Travel in London

Report 10

MAYOR OF LONDON

TRANSPORT FOR LONDON

EVERY JOURNEY MATTERS

Travel in London report 10

Overview

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Travel in London is TfL's annual publication that summarises trends and developments relating to travel and transport in London. Its principal function is to describe how travel in London is changing and provide an interpretative overview of progress towards implementing the transport and other related strategies of the Mayor of London, to inform future policy development. It also provides an evidence and analysis base for the general use of stakeholders and policymakers whose responsibilities cover many different aspects of transport and travel in London.

This tenth Travel in London report reports on travel trends up to 2016, the year preceding the publication of Mayor Sadiq Khan's new draft Transport Strategy (MTS), which was released for consultation in June 2017. This set out an ambitious programme to improve transport and the wider quality of life of Londoners over the next 25 years. The findings up to 2016 therefore provide an important backdrop to the strategy and the achievement of the new goals it sets.

The strategy establishes the overarching goal of increasing the mode share for walking, cycling and public transport in London to 80 per cent of all trips by 2041, to enable the city to grow and address key environmental and health challenges. This and the related priorities below form an overall structure for this report:

- Achieving an active, efficient and sustainable mode share for travel in London
- Healthy Streets and healthy people
- A good public transport experience
- Supporting new homes and jobs

The draft MTS sets London on a new direction for sustainable, inclusive development. This report reveals the scale of the challenge we face in changing London's travel trends in future. The evidence base for the draft Transport Strategy, and more recent data presented in this report, demonstrates the importance of implementing the policies and proposals in the strategy to ensure the overall objectives of the draft MTS can be achieved, and to secure London's long-term success.

The context

For much of the last decade London saw rapid population growth, which fed through to increased demand for travel. Usage of the key public transport networks grew, often at a more rapid rate, reflecting enhancements to the networks such as the Tube Upgrade programme and the progressive recovery from the recession, with increasing employment. Meanwhile, road traffic consistently fell, reflecting increasing constraints on the road network and underlying an overall progressive and consistent change in mode share away from the private car and towards more attractive public transport, walking and cycling.

Travel in London report 10 reflects a time of particular change, however. With uncertainty in some parts of the economy, there is less-strong growth on public transport; while in parts of outer London, there have been some increases in road traffic volumes, reflecting the relative lack of public transport offering here. These

trends pre date the draft Transport Strategy, but, if sustained over the longer term, serve to intensify the need for the kind of policies outlined in the strategy.

Interestingly, we have strong new evidence that overall person trip-rates have also been reducing, in line with new forms of shopping and use of leisure time, and perhaps also reflecting policies over time to reduce the need to travel, although London's population is expected to continue to grow strongly in the future.

With population continuing to grow, and with employment and international visitors to London at all-time highs, overall travel demand in 2016 was 1.3 per cent higher than in 2015. However, there were significant differences between the travel modes, between different parts of London, and in relation to previously established trends. Furthermore, these changes appear to be grounded in corresponding change in wider economic and societal trends affecting the known drivers of travel demand. So, in 2016:

- Overall demand for travel in London grew by 1.3 per cent, this largely reflecting population and employment growth (estimated at 1.3 and 1.8 per cent over the year respectively).
- Overall travel demand, in terms of the average number of trips per person per day (trip rate), among London residents only, however, fell to 2.22 trips, continuing the reduction previously observed and comparing to 2.64 trips per person per day in 2006/07.
- However, patronage of the bus network fell, although has since stabilised, and growth on the Underground, hitherto typically between 5 and 9 per cent per year, was effectively flat at 1 per cent. A similar trend was seen on National Rail in London (up by 0.1 per cent year on year compared to, typically, growth of between 4 and 8 per cent in recent years).
- The long established trend for reducing volumes of motorised road traffic turned, with year-on-year growth in 2016 of 1.6 per cent in London (all traffic). In central London however traffic was down by 0.9 per cent, despite significant recent growth in the numbers of licensed private hire vehicles here; in inner London traffic was up by 0.9 per cent, and in outer London it was up by 1.9 per cent. This compares with a net reduction of 5.7 per cent (GLA level) since 2006.
- There was particularly strong growth in cycling – up by 8.8 per cent at the journey stage level London-wide against the previous year.

It is significant that many of the trends affecting overall travel demand have parallels at the national scale and, at this level, appear to be longer established. For example, person trip rates at the national scale have fallen by 8.4 per cent over the period 2006 to 2016. Road traffic volumes nationally grew by 2.2 per cent between 2015 and 2016, an accelerating picture of growth with a net increase of 6.8 per cent between 2010 and 2016. Bus patronage nationally (outside London) fell by 8.7 per cent between 2008/09 and 2016/17. Growth on National Rail, hitherto typically between 3 and 8 per cent per year nationally, was just 0.8 per cent in the latest year.

Local modal trends were observed in different parts of London:

- Inner London saw some relatively sharp year on year changes that may be indicative of longer-term trends and/or challenges. In 2016/17, for residents only, the private transport mode share decreased by 1.9 percentage points; the

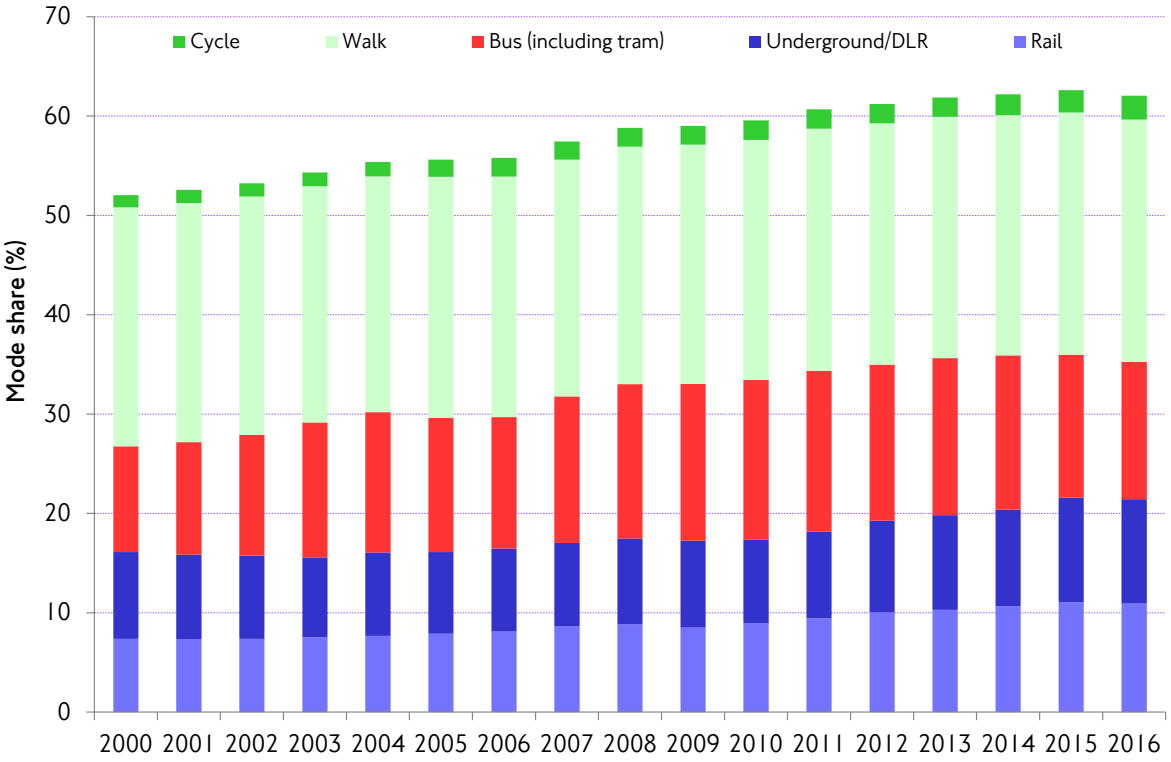
public transport mode share also decreased by 2.4 percentage points. However, cycling was up by 0.3 percentage points and the walking mode share increased sharply, by 4.0 percentage points – from 36.1 to 40.1 per cent in the latest year.

- In outer London there were some similar changes – the walking mode share for residents increasing by 2.5 percentage points in the latest year – to 27.4 per cent, and the private transport mode share decreasing by 2.2 percentage points, to 45.3 per cent.
- Meanwhile, the mode share of trips London-wide for licensed private hire vehicles increased from 0.6 per cent of all trips in 2009/10 to 1.2 per cent in 2016/17 – an effective doubling of the mode share over this period, albeit from a very small base.

Active, efficient and sustainable mode share

Trends in travel over the past decade or so have had the effect of progressively increasing the share for active, efficient and sustainable modes – public transport, walking and cycling – from 52.0 per cent in 2000 to 62.1 per cent in 2016, as shown by the figure below.

Trend in active, efficient and sustainable mode shares in London 2000-2016. All trips.

