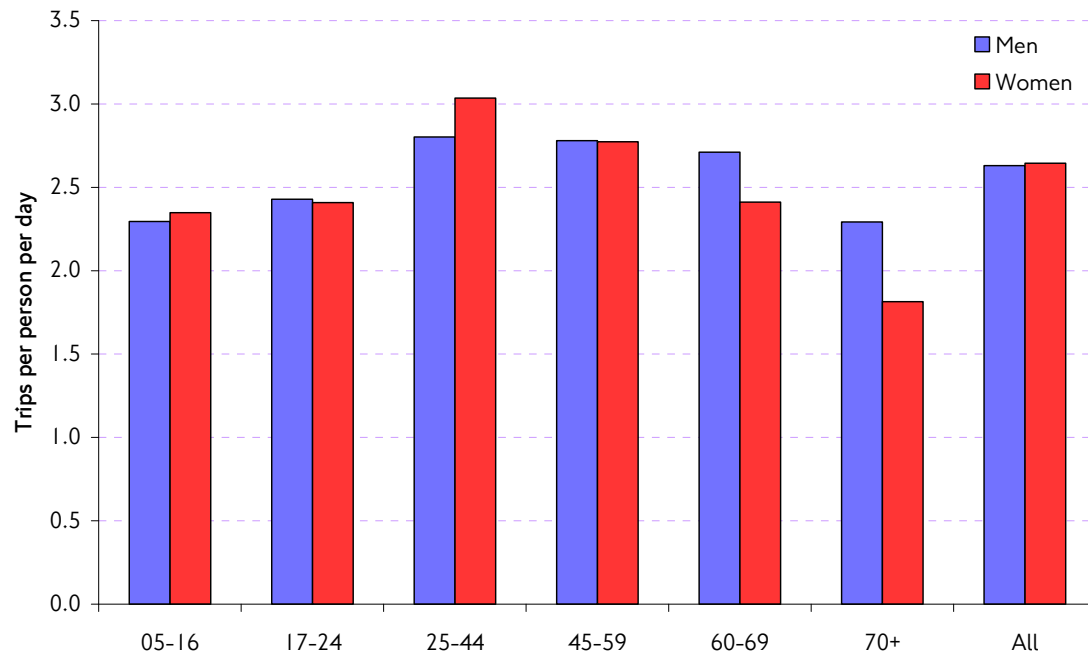
Source: LTDS Household Survey



## 9.6 Frequency of travel

Figure 9.1 shows average trip rates by age and gender for the Greater London population, whereas Figure 9.2 shows how these trips are distributed between the different modes of transport.

Figure 9.1 Trips per person per day, by age and gender, 2007/08 average day, 7-day week.

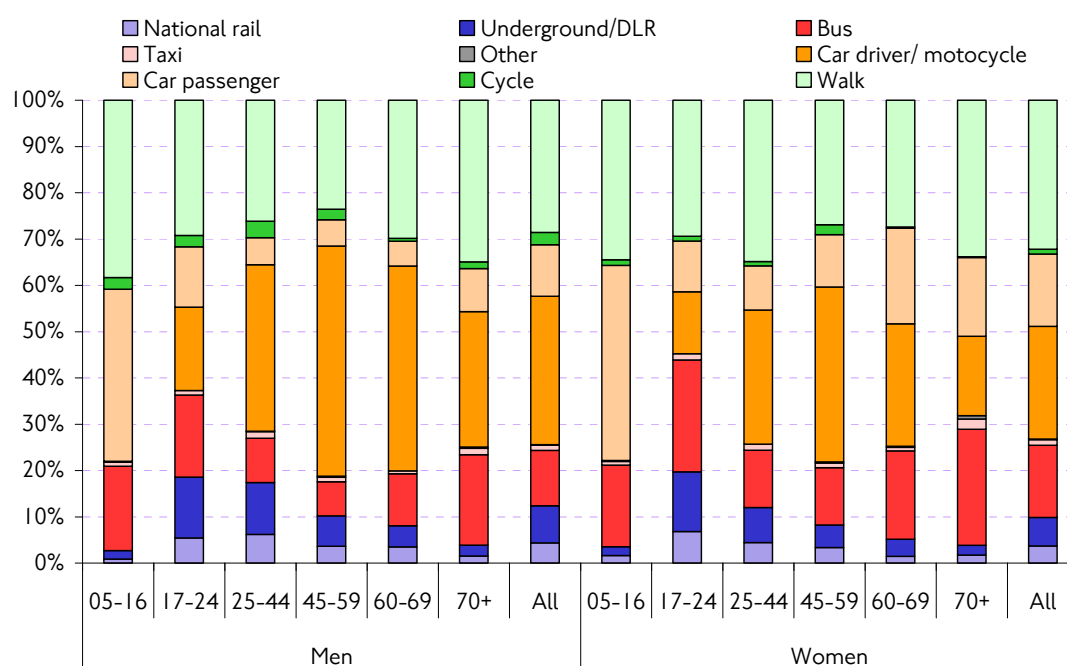


Source: LTDS Household Survey

The first thing to note is that there is relatively little variation – all groups except the 70-plus age group make on average between two and three trips per person per day, around a Greater London average of 2.6 trips per person per day. The highest trip rates, as might be expected, are to be found among those of working age. Lower trip rates characterise both younger and older people – who are more able to make non-work-related trips during working hours. Male and female trip rates are very similar across all age groups except in the 25 to 44 group where women make noticeably more trips than men, and in the 60 to 69 and 70-plus age group where, by contrast, men tend to make more trips, perhaps reflecting the higher number of men in employment after age 60, and the higher number of women in the 70-plus age group.

## 9. How Londoners travel

Figure 9.2 Mode share by age and gender, 2007/08 average day, 7-day week.



Source: LTDS Household Survey

### 9.7 Trip purposes

Travel is a **derived demand**: people travel as a means to an end – to achieve other purposes. The LTDS gathers information by which the purpose of each trip can be established. This is usually considered in terms of a basic **trip purpose**, such as ‘commuting’ – a trip from home to work or vice versa. This is relevant because different trip purposes tend to have different characteristics and requirements (eg work trips being concentrated in weekday ‘peak’ periods), and are therefore likely to have different responses to policy interventions. For example, commuting trips are not usually ‘optional’, and therefore tend to be relatively insensitive to policy changes.

Table 9.3 shows the basic trip purpose split across all trips made by Londoners on an average weekday. In 2007/08, 20 percent of trips were for commuting, ie trips between home and a usual place of work. Another 8 percent of trips were for travel in course of work or on employer’s business. Some 27 percent were for shopping or personal business, 21 percent for leisure purposes, 10 percent for education and the remaining 14 percent for other purposes, including accompanying or escorting another person.

Apart from a slightly declining trend over the three years (2005/06 to 2007/08) in the number of commuting trips, the share of travel accounted for by the various journey purposes has shown little change between years. The higher share of education trips in 2005/06 is attributable to more of the fieldwork for that survey year being conducted during school terms.

In comparison with national equivalent figures (from the DfT's National Travel Survey), work and education trips account for a slightly greater share of Londoners' travel, while trips for shopping, personal business and leisure are correspondingly fewer.

**Table 9.3** Percentage share of trips by purpose, average weekday.

Trip purpose	1991	2001	2005/06	2006/07	2007/08	GB National (2002-06)
Commuting	25%	22%	22%	21%	20%	19%
Other work	7%	6%	6%	7%	8%	4%
Education	11%	12%	13%	10%	10%	8%
Shopping and personal business	22%	27%	27%	28%	27%	29%
Leisure	21%	20%	18%	21%	21%	25%
Other	14%	13%	15%	14%	14%	15%
<b>All purposes</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: LATS 1991 and 2001, LTDS Household Survey, DfT National Travel Survey

## 9.8 Travel by selected socio-demographic groups

The LTDS collects full socio-demographic data relating to respondents. It is therefore possible to examine travel patterns on the basis of different socio-demographic criteria. This section looks at selected dimensions relevant to the Mayor's transport objective of making transport in London fairer for everyone. More widely, these examples again serve to demonstrate the variety of 'custom' analyses that are possible with the LTDS dataset.

- About 10 percent of Londoners report reduced access to travel. This rate rises to 30 percent for Londoners over 60. Over 4 percent of those use wheelchairs on at least some occasions.
- Trip rates of disabled people are lower than for the population in general. Disabled people make significantly fewer trips than average, particularly wheelchair users and those with hearing impairments. Mode use patterns also relate strongly to different impairments.
- London's population is notably diverse in terms of ethnic mix; and different employment, cultural and location patterns express themselves in different aggregate travel behaviours.
- Comparatively high levels of walking among the Bangladeshi community, and relatively low use of bicycles across most ethnic groups, comparatively high levels of car use among people from the Indian and Pakistani community, coupled with relatively low bus use, and relatively high use of Underground among Chinese people are features revealed by recent London Travel Demand surveys.
- Trip making is also strongly related to household income, with those living in households in the highest income band making approximately 40 percent more

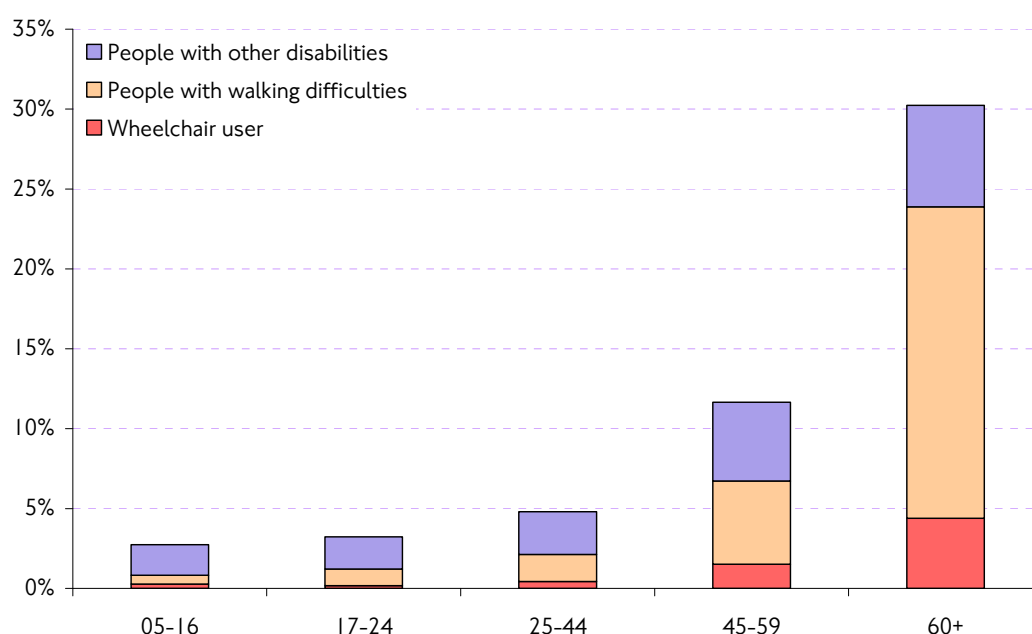
## 9. How Londoners travel

trips per day than those in the lowest. Modal use patterns are also characteristic, with car use rising, and bus use declining, with increasing household income.

### Travel-related disability

Figure 9.3 shows the prevalence of travel related impairments from the LTDS survey. As might be expected, the prevalence of these impairments rises sharply with age, with over 30 percent of older people in the 60-plus age group reporting some form of mobility difficulty. Over 4 percent of this age group are wheelchair users on at least some occasions.

Figure 9.3 Indicative prevalence of travel-related impairments for London residents by age group, 2007/08.



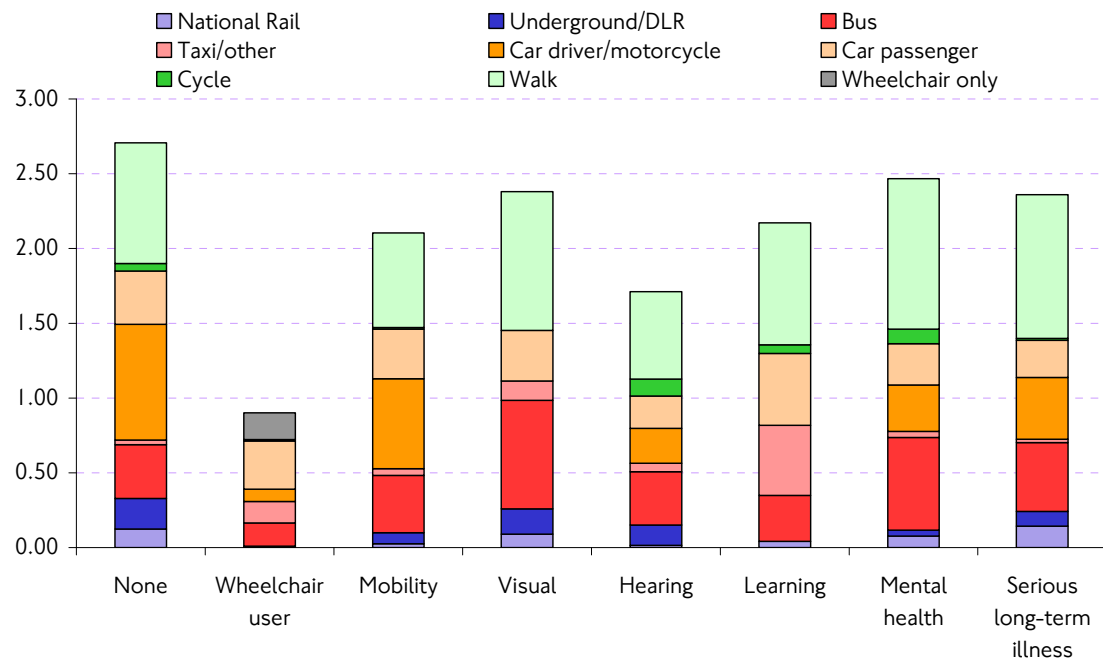
Source: LTDS Household Survey

Figure 9.4 shows trip rates (number of trips per person on an average day) by main mode of transport for those with a range of recognised travel-related impairments.

The most striking feature here of course is the comparatively lower mobility levels of disabled people in general. Wheelchair users typically make only one-third of the number of trips made by those with no impairments, while those with hearing impairments also make notably fewer trips than average.

In terms of use of the various methods of transport, specific impairments and the specific requirements arising from them tend to result in quite distinctive patterns of transport mode use. Thus, few people with learning difficulties or visual impairments drive a car or motorcycle; nevertheless the former group do make some use of bicycles, and buses and taxis are particularly important for both groups. Rail use among wheelchair users is very infrequent, reflecting access problems.

Figure 9.4 Trip rates by mode and type of impairment, 2007/08 average day, 7-day week.



Source: LTDS Household Survey

While statistics of this kind serve to highlight differences they do not address the underlying causes. Given that the lack of access imposes restrictions on travel choices there remains much scope to understand better, and make effective improvements to, the individual requirements and travel options available.

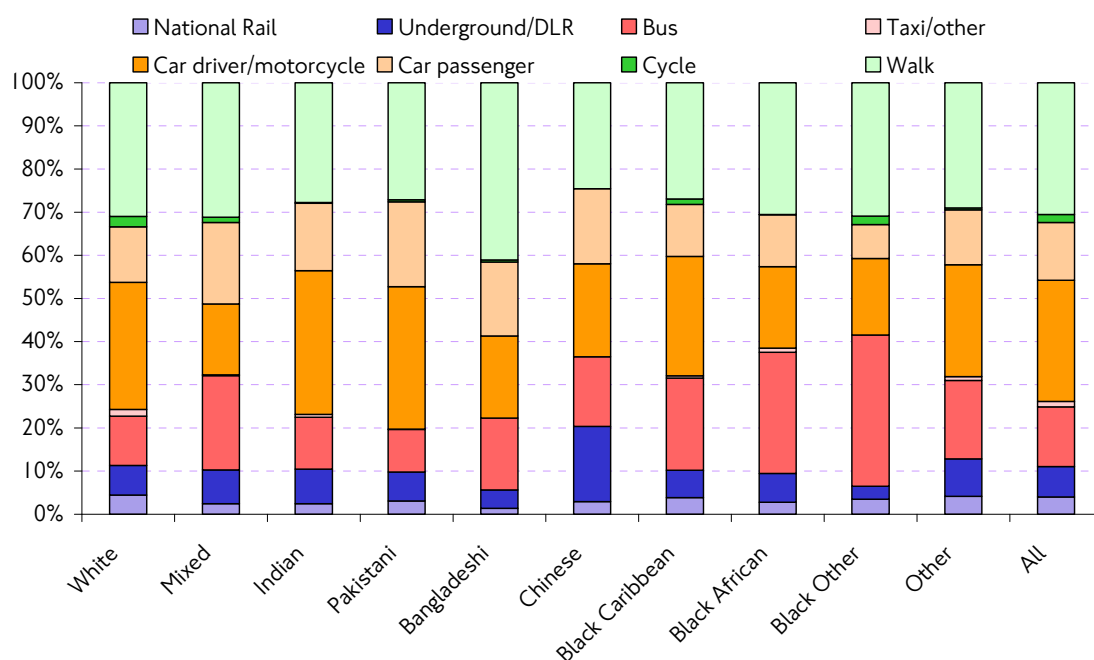
### Ethnic groups

London's population is notably diverse in terms of ethnic mix, and different employment, cultural and location patterns express themselves in different aggregate travel behaviours. Figure 9.5 shows mode use (in terms of percentage mode share for all trips made) for the conventional ethnic groupings. Notable features are:

- Comparatively high levels of walking among the Bangladeshi community, and relatively low use of bicycles across most ethnic groups.
- Comparatively high levels of car use among people from the Indian and Pakistani community, coupled with relatively low bus use.
- Relatively high use of Underground among Chinese people.

## 9. How Londoners travel

Figure 9.5 Mode share by ethnic group, 2007/08 average day, 7-day week.



Source: LTDS Household Survey

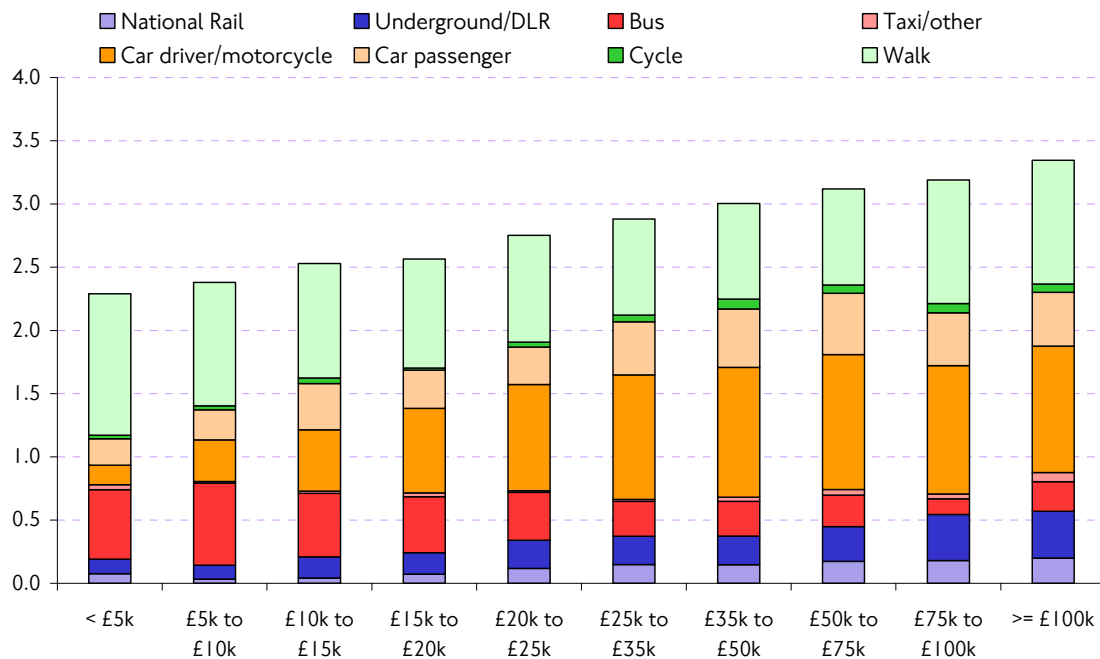
### Household income

The LTDS survey collects information on gross annual income at the level of the household. This is not precise in absolute terms, since within the constraints of this general transport survey, non-work or non-benefit sources of income (such as savings) are often overlooked by respondents. Also, response rates to the income question are lower than for other questions. Nevertheless, in relative terms, some interesting patterns are apparent (Figure 9.6).

There is a clear tendency for individuals living in households with higher incomes to make more trips. People living in households in the highest income group make on average over 40 percent more trips per day than those in the lowest income group, with a consistent progression through the income groups.

Most of this difference reflects an increased tendency to drive cars. Also evident are tendencies towards relatively high bus use by lower income households; and relatively higher rail, Underground and bicycle use by those in higher income households.

Figure 9.6 Trip rates per person by main mode and gross annual household income, 2007/08 average day, 7-day week.



Source: LTDS Household Survey

## 9.9 Car ownership

Levels of car ownership in London are much lower than in the rest of Great Britain. Almost 40 percent of London households do not have a car, compared with less than a quarter in the rest of Great Britain. However, roughly the same proportion of households own one car. The main difference occurs in households owning two or more cars; over a third of households in the rest of Great Britain own two or more cars, twice the proportion of London households.

As would be expected, large households tend to have more cars than small ones. Around a third of two and three-person households in London do not own a car, compared with 14 percent of such households in the rest of Great Britain.

In Great Britain as a whole, the proportion of households not owning a car has gradually fallen but in London it has been almost constant at about 40 percent since the mid-1980s. Although the proportions fluctuate from year-to-year, recent years show a decline in the level of London car ownership. This is particularly evident in the proportion of households with more than one car, which has dropped from 21 percent in 2001 to 17 percent in 2007. This may be partly due to a trend towards smaller households needing fewer cars: the average household size fell by over 3 percent between 2001 and 2006. However, it is also consistent with the observed trend in car traffic (vehicle kilometres) in London (see also Section 2).

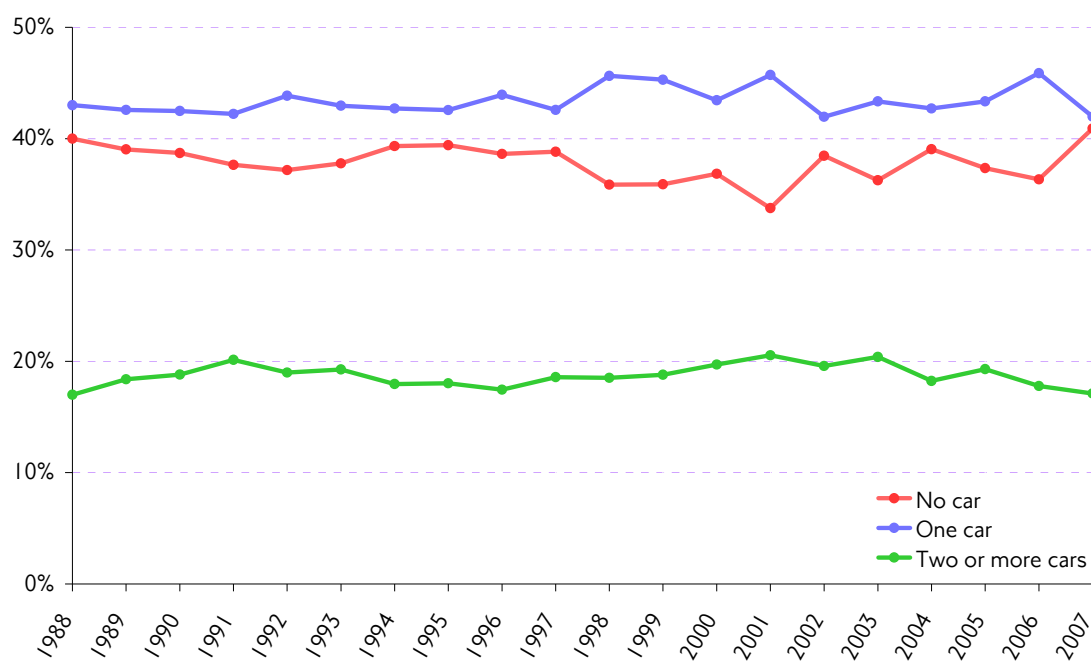
## 9. How Londoners travel

Table 9.4 Car ownership in London and Great Britain by household size, 2006/2007.