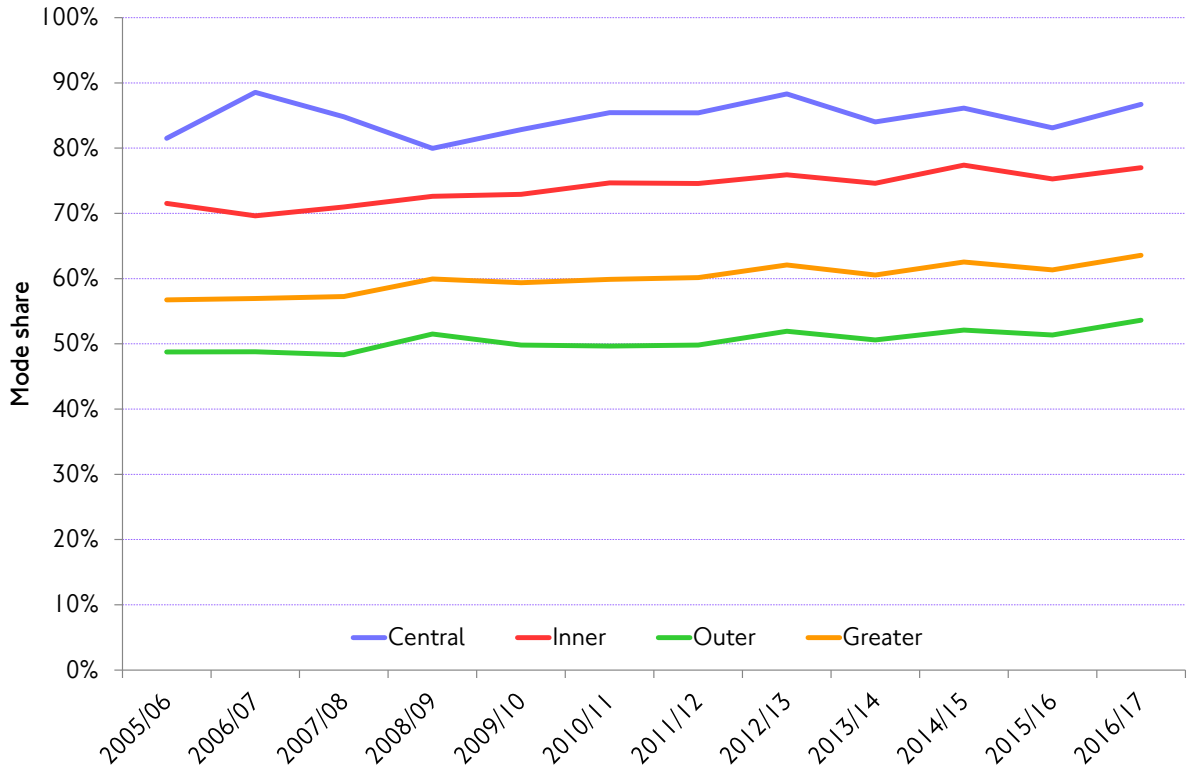


Achieving the Mayor's goal for an active, efficient and sustainable mode share of 80 per cent by 2041 requires an intensification of existing policies and the development of new ones, focused around Healthy Streets, to ensure that this trend continues in the context of new challenges. In 2016, for example, there was a net shift away from active, efficient and sustainable modes of 0.6 percentage points, which serves to highlight and intensify the pressures and challenges that the strategy seeks to address.

The proportion of journeys made actively, efficiently and sustainably varies considerably across different parts of London, as is illustrated by the figure below.

Whilst there are many factors underlying this pattern, for example, the extent to which streets and transport networks have been planned to prioritise cars over walking, cycling and public transport, it does demonstrate both the general upward trend in recent years, and also the considerable further scope for improvement. Of particular note is that residents of central and inner London are achieving or very close to achieving the 80 per cent ambition; however this does just relate to residents – the ambition relates to all travellers – and there is considerable variation at the borough-scale. The picture for outer London, which accounts for the majority of trips in London, is however different; typically just over 50 per cent of residents currently achieving the target.

Trip-based active, efficient and sustainable mode share 2005/06-2016/17. Residents only.



The Healthy Streets Approach

The Healthy Streets Approach is the overarching framework of the draft Transport Strategy. It emphasises improvement to a wide range of factors affecting quality of life in London – including but far beyond 'traditional' health matters – with the overall goal of making life in London better.

The Healthy Streets Approach is a key facilitator to help deliver the aims of the strategy. It will be applied to the street environment and the wider street network to promote healthier, more efficient and more sustainable transport options. It will also be key to reducing car dependency by providing higher-quality public transport services, better-planned transport networks and the extension of public transport links to new areas. The Healthy Streets approach also applies to London's future development, ensuring that regeneration and new developments are planned around walking and cycling for shorter trips, and cycling and public transport for longer ones.

These aims will contribute to an overall improvement in London's 'quality of place', and in turn improving London's offer and attractiveness as a place to live, work and do business – vital considerations in an era of relative economic uncertainty.

Healthy Streets and healthy people

London's streets are fundamental to the character and operation of the city and the quality and design of the street network can have a huge impact on people's quality of life. Attractive street environments encourage active travel and the Mayor's ambition is that every Londoner walks or cycles for twenty minutes every day (in terms of two sessions of at least 10 minutes). This is important because being active every day helps prevent a wide range of diseases.

The easiest way for Londoners to keep active is to build walking or cycling into their daily travel, often connected to trips to and from public transport networks, and the Healthy Streets Approach provides the framework of policies and strategies that are needed to help Londoners achieve this. In 2016/17, the percentage of Londoners who achieved two ten-minute sessions of active travel per day was 31 per cent, demonstrating the extent of change needed to meet the Mayor's ambition.

Walking and cycling

Londoners' propensity to walk or cycle, where these modes are a viable alternative for the person and trip in hand, is conditioned by their attitudes towards these modes. The factors underlying these attitudes are varied and complex, ranging from specific deterrents such as safety to more intangible 'cultural' factors. Other factors, such as the quality of the street environment, also affect how likely people are to walk or cycle.

In 2016, 43 per cent of Londoners agreed with the proposition that 'London is a city for cycling', this value reflecting an increase from (typically) around 40 per cent in 2013, and positively reflects the improvements to cycle facilities that were built in 2016. In 2016, 74 per cent of Londoners also agreed that 'London is a city for walking', again reflecting an increase from around 71 per cent in 2013. It is to be expected that these evaluations will progressively improve as the Healthy Streets Approach is rolled out, and feed through to increased preferential use of these modes for trips to which they are suited.

The best indicator of the popularity of walking and cycling is of course the number of trips made. London-wide, in 2016, there was an average of 649,000 cycle trips made per day. This was 8.2 per cent higher than in 2015 (8.8 per cent at the journey stage level) and appreciably higher than the average annual growth rate of 4.3 per cent in this measure over the preceding five years. This is a significant increase and potentially reflects the impact of high quality new cycling infrastructure delivered in central London in 2016.

Historic growth in walking trips in London has closely reflected population growth. Given a stable overall propensity to walk per capita, population growth will result in a corresponding growth in the number of walk trips made. So, over the period between 2010 and 2016, walking (at the trip level in London) was estimated to have grown by 9 per cent, primarily in response to a (very similar) population growth of 9 per cent over the period. The growth in overall walk trips in Greater London recorded between 2015 and 2016 was 1.3 per cent and this was in line with this

historic trend; however there is still a lot of potential to increase walk trips in outer London by switching trips from car.

Improving London's cycle network infrastructure, as well as facilities and conditions for cycling more generally, is key to encouraging more people to cycle. Building on previous infrastructure, London's combined Superhighway and Quietway network is now more than 100km long, and 10 per cent of Londoners live within 400m of at least one of these routes. More widely, 26.7 per cent of Londoners live within 400 metres of the operational cycle network. Looking further ahead, the draft Transport Strategy sets the framework for a strategic cycling network that will achieve the Mayor's aim of 70 per cent of Londoners living within 400m of a high-quality, safe cycle route by 2041.

Road traffic and emissions

In 2016, general motorised traffic on London's roads grew by 1.6 per cent, with this growth largely focused on outer London where there is still available road capacity and where the public transport offer is less comprehensive. This again highlights the challenge ahead in achieving the Mayor's target for the active, efficient and sustainable mode share.

In the central London Congestion Charging zone however, motorised traffic volumes continued to fall, with a 4.1 per cent reduction overall in 2016/17 compared to the previous year. Traffic volumes in the charging zone are now 22.4 per cent lower than in 2007/08, albeit with a notable increase in licensed private hire vehicles (PHVs), against a strong fall in the number of private (chargeable) cars. Central London has also been a particular focus for the improvement of active, efficient and sustainable transport, with new cycling infrastructure and other urban realm improvements, and corresponding increases in cycling.

Road traffic accounts for 28 per cent of London's total emissions of Carbon Dioxide (CO_2), 50 per cent of London's total emission of nitrogen oxides (NO_x), and 50 per cent of London's particulate matter (PM_{10}) emission. The trends affecting the different pollutants have varied over recent years. Emissions of CO_2 are decreasing as vehicles become more fuel-efficient. However, in 2016 the increase in levels of road traffic partly offset this on-going reduction, with a decrease of 0.7 per cent in the year. This compared to a reduction of two per cent in the previous year.

Emissions of NO_x are the most pressing problem for London's air quality, with ambient levels of Nitrogen Dioxide (NO_2) continuing to exceed European Union limit values across much of central and inner London – particularly close to busy roads. The Mayor is developing an ambitious programme to enable London to be brought into compliance with these limit values at the earliest possible opportunity, with an ultra-low emission zone (ULEZ) due to be brought into operation in central London from April 2019. In 2016, NO_x emissions from road transport fell by 8 per cent, following a 6.9 per cent reduction the previous year.

Although London now complies with limit values for PM_{10}, continued reductions to ambient concentrations will bring further significant health benefits. Achieving this is however difficult, given that about 88 per cent of London's road traffic emission now arises from vehicle brake and tyre wear and resuspension, with only limited technological options for improvement currently available. In 2016, London's road traffic PM_{10} emission was effectively unchanged; some small reductions arising

from the natural turnover of the vehicle fleet were offset by increased emissions reflecting the overall increase in road traffic levels.

In terms of ambient concentrations, NO_2 concentrations are now consistently improving year on year, but remain above EU limit values across much of central and inner London, particularly at the roadside. PM_{10} concentrations in London have reduced significantly over recent years; however from 2015 onwards the average trends suggest that PM_{10} concentrations in Inner London are increasing slightly. The reasons for these may be related to weather conditions but also may in part be due to increases in the use of solid fuel burning in some areas.

A good public transport experience

Good public transport is fundamental to London's overall vitality and the quality of life of residents and visitors. It is also a key facilitator to achieving many of the Mayor's strategy outcomes. The quality of London's public transport networks can be assessed through measures such as the amount of transport provided (service supply) and its connectivity, the operational reliability of those services, the accessibility of public transport to all people, the attitudes that people have towards public transport and, finally, by the use that is made of them, both absolutely in terms of patronage of the public transport modes, and relatively in terms of their overall mode share.

Capacity

In terms of capacity, the most basic measure is the annual number of person kilometres capacity provided by the core public transport networks (based on planned maximum capacities of buses and trains multiplied by kilometres operated). In 2016/17, this was 116,685 million kilometres, a 2.3 per cent increase on the previous year and an overall 22 per cent increase from 2010/11. Since 2011/12, public transport supply has grown at a faster rate than demand, particularly in the latest year where overall demand fell by 2.7 per cent and supply increased by 2.3 per cent. However, overall supply does not necessarily reflect demand patterns spatially, which are particularly focused on central London during the peak periods, or the extent of journey opportunities offered by the current network.

Physical accessibility

Legacy infrastructure continues to limit the extent to which all Londoners can use public transport. People with mobility needs require more time to complete journeys by public transport if only the step-free network can be used. In some cases, these journeys may not be possible. The Mayor's ambition is to eliminate this differential as soon as possible. In 2016, across all possible public transport journey permutations, trips using only the step-free network (all buses and step-free stations) took, on average, 11 minutes longer than those that could make use of the full network – a differential of 14 per cent. This indicator will now be tracked on a yearly basis to measure progress towards this outcome.