Number of cars (percentage)	Number of people in household				All households	Average household size
	One	Two	Three	Four or more		
<b>Greater London</b>						
No car	63	34	30	21	40	1.9
One car	36	49	48	44	44	2.4
Two or more cars	1	17	21	36	16	3.3
<b>All households</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>2.4</b>
<b>Rest of Great Britain</b>						
No car	49	14	14	9	23	1.7
One car	48	49	35	32	43	2.2
Two or more cars	3	37	51	59	34	3.1
<b>All households</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>2.4</b>
<b>Great Britain</b>						
No car	51	17	16	10	25	1.7
One car	46	49	37	33	43	2.2
Two or more cars	2	34	48	56	32	3.1
<b>All households</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>2.4</b>

Source: DfT, National Travel Survey

Figure 9.7 London households with no car, one car and two or more cars.



Source: DfT, National Travel Survey



On the other hand, the number of cars with registered owner address in London has increased over time, recording a 4 percent rise in the five years to 2007. For this statistic, cars are taken to be vehicles in the Private and Light Goods taxation class with car body-type. As well as household vehicles, they include cars registered to companies as fleet cars: they are therefore not directly comparable to the data on household car ownership, and may include vehicles whose use is wholly outside London. In contrast to the indications of declining numbers of cars in households, the registration statistics continue to show increasing numbers of cars registered in London. Over 70 percent of these registrations were to Outer London addresses, with 7 percent more cars registered there than five years earlier.

However, this increase has to be put in context with the increase in London's population, which grew by 3 percent over the same period. The net result was an increase of 2 percent between 2002 and 2007 in the number of registered cars per head of population.

There is, however, a clear difference in trend between Inner and Outer London. Between 2002 and 2007, the Inner London population increased faster than the stock of cars registered in Inner London, which resulted in a decline in cars registered per head of population of 5 percent. The reverse was the case in Outer London, where the number of registered cars per head increased by 5 percent.

**Table 9.5** Private cars registered in Greater London.

Year	Greater London (000s)	Percentage company cars	Inner London (000s)	Outer London (000s)
1996	2,262	14	679	1,583
1997	2,259	12	688	1,571
1998	2,287	11	697	1,590
1999	2,319	10	707	1,611
2000	2,331	10	709	1,622
2001	2,379	9	721	1,657
2002	2,390	7	717	1,672
2003	2,397	6	714	1,682
2004	2,438	6	718	1,720
2005	2,473	5	724	1,750
2006	2,480	5	719	1,761
2007	2,497	6	709	1,788
<b>Percentage change</b>				
1 Year	1	-	-1	2
5 Years	4	-	-1	7

Source: DVLA vehicle licensing data

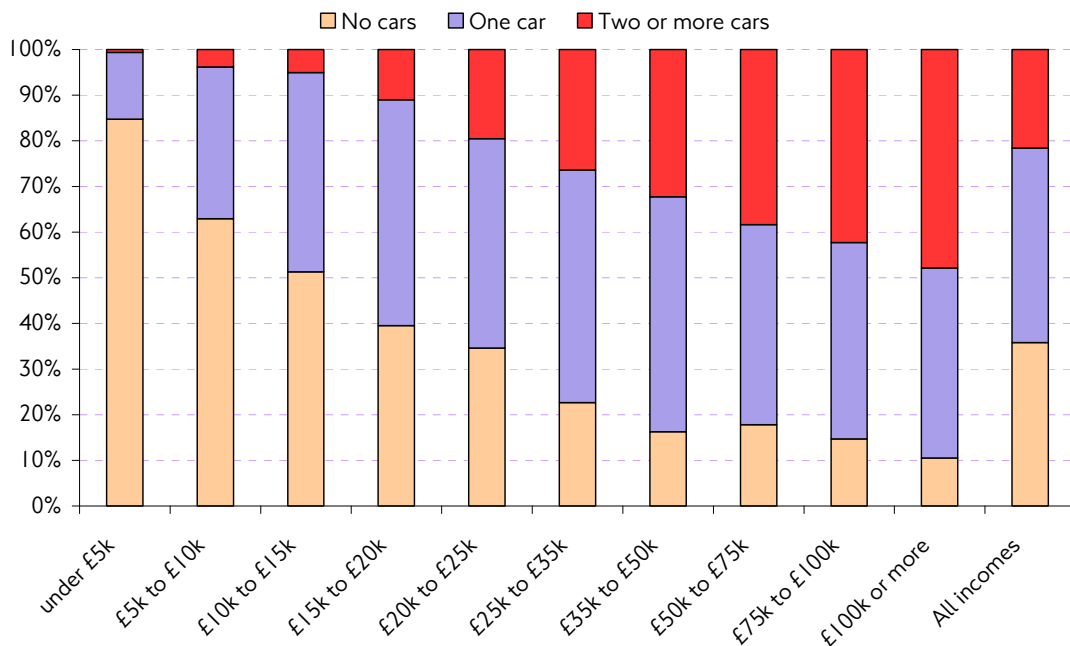
1. Data recorded at the end of December each year

## 9. How Londoners travel

Figure 9.8 shows how household car ownership rates are related to annual household income. Unsurprisingly, car ownership increases as household income increases, with substantial and characteristic differences between the income bands. Note that this increase partly reflects a tendency for higher-income households to contain more people than lower income households.

Across all London households, 36 percent do not own a car according to LTDS in 2006/07 and 2007/08. DfT estimate, from other survey sources, that 38 percent of London households had no car in 2006, while the corresponding figure for other English metropolitan areas was 31 percent. In 2007/08, according to LTDS, 43 percent of London households owned one car, and 22 percent owned two or more cars.

Figure 9.8 Car ownership by household income, 2007/08.



Source: LTDS Household Survey

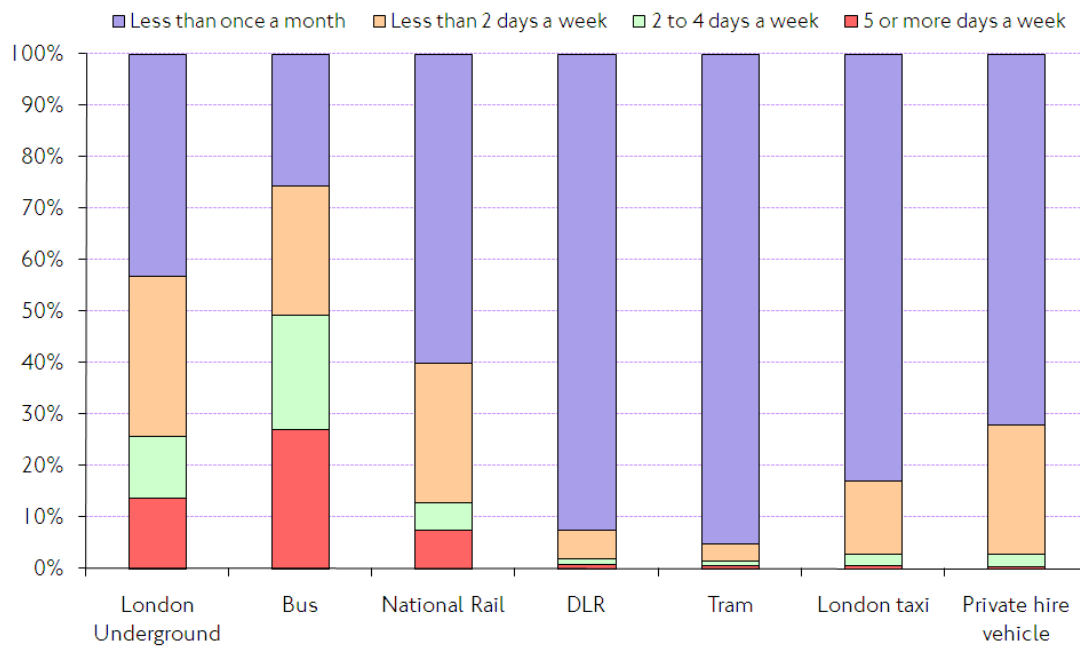
### 9.10 Londoners' use of the various modes of transport

Results from the LTDS illustrate how Londoners use the different modes of transport.

Figures 9.9 and 9.10 show the different frequencies of use, for public and private transport modes, respectively. Almost half of Londoners (49 percent) in 2007/08 used buses on at least two days a week, and three-quarters (75 percent) once a month or more. A quarter of Londoners (26 percent) used the Underground at least twice a week and 56 percent at least once a month. However, for National Rail, only 13 percent used this mode of transport at least twice a week, and 40 percent at least once a month.

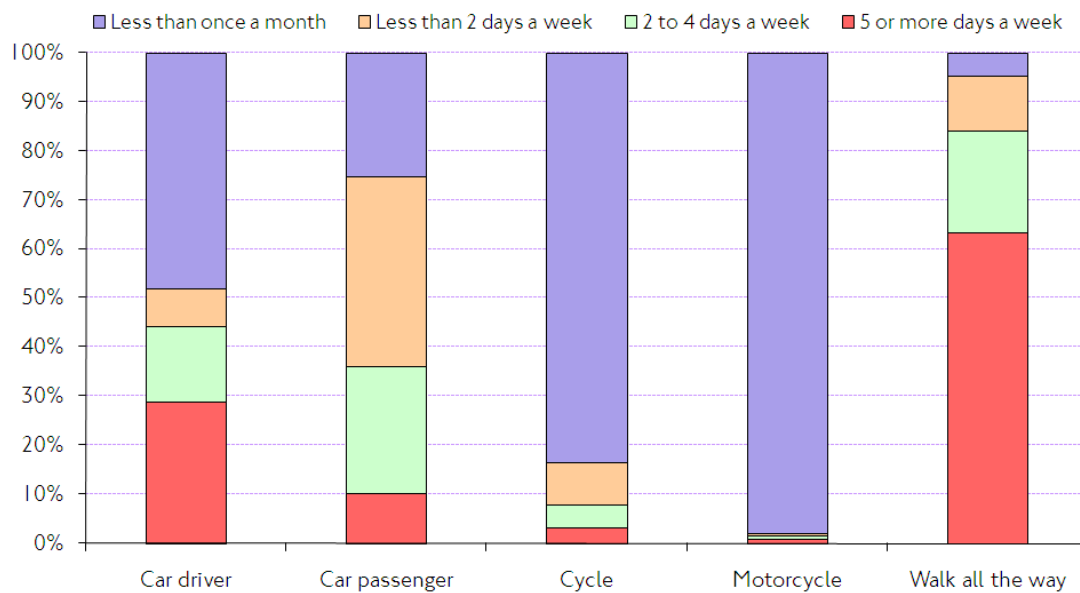
Among private modes of transport (Figure 9.10), three-quarters of Londoners (75 percent) travelled as car passengers at least once a month and 36 percent at least twice a week. Among adults of driving age, 44 percent drive a car at least twice a week and 52 percent at least once a month, showing that most active drivers tended to use their vehicles quite frequently.

Figure 9.9 Frequency of use – public transport modes, 2007/08.



Source: LTDS Household Survey

Figure 9.10 Frequency of use – private transport modes, 2007/08.



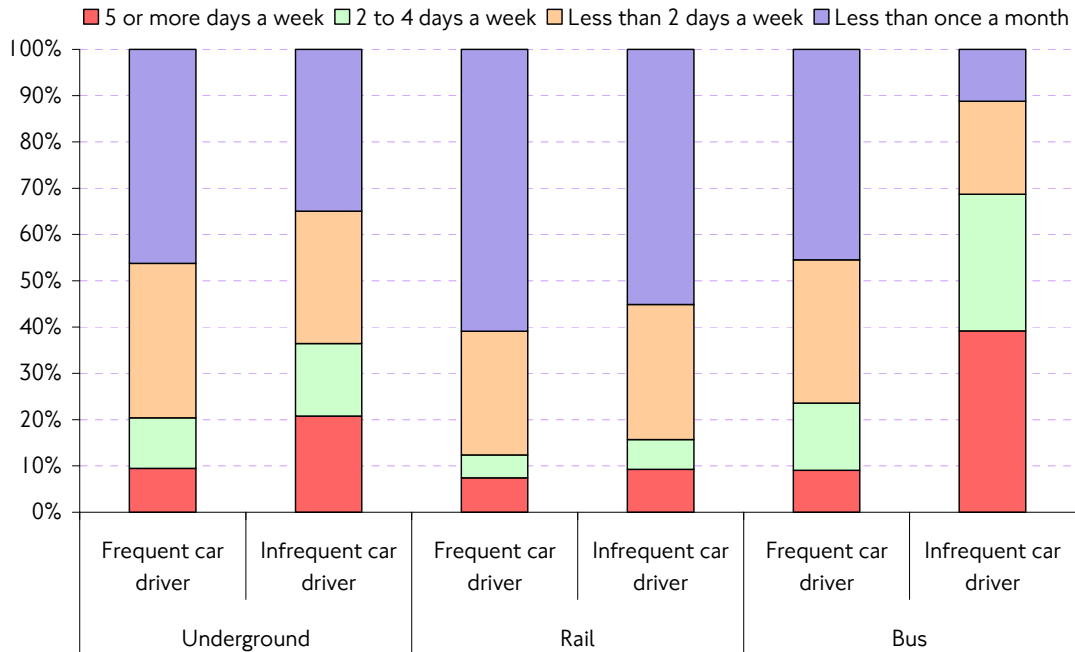
Source: LTDS Household Survey

If the results are used to classify adults into ‘frequent’ and ‘infrequent’ drivers (including non-drivers within the latter group), it is possible to examine the extent to which car drivers also use public transport. A frequent driver is defined here as someone who drives a car on at least two days a week, while an infrequent driver is anyone (apart from children below driving age) who drives less than twice a week or not at all.

## 9. How Londoners travel

Figure 9.11 compares the frequency of use of different types of public transport for these two groups. Overall, as expected, frequent car users make less use of public transport than infrequent car users. The differences are most pronounced in respect of bus use, and least pronounced in respect of rail use. Nevertheless, a significant proportion of public transport use is by frequent car drivers. For example, 22 percent of frequent drivers used bus at least two days a week, while 20 percent used Underground, and 12 percent used rail.

Figure 9.11 Frequency of use of public transport modes (Underground, rail and bus): frequent and infrequent car drivers, 2007/08.



Source: LTDS Household Survey

### 9.11 Distance travelled

The distances people travel and the time that they spend doing so are key variables that reflect both personal travel characteristics and the operation and performance of the transport networks. This section explores relationships in terms of how these quantities vary, across the different modes, for different trip purposes and by region of London.

Travel distance is measured in the LTDS survey as the straight-line distance between the origin and destination of each trip. Respondents report the address of each trip end and the locations of intermediate interchanges. These are coded to grid references (and hence to other spatial classifiers such as postcodes and boroughs) by matching the data with known addresses using gazetteers. The length of each trip is then calculated as a straight line distance. The results certainly understate the **actual** distance travelled if it could be measured on the ground, by up to 30 percent. However, they do serve to identify trends in travel distance and trip length for various types of trip and to allow derivation of statistics such as distance-based mode shares of travel.

Table 9.6 shows that Londoners travel around 15 kilometres on an average day, with relatively little variation by day of the week, and with Inner and Outer London residents respectively travelling smaller or greater distances than the Greater London average.

**Table 9.6** Average straight line travel distance per person per day (km) by area or region of residence.

Area of residence	Average weekday		2005-2008 average			
	1991	2001	Weekday	Saturday	Sunday	All days
Greater London	15.0	15.0	15.2	14.3	14.4	15.0
Inner London	11.5	12.5	12.7	11.3	13.2	12.6
Outer London	17.1	16.5	16.9	16.2	15.1	16.6
<b>London region</b>						
- Central	11.5	12.3	12.0	10.6	12.2	11.8
- North	14.8	14.9	15.9	18.4	16.2	16.3
- East	13.9	13.8	13.8	13.7	12.6	13.6
- South	18.3	18.1	18.2	14.7	16.7	17.5
- West	16.1	15.5	16.3	15.1	14.9	16.0

Source: LTDS Household Survey

Different trip purposes account for varying proportions of total travel distance. For example, Table 9.7 shows that commuting and leisure trips account for the highest proportions of aggregate travel distance, and education-related trips the least. From the perspective of aggregate distance travelled by Londoners, commuting trips account for just under one-quarter of the total, with education-related trips accounting for about 5 percent.

## 9. How Londoners travel

**Table 9.7** Percentage shares of travel distance by trip purpose, average day, 2006/07 and 2007/08, 7-day week.

Trip purpose	Distance per person (kms)		Percentage of travel distance	
	2006/07	2007/08	2006/07	2007/08
Commuting	3.5	3.2	23%	22%
Other work	2.1	2.2	14%	15%
Education	0.8	0.6	5%	4%
Shopping and personal business	2.7	2.6	18%	18%
Leisure	4.7	5.0	31%	33%
Other	1.2	1.2	8%	9%
<b>All purposes</b>	<b>15.0</b>	<b>14.9</b>	<b>100%</b>	<b>100%</b>

Source: LTDS Household Survey

In terms of trends, the shares of travel distances for each purpose were similar in the two most recent survey years, 2006/07 and 2007/08. There was a slight fall in the share of commuting trips and with a corresponding increase in the share of leisure trips. Variations in the shares of travel distance accounted for by the main trip purposes for residents of the five London regions are shown in Table 9.8.

**Table 9.8** Percentage shares of travel distance by trip purpose by London region of residence, 2007/08 average day, 7-day week.

Trip purpose	Central	North	East	South	West
Commuting	18%	19%	26%	22%	20%
Other work	16%	14%	14%	13%	16%
Education	5%	4%	4%	5%	4%
Shopping and personal business	19%	17%	19%	14%	19%
Leisure	35%	36%	28%	37%	32%
Other	7%	9%	9%	9%	9%
<b>All purposes</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Source: LTDS Household Survey

In interpreting these tables it is necessary to bear in mind that these are averages across all residents, not all of whom actually make these trips, and that travel made by Londoners wholly outside the Greater London area is excluded. The actual travel for commuting or education-related trips among those people making such trips will therefore be higher.

Different methods of transport are naturally more appropriate to certain distance ranges, although the average distance travelled per Londoner by each mode also strongly reflects the intensity of use of that mode (Table 9.9).

**Table 9.9** Percentage shares of travel distance by main mode of trip, average day, 2006/07 and 2007/08, 7-day week.

Main mode	Percentage of travel distance	
	2006/07	2007/08
Rail	16%	14%
Underground/DLR	11%	11%
Bus	11%	11%
Taxi and other public	2%	3%
Car driver	36%	38%
Car passenger	18%	18%
Cycle	1%	1%
Walk	5%	5%
<b>All modes</b>	<b>100%</b>	<b>100%</b>

Source: LTDS Household Survey

In terms of percentage share of total travel distance by area of residence, residents of Inner London travel proportionately further by the main public transport modes (Table 9.10), and residents of Outer London travel proportionately further by car (either as driver or passenger). At the London regional level, with the exception of the Central region and the limited Underground network in the South, there are few differentiating features.

**Table 9.10** Percentage mode shares (main mode of trip) by travel distance, by area of residence, 2007/08 average day, 7-day week.

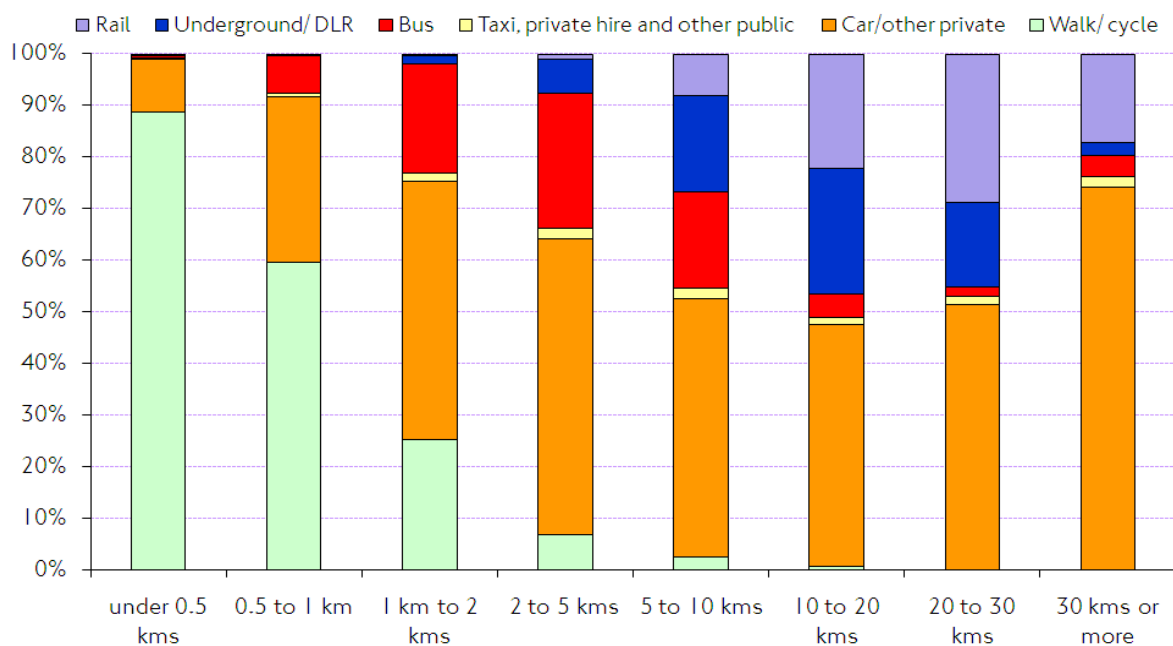
	Rail	Underground / DLR	Bus	Taxi / other	Car driver	Car passenger	Cycle	Walk	All modes
<b>Greater London</b>	14%	11%	11%	3%	38%	18%	1%	5%	<b>100%</b>
<b>Inner London</b>	17%	15%	15%	6%	26%	14%	2%	7%	<b>100%</b>
<b>Outer London</b>	13%	10%	9%	1%	44%	20%	1%	3%	<b>100%</b>
<b>Central region</b>	20%	14%	18%	6%	22%	10%	2%	9%	<b>100%</b>
<b>North region</b>	10%	15%	10%	1%	40%	21%	0%	3%	<b>100%</b>
<b>East region</b>	12%	12%	10%	1%	38%	22%	1%	5%	<b>100%</b>
<b>South region</b>	21%	4%	9%	1%	45%	16%	1%	4%	<b>100%</b>
<b>West region</b>	8%	15%	10%	5%	39%	18%	1%	4%	<b>100%</b>

Source: LTDS Household Survey

## 9. How Londoners travel

Mode shares are strongly related to trip length (Figure 9.12). Considering all residents of Greater London, for the shortest trips, 90 percent under half a kilometre ‘crow-fly’ distance were by walking or cycling, with the remaining 10 percent by car. The proportion of car trips increases as trips get longer, with over 75 percent of trips over 30 kilometres being made by car. Bus was used more than Underground for trips between 1 and 5 kilometres, whereas Underground use was more prevalent for trips between 5 and 30 kilometres. Rail use by Londoners was most common for trips between 10 and 30 kilometres long. Broadly similar patterns are seen for residents of central, Inner and Outer London, but with a progressively greater dominance of car travel moving outwards from central London.

Figure 9.12 Mode shares (main mode of trip) by straight line length of trip, 2007/08 average day, 7-day week. All Greater London residents.



Source: LTDS Household Survey

### 9.12 Time spent travelling

On **weekdays**, residents of both Inner and Outer London spend an average of 73 to 74 minutes per day travelling (Table 9.11). But as Figure 9.13 shows, there is considerable variation around this average. On a given weekday, about 13 percent of all Londoners make no trips at all. More than a third travel for less than an hour, with most people travelling for between 30 and 45 minutes. But there are significant numbers of people who spend much longer travelling, which has the effect of increasing the average travel time per person. On any one weekday, about 20 percent of Londoners are travelling for over two hours.

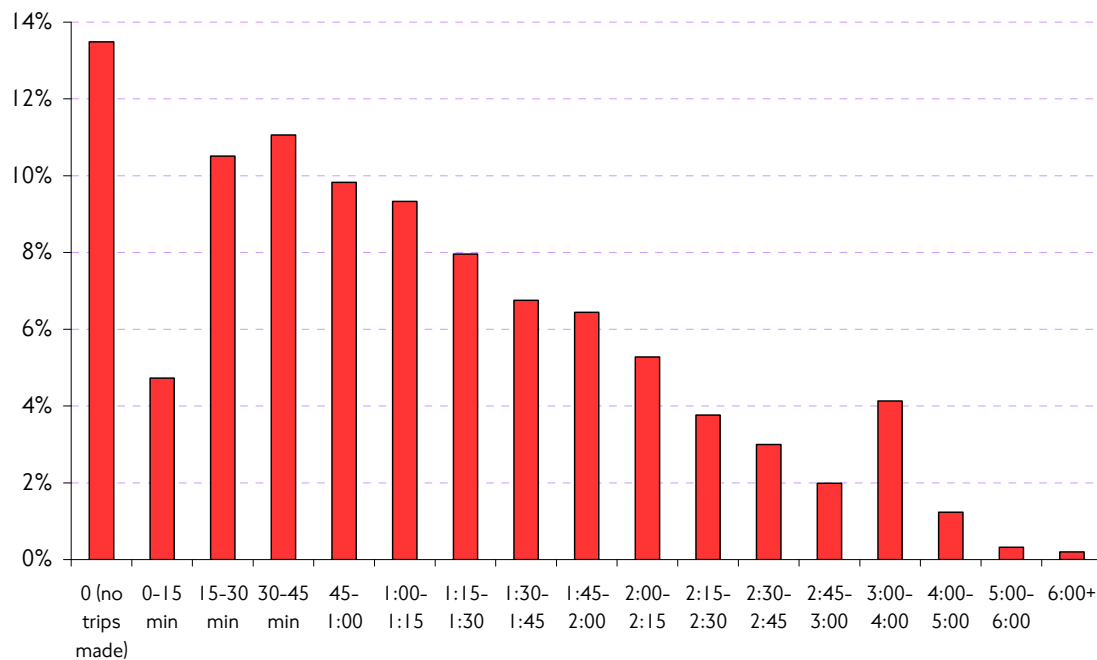


Table 9.11 Average weekday travel time per person by area of residence. 2007/08.

Area of residence	Time (minutes)
Central London	68.2
Inner London	73.3
Outer London	74.2
Greater London	73.7

Source: LTDS Household Survey

Figure 9.13 Distribution of Londoners by the total amount of time spent travelling, average weekday, 2007/08.



Source: LTDS Household Survey

Table 9.12 shows the proportion of travel time split by mode, for an 'average day' (including weekends). While only 4 percent and 7 percent of trips are made by National Rail and Underground or DLR, they account for 12 percent and 14 percent, respectively, of total time spent travelling. The converse is true for walk trips, which make up almost a third of all trips, but account for only 14 percent of travel time, despite their low speeds.

## 9. How Londoners travel

**Table 9.12** Percentage shares of time spent travelling by main mode, average day, 7-day week.

Main mode	2006/07	2007/08
Rail	12%	12%
Underground/DLR	13%	14%
Bus	20%	20%
Taxi and other public	2%	1%
Car driver	26%	26%
Car passenger	12%	12%
Cycle	1%	1%
Walk	14%	14%
All modes	100%	100%
<b>Total time</b>	<b>72</b>	<b>70</b>

Source: LTDS Household Survey

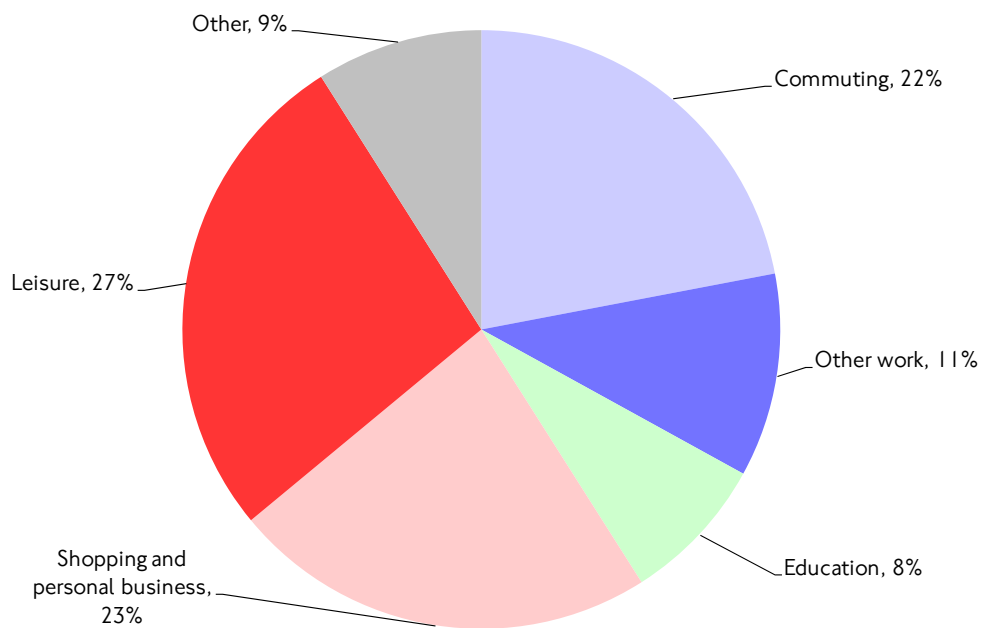
In terms of trip purpose, one third of Londoners' travel time is spent on commuting and other work-related trips, although this figure is higher on weekdays. Leisure purposes and shopping (with personal business) each make up about a further quarter of total travel time (Table 9.13).

**Table 9.13** Percentage shares of time spent travelling by purpose, average day, 7-day week.

Purpose	2006/07	2007/08
Commuting	24%	22%
Other work	10%	11%
Education	8%	8%
Shopping and personal business	22%	23%
Leisure	27%	27%
Other	9%	9%
All purposes	100%	100%
<b>Total time (minutes)</b>	<b>72</b>	<b>70</b>

Source: LTDS Household Survey

Figure 9.14 Percentage shares of time spent travelling by purpose, average day, 7-day week, LTDS 2007/08.



Source: LTDS Household Survey

### 9.13 Working from home

Working from home, or other working patterns that do not involve a regular daily commute, is of increasing importance. Table 9.14 shows that around 5 percent of employed London residents usually worked from home in 2001, compared with around 5 to 6 percent in 2005/06 to 2007/08. It also shows that the proportion of employed residents who travel to different workplaces on different days has significantly increased: from around 16 percent in 2001 to 21 percent in 2007/08.

Table 9.14 Percentage of Londoners in employment by usual workplace LATS 2001, LTDS 2005-2008.

	LATS 2001	LTDS 05/06	LTDS 06/07	LTDS 07/08
Travel to the same workplace every day	80%	80%	74%	73%
Travel to different workplaces	16%	15%	20%	21%
Usually work from home	5%	5%	6%	6%
All employed people	3.1m	3.4m	3.4m	3.5m

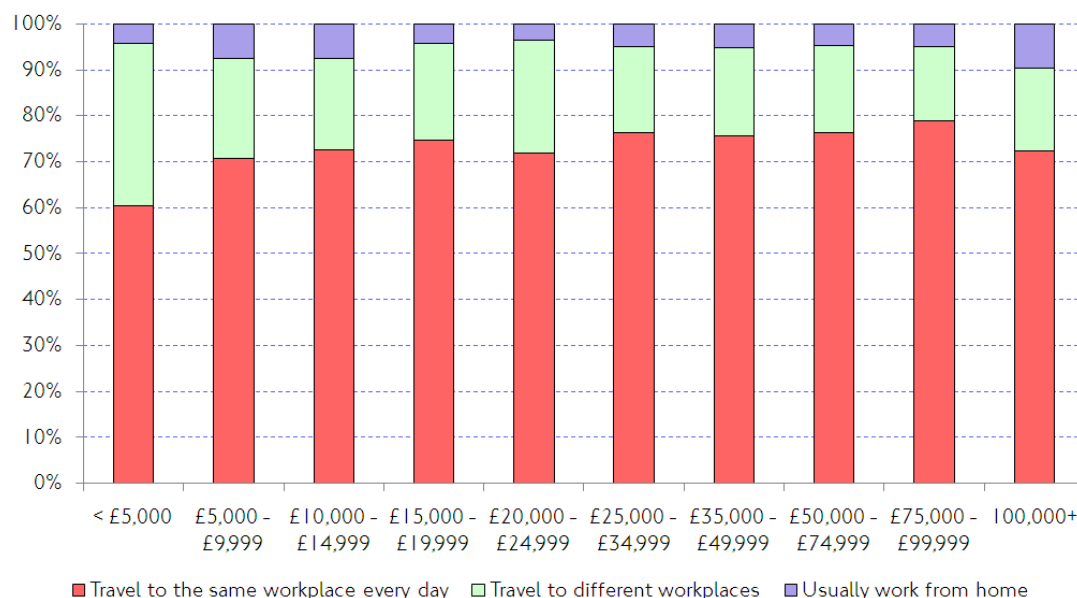
### Who works from home in London?

In 2007/08, London residents working on a self-employed basis were far more likely to work from home (23 percent) than those working as employees (2 percent). London residents who work part-time were also more likely to work from home, with 11 percent of part-time workers usually working from home compared with 5 percent of full-time workers.

There is also some apparent correlation with household income. The largest proportions of those working from home are in households with incomes of £5,000 to £15,000 per year (8 percent of employed working from home) or incomes of over £100,000 per year (10 percent of employed working from home).

The majority of workers travel to a single usual workplace every working day. Figure 9.15 provides more details of the proportions, by household income, of workers who usually work at home or travel to more than one workplace.

Figure 9.15 Percentage of Londoners in employment by household income, LTDS 2007/08.



## 10. Taxis, private hire, Dial-a-Ride and Taxicard

### 10.1 Introduction

This section sets out key trends in relation to licensed taxis and private hire. It also looks at Dial-a-Ride and Taxicard, two established schemes targeted at disabled travellers.

### 10.2 Key features and trends

- The number of taxi drivers licensed in London has remained fairly stable since 2001. However, the number of taxis licensed is at historically high levels.
- Private hire vehicle and driver numbers are continuing to increase, with almost 47,000 vehicles registered in 2008.
- In 2007/08 over 1.1 million Dial-a-Ride trips were made by 52,000 registered users using a fleet of 355 vehicles. This is a door-to-door service for disabled people who cannot use buses, trains or the Underground. From January 2008 this service has been free to members.
- Taxicard scheme members and the number of subsidised licensed taxi journeys made under this scheme continued to increase in 2007/08, with the number of journeys made almost trebling since 2000/01.

### 10.3 Licensed taxis and private hire

Licensed taxis and private hire vehicles are both significant transport modes in London. **Private hire** vehicle and driver numbers are continuing to increase, with nearly 47,000 vehicles registered in 2008. Tables 10.1 and 10.2 are reference tables showing key statistics and trends for licensed taxis and private hire in London. The number of **taxi drivers** licensed in London has remained stable since 2001.

Table 10.1 Private hire operators and vehicles.

Year	Licensed private hire operators (000s)	Licensed private hire vehicles (000s)	Licensed private hire drivers (000s)
2001	0.1	-	-
2002	1.6	-	-
2003	2.2	-	-
2004	2.3	-	7.0
2005	2.3	36.9	19.0
2006	2.3	40.5	31.1
2007	2.1	44.4	38.0
2008	2.3	46.9	48.3

Source: TfL, Public Carriage Office

10. Taxis, private hire, Dial-a-Ride and Taxicard

Table 10.2 London taxi drivers and vehicles.

Year	Taxi drivers licensed			Taxis licensed (000s)
	All London (000s)	Suburban (000s)	Total (000s)	
1983	16.2	1.9	18.1	13.1
1984	16.4	1.9	18.3	13.6
1985	16.6	1.8	18.4	13.8
1986	17.0	1.8	18.8	14.2
1987	17.7	1.7	19.4	14.8
1988	18.1	1.7	19.8	15.2
1989	18.5	1.7	20.1	15.6
1990	18.9	1.7	20.6	16.3
1991	19.3	2.0	21.2	16.6
1992	18.8	1.8	20.5	17.1
1993	18.8	1.8	20.5	17.3
1994	19.6	1.8	21.3	18.3
1995	20.2	1.8	21.9	18.3
1996	20.3	1.8	22.1	18.7
1997	20.3	2.0	22.3	18.9
1998	20.4	2.1	22.5	19.4
1999	20.9	2.5	23.3	19.2
2000	21.0	2.4	23.4	19.4
2001	21.3	2.5	23.9	20.9
2002	21.7	2.7	24.4	20.5
2003	21.8	2.9	24.7	20.9
2004	21.7	3.1	24.9	20.9
2005	21.6	3.1	24.7	21.0
2006	21.5	3.1	24.7	21.7
2007	21.5	3.1	24.6	21.6
2008	21.5	3.2	24.7	21.8

Source: TfL, Public Carriage Office

## 10.4 Dial-a-Ride and Taxicard

Dial-a-Ride is a free door-to-door service for disabled people who cannot use buses, trains or the Underground (see: <http://www.tfl.gov.uk/gettingaround/3222.aspx>). Table 10.3 sets out key trends in relation to this service. In 2007/08 over 1.1 million Dial-a-Ride trips were made by the 52,000 registered scheme users using a fleet of 355 vehicles. Following a long period of sustained growth in use of this service, the number of trips made in 2007/08 was lower than in the previous year, continuing a recent trend of falling use from 2004/05. From 1 January 2008, this service has been free to registered users.

Table 10.3 Dial-a-Ride key trends.

Year	Number of journeys (thousands)	Number of buses	Registered passengers (thousands)	Average cost per passenger journey (2007/08 prices) (£)	Total grant (2007/08 prices) (£m)
1990/91	676	160	77	17.99	13.2
1991/92	745	175	82	17.95	15.2
1992/93	750	177	39	19.88	15.5
1993/94	746	193	51	20.59	17.4
1994/95	835	215	61	17.90	18.4
1995/96	961	242	66	14.98	15.7
1996/97	993	244	80	13.95	15.4
1997/98	1,084	245	93	13.02	14.9
1998/99	1,142	262	107	12.79	15.1
1999/00	1,178	287	71	12.76	16.1
2000/01	1,222	292	73	12.39	15.6
2001/02	1,260	302	86	13.80	17.4
2002/03	1,269	317	96	14.64	18.6
2003/04	1,325	316	61	15.25	19.0
2004/05	1,261	316	66	18.87	22.8
2005/06	1,232	336	71	20.67	24.6
2006/07	1,173	342	72	24.39	27.8
2007/08	1,127	355	52	25.89	28.6

Source: Transport for London, Dial a Ride

1. Re-registration exercises took place in 1992/93, 1999/00 and 2003/04.
2. From 2003/04, cost per passenger journey includes fares paid by passengers.
3. Additional costs in 2005/06 and 2006/07 were caused by delays to the implementation of a new booking system and central call centre.

Taxicard is a door-to-door transport service for Londoners with serious mobility impairments and to whom public transport is not usually accessible. It provides subsidised trips in licensed London taxis (see also: <http://www.tfl.gov.uk/gettingaround/1197.aspx>). Table 10.4 sets out a range of statistics relating to the Taxicard scheme.

## 10. Taxis, private hire, Dial-a-Ride and Taxicard

Table 10.4 Taxicard key trends.

Year <sup>1</sup>	Number of journeys (thousands)	Number of members (thousands)	Average cost per vehicle trip at 2007/08 prices (£) <sup>2</sup>	User contribution at 2007/08 prices (£) <sup>3</sup>	Total joint-funding (TfL and Boroughs) at 2007/08 prices (£m) <sup>2</sup>
1990/91	756	35	13.44	-	-
1991/92	760	37	12.97	-	-
1992/93	765	45	13.10	-	-
1993/94	702	40	10.59	-	-
1994/95	741	45	11.16	-	-
1995/96	751	44	10.67	-	-
1996/97	553	36	11.85	-	-
1997/98	500	43	12.23	-	-
1998/99	533	45	11.88	-	-
1999/00	501	44	12.22	-	-
2000/01	478	41	12.68	-	-
2001/02	523	39	13.23	5.06	10.68
2002/03	653	44	13.32	4.48	12.22
2003/04	791	50	13.70	4.19	12.69
2004/05	948	63	12.69	2.82	13.53
2005/06	1,118	74	14.83	2.59	13.93
2006/07	1,275	77	14.27	2.37	15.93
2007/08	1,436	80	13.13	2.26	17.10
<b>Percentage change</b>					
1 year	13%	4%	-8%	-5%	7%
10 years	187%	86%	7%	-	-

Source: TfL Taxicard Survey

1. Up to 2003/04 excludes Barnet, Greenwich, Redbridge and Westminster, which operated their own Taxicard scheme. From 2004/05, only Westminster is excluded.

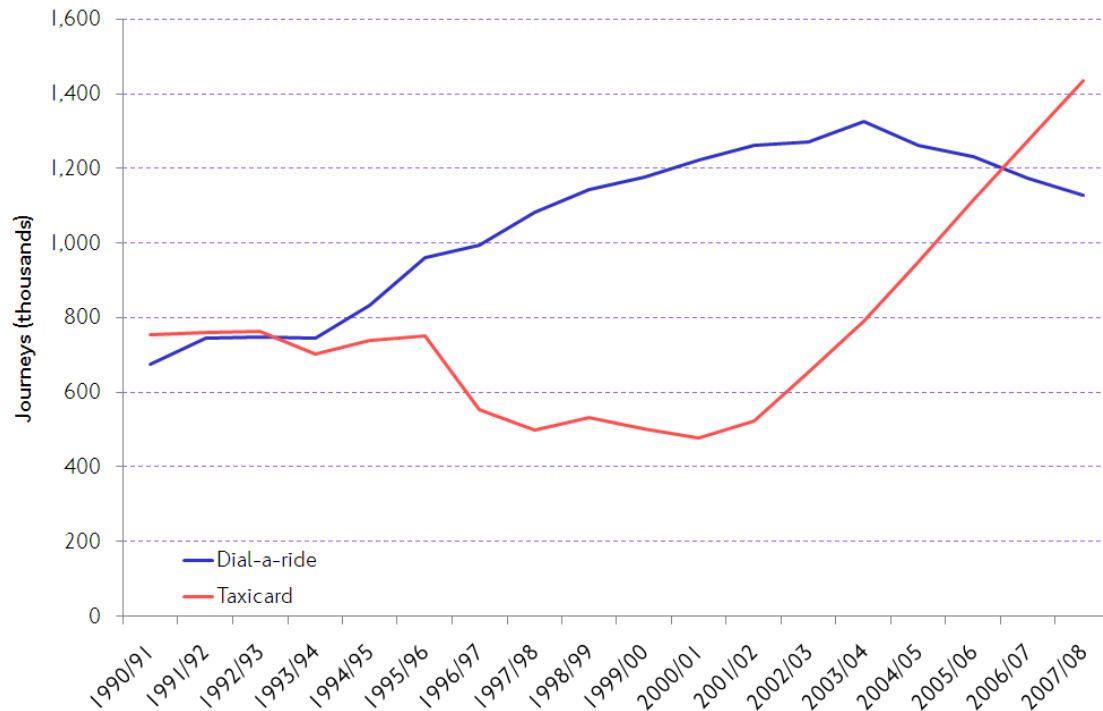
2. The average cost per trip comprises the total metered fare, plus an administration fee, before the user's contribution is deducted.

3. The user contribution comprises the user's minimum fare, plus any amount on the meter that is in excess of the borough's subsidy. Data available since TfL funding began in 2001.



Both the number of Taxicard members and number of journeys continued to increase in 2007/08, with the number of journeys made almost trebling over the last 10 years to stand at over 1.4 million in 2007/08. The average cost per vehicle trip and user contributions both continued to decrease in real terms. Since TfL funding began in 2001, the number of Taxicard members has more than doubled.

Figure 10.1 Taxicard and Dial-a-Ride journeys.





## 11. Fares, expenditure and customer satisfaction

### 11.1 Introduction

The section looks at long-run trends in public transport fares and motoring costs, and household expenditure on transport. It then proceeds to consider trends in customer satisfaction and value for money.

### 11.2 Key features and trends

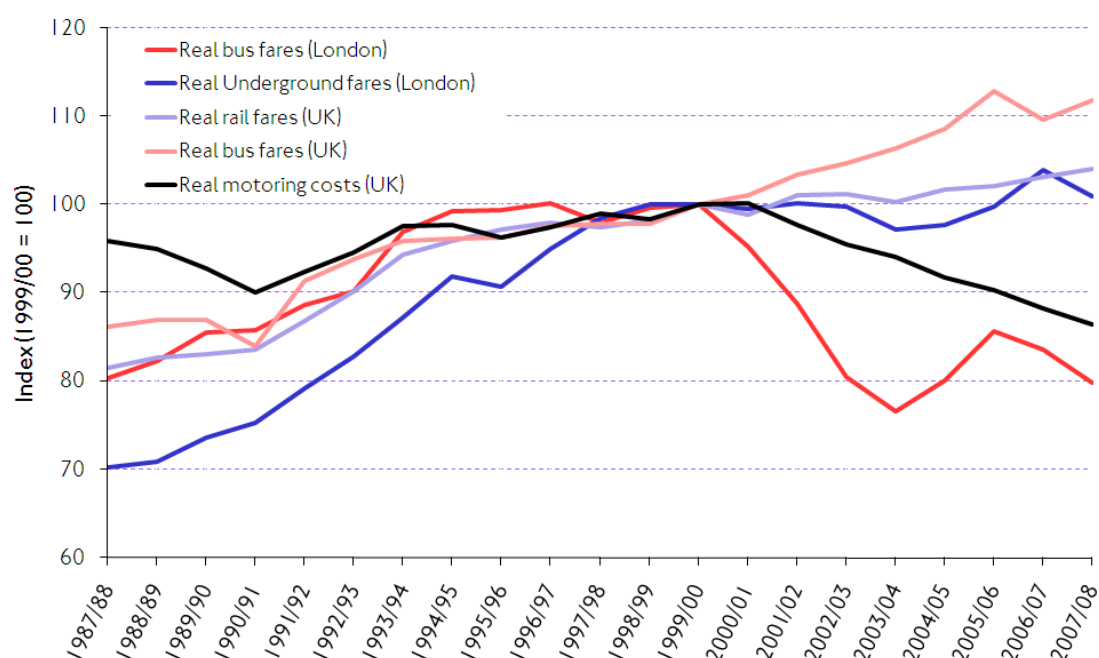
- Taking a long-term view, and taking rising incomes into account, many public transport fares are now substantially cheaper in real terms than in the past.
- Bus fares in London have not followed the wider UK trend, with real fares decreasing in London since 1999/00. Bus fares in the rest of Great Britain are around 10 percent higher than in 1999/00.
- Underground fares have remained relatively stable over the same period, although fares have been increasing since 2004/05, and are now above 1999/00 levels.
- Once the increase in Londoners' earnings is taken into account, bus fares related to earnings are almost 60 percent lower than they were in 1971. The average fare paid on the Underground has increased since the mid-80s, with fares over 50 percent higher, in real terms, than in 1971. Again, when Londoners' earnings are taken into account, the average Underground fare paid relative to earnings is below the 1971 level, by around 30 percent.
- By contrast, real motoring costs have decreased steadily year-on-year across the UK as a whole, and are now 14 percent lower than in 1999/00. Real rail fares in the UK have increased slightly over the same period.
- Households in London spend more per week on transport than the average Great Britain household. While spending less on motoring, especially petrol, they spend over twice as much on fares and other travel costs.
- Over the past 10 years the customer 'overall evaluation' of bus services has risen progressively – from a score of 75/100 in 1998/99 to 79/100 in 2007/08 – a reflection of improvements to the bus service over this period.
- Over the past 10 years the 'overall evaluation' score for the Underground has stayed fairly constant, with a score of 77/100 in 2007/08 compared to 76/100 in 1998/99. This is encouraging, given the sometimes negative repercussions of TfL's large investment programme on the Underground in recent years.