Lack of accessibility however contributes to wider societal disadvantage, as reflected in the average person trip rate for those with mobility needs being 12 per cent lower than the average for the whole population over the period 2014/15-2016/17. Typically, around 55 per cent of all people agree with the proposition that TfL is making it easier for disabled people to get around London, and in recent years

this proportion has been slightly higher for disabled people. Yet around 20 per cent of disabled people and 15 per cent of all people disagree with this proposition.

Reliability is a key factor affecting the relative attractiveness of public transport, and a range of mode-specific measures are available to quantify this. In general, London's public transport networks offer a high level of reliability, and it is important that this is maintained. However, reliability of both bus and Underground fell slightly in 2016, alongside several operational issues having a similar impact on the reliability of National Rail in London.

Safe and secure transport network

Recent years have seen substantial reductions in the number of killed or seriously injured casualties (KSI) from road traffic collisions in London. TfL and the London boroughs have made significant progress by building new infrastructure that protects vulnerable road users and working with partners to implement new ideas and technologies. The current Mayor has adopted a Vision Zero, which sets the goal of reducing the number of people killed in, or by, buses in London to zero by 2030, and for all deaths and serious injuries from road collisions to be eliminated from London's streets by 2041.

In 2016, 116 people were fatally injured, and 2,385 seriously injured. Whilst fatalities were 15 per cent down on 2015, the number of recorded serious injuries was 22 per cent higher than in 2015. The majority of this increase occurred during the last four months of 2016 following the introduction of new reporting systems by the Metropolitan Police. Whilst these new figures represent an improvement on previous reporting, they should not be compared directly with estimates for previous years. Instead, the new figures will form a baseline for the future monitoring of road collision casualties in London.

In 2016, the terrible tram derailment near Sandilands tram stop in Croydon tragically resulted in 7 fatalities and 15 major injuries.

Levels of recorded crime on TfL's transport system decreased in 2016/17 – down by 6.1 per cent on 2015/16, while the rate of crime has decreased to 7.3 crimes per million passenger journeys, down from 7.8 in 2015/16. This is broadly in line with the trend of substantial reductions over previous years.

Quality

As with walking and cycling, people's propensity to use public transport is partly conditioned by their attitude towards it. Overall customer satisfaction with the main public transport modes is relatively high, and has increased slowly over recent years. However, there are signs that this improving trend has plateaued – a recognised feature with measures of this type once a certain level has been reached. More insightful are measures that encapsulate the attitude of people towards TfL as a transport operator, although this offers a less-targeted response in terms of the TfL-operated public transport networks only.

TfL has therefore developed a metric that measures the extent to which Londoners believes that TfL cares about its customers (including users of all modes). Measurements since 2012 show an increasing trend with, typically between 45 and 50 per cent of people agreeing with the proposition. However, typically between 15 and 20 per cent of people disagree, and around 35 per cent of people express a neutral view.

Fares

The level of public transport fares is a key factor affecting the relative attractiveness of public transport as a mode, and the wider quality of life in London. The Mayor froze public transport fares in 2017, which will apply until 2020, and introduced the 'Hopper' fare option on buses in September 2016. The extent to which Londoners agree with the proposition that 'TfL provides value for money' measures wider factors; however the level of fares is considered to be the main driver behind this indicator. Typical levels of agreement with the proposition have been just less than 40 per cent in recent years with, typically, just less than 30 per cent disagreeing.

Supporting new homes and jobs

The draft Transport Strategy aims to provide for a future where, in 2041, London is expected to have 10.8 million residents, around 30 per cent higher than in the 2011 Census, and 1 million more jobs. The transport networks need to grow to accommodate the additional demand resulting from this, but they are also vital tools to help shape the future of London in ways that optimise social and economic conditions, for example through high-density, well connected developments that co-locate homes, jobs and services, thereby reducing the need to travel – the principle of 'Good Growth'.

The transport networks can also be a powerful tool in helping to address London's housing crisis, which is generally acknowledged to be a serious threat to the future growth and prosperity of the city. They can do this in two principal ways – through encouraging the provision of housing on TfL's own land and through the wider facilitation of new housing development that transport connectivity – improved connectivity in particular – offers.

The new London Plan sets out how London will need at least 66,000 new homes every year between now and 2041 to meet the needs of its rapidly growing population. But with the city building less than half of this in recent years, we will need to use every tool available to increase the rate of delivery. The transport network has a crucial role to play in this. We will ensure there is sufficient capacity on the rail, bus and tram networks, and will improve the environment for walking and cycling, to enable higher density housing and mixed use development at transport hubs. In addition, new public transport connections can make parts of London viable places to build homes for the first time. TfL's planned extension of the Overground to Barking Riverside will unlock the delivery of 11,000 new homes, which would otherwise not have been possible, whilst Crossrail (Elizabeth line) has already seen planning applications for over 55,000 new homes around its stations. Future major transport schemes, such as Crossrail 2 and the Bakerloo Line extension, are also being planned to maximise the number of much needed new homes that they could support.

1. Introduction and contents

1.1 TfL's Travel in London reports

Travel in London is TfL's annual publication that examines and summarises trends and developments relating to travel and transport in London. It provides an authoritative source of transport statistics as well as topical evidence-based analysis, and tracks trends and progress in relation to the transport and other related strategies of the Mayor. It also provides an interpretative commentary that looks across the immediate impacts of TfL and its delivery partners, as well as external influences and trends, in shaping the contribution of transport to the daily lives of Londoners and the economic and social vitality of the Capital. As such, it serves as a general resource for those planning and operating transport in London, as well as a more specific 'evidence base' in relation to particular policy themes and challenges.

1.2 Travel in London report 10

This tenth edition of Travel in London provides a comprehensive and updated overview of key travel and related trends and their causes, to inform the on-going development of the transport and related strategies of the Mayor of London.

Sadiq Khan released his draft Transport Strategy for public consultation in June 2017 (see: https://tfl.gov.uk/corporate/about-tfl/how-we-work/planning-for-the-future/the-mayors-transport-strategy). This drew on a wide range of evidential material, summarised in accompanying documents and in previous Travel in London reports. It organised transport priorities around four 'strategic policies':

- Active, efficient and sustainable mode share
- Healthy Streets and healthy people
- A good public transport experience
- New homes and jobs

The content of this and subsequent reports is therefore broadly organised around these four headings. In line with the proposals in chapter 6 of the draft Transport Strategy, Travel in London reports will continue to be the primary means of tracking progress towards strategy goals through their role of bringing together available evidence from across the various monitoring programmes that are in place.

Part of TfL's work in responding to the draft Transport Strategy is to review this existing monitoring and ensure that it is properly orientated towards strategic priorities. The material presented in this report, which can be thought of in terms of a 'baseline' set of conditions for the future monitoring of the final strategy, reflects this developing position and, where appropriate, proposals for developing the monitoring in the future are set out alongside such historic data as are available.

1.3 About Transport for London (TfL)

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

We have a key role in shaping what life is like in London, helping to realise the Mayor's vision for a 'City for All Londoners'. We are committed to creating a fairer,

greener, healthier and more prosperous city, with 80 per cent of all trips being made on foot, by cycle or using public transport by 2041.

We manage the city's 'red route' strategic roads and, through collaboration with the London boroughs, can help shape the character of all London's streets. These are the places where Londoners travel, work, shop and socialise. Making them places for people to walk, cycle and spend time will reduce car dependency and improve air quality, revitalise town centres, boost businesses and connect communities.

We run most of London's public transport services, including the London Underground, London Buses, the Docklands Light Railway, London Overground, TfL Rail, London Trams, London River Services, London Dial-a-Ride, Victoria Coach Station, Santander Cycles and the Emirates Air Line. The quality and accessibility of these services is fundamental to Londoners' quality of life. By improving and expanding public transport, we can make people's lives easier and increase the appeal of active, efficient and sustainable travel over private car use.

We are moving ahead with many of London's most significant infrastructure projects, using transport to unlock growth. We are working with partners on major projects like Crossrail 2 and the Bakerloo line extension that will deliver the new homes and jobs London and the UK need. We are in the final phases of completing the Elizabeth line which, when it opens, will add 10 per cent to London's rail capacity.

Supporting the delivery of high-density, mixed-use developments that are planned around active, efficient and sustainable travel will ensure that London's growth is Good Growth. We also use our own land to provide thousands of new affordable homes and our own supply chain creates tens of thousands of jobs and apprenticeships across the country.

We are constantly working to improve the city for everyone. This means freezing fares so everyone can afford to use public transport, using data and technology to make services intuitive and easy to use, and doing all we can to make streets and transport services accessible to all. We reinvest every penny of our income to continually improve transport networks for the people that use them every day.

1.4 Further information

For specific technical queries on the contents of this report, readers should contact TILenquiries@tfl.gov.uk.

Section 1: Overall travel demand and mode shares

2. Overall trends in travel demand and mode shares

2.1 Introduction

This chapter looks at overall travel demand trends in London, in terms of the overall number of trips made and the mode shares for the different forms of transport. The factors underlying these trends are considered further in chapter 4 of this report.

The volume of travel in London has grown substantially over the last two decades or so, more recently at a notably faster rate than previously anticipated, albeit historically matched by a consistent shift in mode share away from private car towards walking, cycling and public transport. These overall trends are projected to continue into the foreseeable future, although London's expected future rapid population growth will significantly intensify many transport challenges.

The draft Transport Strategy sets out the Mayor's vision for 80 per cent of all trips in London to be made by active, efficient and sustainable modes (walking, cycling and public transport) by 2041.

2.2 Total travel in London

Previous Travel in London reports consolidated historic information on travel trends over the last two decades or so. Principal features of these trends have been:

- Sustained growth in demand for travel, most directly reflecting population and employment growth.
- A substantial and sustained shift in mode share away from private car and towards walking, cycling and public transport, in parallel with increased supply and service quality for these modes.