### 11.3 Fares and prices – bus and rail

Figure 11.1 shows indexed real fares (deflated by the Retail Prices Index) for public transport in London, together with indexed motoring costs for comparison. Values are indexed to 1999/2000.

- Bus fares in London have not followed the wider national trend, with fares decreasing in London since 1999/2000. Bus fares in the rest of the UK are around 10 percent higher than in 1999/2000.
- Underground fares have remained relatively stable over the same period, although fares have been increasing since 2004/05, and are now above 1999/2000 levels.
- By contrast, real motoring costs have decreased steadily year-on-year across the UK, and are now 14 percent lower than in 1999/2000. Real rail fares in Great Britain have increased slightly over the same period.

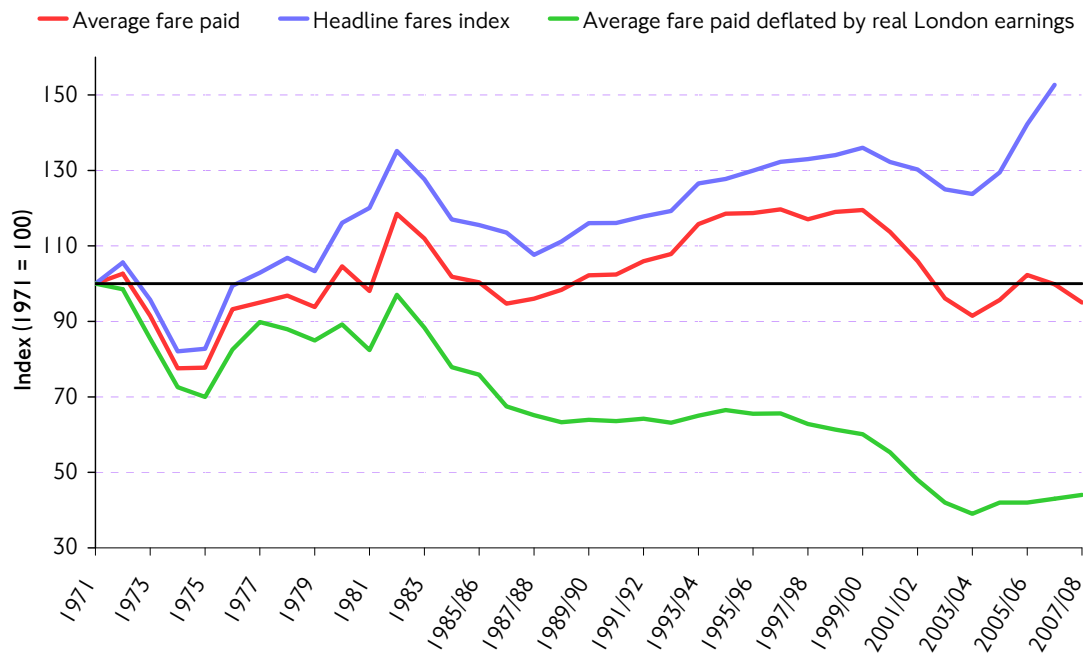
Figure 11.1 Public transport fares in London, with motoring costs for comparison.



Source: Transport for London

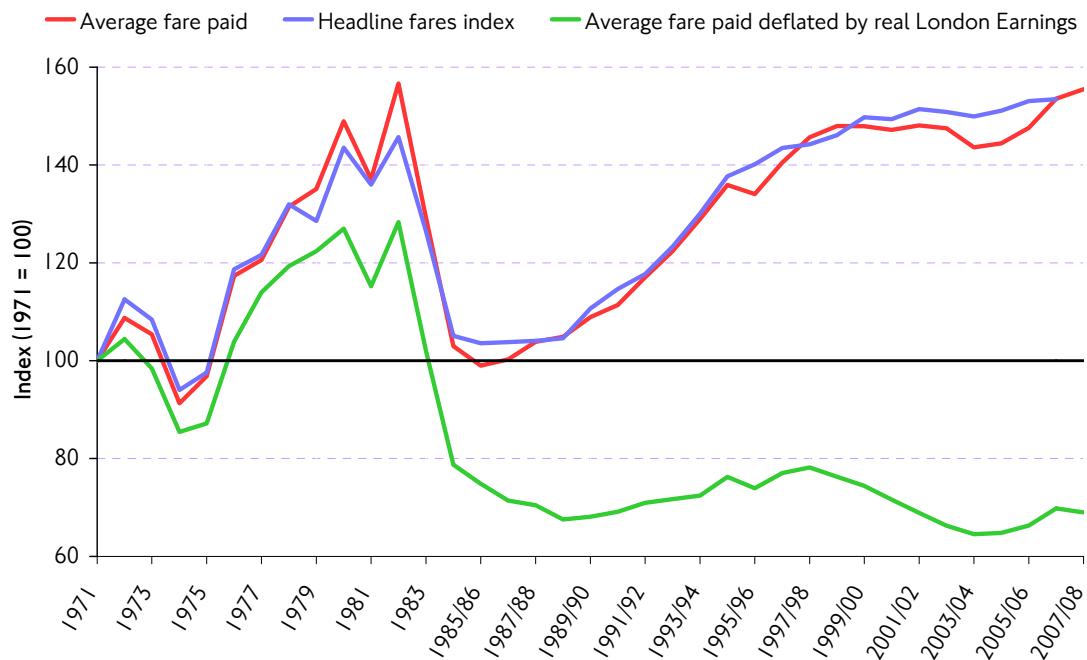
The average fare paid on London’s buses has fallen since 1999/00, and is now at the same level, in real terms, as it was in 1971. Once the increase in Londoners’ earnings is taken into account, bus fares relative to earnings are almost 60 percent lower than they were in 1971. By contrast, the average fare paid on the Underground has increased since the mid-1980s, with fares over 50 percent higher than in 1971. Again, when Londoners’ earnings are taken into account, the average Underground fare paid is below the 1971 level, by around 30 percent. Figures 11.2 and 11.3 show these distinctions, for bus and Underground respectively.

Figure 11.2 Bus fare trends.



Source: TfL, Ticket Sales Data

Figure 11.3 London Underground fare trends.



Source: TfL, Ticket Sales Data

## 11. Fares, expenditure and customer satisfaction

Table 11.1 is a reference table showing the value of fares paid. This table shows the average fare paid, including those who travel for free. In recent years, increasing numbers of people have become eligible for free and discounted travel, such as young people, particularly on buses. The average fare, calculated on the basis of those actually paying a fare (noting that some passengers do not pay a fare), was 16.7 pence per kilometre in 2007/08.

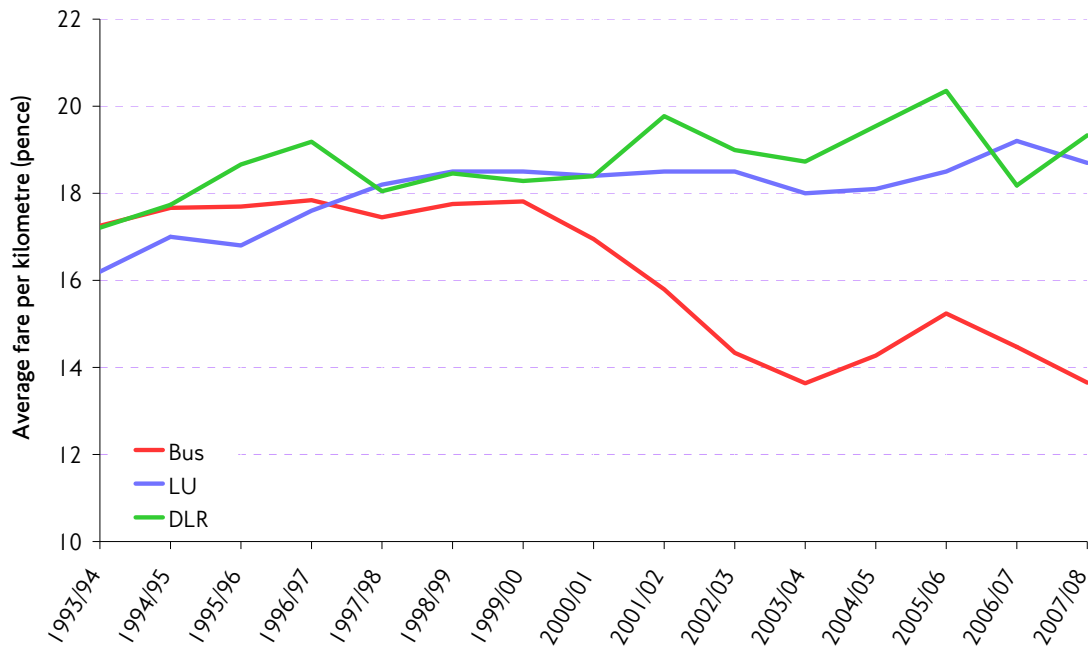
Table 11.1 Real average fares per passenger kilometre (2007/08 prices).

Year	Pence			
	Bus	Underground	DLR	London Tramlink
1991/92	15.8	14.7	14.3	-
1992/93	16.1	15.3	17.1	-
1993/94	17.3	16.2	17.2	-
1994/95	17.7	17.0	17.7	-
1995/96	17.7	16.8	18.7	-
1996/97	17.8	17.6	19.2	-
1997/98	17.4	18.2	18.0	-
1998/99	17.8	18.5	18.5	-
1999/00	17.8	18.5	18.3	-
2000/01	16.9	18.4	18.4	-
2001/02	15.8	18.5	19.8	14.2
2002/03	14.3	18.5	19.0	14.3
2003/04	13.6	18.0	18.7	14.2
2004/05	14.3	18.1	19.5	15.5
2005/06	15.2	18.5	20.4	16.2
2006/07	14.5	19.2	18.2	14.9
2007/08	13.7	18.7	19.3	15.1

Source: TfL, Service Performance data

Figure 11.4 shows trends in average fare paid per kilometre of travel for the three main public transport modes. The trend towards relatively cheaper bus fares is clearly apparent, although there has been little overall long-run change in the indices for the Underground and DLR since the mid 1990s.

Figure 11.4 Average fare per kilometre on bus, Underground and DLR (2007/08 prices).



Source: TfL, Service Performance Data

Table 11.2 Traffic revenue (2007/08 prices). Main public transport modes.

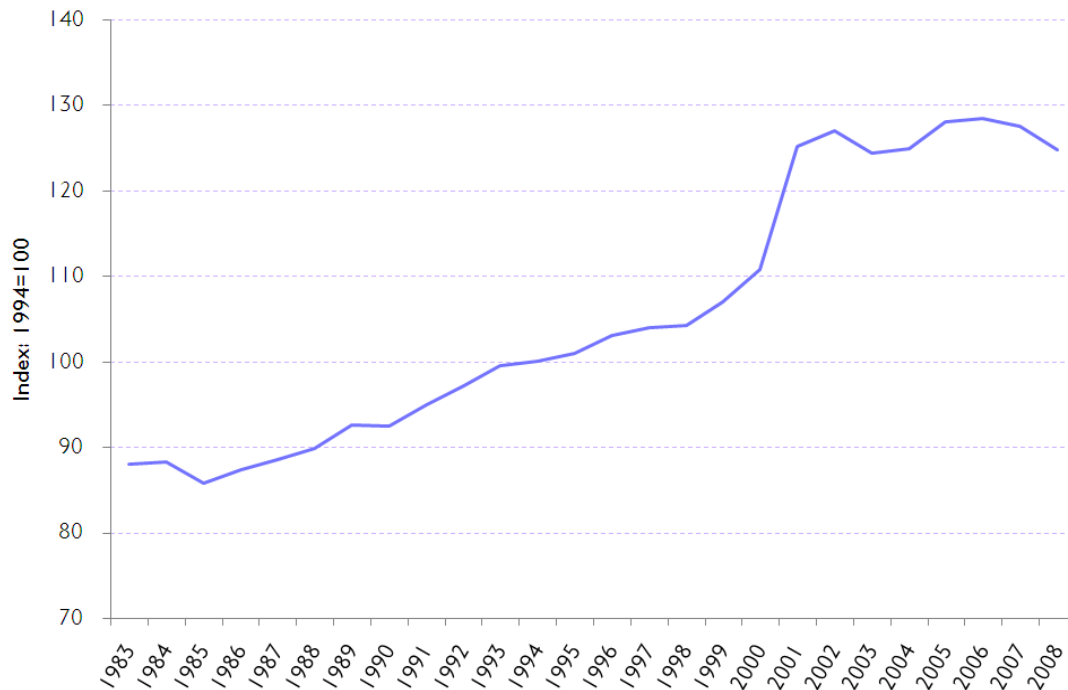
Year	£ million				
	Bus	Underground	DLR	London Tramlink	Overground
1991/92	631	864	5	-	-
1992/93	631	883	6	-	-
1993/94	659	939	7	-	-
1994/95	692	1,030	10	-	-
1995/96	711	1,064	13	-	-
1996/97	742	1,083	16	-	-
1997/98	759	1,182	20	-	-
1998/99	766	1,245	26	-	-
1999/00	789	1,329	28	-	-
2000/01	799	1,377	36	-	-
2001/02	810	1,382	41	14	-
2002/03	822	1,361	44	14	-
2003/04	877	1,321	44	15	-
2004/05	964	1,376	47	18	-
2005/06	1,015	1,403	52	19	-
2006/07	1,044	1,475	55	19	-
2007/08	1,053	1,525	63	21	15

Source: TfL, Service Performance data

Traffic revenues have continued to increase across all modes in 2007/08, albeit at a slower rate than in 2006/07 (Table 11.2). Underground continued to generate the largest revenues, comprising over 50 percent of all traffic revenue. London Overground generated £15m revenue in its first five months of operation.

### 11.4 Fares and prices – taxis

Figure 11.5 Taxi real fares index.



Source: TfL, Public Carriage Office

TfL regulates taxi fares throughout London. Figure 11.5 shows the index of real taxi fares for London taxis since 1983. Fares have risen steadily in real terms since the mid-1980s, increasing by 20 percent in the 10 years to 2000. Between 2000 and 2001 fares increased by 13 percent when evening and night tariffs were introduced in order to encourage more drivers to work later at night, when there was evidence of unmet demand and a significant number of assaults associated with illegal cab activity. Another recent change was the temporary introduction of a 20 pence charge on each taxi fare between April 2005 and April 2008, so that taxi users would fund the improvements needed to bring London's taxi fleet to Euro III emissions standards for particulate and nitrogen oxide emissions. With the removal of this charge in 2008, taxi fares were at the same level in real terms as in 2001.

Taxi fares are paid to the drivers, who have to cover the costs of the taxi and associated equipment, fuel, spares and maintenance as well as licensing costs and any arrangements they have with taxi-booking companies from this fares income. Since the early 1980s, changes in taxi fares have been determined with reference to a cost index that reflects the costs of providing a taxi service in London. This was agreed as the fairest way of ensuring that a reasonable balance was struck between users' desires for a cheaper service and the drivers' expectations of meeting the costs of the vehicle and recovering the expense of qualifying as a taxi driver. Learning the Knowledge typically



takes three years or more for an All-London licence. The cost index was reviewed independently in 2004/05 and it remains a good indicator of how the costs change.

The index is retrospective, so the 3.4 percent increase in average fares announced in February 2009 reflects cost changes during 2008. In response to views that taxi fares should not be increased more than necessary in the present economic environment, TfL decided not to make allowance for the very high costs of fuel in the first half of 2008 which could have justified a higher increase. The low rates of inflation at the end of 2008 will be reflected in the tariff revision to take place in April 2010.

## 11.5 Expenditure on transport

Table 11.3 Expenditure per London household per week on travel and transport.

Type of expenditure	London (pounds, 2007/08 prices)				United Kingdom (pounds, 2007/08 prices)			
	2003/04	2004/05	2005/06	2006	2003/04	2004/05	2005/06	2006
<b>Motoring and cycling</b>								
Purchase and repairs <sup>1</sup>	27.60	25.00	32.00	29.40	33.10	30.80	29.90	29.40
Spares and accessories <sup>1</sup>	1.40	1.50	1.50	1.20	2.00	2.10	2.00	2.10
Motor vehicle insurance and taxation	11.00	9.20	11.30	10.20	10.40	11.00	11.60	10.60
Petrol, diesel and other motor oils	13.70	11.80	13.50	13.90	15.00	16.20	17.50	18.20
Other motoring costs	2.60	2.30	2.30	2.20	1.90	2.40	2.30	2.40
<b>Total motoring and cycling</b>	<b>56.30</b>	<b>49.90</b>	<b>60.70</b>	<b>56.80</b>	<b>62.40</b>	<b>62.40</b>	<b>63.40</b>	<b>62.60</b>
<b>Fares and other travel costs</b>								
Rail and Underground fares	3.60	3.70	3.40	3.60	1.90	2.00	2.10	2.20
Bus and coach fares	1.90	2.30	2.40	2.00	1.40	1.50	1.50	1.30
Combined fares <sup>2</sup>	4.70	5.10	6.70	6.70	0.70	0.80	1.00	1.00
Other travel costs <sup>3</sup>	4.20	4.90	8.40	9.20	4.80	3.90	5.40	5.50
<b>Total fares and other travel costs</b>	<b>14.30</b>	<b>16.00</b>	<b>20.90</b>	<b>21.60</b>	<b>8.80</b>	<b>8.10</b>	<b>9.90</b>	<b>10.00</b>
<b>Totals</b>								
<b>Transport expenditure per household</b>	<b>70.60</b>	<b>65.90</b>	<b>81.60</b>	<b>78.40</b>	<b>71.10</b>	<b>70.60</b>	<b>73.30</b>	<b>72.60</b>
<b>Total expenditure per household</b>	<b>485.40</b>	<b>485.00</b>	<b>530.00</b>	<b>538.00</b>	<b>418.10</b>	<b>434.40</b>	<b>443.40</b>	<b>455.90</b>

Source: Family Expenditure Survey and the Expenditure and Food Survey, National Statistics © Crown Copyright 2008 Published with the permission of the Controller of Her Majesty's Stationery Office (HMSO)

1. Includes cars, vans, motorcycles, cycles and other vehicles.

2. Includes travelcards to be used on Underground, rail and bus.

3. Includes air fares, school travel, taxis, hire cars and ferry travel.

Average expenditure per household on travel and transport for years 2003/04, 2004/05, 2005/06 and 2006 have been rebased to constant (2007/08) prices using the Retail Price Index (all items). Table 11.3 shows that in 2006, Londoners continued to spend more per household on transport than was typical for UK households, spending over twice as much per week on public transport fares, at over £20 per household. Correspondingly, Londoners spend less on motoring and cycling than UK households, mostly as a result of spending less on fuel.

## 11.6 Customer satisfaction

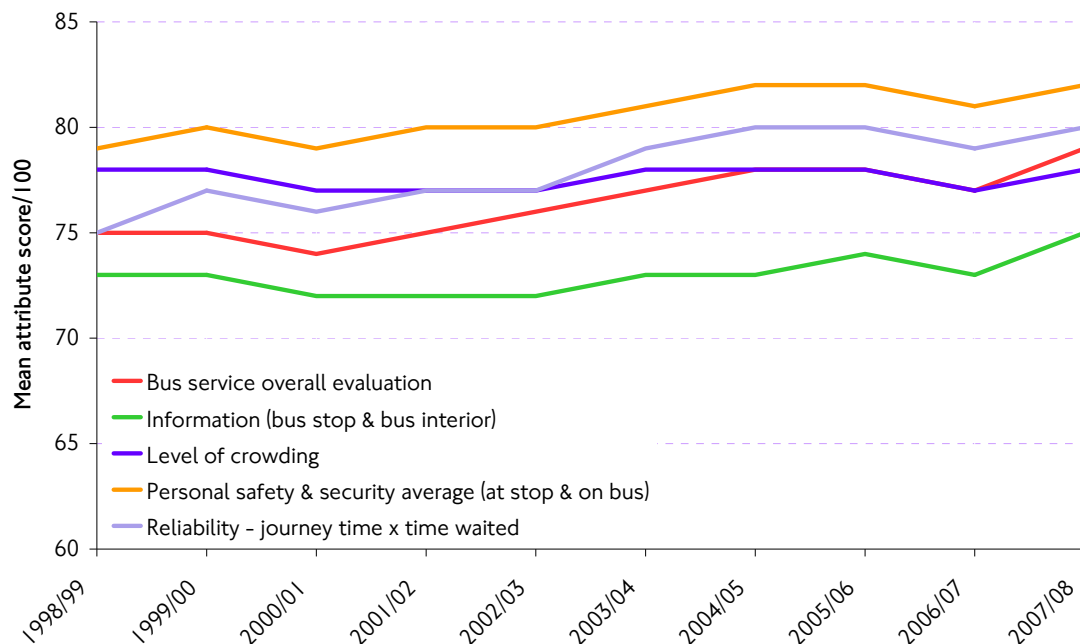
Customer satisfaction surveys are designed to provide feedback from customers on the quality of services provided. Interviews take place at the point of service delivery, and customers are asked detailed questions about their satisfaction with the service they have just experienced. The results of the surveys are used to ensure that TfL continues to meet customer needs, and to identify any areas for improvement.

With the focus of the Mayor of London on making transport in London easier to use, such surveys will become increasingly important for measuring progress and new measurement techniques are currently being designed. For this year's report, summary results from TfL's existing Customer Satisfaction surveys, carried out on bus and Underground for the past 10 years, are shown below. Results are presented as scores out of 100. It should be noted that satisfaction levels tend to change slowly, as customer expectations of service quality also tend to rise over time.