In 2016, however, whilst total travel demand continued to grow, the long-term pattern of a progressive shift away from the private car was interrupted. In 2016:

- 27.1 million trips were made on an average day (*365) in London, a 1.3 per cent increase since 2015. The average number of trips in 2016 was 19.7 per cent higher than in 2000, an average growth rate of 1.1 per cent per year. Over this period, London's population grew by 21.4 per cent.
- In contrast to recent years however, there was a 0.5 percentage point net shift in mode share towards the private car – the first time that this has occurred since the 1990s.
- On an average day, the share for active, efficient and sustainable modes (walking, cycling and public transport) was 62.1 per cent; the share for private transport was 36.5 per cent. These compare to 62.6 per cent and 36.1 per cent respectively in 2015, and 52.0 per cent and 46.7 per cent respectively in 2000.
- Whilst the growth in total travel demand is a reflection of on-going population growth, the decrease in the latest year in active, efficient and sustainable modes is thought to reflect particular factors affecting the public transport networks, particularly the bus network, during 2016, coupled with a national-scale increase in car use, thought primarily to reflect increased employment.

The Mayor's vision of 80 per cent of trips in London being made by active, efficient and sustainable modes in 2041 requires, on average, a yearly 0.7 percentage point shift towards public transport, walking and cycling, although it is recognised that

this is an idealised trajectory and that progress may vary from year to year. For comparison, the average annual percentage point shift towards active, efficient and sustainable modes between 2000 and 2016 was 0.6 per cent.

2.3 Trips in London

Essential background and terminology

This section updates consolidated estimates of total travel in London on an average day. A **trip** is defined as a one-way movement from an origin to a destination to achieve a specific purpose, for example, to go from home to work. Each trip may involve travel by one or more individual modes of transport. These component parts of trips are referred to as **journey stages**. Key concepts relating to trips, journey stages and main mode of travel were explained in detail in Travel in London report 5.

The draft Mayor's Transport Strategy vision of an increase in active, efficient and sustainable mode share to 80 per cent by 2041 is based on trips, which are explored in detail in this section, with trip mode shares discussed in section 2.6.

Total number of trips

Over the period since 2000, total trips in London have increased by 19.7 per cent, with particularly notable increases of 77.4 per cent in rail trips and 55.4 per cent in bus trips, with cycle trips (as main mode) increasing by 135.6 per cent.

The number of trips made in London in 2016 averaged 27.1 million per day, an increase of 1.3 per cent over the previous year (table 2.1). This is a larger increase to that observed for journey stages, and is in line with the increase in London's population in 2016.

Over the most recent year there were small increases in patronage on rail and Underground, although there was a decline of 2.6 per cent in bus trips. Car driver and passenger trips increased by over 2 per cent, and car driver trips are now at their highest level since 2010.

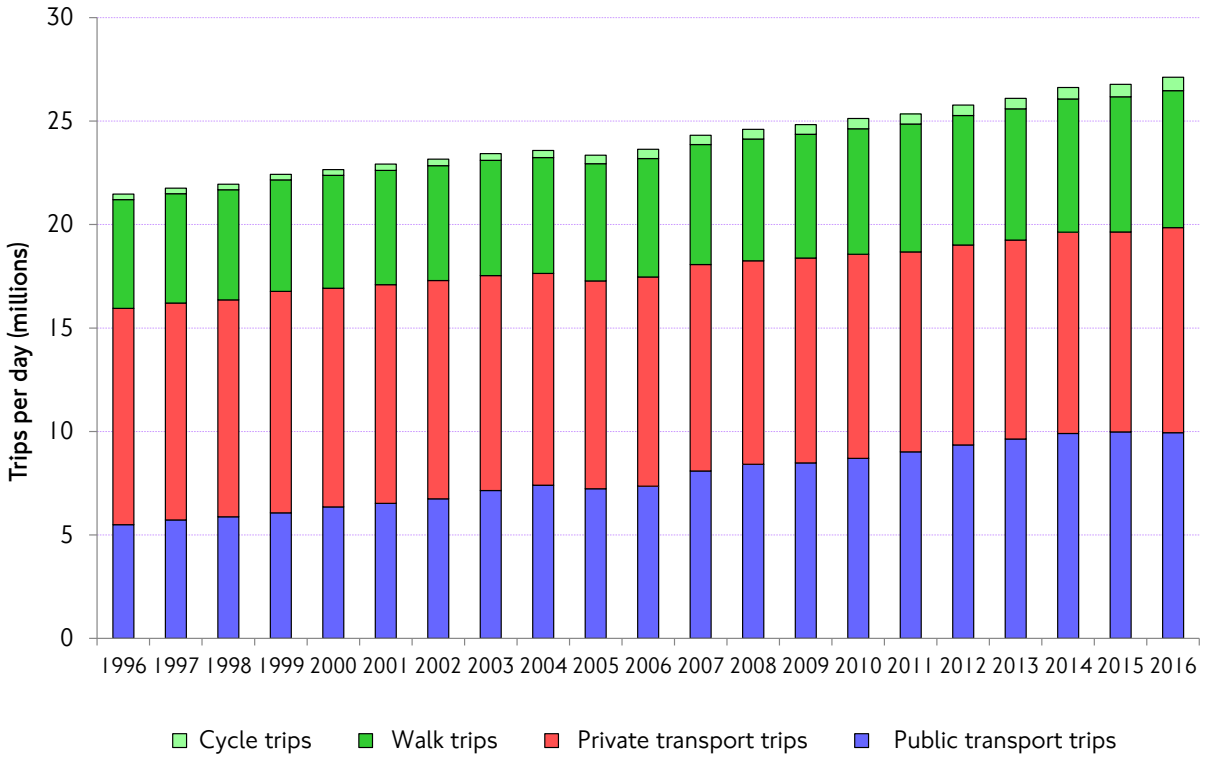
Included in these totals are all trips with an origin, a destination, or both, in Greater London by London residents and by non-residents, including commuters and day visitors from outside London as well as overnight visitors and tourists. The London resident population in 2016 was 8.8 million, 1.3 per cent higher than in 2015 and 21.4 per cent higher than in 2000. The larger 'daytime population' of Greater London, including non-resident visitors, was estimated at 10.0 million in 2016, 1.3 per cent higher than the previous year.

Table 2.1 Aggregate travel volumes in Greater London. Estimated daily average number of trips by main mode of travel, 1996 to 2016. Seven-day week.

	Millions of trips									
Year	Rail	Under-ground /DLR	Bus (including tram)	Taxi/ PHV	Car driver	Car passenger	Motor cycle	Cycle	Walk	All modes
1996	1.4	1.5	2.3	0.3	6.7	3.6	0.2	0.3	5.3	21.5
1997	1.5	1.6	2.3	0.3	6.7	3.6	0.2	0.3	5.3	21.8
1998	1.5	1.7	2.3	0.3	6.7	3.6	0.2	0.3	5.3	21.9
1999	1.6	1.8	2.3	0.3	6.9	3.6	0.2	0.3	5.4	22.4
2000	1.7	2.0	2.4	0.3	6.8	3.6	0.2	0.3	5.5	22.7
2001	1.7	1.9	2.6	0.3	6.8	3.6	0.2	0.3	5.5	22.9
2002	1.7	1.9	2.8	0.3	6.8	3.5	0.2	0.3	5.6	23.2
2003	1.8	1.9	3.2	0.3	6.7	3.5	0.2	0.3	5.6	23.4
2004	1.8	2.0	3.3	0.3	6.6	3.4	0.2	0.3	5.6	23.6
2005	1.8	1.9	3.2	0.3	6.5	3.4	0.2	0.4	5.7	23.4
2006	1.9	2.0	3.1	0.3	6.4	3.5	0.2	0.4	5.7	23.6
2007	2.1	2.0	3.6	0.4	6.3	3.5	0.2	0.4	5.8	24.3
2008	2.2	2.1	3.8	0.3	6.1	3.5	0.2	0.5	5.9	24.6
2009	2.1	2.2	3.9	0.3	6.2	3.5	0.2	0.5	6.0	24.8
2010	2.3	2.1	4.0	0.3	6.1	3.6	0.2	0.5	6.1	25.1
2011	2.4	2.2	4.1	0.3	5.9	3.6	0.2	0.5	6.2	25.3
2012	2.6	2.4	4.1	0.3	5.9	3.6	0.2	0.5	6.3	25.8
2013	2.7	2.5	4.1	0.3	5.8	3.6	0.2	0.5	6.3	26.1
2014	2.8	2.6	4.1	0.3	5.9	3.7	0.2	0.6	6.4	26.6
2015	3.0	2.8	3.8	0.3	5.9	3.6	0.2	0.6	6.5	26.8
2016	3.0	2.8	3.7	0.4	6.0	3.7	0.2	0.6	6.6	27.1
Percentage change 2015 to 2016	*0.1*	*1.0*	*-2.6*	*9.8*	*2.4*	*2.3*	*11.4*	*8.2*	*1.3*	*1.3*
2000 to 2016	*77.4*	*44.0*	*55.4*	*29.2*	*-11.8*	*3.9*	*0.0*	*135.6*	*21.4*	*19.7*

Source: TfL City Planning, Strategic Analysis.
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 2.3 trips are classified by the mode that is typically used for the longest distance within the trip.
4. Round trips are counted as two trips, an outward and an inward leg.
5. Values for 'rail' include London Overground.

Figure 2.1 Trips in Greater London – trend in total travel demand by principal mode. Estimated daily average number of trips by main mode of travel, 1996 to 2016. Seven-day week.



Source: TfL City Planning, Strategic Analysis.

2.4 Journey stages in London

Total number of journey stages

Table 2.2 shows the trend for total travel volumes and mode shares at the journey stage level. Notable from the table is the 16-year trend, showing a 25.3 per cent increase in total journey stages from 2000, with rail stages up by 85.0 per cent over the same period. Also notable is the 69.4 per cent increase in bus stages since 2000, despite the fall in more recent years.

Daily journey stages in London in 2016 were 31.7 million, relatively unchanged from 2015 and up from 31.3 million in 2014. This is a 0.2 per cent increase in journey stages in the latest year.

Annual growth in journey stages slowed on rail-based modes, with growth in 2016 of 0.5 per cent on London Underground and 2.5 per cent on DLR compared with the previous year. National Rail stages also increased at a slower rate in 2016, with growth of 0.7 per cent. Bus stages fell by 4.8 per cent, continuing the decline that started in 2015.

Car driver stages increased by 1.6 per cent in 2016, following a slight decrease in the previous year. Cycle and walk stages both increased in 2016, by 8.8 per cent and 1.3 per cent respectively.