### Customer satisfaction indices – buses

Figure 11.6 shows selected customer satisfaction indices for buses. Satisfaction is expressed in terms of a mean score, out of 100, for each attribute. Over the past 10 years the overall 'customer evaluation' of bus services has risen progressively – from a score of 75 in 1998/99 to 79 in 2007/08 – a reflection of the numerous improvements to the bus service over this period. The increase in bus service provision has led to an increase in the reliability score, while the crowding score has remained static, reflecting increased patronage.

Figure 11.6 Selected customer satisfaction indicators for TfL buses.

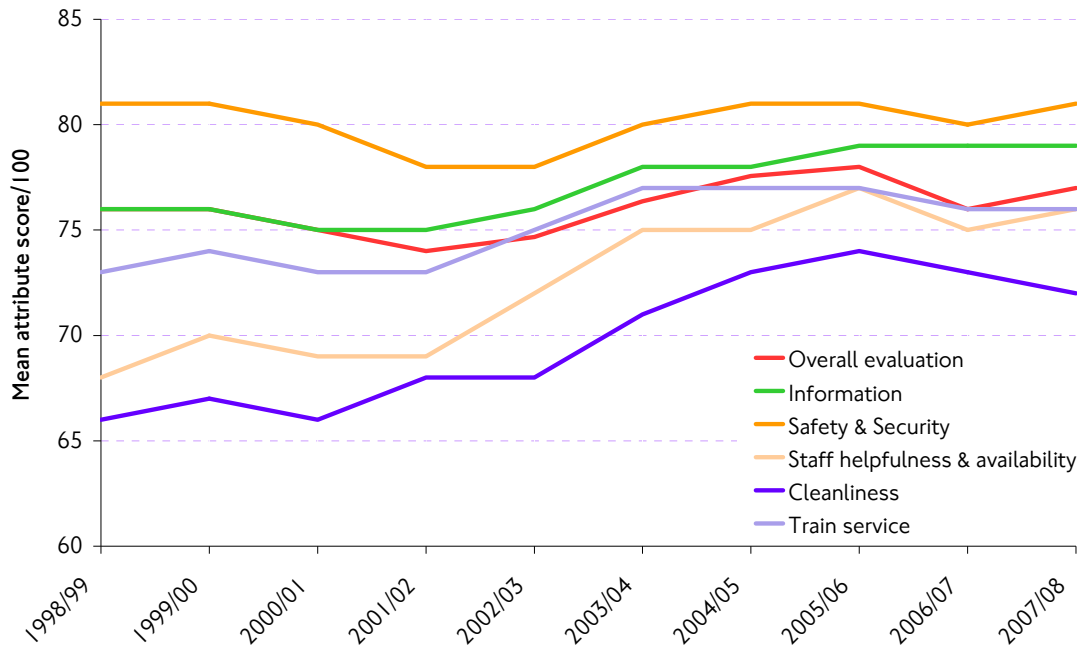


Source: TfL, Customer Research

### Customer satisfaction indices – LU

Figure 11.7 shows equivalent indices for LU. The customer satisfaction overall evaluation score is slightly higher than 10 years ago despite the significant increase in demand and the impact, notably at weekends, of works being carried out under TfL’s large investment programme. The staff helpfulness and cleanliness indices have risen by six points or more over the review period.

Figure 11.7 Selected customer satisfaction indicators for LU.



Source: TfL, Customer Research

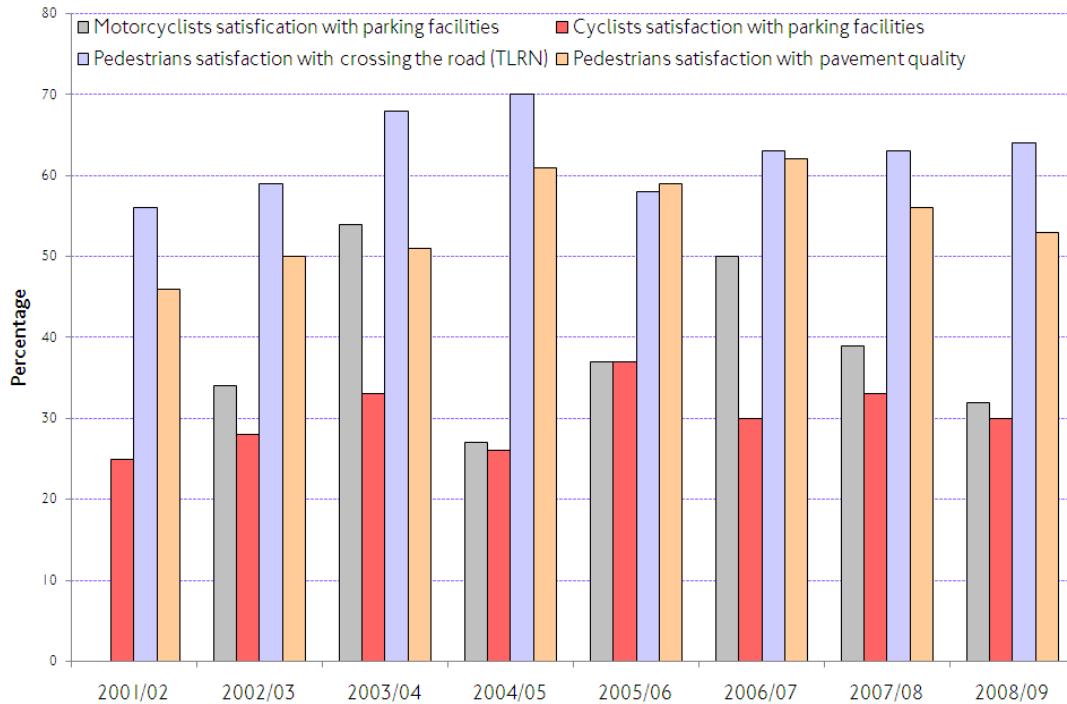
### The TLRN Customer Satisfaction Survey – motor roads in London

TfL Surface Transport has for eight years conducted an annual customer satisfaction survey with people at retail centres on the Transport for London Road Network (TLRN) asking them to rate three indicators on a five point semantic scale from ‘very satisfied’ to ‘very dissatisfied’. Since 2005 the sample has been about 2,000 respondents each year.

- In 2008/09 64 percent of pedestrians reported that they were satisfied with crossing the main road in their area. This compares with 63 percent in 2007/08 and 2006/07.
- In 2008/09 53 percent of pedestrians reported that they were satisfied with the quality of the pavements in their area. This compares with 56 percent in 2007/08 and 62 percent in 2006/07.
- The small sample of motorcycles users (approximately 40 each year) introduces variability in the year-to-year results and therefore should be viewed as indicative and not statistically significant. Thirty two percent of customers surveyed in 2008/09 reported that they were satisfied with parking facilities for motorcycles in their area. This compares with 39 percent in 2007/08 and 50 percent in 2006/07.

- Cyclists were also asked how satisfied they were with parking facilities for bicycles in their area; 30 percent said they were satisfied in 2008/09 compared to 33 percent in 2007/08 and 30 percent 2006/07.

Figure 11.8 Key indicators from the TLRN Customer Satisfaction Survey.

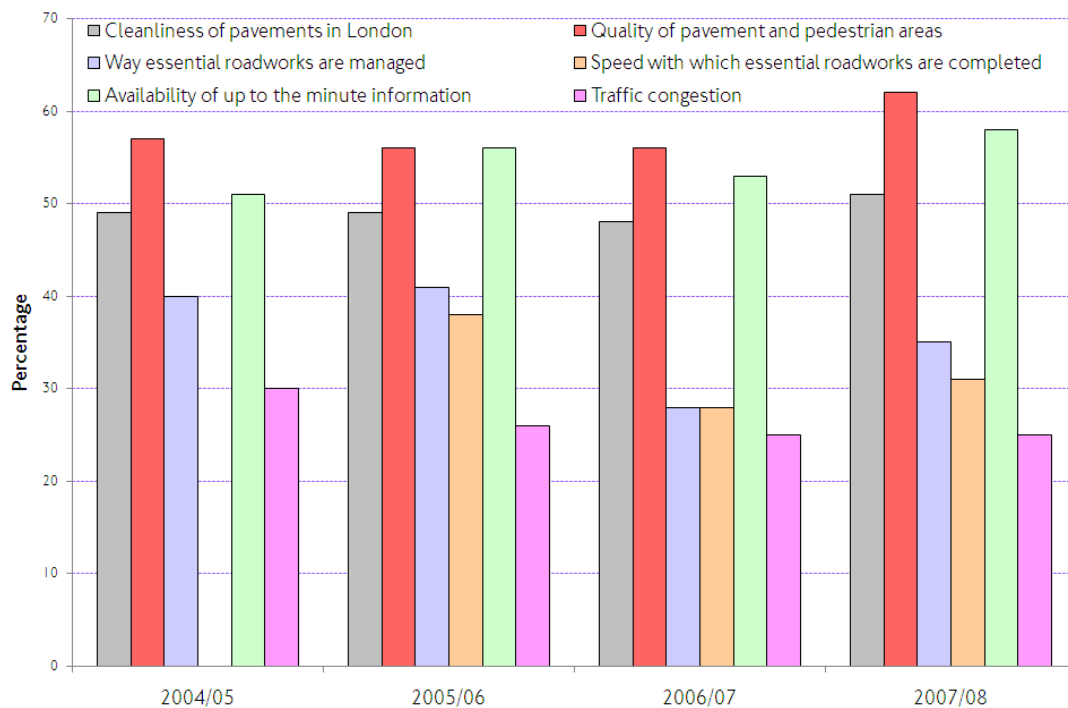


Source: TfL Road Network Performance

### The TfL Streets Management Customer Satisfaction Survey

Since 2005, TfL has also commissioned an annual customer satisfaction survey by telephone with London residents asking them to rate their satisfaction with the maintenance and management of all London streets. The 2007/08 survey was carried out in February 2008. Figure 11.9 shows the percentages of respondents reporting they were satisfied or very satisfied with 6 key aspects of the street environment.

Figure 11.9 TfL Customer Satisfaction Survey – satisfaction with streets and traffic.



Source: TfL Road Network Performance

### Traffic congestion and car use

In the 2008 survey, only 25 percent of respondents were satisfied with the level of traffic congestion London-wide. More detailed questions relating to whether respondents considered that the delays were worse than the previous year produced the following results:

- 38 percent of car users considered that they were more delayed; 8 percent less delayed
- 19 percent of cyclists considered that they were more delayed; 9 percent less delayed
- 21 percent of powered two wheeler users considered that they were more delayed; and fewer than 0.5 percent less delayed

Comparing car use to the previous year, 56 percent of respondents used their car the same amount, 30 percent reported less use and 13 percent more use than the previous year. The main reasons given for reducing car use were: too much traffic makes car journey slow (23 percent); congestion charging makes using the car too expensive (20 percent) and lack of parking or that parking is too expensive (17 percent).

Of those who used their car less, buses were the most popular alternative mode of transport (45 percent) followed by the Underground (29 percent). Reasons for increased car use included public transport being unreliable (19 percent) and need to have a car for journeys with others (13 percent).

## 11.7 Enforcement

Table 11.4 shows numbers of penalty charge notices issued by relevant authorities in London for 2004/05 and 2005/06. For parking, TfL is responsible for enforcement of parking regulations on the TLRN. Individual boroughs are responsible for enforcement on non-TLRN roads within their own area.

Table 11.4 Key enforcement statistics – 2004/05 to 2005/06.

Borough	Thousands of penalty charge notices (PCNs)							
	Parking PCNs		Bus lanes PCNs		Moving traffic PCNs		Total PCNs	
	2004/05	2005/06	2004/05	2005/06	2004/05	2005/06	2004/05	2005/06
Barking and Dagenham	47	42		9			47	51
Barnet	156	169	16	33			172	202
Bexley	63	66	11	6			74	72
Brent	112	114	18	12			130	126
Bromley	68	70	10	20			78	89
Camden	464	448	46	25	52	106	562	579
City of London	44	37		16			44	54
Croydon	70	87	28	3	4	12	101	102
Ealing	179	213	64	70	5	101	248	384
Enfield	93	100	9	48		3	103	151
Greenwich	62	49					62	49
Hackney	127	141	3	22			130	163
Hammersmith and Fulham	185	165	26	19		4	211	188
Haringey	146	135	55	25		44	201	203
Harrow	74	83	8	17			82	100
Havering	38	40					38	40
Hillingdon	67	61	21	28			88	89
Hounslow	99	93					99	93
Islington	310	211	58	44		17	368	271
Kensington and Chelsea	292	295					292	295
Kingston	75	64	0	5			75	69
Lambeth	244	255	66	37		3	310	295
Lewisham	77	63		2			77	65
Merton	49	57	13	12			62	69
Newham	168	188	52	33	16	35	237	256
Redbridge	95	96					95	96
Richmond	99	73	20	16			119	89
Southwark	131	135	11	6			142	141
Sutton	48	49					48	49
Tower Hamlets	69	73		8			69	81
Waltham Forest	135	140	16	12			150	153
Wandsworth	243	245	12	13	1	3	256	261
Westminster	818	715		1		6	818	722
Transport for London	56	304	273	155	24	56	352	515
<b>All local authorities</b>	<b>5,000</b>	<b>5,075</b>	<b>835</b>	<b>698</b>	<b>102</b>	<b>389</b>	<b>5,938</b>	<b>6,162</b>





## 12. Accessibility and London's interaction with its hinterland

### 12.1 Introduction

This section looks at the role of the transport networks in facilitating access to different parts of London. It also considers some aspects of London's interaction with wider national and international transport networks.

### 12.2 Key features and trends

- Increasing the accessibility and user-friendliness of London's transport system are key priorities of the new Mayor of London. TfL's Public Transport Accessibility Levels (PTAL) and its CALculator for Public Transport Accessibility in London (CAPITAL) tools facilitate detailed examination of accessibility in relation to specific locations or new developments, or comparatively across Greater London. Examples are provided that demonstrate the potential application of these tools for stakeholders and delivery partners going forward.
- In 2007 there were 10.2 million domestic (ie rest of UK) visitors to London, this translating to about 64,000 people on an average night. The corresponding numbers for overseas visitors were 15.3 million and 320,000 people on an average night (taking account of differing lengths of stay). These two categories of non-resident visitors (which do not represent all overnight visitors and do not include day-only visitors) are equivalent to an additional 5 percent of the total resident population.
- The number of passengers travelling through London airports continued to grow in 2007. Almost 140 million non-transit passengers passed through London's five major airports, over twice as many as in 1990. This corresponds to over 380,000 people per day, roughly equally split between those arriving and those departing. The trend since 1991 has been one of steady year-on-year growth, briefly interrupted in 2001 following terrorist attacks in the USA.
- Heathrow accounted for almost half of all London airport terminal (ie non-transiting) passengers, with Gatwick a further quarter. However, rates of growth have been greater at other London airports. Over the 10 years to 2007, passenger numbers have increased by a factor of 3.1 at Luton, a factor of 4.4 at Stansted, and by 2.5 at London City. Over the same period, passengers travelling through Heathrow increased by 17 percent, and those through Gatwick by 31 percent.
- Almost 800,000 people commuted to Greater London on a regular basis by all modes in 2007, roughly equivalent to 13 percent of the adult resident population. This was an increase of 13 percent over the year 2000. A slightly larger percentage increase of 17 percent was seen over the same period in out-commuters, although the net positive daily commuting inflow to Greater London was 470,000 people – equivalent to 7.5 percent of the adult resident population.

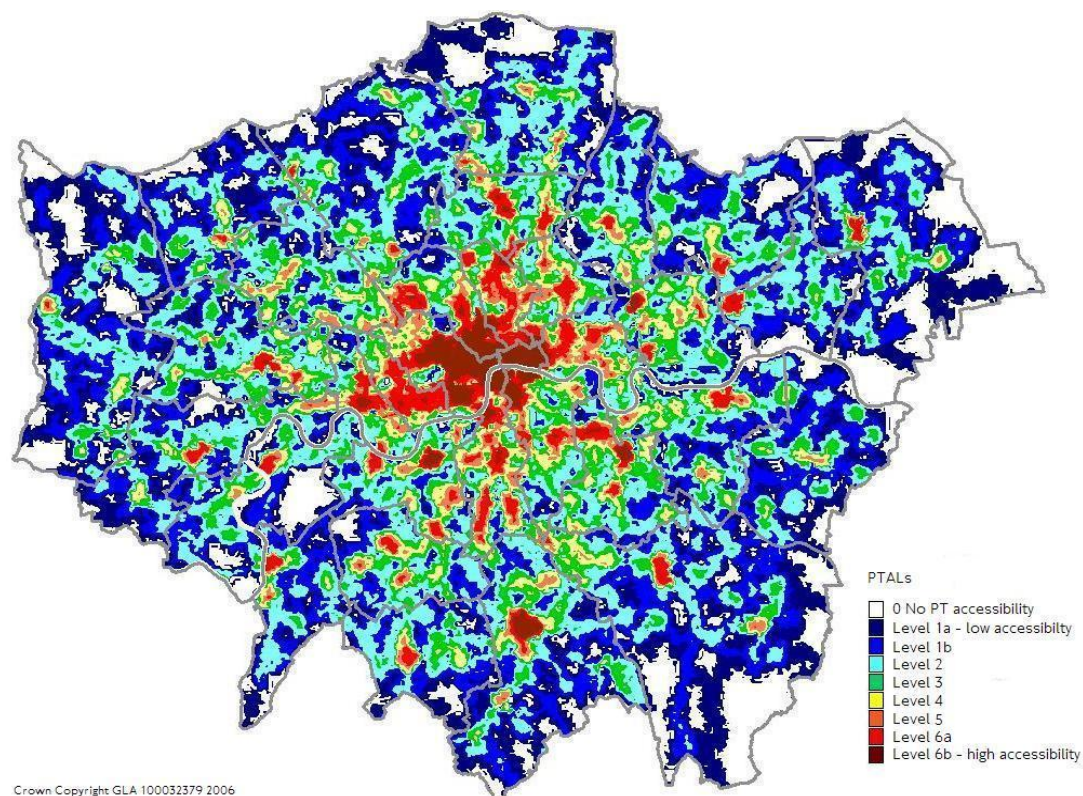
### 12.3 Accessibility to locations within London

Accessibility in this context can be considered in two ways. The first reflects the density of transport **provision** for a particular location. While basic access by road can be regarded as almost universal, this is not the case for the public transport network. Different locations in Greater London have differing public transport provision or access. A measure of this provision in respect of specific locations is a measure of accessibility to the public transport networks. This measure can be used to understand how provision relates to local circumstances (eg population density), and to explore what might be done to provide for future circumstances (eg new developments). TfL has developed its PTAL tool to address this requirement. PTALs are a measure of access to the network for any point in Greater London, combining walk time to the network with public transport service waiting times or frequencies.

A second measure of accessibility relates to the **orientation** and **performance** of the transport networks for a particular location, most obviously reflected in travel times to or from key employment or development locations, although in practice able to be used between arbitrary pairs of locations. Making use of public transport timetables and road network travel times, TfL's CAPITAL tool is being developed to address this requirement.

Figure 12.1 shows levels of public transport accessibility across London, derived from TfL's PTAL tool. An 'Accessibility Index' is calculated which is then allocated to bands of PTALs, where band 1 (1a and 1b) represents a low level of accessibility and 6 (6a and 6b) a high level. A value of zero would indicate no access to the public transport network within the specified catchment area.

Figure 12.1 Public transport accessibility – Greater London overview, 2006.



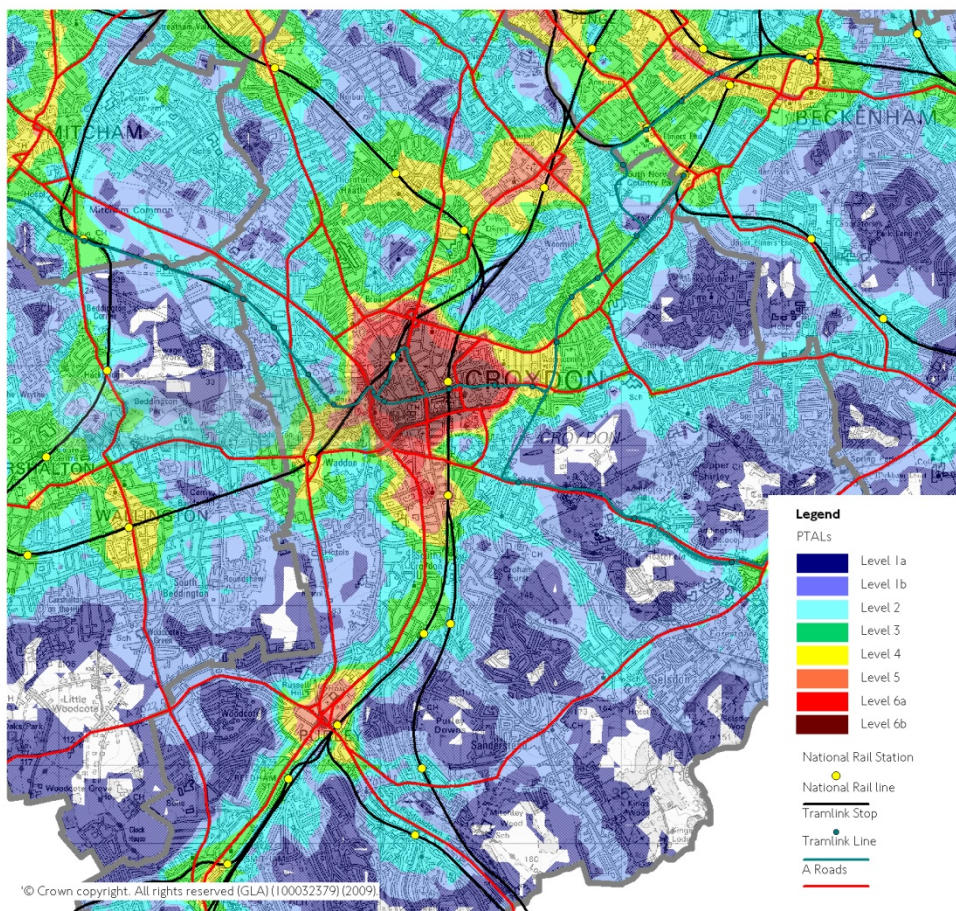
Source: Transport for London PTAL tool

The pattern of accessibility across London is fairly complex although ultimately shows that locations closer to central and Inner London benefit from higher levels of public transport accessibility than those further out. This reflects the strongly 'radial' orientation of the rail networks.

The influence of major geographical features, such as the Lea Valley and some of the larger Royal Parks, is clearly visible, and there are recognisable patterns reflecting the presence or absence of major rail corridors; for example, in the Lewisham area. Some of the larger strategic town centres in Outer London show comparably high levels of access to public transport. However, much of Outer London has, on this measure, relatively low levels of access to public transport.

Indices such as these are most useful when examined in relation to specific local issues or initiatives. Figure 12.2 shows how this tool can be used at the detailed level, for example, to examine existing public transport provision in respect of proposed developments and determine what additional capacity may be warranted. This example clearly shows how higher levels of access to public transport are concentrated in Croydon town centre and extend outwards following rail, bus and Tramlink routes.

Figure 12.2 Public transport accessibility – detailed view of Croydon town centre and surrounding area, 2006.