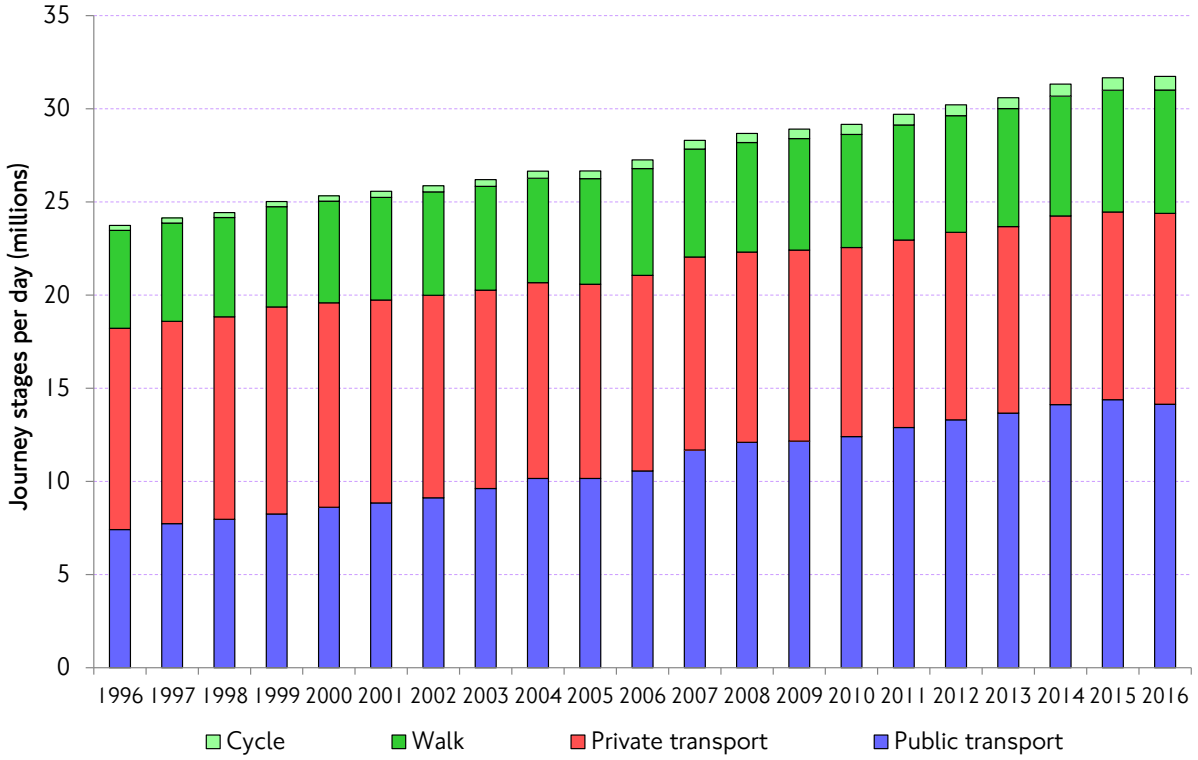
Table 2.2 Aggregate travel volumes in Greater London. Estimated daily average number of journey stages by mode, 1996 to 2016. Seven-day week.

Millions of journey stages

Year	Rail	Under-ground	DLR	Bus (incl. tram)	Taxi /PHV	Car driver	Car passenger	Motor cycle	Cycle	Walk	All modes
1996	1.5	2.1	0.0	3.4	0.3	6.9	3.8	0.2	0.3	5.3	23.7
1997	1.6	2.2	0.1	3.5	0.3	6.9	3.8	0.2	0.3	5.3	24.1
1998	1.7	2.4	0.1	3.5	0.4	6.9	3.8	0.2	0.3	5.3	24.4
1999	1.8	2.5	0.1	3.5	0.4	7.1	3.8	0.2	0.3	5.4	25.0
2000	1.8	2.6	0.1	3.7	0.4	7.0	3.8	0.2	0.3	5.5	25.3
2001	1.8	2.6	0.1	3.9	0.4	6.9	3.7	0.2	0.3	5.5	25.6
2002	1.9	2.6	0.1	4.2	0.4	6.9	3.7	0.2	0.3	5.6	25.9
2003	1.9	2.6	0.1	4.6	0.4	6.8	3.6	0.2	0.4	5.6	26.2
2004	2.0	2.7	0.1	5.0	0.4	6.7	3.6	0.2	0.4	5.6	26.6
2005	2.0	2.6	0.1	5.0	0.4	6.6	3.6	0.2	0.4	5.7	26.7
2006	2.1	2.7	0.2	5.2	0.4	6.6	3.7	0.2	0.5	5.7	27.2
2007	2.3	2.9	0.2	5.9	0.4	6.4	3.7	0.2	0.5	5.8	28.3
2008	2.4	3.0	0.2	6.2	0.4	6.3	3.7	0.2	0.5	5.9	28.7
2009	2.3	2.9	0.2	6.3	0.4	6.3	3.7	0.2	0.5	6.0	28.9
2010	2.5	3.0	0.2	6.3	0.3	6.3	3.7	0.2	0.5	6.1	29.2
2011	2.7	3.2	0.2	6.4	0.4	6.1	3.8	0.2	0.6	6.2	29.7
2012	2.9	3.3	0.3	6.4	0.4	6.0	3.8	0.2	0.6	6.3	30.2
2013	3.1	3.4	0.3	6.5	0.4	6.0	3.8	0.2	0.6	6.3	30.6
2014	3.2	3.5	0.3	6.7	0.4	6.1	3.9	0.2	0.6	6.4	31.3
2015	3.4	3.7	0.3	6.5	0.4	6.0	3.9	0.2	0.7	6.5	31.7
2016	3.4	3.7	0.3	6.2	0.4	6.1	3.9	0.2	0.7	6.6	31.7
Percentage change 2015 to 2016	*0.7*	*0.5*	*2.5*	*-4.8*	*2.8*	*1.6*	*1.7*	*10.7*	*8.8*	*1.3*	*0.2*
2000 to 2016	*85.0*	*42.2*	*229.7*	*69.4*	*20.2*	*-12.4*	*3.9*	*0.0*	*153.8*	*21.4*	*25.3*

Source: TfL City Planning, Strategic Analysis.
1. A journey stage is a part of a trip made by a single mode of transport.
2. Each rail interchange between train operating companies is a new journey stage.
3. Bus journey stages are counted by starting a new 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.
6. Values for 'rail' include London Overground.

Figure 2.2 Aggregate travel volumes in Greater London. Estimated daily average number of journey stages, 1996 to 2016. Seven-day week.



Source: TfL City Planning, Strategic Analysis.

2.5 Overall trip rates in London

Overall trip rates

Trip rates (the average number of trips per person per day) have been broadly stable over the whole period covered by table 2.2, at around 2.7 to 2.8 trips per person per day. However, evidence is beginning to emerge, both in London and further afield, of a possible more recent trend towards slightly lower travel volumes on a per capita basis (see Chapter 4 of this report for further information on this topic).

Trip rates are calculated for the average daily population, which makes allowance for overnight visitors and commuters from outside London making trips in the Capital. The historic relative stability of trip rates indicates that the increase in stages and trips in London is driven primarily by increases in population, both of London residents and visitors to the Capital, rather than individuals making more trips.

London resident trip rates

Looking specifically at London residents, using the London Travel Demand Survey (LTDS), average trip rates in 2016/17 were 2.2 trips per person per day, lower than the average of 2.7 for all travellers in London. This difference is to be expected, given that the large majority of non-resident day visitors are already (by definition) in the course of making at least one trip on the day in question to get to or from London.

After rising from 2.4 trips per person per day in 2008/09 to 2.5 in 2013/14, trip rates for London residents have fallen by an average of 4.1 per cent per year for the

last three years, this reduction primarily affecting 'discretionary' trips, for example trips for shopping and leisure, and again having parallels at the national scale.

Further details of travel demand trends affecting specific modes of transport are given in chapter 3 of this report.

2.6 Mode shares in London

Introduction

Mode shares reflect the choices that people make for travel in London. The Mayor's aim for 2041 is for 80 per cent of trips in London to be made by active, efficient and sustainable modes (walking, cycling and public transport). This section looks at historic trends in mode share and recent changes to this. The following section (2.7) focuses on active, efficient and sustainable modes and the scale of change required to meet the Mayor's aim for 2041.

Trip based mode shares

Public transport accounted for 36.7 per cent of trips in 2016, up from 28.1 per cent in 2000. Over the most recent year, the private transport mode share increased by 0.5 percentage points to 36.5 per cent. Despite this increase in private transport mode share, the mode share for public transport trips in London remains higher than for private transport – continuing the situation first seen in 2013. This highlights the large shift in how people travel around London over recent decades, given that in 1993 the public transport mode share was less than half the private transport mode share. Cycle and walk mode shares remained constant in 2016, at 2 per cent and 24 per cent respectively, despite absolute increases in the use of these modes.

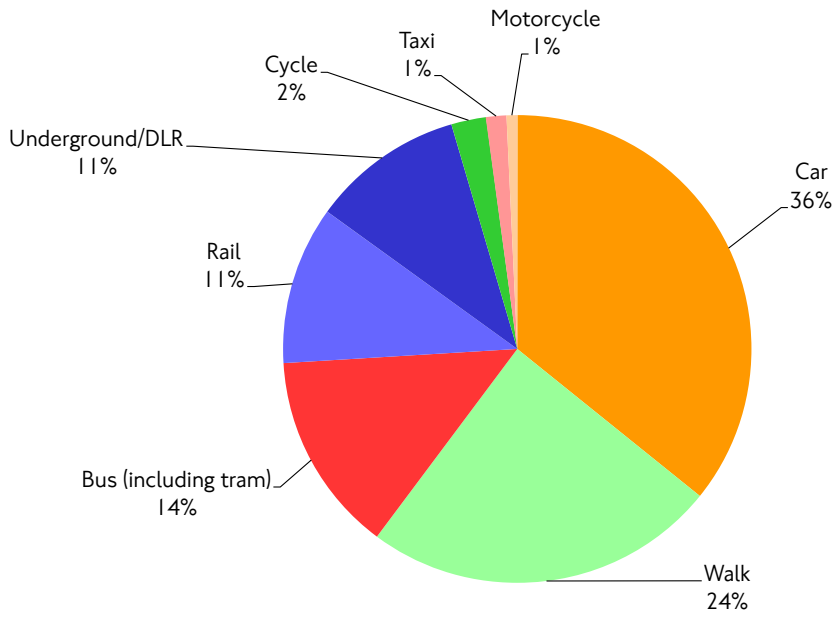
Over the longer term, the decrease of 11.0 percentage points between 2000 and 2016 in the private transport mode share in terms of journey stages is equivalent to a decrease of 10.1 percentage points in terms of trips. Similarly, the public transport mode share, which increased by 10.5 percentage points in terms of journey stages, increased by 8.6 percentage points in terms of trips since 2000 (note that public transport trips typically involve more than one stage).