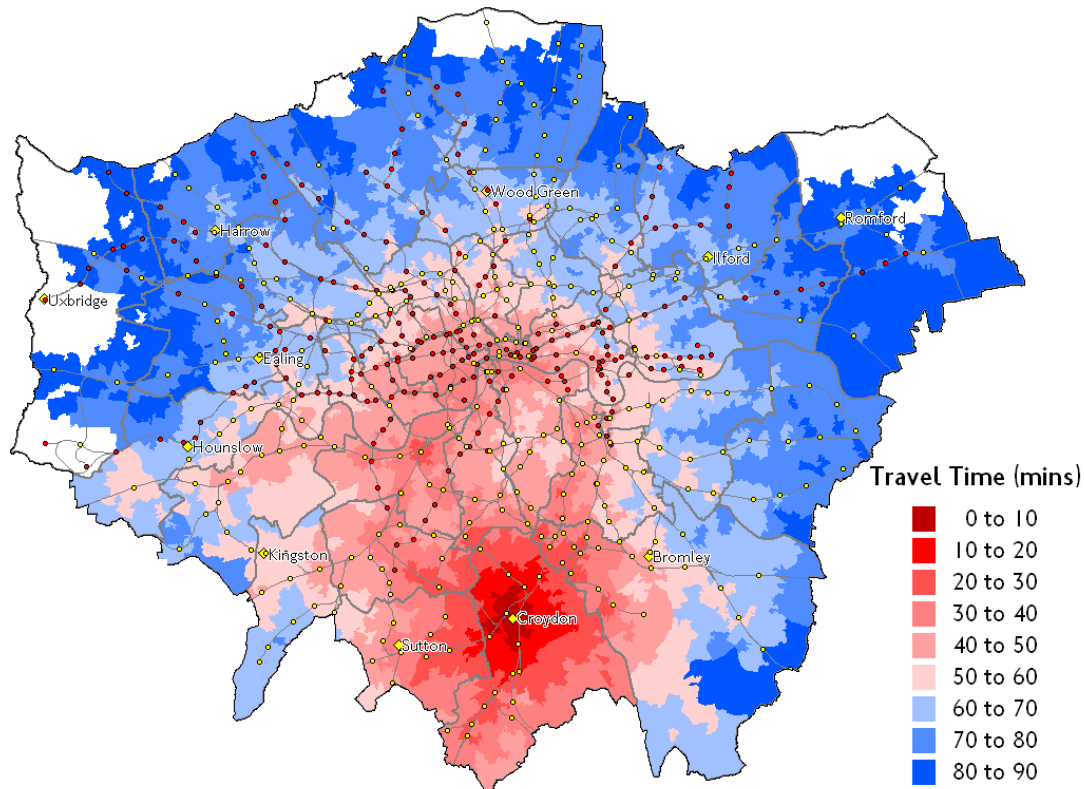
Source: Transport for London PTAL tool

## 12. Accessibility and London's interaction with its hinterland

The patterns in Figure 12.1 will change only slowly - while they are useful for tracking progress in a periodic 'benchmarking' sense, they are unlikely to show significant changes at the London-wide level on a yearly basis. Furthermore, access to public transport is only part of the picture, as rail lines and bus routes available locally may or may not directly serve appropriate destinations.

TfL's CAPITAL tool addresses this issue, and can also be used to define 'accessibility footprints' from locations of specific interest. Figures 12.3 and 12.4 illustrate the use of this tool, looking at accessibility isochrones (time bands) for minimum travel times by public transport, and for comparison, by car in Figure 12.5, to two key locations in the weekday morning peak period. Note especially that these time bands include, in the case of public transport, access trips to the nearest bus stop or rail station together with an allowance for appropriate interchange and, in the case of private vehicle trips, an appropriate allowance for parking search.

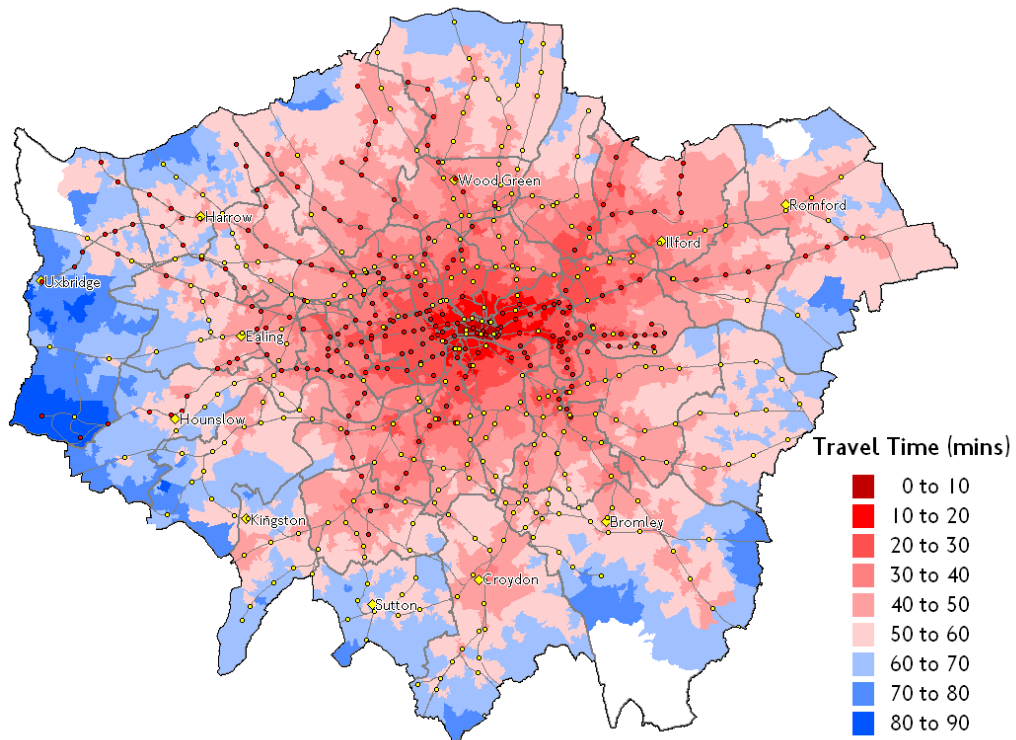
Figure 12.3 Minimum travel times to Croydon from within Greater London, public transport – weekday morning peak 2006.



Source: Transport for London CAPITAL tool

Croydon town centre is accessible by public transport from much of south and central London. However, access from the east is relatively poor, and access from about half of London requires journeys of more than 60 minutes.

Figure 12.4 Minimum travel times to Bank station from within Greater London, public transport – weekday morning peak, 2006.



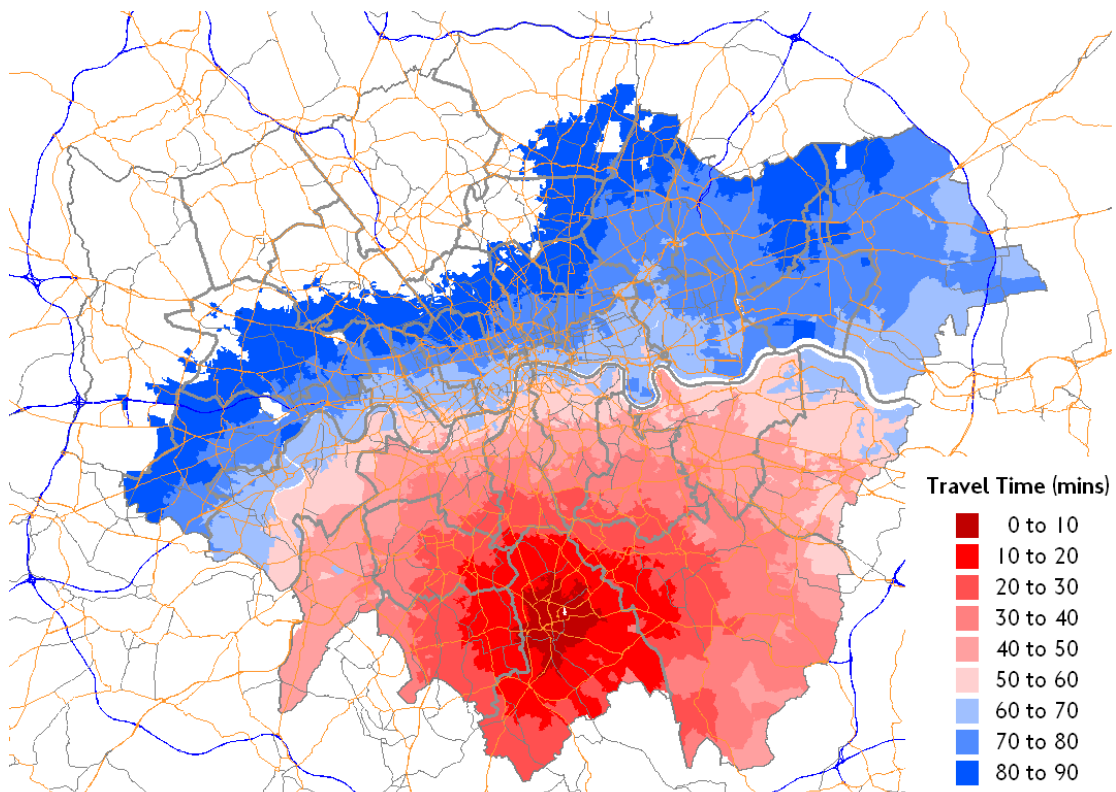
Source: Transport for London CAPITAL tool

The equivalent picture for public transport to Bank, in the heart of the City of London, clearly reflects the radial orientation of the rail networks, being accessible within an hour for all of Inner London, and those parts of Outer London alongside radial rail links.

CAPITAL can also be used to perform similar analyses for journeys by road. Figure 12.5 shows morning peak minimum drive times to central Croydon. Here, the accessibility pattern is more recognisably concentric, reflecting individual drivers' routing choices. However, it is noticeable that the 60 minute isochrone tends to follow the Thames for much of its length within London. Figures 12.3 and 12.5 show that compared with public transport, the proportion of London north of the river from which Croydon is accessible by road is lower than for public transport across all time bands.

## 12. Accessibility and London's interaction with its hinterland

Figure 12.5 Minimum driving times to Croydon from within Greater London, weekday morning peak 2006.



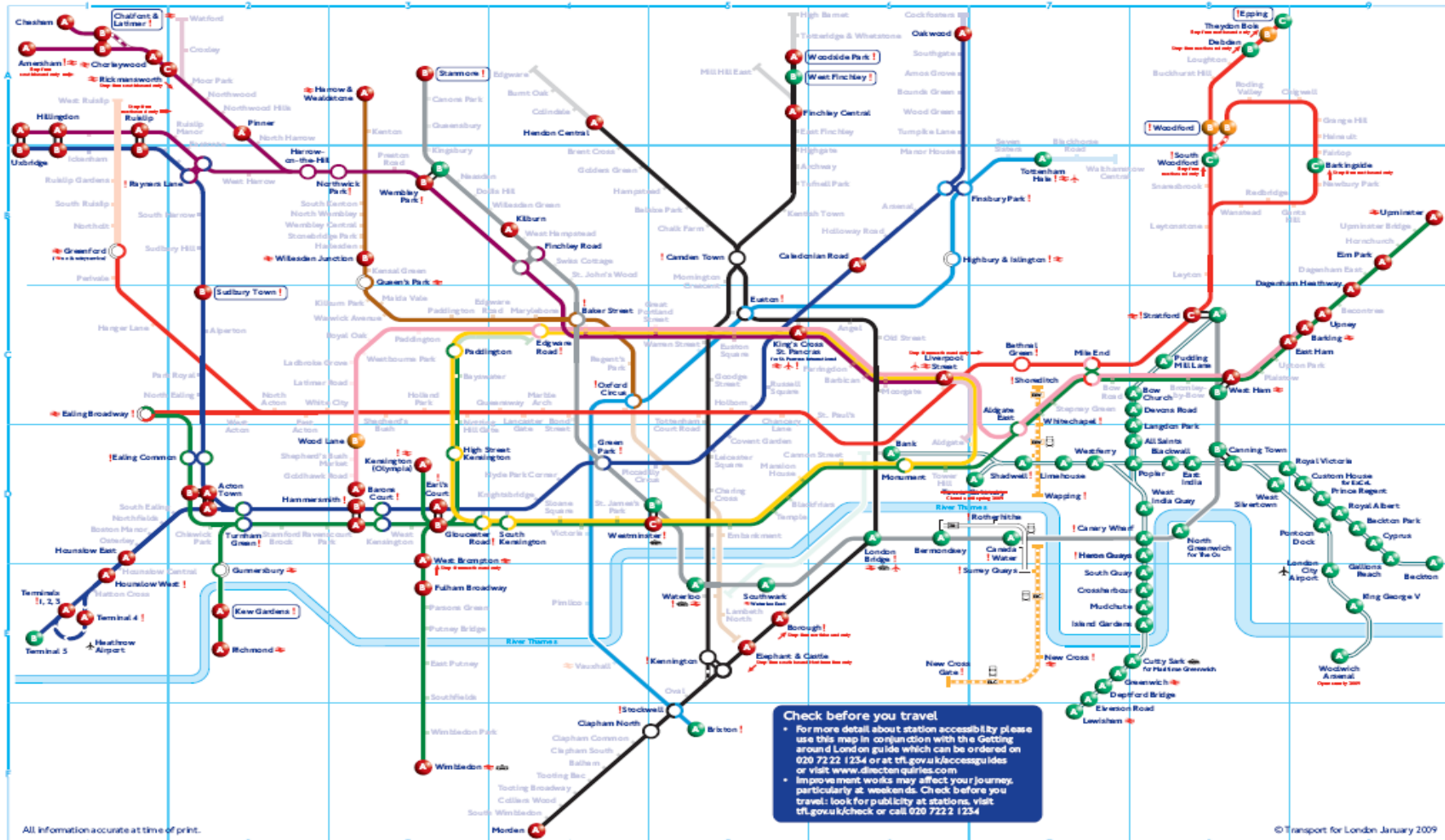
Source: Transport for London CAPITAL tool

### 12.4 Accessibility to the transport network

TfL is committed to making travelling around London on public transport as easy and accessible for all members of the community as possible. All buses in London (except for Heritage buses on routes 9 and 15) are low-floor and wheelchair-accessible. There are currently 56 stations on the LU network with step-free access, and a further eight that are step-free in one direction. By 2010, another 12 stations will be modified to provide step-free access. The DLR is already fully accessible, as is London Tramlink.

Figure 12.6 shows the locations of stations with step-free access on the Underground and DLR network. Stations with a coloured circle have step-free access, with the colour representing the step between the platform and the train; green represents a step of 0-50mm, amber represents a step of 51-120mm, and red represents a step of 121-323mm. The gap between the train and the platform is represented by letters; A denotes a gap of 0-85mm, B a gap of 86-180mm, and C a gap of 181-253mm. Also highlighted are step-free interchanges; for example, at Green Park it is possible to interchange between the Piccadilly and Jubilee lines, but not with the Victoria line.

Figure 12.6 London Underground map showing stations with step-free access, 2009



## 12.5 Overnight visitors to London

Table 12.1 sets out basic statistics in relation to non-resident visitors spending at least one night in London. In 2007 there were 10.2 million domestic (ie rest of UK) visitors to London, this equates to about 64,000 people on an average night, taking into account average length of stay. The corresponding numbers for overseas visitors were 15.3 million people per year and 320,000 people on an average night. In other words, these two categories of non-resident visitors (which do not represent all overnight visitors and do not include day-only visitors) are equivalent to an additional 5 percent of the total resident population. It is also likely that they use the transport system in different ways to London residents.

Apparently substantial changes in the relative balance between domestic and overseas visitors are evident from Table 12.1. However this is thought to largely reflect methodological changes with the survey and, particularly in the case of domestic visitors to London, comparisons between survey years should be regarded as indicative only.



Table 12.1 Number and characteristics of overnight visitors to London.

Year	Number of visitors (millions)	Average number of nights spent	Average spend per visit (£)
<b>Domestic visitors</b>			
2000	18.5	2.3	166
2001	17.0	2.4	177
2002	16.1	2.2	175
2003	14.3	2.3	225
2004	12.8	2.3	216
2005	10.8	2.2	194
2006	11.0	2.2	207
2007	10.2	2.3	217
<b>Overseas visitors</b>			
2000	13.1	6.3	525
2001	11.4	6.6	510
2002	11.7	6.5	499
2003	11.6	6.8	502
2004	13.4	6.8	481
2005	13.9	6.6	496
2006	15.6	6.5	502
2007	15.3	7.7	490

Source: United Kingdom Tourism Survey (UKTS), International Passenger Survey (IPS)  
1. Excludes day visits.

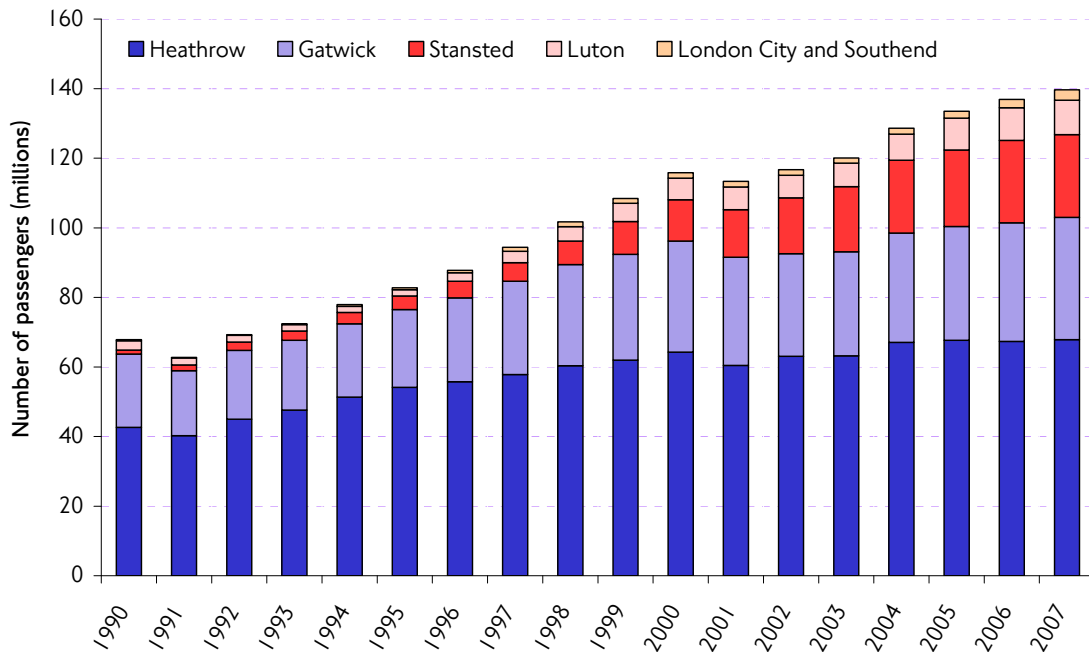
## 12.6 Passengers using London's airports

The number of passengers travelling through London airports continued to grow in 2007 (Figure 12.7). Heathrow accounts for almost 50 percent of all passengers, with Gatwick a further 25 percent.

However, rates of growth have been greater at other London airports. Over the 10 years to 2007, passenger numbers have increased by a factor of 3.1 at Luton, a factor of 4.4 at Stansted, and by 2.5 at London City. Over the same period, passengers travelling through Heathrow increased by 17 percent, and those through Gatwick by 31 percent.

## 12. Accessibility and London's interaction with its hinterland

Figure 12.7 Terminal passengers by London area airport.



Source: Civil Aviation Authority

In 2007, almost 140 million passengers passed through London's five major airports. This is over twice as many as in 1990. This corresponds to over 380,000 people per day, almost equally split between those arriving and those departing. The trend since 1991 has been one of steady year-on-year growth, briefly interrupted in 2001 following terrorist attacks in the USA.

Table 12.2 is a reference table showing the global spread of origins and destinations for those using London's airports. Over half (51 percent) of all passengers are flying to or from countries within the European Union, while just under 14 percent are to or from North America. Domestic passengers, flying to or from other UK airports, account for about 10 percent of all passengers at London's airports. Heathrow and Gatwick together account for two-thirds of domestic passengers. Almost a quarter of passengers travelling through London City airport are domestic passengers.

Table 12.2 Terminal passengers arriving /departing through London's airports by country of origin or destination, 2007.

Country of origin	Millions of passengers					
	Heathrow	Gatwick	Stansted	Luton	London City	All London airports
Western Europe - EU	22.6	17.6	17.1	5.9	1.5	64.6
Western Europe - other	3.4	2.0	1.3	0.8	0.7	8.3
Eastern Europe - EU	1.4	1.4	2.5	1.5	-	6.8
Eastern Europe - other	1.0	0.2	-	-	-	1.2
North Africa	0.7	1.4	-	0.2	-	2.3
Southern Africa	1.6	0.2	-	-	-	1.8
West Africa	0.6	0.3	-	-	-	1.0
Central Africa	0.1	-	-	-	-	0.1
United States of America	11.4	4.1	0.2	0.1	-	15.7
Central America	0.1	0.6	-	-	-	0.7
South America	0.3	-	-	-	-	0.4
Canada	2.6	0.6	-	-	-	3.2
Caribbean	0.2	1.4	-	-	-	1.6
Indian Sub Continent	3.0	0.1	-	-	-	3.1
Middle East	3.6	0.7	-	-	-	4.3
Near East	0.9	-	0.1	-	-	1.0
Far East	5.8	0.2	-	-	-	6.0
Australasia	1.6	-	-	-	-	1.6
Other countries	0.3	0.1	-	-	-	0.4
<b>Total international passengers</b>	<b>61.4</b>	<b>31.0</b>	<b>21.2</b>	<b>8.4</b>	<b>2.2</b>	<b>124.2</b>
<b>Total domestic passengers</b>	<b>5.8</b>	<b>4.0</b>	<b>2.6</b>	<b>1.5</b>	<b>0.7</b>	<b>14.5</b>
<b>Total passengers</b>	<b>67.1</b>	<b>35.0</b>	<b>23.8</b>	<b>9.9</b>	<b>2.9</b>	<b>138.8</b>

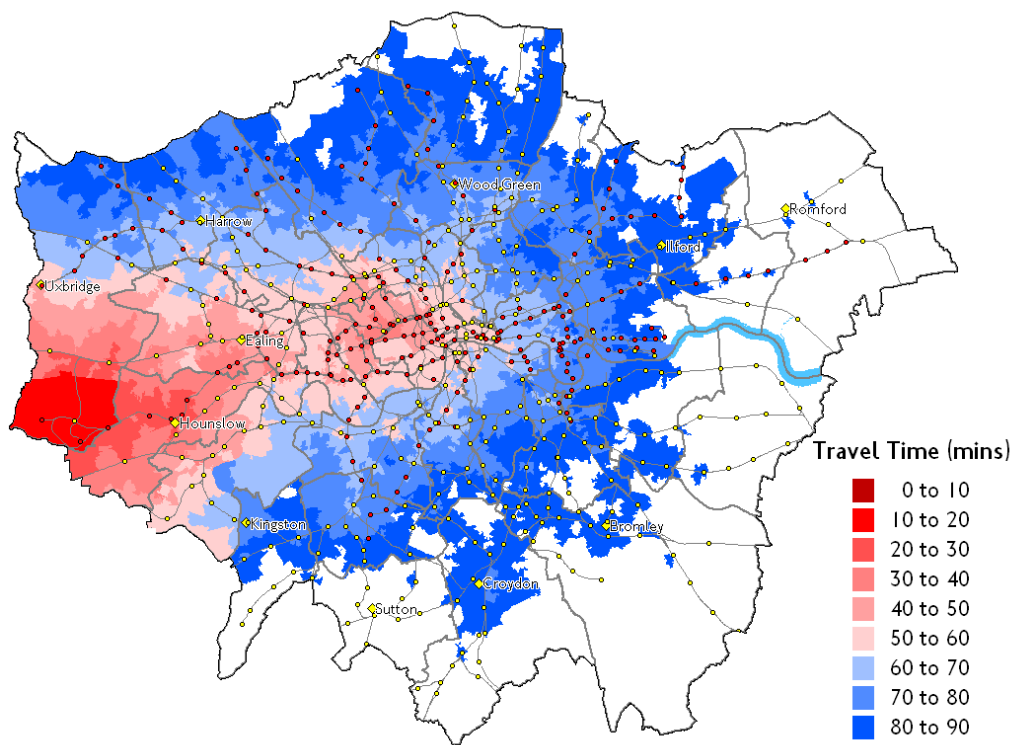
Source: Civil Aviation Authority

1. Terminal passengers include both arrivals and departures (terminating passengers) and passengers transferring between planes, but exclude transit passengers, who do not leave a plane.