Table 2.3 Trip-based mode shares – public and private transport by main mode.

	Percentage of trips			
Year	Public transport	Private transport	Cycle	Walk
1996	26%	49%	1%	24%
1997	26%	48%	1%	24%
1998	27%	48%	1%	24%
1999	27%	48%	1%	24%
2000	28%	47%	1%	24%
2001	28%	46%	1%	24%
2002	29%	46%	1%	24%
2003	30%	44%	1%	24%
2004	31%	43%	1%	24%
2005	31%	43%	2%	25%
2006	31%	43%	2%	24%
2007	32%	43%	2%	23%
2008	34%	40%	2%	24%
2009	34%	40%	2%	24%
2010	34%	39%	2%	24%
2011	36%	38%	2%	24%
2012	36%	37%	2%	24%
2013	37%	37%	2%	24%
2014	37%	37%	2%	24%
2015	37%	36%	2%	24%
2016	37%	37%	2%	24%

Source: TfL City Planning, Strategic Analysis.

Figure 2.3 Modal shares of daily trips in London, 2016.



Source: TfL City Planning, Strategic Analysis.

Journey stage based mode shares

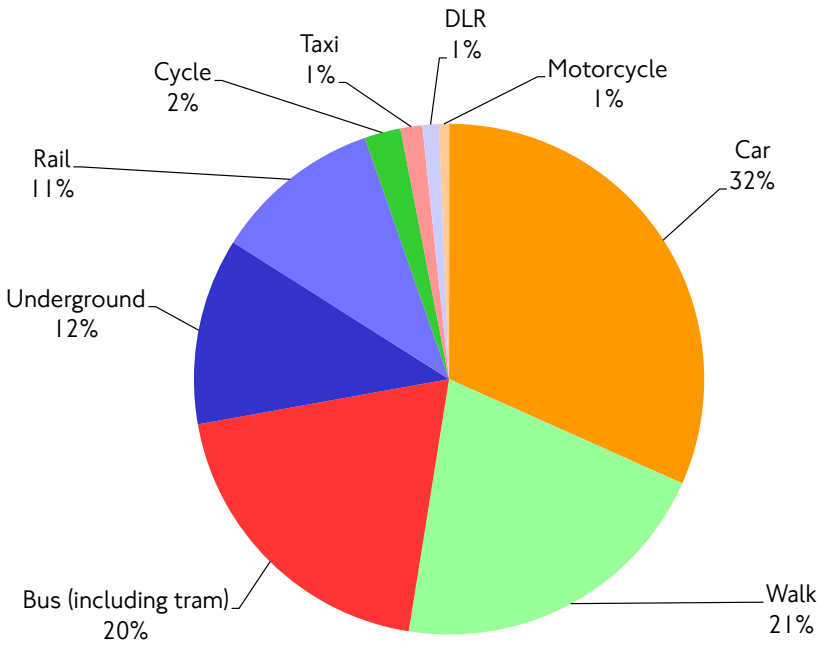
In 2016, 45 per cent of journey stages in London were made by public transport, compared with 32 per cent by private transport. This reflects the historic position of a well-established trend of a net shift in London away from private motorised transport to the public transport modes. Since 2000 the public transport mode share has increased by 10.5 percentage points. In the latest year, however, the public transport mode share decreased by 0.9 percentage points while the private transport mode share increased by a corresponding 0.5 percentage points. Cycling and walking mode shares at the journey stage level remained at 2 and 21 per cent respectively.

Table 2.4 Percentage shares of journey stages by type of transport, 1996 to 2016.

	Percentage of journey stages			
Year	Public transport	Private transport	Cycle	Walk
1996	31%	46%	1%	22%
1997	32%	45%	1%	22%
1998	33%	45%	1%	22%
1999	33%	44%	1%	22%
2000	34%	43%	1%	21%
2001	35%	43%	1%	22%
2002	35%	42%	1%	21%
2003	37%	41%	1%	21%
2004	38%	39%	1%	21%
2005	38%	39%	2%	21%
2006	39%	39%	2%	21%
2007	41%	37%	2%	20%
2008	42%	36%	2%	21%
2009	42%	35%	2%	21%
2010	43%	35%	2%	21%
2011	43%	34%	2%	21%
2012	44%	33%	2%	21%
2013	45%	33%	2%	21%
2014	45%	32%	2%	21%
2015	45%	32%	2%	21%
2016	45%	32%	2%	21%

Source: TfL City Planning, Strategic Analysis.
Note: Mode shares are calculated from the consistent series for journey stages given in table 2.2. Totals may not add up to 100 per cent due to rounding. 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 2.4 Modal shares of daily journey stages in London, 2016.



Source: TfL City Planning, Strategic Analysis.
Note: 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.

Trends in journey stages by mode

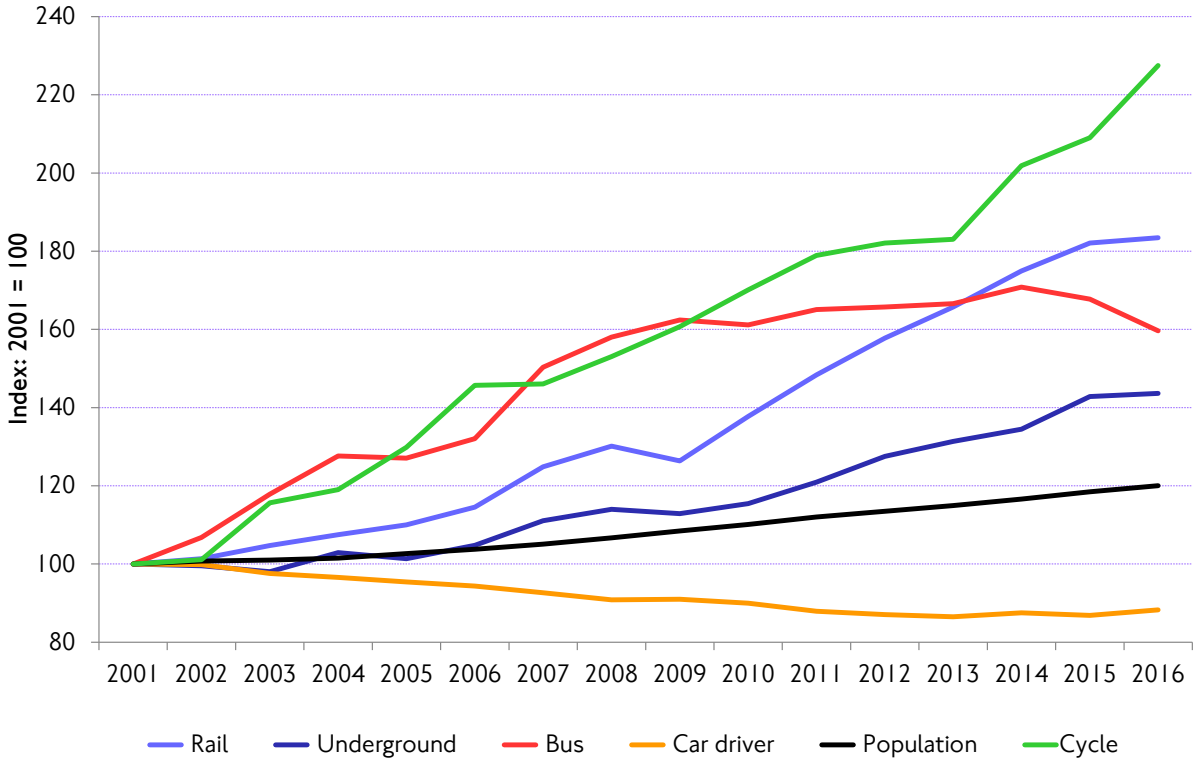
Figure 2.5 shows trends in demand on selected travel modes since 2001. Public transport use has grown strongly over this period, with demand for all of the public transport modes growing faster than population, reflecting changing mode shares. Initially, growth was strongest on the bus network, with a 27.6 per cent increase in bus journey stages between 2001 and 2004. Following slower growth of 8.1 per cent between 2008 and 2014, bus stages have fallen over the last two years, although still remain 60 per cent higher than in 2001.

Growth in National Rail use (including London Overground) was initially slower than bus use until 2009. Since 2009, rail journey stages have increased by 45.2 per cent, partly helped by the opening of TfL's Overground network, with rail stages now 83.4 per cent higher than in 2001.

In contrast, Underground passenger growth closely followed population growth between 2001 and 2006, although use has started to grow at a faster rate in recent years, reflecting completion of upgrades to several lines, which has added extra capacity to the network.

Car driver stages in 2016 were 11.7 per cent below the 2001 level. Growth has been highest in cycle stages, which have grown by 127.5 per cent since 2001, and by 24.3 per cent since 2013.

Figure 2.5 Growth in journey stages on selected modes, 2001 to 2016.



Source: TfL City Planning, Strategic Analysis.