## 12. Accessibility and London's interaction with its hinterland

Figure 12.8, taken from TfL's CAPITAL database, shows minimum weekday morning peak travel times to Heathrow Airport by public transport. Accessibility is particularly good along the 'Heathrow corridor' westwards from central London, particularly reflecting the Heathrow Express rail link. However, for much of east and Outer London, typical journey times are greater than 90 minutes.

Figure 12.8 Minimum travel times to Heathrow Airport from within Greater London. Public transport – weekday morning peak, 2006.



Source: Transport for London CAPITAL tool

### 12.7 London's interaction with the wider South East of England

Relatively little is known about the socio-economic characteristics and travel patterns of residents outside Greater London, particularly daily commuters, who contribute to the demands on London's transport networks. This distinction is increasingly important for planning purposes – for example, when looking at road traffic levels, congestion and employment catchments for locations in Outer London. The following section sets out some basic indicators that illustrate the scale of these flows, comprising workers who are important to London's continued economic vitality.

Table 12.3 shows that almost 800,000 people commuted into Greater London from locations outside on a typical weekday by all modes in 2007, roughly equivalent to 13 percent of the adult resident population. This was an increase of 13 percent over the number in 2000. A slightly larger percentage increase of 17 percent was seen over the same period in out-commuters, although the net positive daily commuting inflow to Greater London was 470,000 people – equivalent to 7.5 percent of the adult resident population. These results come from the Labour Force Survey, where respondents,

surveyed at their home addresses, state their usual workplaces which allows the commuting estimates to be derived. Individuals do not necessarily make the same commuting journey on every weekday.

Table 12.3 Daily commuters to and from Greater London, 2000 to 2008 (thousands).

Year	In-commuters <sup>1</sup>	Out-commuters <sup>2</sup>
2000	700	280
2001	710	280
2002	690	260
2003	670	290
2004	700	290
2005	730	300
2006	740	320
2007	770	330
2008	790	320

Source: Labour Force Survey (ONS) - Spring sample

1. Workers in Greater London with residence outside Greater London.

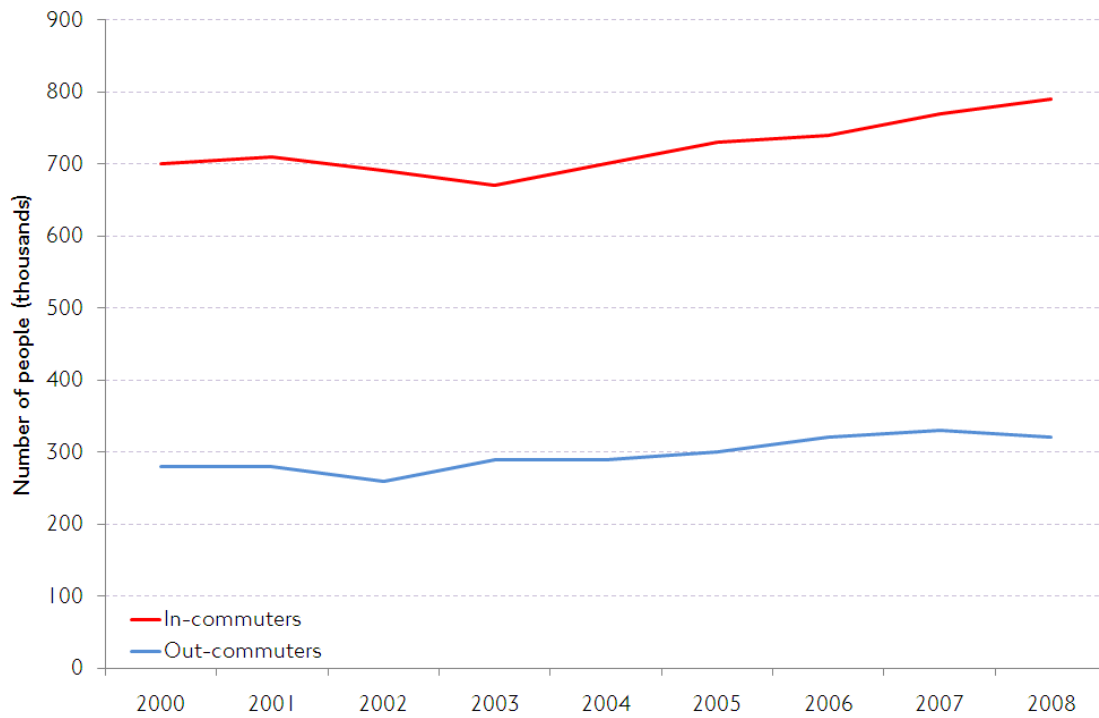
2. Residents in Greater London with workplace outside Greater London.

Technical note: The Labour Force Survey moved from seasonal to calendar quarters in 2005/06. The data has been re-weighted for all years, resulting in some revisions to earlier data.

Figure 12.10 gives some idea of the spread of home locations for these non-resident daily commuters, based on the most recent Census of Population in 2001. In terms of the absolute numbers used in the figure, locations closest to the Greater London boundary generate the highest numbers of commuters. However, these locations are not necessarily the most accessible by road or public transport, as locations some distance from London, such as Reading, feature frequent, high-speed rail links. The overall pattern is therefore suggestive of significant local interaction across the Greater London boundary.

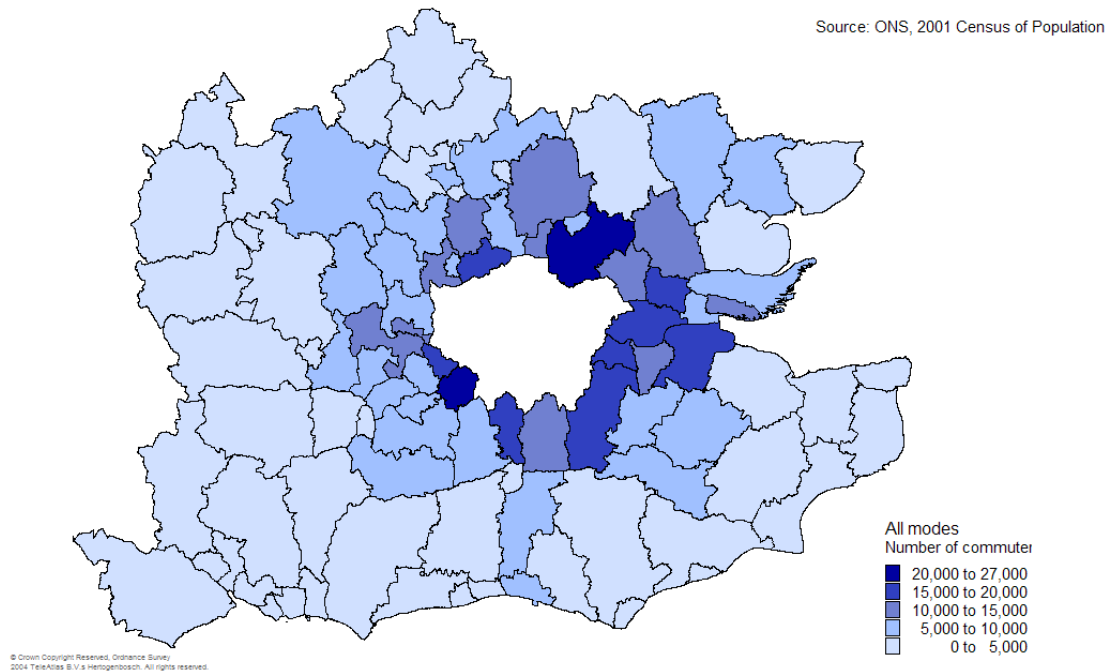
## 12. Accessibility and London's interaction with its hinterland

Figure 12.9 Daily commuters to and from Greater London, 2000 to 2008 (thousands).



Source: Labour Force Survey (ONS) - Spring sample

Figure 12.10 Commuters to Greater London by district of residence, all modes, 2001.



## 12.8 London's transport networks

The following data, showing the extent of London's transport networks, are included for reference.

Land area	Square Km	Square Miles	
Central London	27	11	
Rest of Inner London	294	114	
Outer London	1,259	486	
All Greater London	1,579	610	
<b>Road Network (2007)</b>	<b>Km</b>	<b>Miles</b>	
Motorways	60	37	
Trunk and Principal roads	1,720	1,069	
Minor roads	13,003	8,082	
All London roads	14,784	9,188	
of which TfL Road Network	580	360	
		Route length	
Rail networks (January 2009)	Stations served	Km	Miles
Rail (within Greater London)	321	788	490
London Underground	270	402	249
London Overground	56	86	53
Docklands Light Railway	38	31	19
		Route length	
Tram network	Stations served	Km	Miles
London Tramlink	38	28	18.5





## **13. Population and employment trends and the London economy**

### **13.1 Introduction**

This section looks at the key demographic and economic factors underlying transport activity in Greater London.

### **13.2 Key features and trends**

- The total resident population of Greater London was estimated at 7.6 million in 2007 – an increase of 3 percent from 2001 which, in turn, was an increase of 7 percent over 1991. Over the past 15 years, London's population has grown at an average rate of 0.7 percent per year.
- There have been substantial changes to the age structure of London's population, with relative increases in the number of young people and those of working age, and relative decreases in the number of people of retirement age.
- Outer London accounts for about 60 percent of London's population, with residential densities being much lower than in Inner and central London, where the remaining 40 percent of Londoners live.
- The total number of jobs in Greater London was around 4.7 million in both 2007 and 2008.
- London's economy grew by 4.3 percent in 2007, comfortably higher than UK economic growth of 3 percent in the same period. However, 2007 is expected to have been the peak of the current economic cycle following four years of continuous economic growth.
- More recently available data shows that the UK economy is in recession, and that it contracted by 1.5 percent in Quarter 4, 2008, and by 1.9 percent in Quarter 1, 2009.

### **13.3 London's population**

London's population has increased significantly over recent years, reflecting relative economic buoyancy and migration to Britain. The total resident population of Greater London was estimated at 7.6 million in 2007 – an increase of 3 percent from 2001 which, in turn, was an increase of 7 percent over 1991 (Table 13.1). Over the past 15 years, London's population has grown at an average rate of 0.7 percent per year, contributing to increased demand pressures on the transport networks and reversing the trend of population decline during the 1970s and into the 1980s.

Points of interest from Table 13.1 are that:

- London grew at a faster rate compared to Great Britain as a whole during the 1990s.
- Population growth in Inner London has outpaced that of Outer London.

### 13. Population, employment trends and the London economy

- There have been substantial changes to the age structure of London's population, with relative increases in the number of young people and those of working age, and relative decreases in the number of people of retirement age.
- In 2007, London's population was estimated to account for 12.8 percent of the Great Britain population.
- Despite these recent changes, London's total resident population in 2007 was closely comparable to that of 1971.

Table 13.1 Resident population (mid-year estimates), 1971 to 2007, London and Great Britain compared.

Year	All London (000s)				Inner London	All ages (000s)	
	0 – 14	15 – 64	65 and over	All ages		Outer London	Great Britain
Estimates							
1971	1,598	4,922	1,010	7,529	3,060	4,470	54,388
1981	1,245	4,513	1,048	6,806	2,550	4,255	54,815
1991	1,266	4,600	964	6,829	2,599	4,230	55,831
1996	1,360	4,686	929	6,974	2,656	4,318	56,477
2001	1,368	5,058	897	7,322	2,859	4,463	57,361
2002	1,362	5,104	895	7,362	2,886	4,475	57,627
2003	1,356	5,116	892	7,364	2,891	4,473	57,855
2004	1,351	5,150	888	7,389	2,907	4,482	58,136
2005	1,355	5,214	887	7,456	2,944	4,512	58,514
2006	1,360	5,269	884	7,512	2,973	4,539	58,846
2007	1,371	5,303	882	7,557	3,000	4,557	59,216
<b>Percentage change</b>							
1971 – 1981	-22%	-8%	4%	-10%	-17%	-5%	1%
1981 – 1991	2%	2%	-8%	0%	2%	-1%	2%
1991 – 2001	8%	10%	-7%	7%	10%	6%	3%
2001 – 2007	0%	5%	-2%	3%	5%	2%	3%

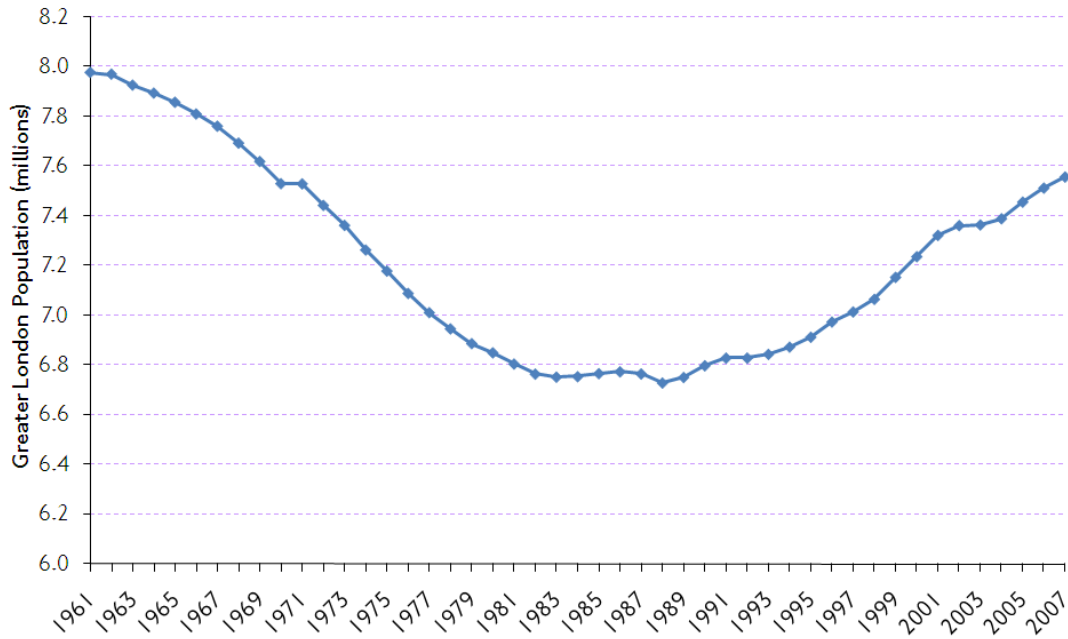
Source: ONS

Figure 13.2 shows how London's population is distributed, in terms of a population density map reflecting the most recent comprehensive Census of Population in 2001. The highest population densities are to be found in the inner ring. Inner London

### 13. Population, employment trends and the London economy

(including central London) accounts for just 40 percent of all London's population, but residential densities are much higher than in Outer London, where the remaining 60 percent of Londoners live. Notable from the figure are the comparatively low population densities of central London, reflecting the functional role of the city centre.

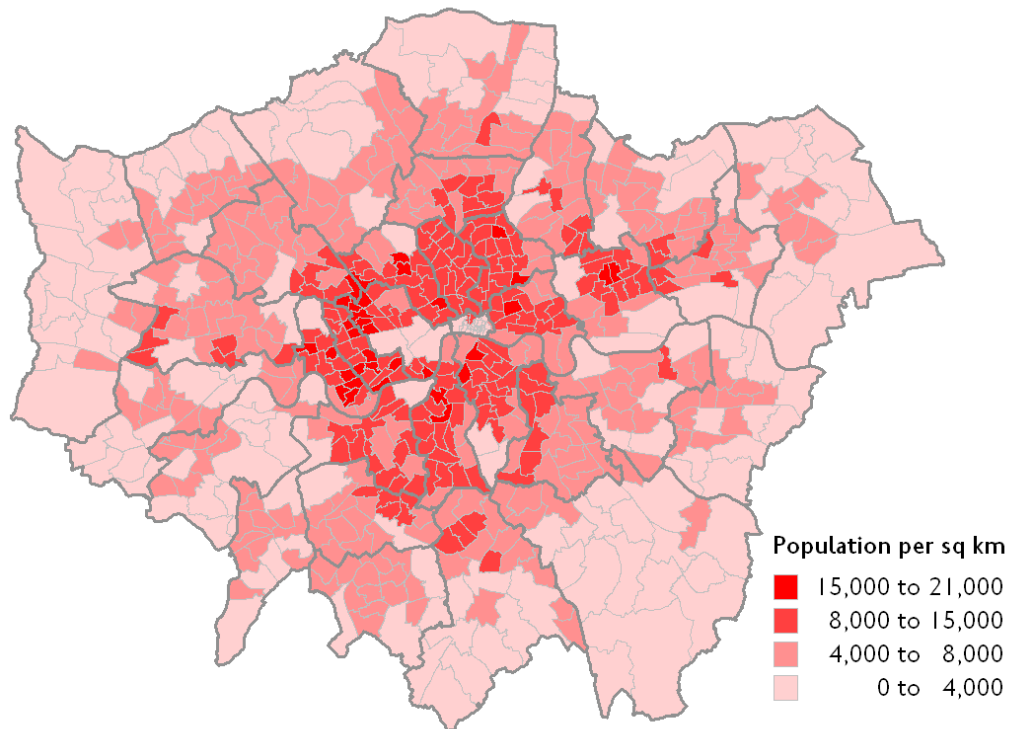
Figure 13.1 Greater London population, millions.



Source: GLA DMAG

### 13. Population, employment trends and the London economy

Figure 13.2 Population densities across Greater London, 2001 Census of Population.

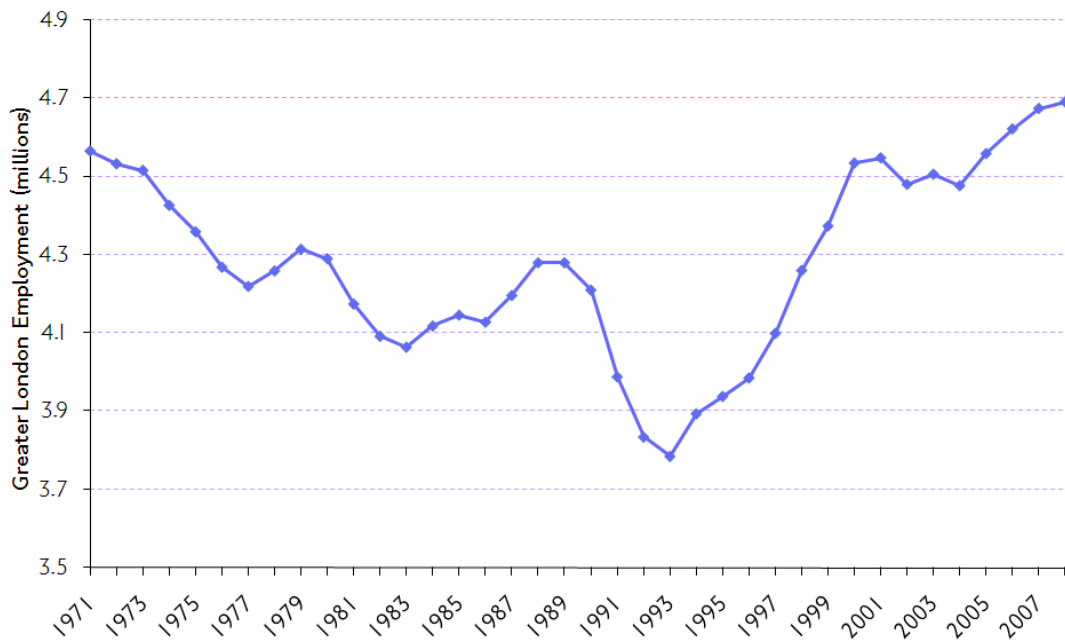


#### 13.4 Employment and labour force

Providing the means by which London's workers can get to work in London is a major role of the transport networks. The total number of jobs in Greater London was around 4.7 million in 2008.

Figure 13.3 shows the trend in jobs since 1971. Following a severe recession in the early 1990s, employment in London grew continuously for almost a decade. Between the low point in 1993 and 2001 around an additional 800,000 people were added to Greater London's workforce, with employment reaching in excess of 4.5 million by the turn of the millennium. The dot.com bubble collapse and subsequent financial services downturn coupled with growth in other sectors of the economy saw employment remain stable at 4.5 million to 2004. The number of jobs began to expand again in 2005 as London's economic growth accelerated. In 2007 London's employment grew by 1.1 percent to 4.7 million – the highest level of employment in the Capital in recent history. In 2008 London employment remained at 4.7 million. However, the recent economic downturn is expected to negatively affect employment over the short to medium term.

Figure 13.3 London employment, millions.



Source: Experian Business Strategies, GLA Economics

Figure 13.4 Employment densities across Greater London, 2001 Census of Population.

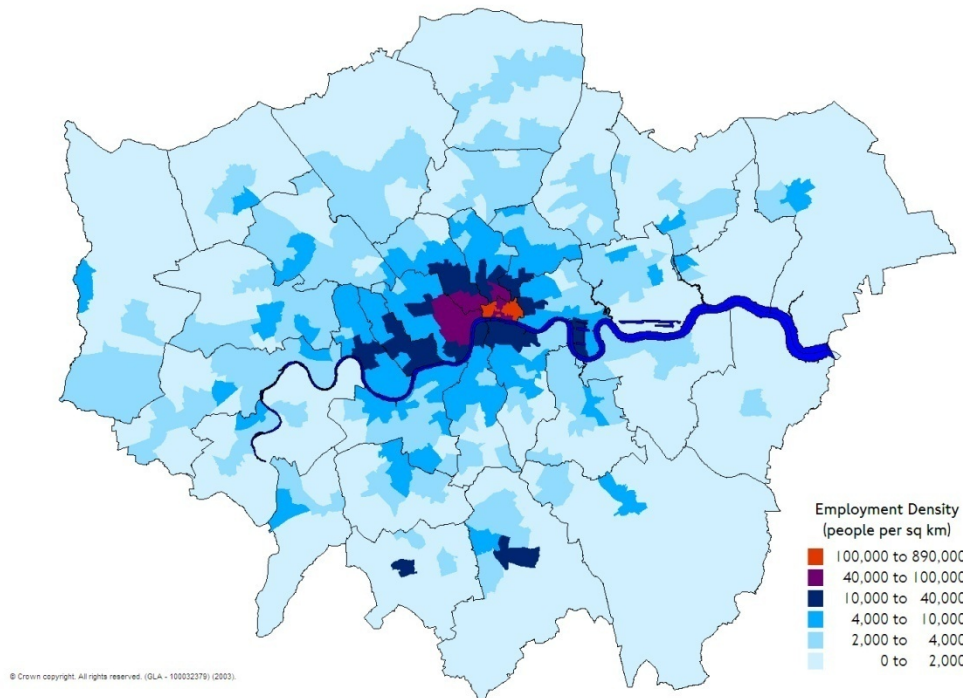


Figure 13.4 shows the spatial distribution of jobs, again drawn from the 2001 Census of Population, with a clear concentration towards the centre of London. Job densities in excess of 40,000 per square kilometre occur in central London, mainly north of the Thames. Highest densities occur in the City of London, with densities of over 100,000 jobs per square kilometre. Also visible are concentrations of

### 13. Population, employment trends and the London economy

employment associated with principal London regional centres, although employment densities in most of Outer London are lower than in Inner London.