2.7 Active, efficient and sustainable mode shares

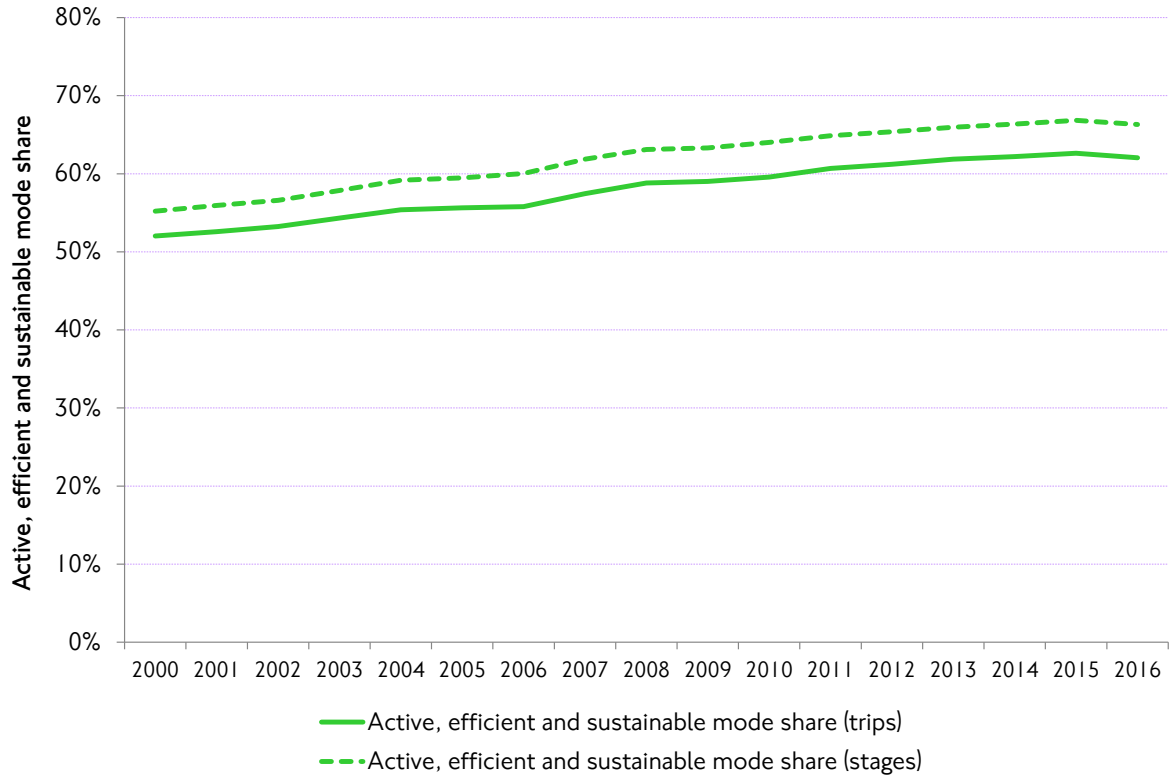
Active, efficient and sustainable modes are defined in the draft MTS as walking, cycling and public transport. For this purpose, public transport does not include trips by licensed taxi and private hire. The active, efficient and sustainable mode share is calculated on the basis of trips, by all people (including residents and visitors) travelling in London, on an average (*365) day. To be included, trips must have at least one 'end' in the Greater London area. Trips are assigned to a 'main mode' according to the stage of the trip on which the longest distance was undertaken (an established convention).

Historic trend – trip-based mode share

Looking firstly at the historic trend, figure 2.6 shows the trend for the proportion of all trips in London made by active, efficient and sustainable modes. There has been a continuous year-on-year increase in the active, efficient and sustainable mode share since 2000, averaging 0.7 percentage points per year.

In 2016 however, the active, efficient and sustainable mode share decreased for the first time, by 0.6 percentage points, to 62.1 per cent. This is thought to reflect the wider set of circumstances affecting travel demand and mode choice that are discussed in Chapter 4 of this report.

Figure 2.6 Proportion of all trips in London made using active, efficient and sustainable modes 2000-2016.



Source: TfL City Planning, Strategic Analysis.

Table 2.5 Percentage of trips and journey stages in London made by active, efficient and sustainable modes – recent trend.

Year	2010	2011	2012	2013	2014	2015	2016
Percentage of trips made by active, efficient and sustainable modes	59.6%	60.7%	61.2%	61.9%	62.2%	62.6%	62.1%
Percentage of journey stages made by active, efficient and sustainable modes	64.0%	64.9%	65.4%	66.0%	66.4%	66.8%	66.3%

Source: TfL City Planning, Strategic Analysis.

Historic trend – journey-stage-based mode share

The trend in the active, efficient and sustainable mode share of journey stages has been similar to that of trips, with a continuous year-on-year increase up to 2015, and a decline of 0.5 percentage points in the latest year. The stage-based measure of active, efficient and sustainable mode share is higher than the trip-based measure, as public transport trips are more likely to be made up of multiple journey stages. In 2016, the active, efficient and sustainable mode share of journey stages stood at 66.3 per cent.

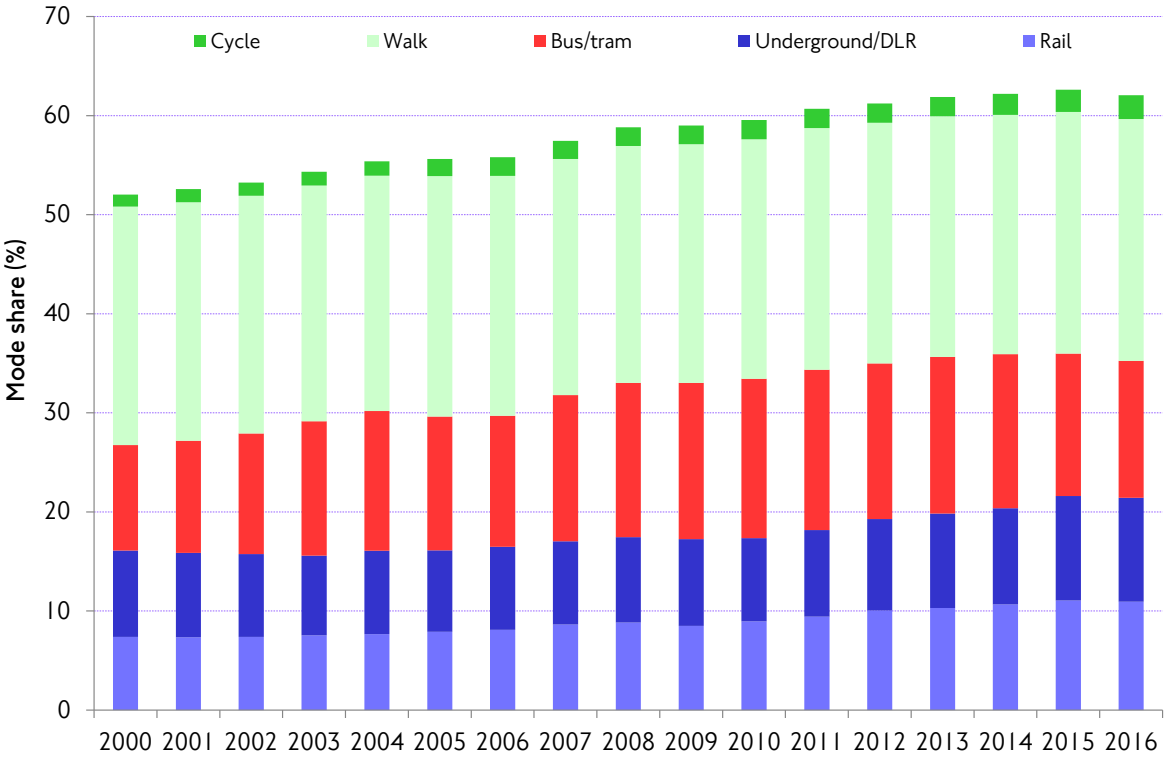
Components of active, efficient and sustainable modes

Figure 2.7 shows the historic trend in the 'headline' indicator, the percentage of trips made by active, efficient and sustainable modes, over the period since 2000.

The chart shows that the proportion of trips made by sustainable public transport modes (excluding taxi/PHV) has increased over the period, from 27 per cent in 2000 to 35 per cent in 2016. The cycle mode share has doubled over the period, although from a much smaller base, from 1.2 per cent in 2000 to 2.4 per cent in 2016. In contrast, the mode share of walking trips has remained relatively stable at around 24 per cent, this reflecting a growth broadly in line with increasing population.

Overall, the active, efficient and sustainable mode share has increased from 52.0 per cent in 2000 to 62.1 per cent in 2016.

Figure 2.7 Components of active, efficient and sustainable modes 2000-2016. Trip level.



Source: TfL City Planning, Strategic Analysis.

Additional comments

The trip-based indicator for active, efficient and sustainable mode share is in accordance with the draft MTS. However, other measures of this are also possible, and can provide valuable additional context.

In particular, LTDS provides a much richer source of data for London residents only, and many of the analyses of wider travel trends considered elsewhere in this report are based on this, which will give different estimates to those described above. These differences should be borne in mind when interpreting the additional material below.

Spatial variation in active, efficient and sustainable mode share

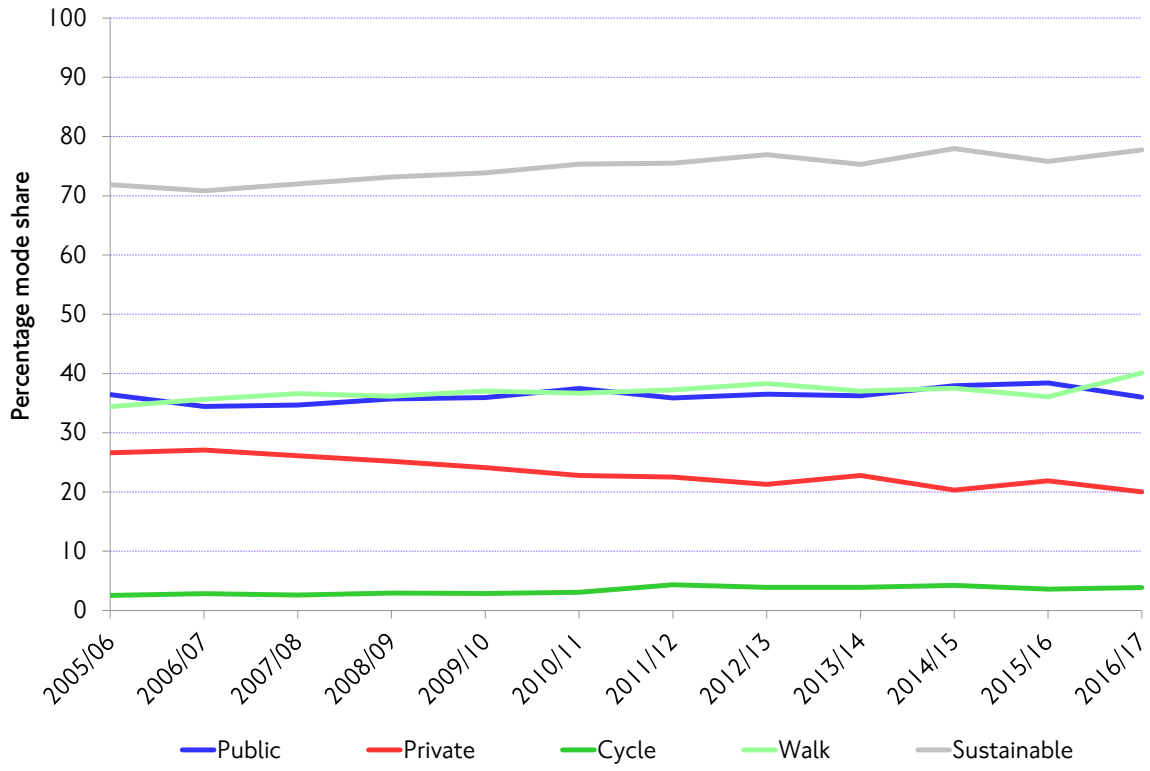
Mode shares vary geographically. Typically, the highest active, efficient and sustainable mode shares characterise trips in central London. To examine these

features, it is necessary to use the LTDS survey, which includes travel by London residents only and provides a continuous dataset back to the 2005/06 financial year.