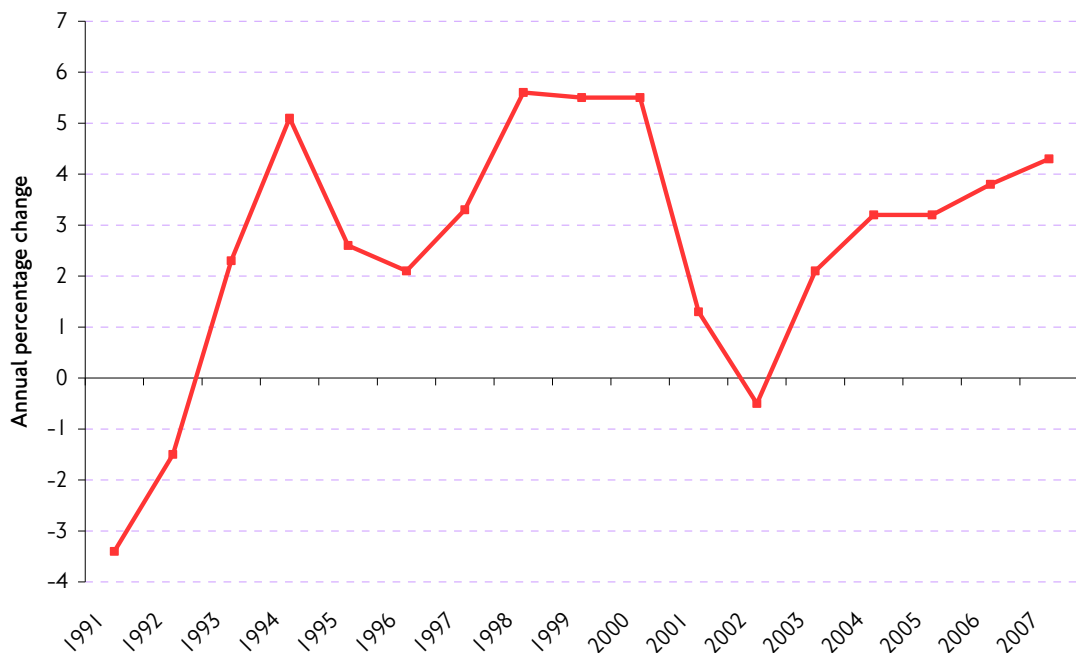
The number of jobs in Greater London, and expected trends in employment, are basic indicators of economic activity. In conjunction with projected changes to the resident population, trends in jobs also contribute to projections of future demands on the transport system.

#### 13.5 Economic output

A basic measure of economic output is Gross Value Added (GVA). Annual change in GVA is a frequently used measure of economic growth. This section considers recent trends in London GVA.

Figure 13.5 shows that the London economy grew by 4.3 percent in 2007, comfortably higher than UK economic growth of 3 percent in the same period. However, 2007 is expected to have been the peak of the current economic cycle following four years of continuous economic growth. More recently available data for the UK economy shows growth contracting by 1.5 percent in quarter 4 of 2008, and this is expected to be reflected in future London GVA measurements.

Figure 13.5 London real GVA, year-on-year percentage change.



Source: Experian Business Strategies in London's Economic Outlook, (GLA Economics, Autumn 2008)

Figure 13.6 shows the London GVA trend in the context of the equivalent trend for the UK as a whole. While the overall long-run trends are similar, it is evident that the peaks and troughs of the economic cycle tend to be more emphatic in London. In the context of future transport demand, forecasting needs to be based on long-run trends such that future provision can accommodate and encourage, and not inhibit, economic growth.

Figure 13.6 GVA trends, Greater London and UK compared. Percentage change year-on-year by quarter, 1983-2008.



Source: Experian Business Strategies and London's Economy Today, February 2009, GLA Economics





## Notes and definitions

### Administrative areas

**Greater London:** The area consisting of the 32 London boroughs and the City of London, and administered by the Greater London Authority.

**Central London:** The Greater London Conurbation Centre or Central Statistical Area – an area roughly rectangular in shape, bounded by Regent’s Park to the north, Whitechapel to the east, Elephant & Castle and Vauxhall to the south, and Kensington Gardens to the west. It is a larger area than the Central London Congestion Charging Zone (excluding the Western Extension), and includes the inner ring road and Paddington, Marylebone, Euston and King’s Cross rail stations.

**Inner London:** City of London, and the London boroughs of Camden, Hackney, Hammersmith and Fulham, Haringey, Islington, Kensington and Chelsea, Lambeth, Lewisham, Newham, Southwark, Tower Hamlets, Wandsworth and Westminster.

**Outer London:** The London boroughs of Barking and Dagenham, Barnet, Bexley, Brent, Bromley, Croydon, Ealing, Enfield, Greenwich, Harrow, Havering, Hillingdon, Hounslow, Kingston upon Thames, Merton, Redbridge, Richmond upon Thames, Sutton and Waltham Forest.

The above refers to the National Statistics definition of Inner and Outer London. An alternative definition is used by the Outer London Commission, tasked by the Mayor with assisting the revision of the London Plan. This includes Haringey and Newham in Outer London and places Greenwich in Inner London. The National Statistics definition is used for the majority of tables in this report and for analyses of the LTDS. The Outer London Commission definition is shown in Tables 2.10 and 2.11 referring to road traffic trends in London.

### London regions

See page 48 and Figure 3.1. TfL’s approach is that regions have flexible boundaries, and boroughs will be in more than one region where that makes sense to them. For statistical purposes only, in order to ensure that journeys are captured only once, regions are defined in this document as the following groupings of boroughs:

**Central London:** City of London, and the London boroughs of Camden, Islington, Kensington and Chelsea, Lambeth, Southwark and Westminster.

**East London:** The London boroughs of Barking and Dagenham, Bexley, Greenwich, Hackney, Havering, Lewisham, Newham, Redbridge and Tower Hamlets.

**North London:** The London boroughs of Barnet, Enfield, Haringey and Waltham Forest.

**South London:** The London boroughs of Bromley, Croydon, Kingston upon Thames, Merton, Richmond upon Thames, Sutton and Wandsworth.

**West London:** The London boroughs of Brent, Ealing, Hammersmith and Fulham, Harrow, Hillingdon and Hounslow.

## Travel – trips and journey stages

A **trip** is defined as a one-way movement from one place to another to achieve a single main purpose. Round trips are divided so that the return leg is treated as a separate trip. These definitions apply to data from interview surveys such as the LATS Household Survey and the LTDS.

Trips may be further subdivided into **journey stages**, the component parts of a trip using a single mode of transport between interchanges. Walking is counted as a separate mode, but walks within single premises or between platforms at interchange stations are not included.

## Mode share

A single trip may use several methods or **modes** of transport, which divide the trip into its separate stages. In this way, trip rates can be analysed by **trip main mode**, based on distance: the main mode of a trip is the mode on which the greatest proportion of the total trip distance is travelled. In Tables 2.1 and 2.2 a slightly different definition is used, namely the mode typically used for the longest distance part of the trip.

## Trip (or journey) purpose

The purpose of a trip is defined by the activity at the destination, except when the trip is returning home in which case the purpose is defined by the activity at the origin. The following purposes are defined:

**Work/commuting** – travel to or from the respondent's usual place of work;

**Employer's business/other work** – travel in course of work or to work at a location that is not the respondent's usual workplace;

**Education** – travel to or from school, college or university;

**Escort education** – accompanying a child to or from school;

**Shopping and personal business** – including shopping and use of services such as hairdressers, dry-cleaners, doctors, dentists, banks, solicitors etc;

**Leisure** – travel to or from entertainment, sport or social activities;

**Other (including escort)** – all purposes not otherwise classified, including accompanying or meeting someone for purposes other than education.

### **Weekday time periods**

**AM peak** – morning peak, 07:00 to 10:00.

**Inter-peak** – 10:00 to 16:00.

**PM peak** – evening peak, 16:00 to 19:00.

**Evening** – 19:00 to 22:00.

**Night-time** – 22:00 to 04:00.

**Early am** – 04:00 to 07:00.

### **Work status**

**Working full-time:** People in paid employment normally working for more than 30 hours a week.

**Working part-time:** People in paid employment working for not more than 30 hours a week.

**Self-employed:** Those who in their main employment work on their own account, whether or not they have any employees.

### **Ticket types**

**Oyster card:** A ‘smart card’ that can be used as a season ticket, such as bus passes and Travelcards, or to pay for travel on a pay as you go basis using credit held on the card. Travelcards on Oyster card are valid on Tube, DLR, trams and some National Rail services within chosen zones and across the entire London bus network. Pay as you go is an alternative to paying cash for single or return fares and offers cheaper single fares, daily price capping and ticket extensions automatically. In addition to TfL’s usual ticket outlets, season tickets can be renewed and pay as you go credit can be topped-up online or over the telephone.

**Season ticket:** A ticket valid for unlimited travel over a specified period of time either within specific fare zones or between specified origin and destination stations. A ‘season ticket’ can be valid for bus travel, National Rail travel, or a Travelcard which is valid for all modes detailed below.

**Travelcard:** A ticket valid for unlimited travel on National Rail, buses, DLR, London Tramlink and Underground, subject to certain conditions within specific fare zones and for a specified time period. Includes both Travelcard seasons (weekly, monthly or annual tickets) and One Day Travelcards. Underground and National Rail services within Greater London are divided into six fare zones; DLR services operate within Zones 1, 2 and 3. The cost of a ticket depends on the number of zones it covers. Zone 1 covers central London, approximately the area served by the Circle line and the South Bank.

**Bus Pass:** A ticket valid for a specified time giving unlimited travel on London bus services. Bus Pass 'seasons' can be weekly, monthly or annual.

**Freedom Pass:** Concessionary pass issued free by local authorities to London residents aged 60 and over and disabled people, giving unlimited travel within Greater London by National Rail, DLR, London Tramlink, buses and Underground, subject to certain conditions.

**Ordinary ticket:** Valid for one specific trip (a single ticket) or for two trips to and from the same place (a return).

## Traffic cordons

Locations of traffic counts for monitoring long-run trends in traffic flows are organised to form three cordons (see Figure 2.8):

**Boundary cordon:** Roughly corresponding to the boundary of Greater London and entirely within the M25 orbital motorway.

**Inner cordon:** Enclosing an area similar to the Inner London boroughs.

**Central cordon:** A cordon, enclosing central London, situated outside the Inner Ring Road and within a radius of 2.5 to 3 kilometres from Aldwych.

## Prices

**Retail price index (RPI):** Measures the price of a constant basket of goods and services purchased by households in the UK. The RPI is available from the Office for National Statistics (ONS) website ([www.statistics.gov.uk](http://www.statistics.gov.uk)).

**Headline Fares Index:** Tracks the change in the Gross Yield, ie the direct effect of a fares revision assuming passengers would buy the same ticket but at the new fare. This does not allow for switching to other ticket types and is likely to overestimate the increase in average fare actually paid. This percentage increase in Gross Yield, deflated by the headline RPI, is applied to the Headline Fares Index from the previous year.

**Real London Earnings:** The actual gross weekly earnings of adults in full-time employment in Greater London deflated by headline RPI. Gross weekly earnings are based on New Earnings Survey from 1971 to 1998 and Annual Survey of Hours and Earnings from 1998/99 and are available from ONS.

**Real prices and fares:** Converts current price levels to a common reference period by adjusting for the effects of inflation as measured by the RPI.

## PTAL

**Public Transport Accessibility Level (PTAL)** is a measure of public transport accessibility reflecting: the access time (by walking) from the point of interest to public transport service access points (SAPs, eg bus stops, stations) within a catchment area; the number of different services (eg bus routes, train services) operating at the SAPs; and levels of service (ie average waiting times, with an adjustment for the relative reliability of different modes). These components are then used to calculate an accessibility index (PTAI) which is allocated to bands corresponding to Public Transport Accessibility Levels (PTALs). The levels 1a and 1b correspond to a 'very poor', 3 corresponds to 'moderate', 6a and 6b correspond to an 'excellent' level of public transport accessibility, and 0 refers to areas where there are no public transport services within the specified catchment area.

## Roads classification

**Major roads:** Include motorways and all class A (principal) roads.

**TLRN:** The Transport for London Road Network is those major roads in London for which TfL has direct responsibility, comprising 580 kilometres of London's red routes and other important streets.

**Minor roads:** B and C classified roads and unclassified roads.

Within London, the London boroughs are responsible for maintenance of minor roads and A roads not part of the TLRN.

## Sources

**CAPC** Central Area Peak Count: TfL estimates of people entering central London in the morning peak period, derived from vehicle and passenger counts annually each autumn.

**EFS** Expenditure and Food Survey: ONS survey of household expenditure (formerly the Family Expenditure Survey) with a sample of about 7,000 households per annum in the UK.

**GLBPS** Greater London Bus Passenger Survey: Quarterly sample survey of bus boarders on a sample of London bus routes, with associated counts for grossing, used principally for apportionment of Travelcard and Concessionary fare revenues.

**IPS** International Passenger Survey: ONS sample survey of passengers at UK ports and airports.

**LATS** London Area Transport Survey 2001: Interviewer-administered sample survey of 30,000 London households, carried out for TfL between January 2001 and April 2002. The survey included a one-day travel diary to collect data on London residents' weekday travel patterns. The data have been expanded to represent the household population of Greater London as measured by the 2001 Census of Population.

**LTDS** London Travel Demand Survey: Annual sample survey of 8,000 randomly selected households in London and the surrounding area. The survey design and methodology are similar to the LATS 2001 household survey.

**LFS** Labour Force Survey: ONS quarterly sample survey with a rolling sample of approximately 57,000 households in Great Britain, a major source of information on participation in the labour market.

**UKTS** United Kingdom Tourism Survey: Survey carried out by the National Tourist Board, of trips undertaken by UK residents. The main results are the number of trips taken, expenditure, and nights spent away from home.

**UUS** Underground Users Survey: On-platform interview sample survey for LU of over 30,000 passengers in each two-year survey cycle. The survey measures usage of ticket types and collects passenger profiles in terms of socio-demographic, economic and other characteristics.

## Estimates of road traffic

The figures in Tables 2.10 and 2.11 are TfL's estimates of traffic in London. This section describes how these were calculated.

DfT estimates of road traffic for Great Britain are constructed from traffic count data collected by manual and automatic methods. Manual counts on major roads are taken according to a planned programme whereby every link is counted on one day at intervals that vary between every year and every 8 years according to the level of flow. Minor roads are covered by manual counts at a fixed sample of sites each year. Manual counts are generally taken for a 12-hour period on a single weekday in neutral months of the year (eg avoiding school holiday periods). Automatic traffic counters (ATC) collect data on a continuous basis, providing information on traffic flows at other times. These are used to derive factors to convert the manual counts to estimates of annual average daily flows (AADF) at each survey site. For this purpose, sites are grouped by road type and regional location. ATC data are also used to derive the year-on-year trends that scale the AADFs for major road sites not surveyed in a given year, to update from the latest count at each site to an estimate for the current year.

For minor roads the trends from the fixed annual sample of sites are applied to the levels observed in a benchmark survey when a larger sample of sites was surveyed. Benchmark surveys are carried out at intervals, with a new survey taking place in 2009 which will update the previous survey in 1999. Estimates of vehicle flows are converted to traffic (vehicle kilometres) by multiplying by the relevant road lengths: for major roads this factoring is done at the level of the individual link, while for minor roads, average flows by road class are factored by network road lengths. More details are given in the DfT Statistics note 'How the National Road Traffic Estimates are Made', available from the DfT Statistics website at:

<http://www.dft.gov.uk/matrix/forms/estimates.aspx>

The main purpose of the DfT surveys is to provide annual and quarterly estimates of road traffic for Great Britain at the national level. Estimates may be broken down by road class and vehicle type. Estimates are naturally less robust when broken down to regional and local levels. In some cases, factors to estimate trends are derived from automatic counts that are national in coverage because the sample of ATC sites is too small to give reliable factors at a regional level. While this is appropriate for national estimates, problems arise when the trends are significantly different in different regions, as has been the case for London in recent years. For this reason, TfL, in consultation with DfT, has reworked the source data in order to produce estimates specific to London that do not depend on trends identified for other parts of Great Britain.

The DfT series for minor road traffic in London shows a generally increasing trend since 2000, whereas the raw 12-hour counts (actual road traffic counted by manual counters) have generally decreased and have fallen by over 4 per cent between 2000 and 2007. The divergence is due to a combination of two factors: variation between years in the factors used to expand the counts to AADFs, which have shown

surprising volatility, and inclusion of sites from other urban areas in deriving the DfT trend. Figure N1 illustrates these two issues.

For TfL's use in monitoring traffic levels and trends in London, the 12-hour counts present the most reliable currently available indicator of trend, and have been used to derive, for years since 2000, the TfL London traffic series for minor roads. For major roads, a trend based on the annual total traffic recorded by London ATCs since 2000 has been used to derive the TfL estimates. Figures N2 and N3 show the indexed monthly totals of motor vehicle flows from the London major road ATCs. TfL will continue to work with DfT to refine the road traffic estimates for London. Table 2.11 reports the resulting total traffic series, for major and minor roads combined, by area of London (central, Inner and Outer).

Figure N1 Comparison of road traffic trends for London minor roads.

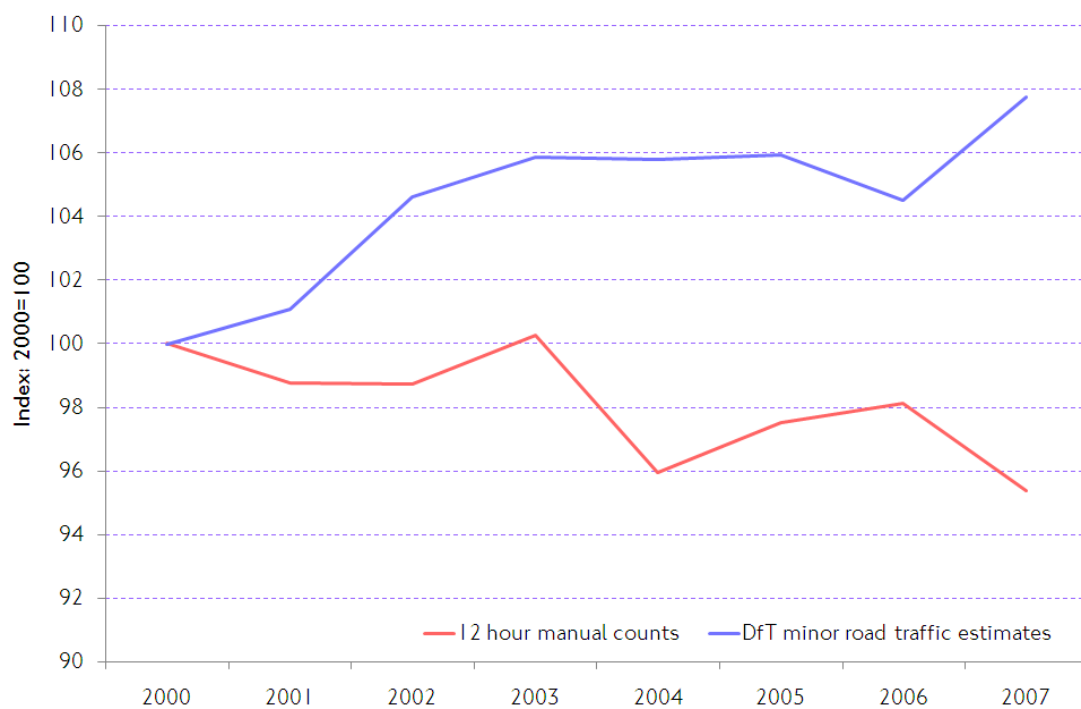


Figure N2 Trends in Inner London road traffic: flows recorded at major road ATCs.

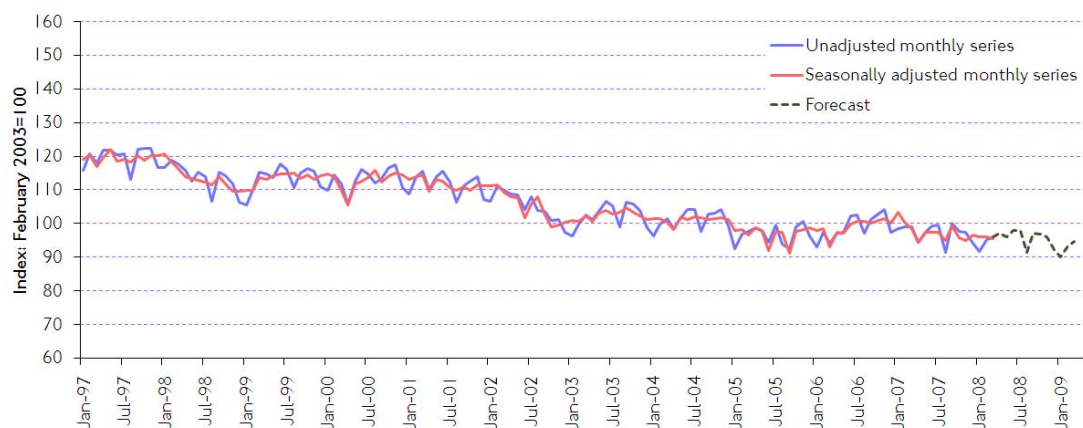
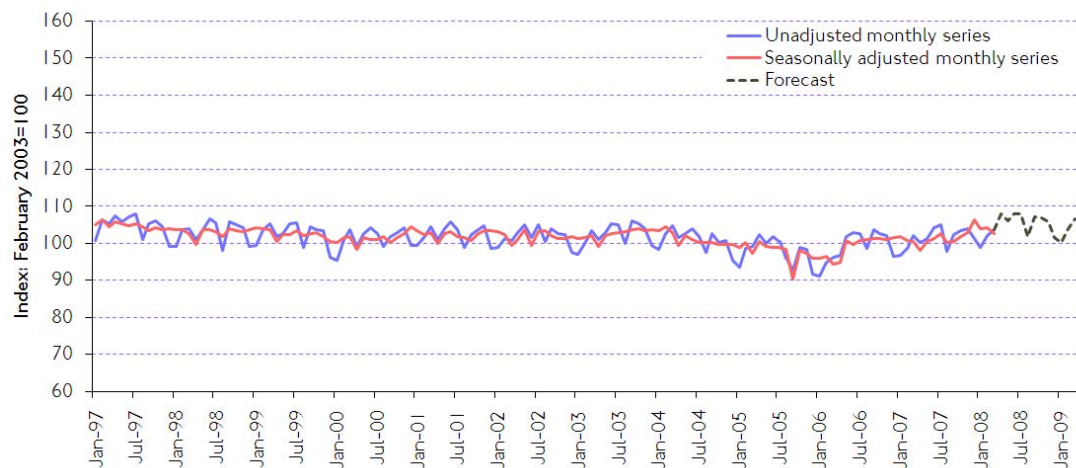




Figure N3 Trends in Outer London road traffic: flows recorded at major road ATCs.



## Organisations

**TfL** Transport for London

**DfT** Department for Transport

**DLR** Docklands Light Railway

**GLA** Greater London Authority

**LBSL** London Bus Services Limited

**LRS** London River Services

**LUL** London Underground Limited  
(LBSL, LRS and LUL are wholly owned subsidiaries of TfL)

**ONS** Office for National Statistics

**ORR** Office of Rail Regulation

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