Inner London (including central London)

Among inner and central London residents, there has been a sustained decline in private transport mode share, falling from 27 per cent in 2005/06 to 20 per cent in the latest year (figure 2.8). Public transport mode shares have remained between around 35 to 38 per cent, with a small decline in the latest year. Cycle mode share increased from 2.5 per cent in 2005/06 to 3.9 per cent in 2016/17 and walk mode share has increased from 34.4 per cent to 40.1 per cent over the same period, with an indicated growth of 4 per cent in the latest year. Because LTDS is 'normalised' to account for population growth, this reflects a genuine and substantial shift in mode share to walking over this period. In terms of the active, efficient and sustainable mode share, 71.9 per cent of trips by central and inner London residents were made by active, efficient and sustainable modes in 2005/06, increasing to 77.7 per cent of trips in 2016/17, an increase of 5.9 percentage points over the period.

Figure 2.8 Mode share of trips by inner London residents. LTDS survey, 2005/06–2016/17.



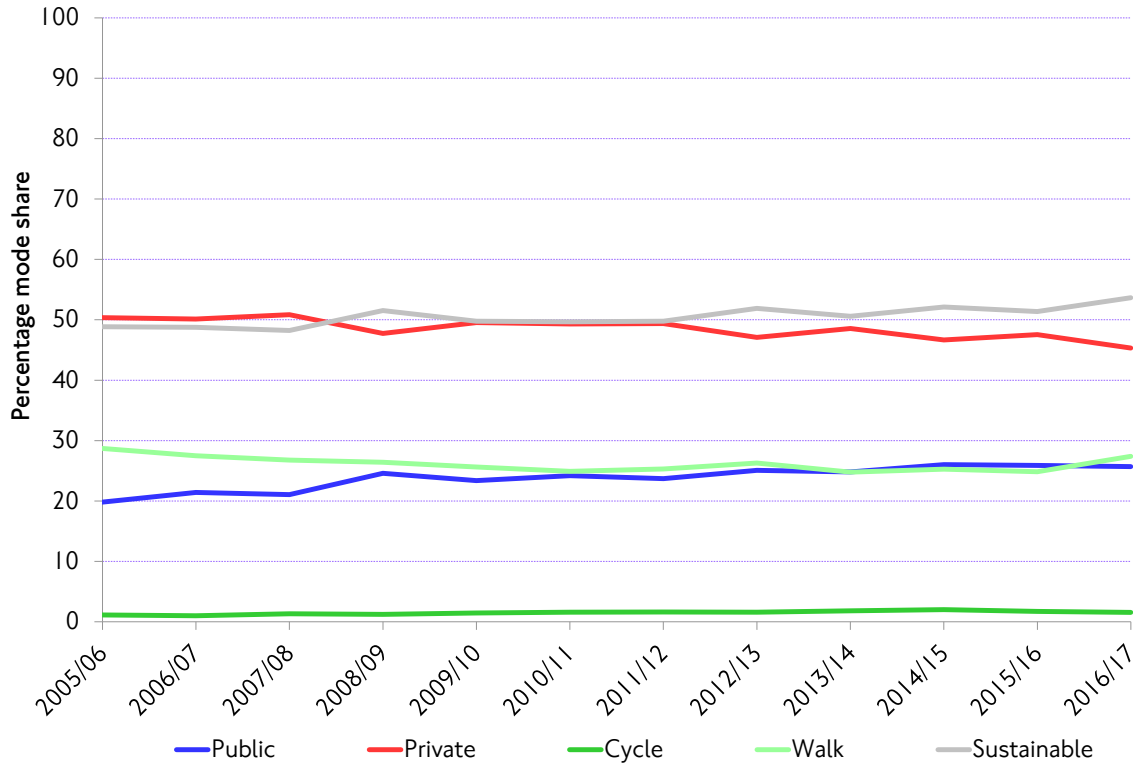
Source: TfL City Planning, Strategic Analysis.

Outer London

In outer London, where public transport coverage is less comprehensive, the trends have been different, with private transport mode share falling at a slower rate, from 50.4 per cent in 2005/06 to 45.3 per cent in 2016/17 (figure 2.9). Public transport mode share increased from 19.8 per cent to 25.7 per cent over the same period. The cycling mode share among outer London residents is much lower than among inner London residents and has increased at a slower rate, from 1.1 per cent in

2005/06 to 1.6 per cent in 2016/17. The walk mode share decreased from 28.7 per cent in 2005/06 to 24.9 per cent in 2015/16, a contrasting trend to inner London, albeit with an increase in the latest year. In 2005/06, less than half (48.9 per cent) of trips by outer London residents were made by active, efficient and sustainable modes, and in 2016/17 this had increased to 53.7 per cent of trips.

Figure 2.9 Mode share of trips by outer London residents, LTDS survey, 2005/06–2016/17.



Source: TfL City Planning, Strategic Analysis.

Borough level patterns

Figure 2.10 shows the trip-based active, efficient and sustainable mode share by borough of residence. This figure includes all trips undertaken by residents of each borough, irrespective of where the trips take place (although one end of the trip must be in the GLA area to be included). There are many 'structural' reasons underlying these patterns but the considerable variation highlights both challenges and opportunities in respect of achieving the active, efficient and sustainable mode share objective.

In general, inner London residents have a higher share of trips made by active, efficient and sustainable modes, and this is to be expected given the denser land use and more comprehensive public transport network. Residents of the City of London have the highest overall active, efficient and sustainable mode share (94 per cent), but the smaller number of households in the City of London compared to other London boroughs should be taken into account and means that this estimate is based on a relatively small sample of households.

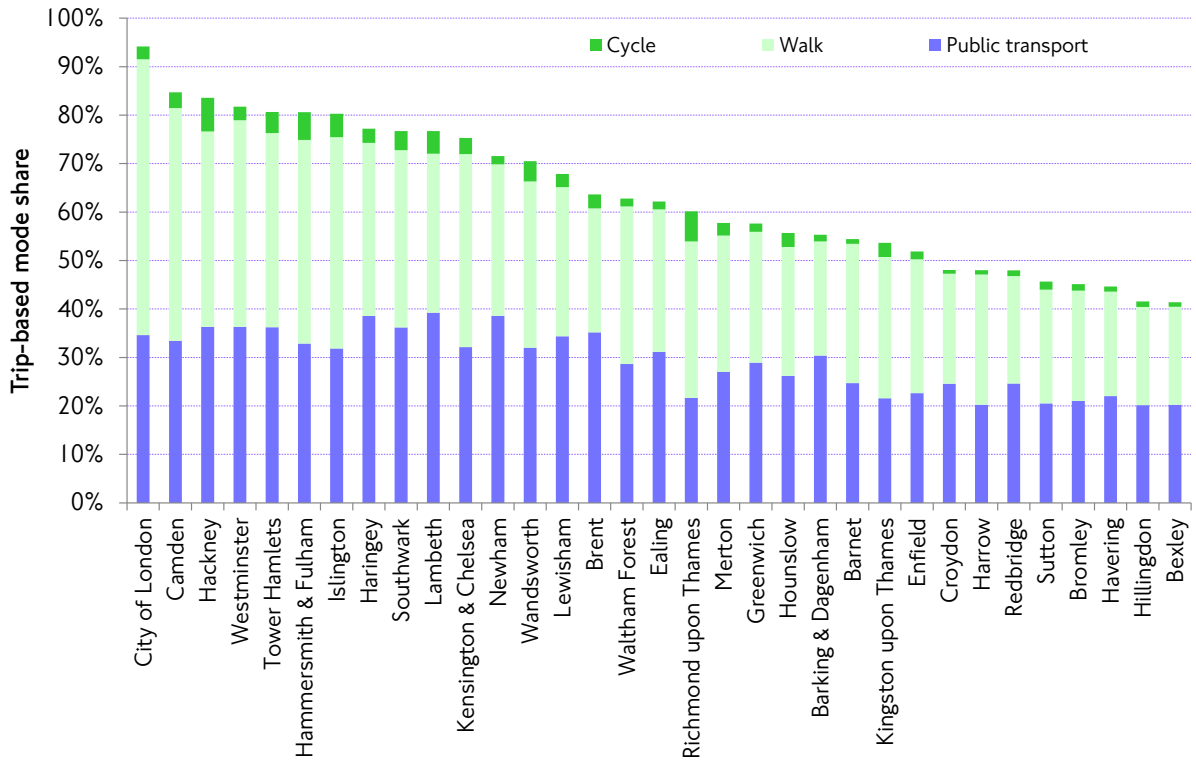
Camden has the second highest active, efficient and sustainable mode share (85 per cent), in part due to the high walk mode share – almost half (48 per cent) of trips made by Camden residents are walked. Residents of Hackney, Hammersmith &

Fulham and Richmond upon Thames have notably high cycle mode shares, whereas residents of Haringey, Lambeth and Newham have the highest public transport mode shares.

Outer London residents have lower overall active, efficient and sustainable mode shares. Residents of Brent have the highest active, efficient and sustainable mode share (64 per cent) of all of the outer London boroughs, due to a higher than average public transport mode share of 35 per cent. Residents of Waltham Forest also have a higher than average active, efficient and sustainable mode share for outer London, with the highest outer London walk mode share of 32 per cent. Richmond upon Thames residents have the highest outer London cycle mode share of 6 per cent, more than twice as high as any other outer London borough. Residents of Bexley and Hillingdon have the lowest active, efficient and sustainable mode share of 41 and 42 per cent respectively, followed by Havering and Bromley (45 per cent respectively).

Particularly notable from the figure is the variation in the proportion of the mode share accounted for by cycling and (in particular) walking, with public transport mode shares being relatively more consistent between boroughs.

Figure 2.10 Trip-based mode share for active, efficient and sustainable modes, by borough of residence, LTDS 3 year average, 2014/15-2016/17.



Source: TfL City Planning, Strategic Analysis.

Indicative trajectory to meet active, efficient and sustainable mode share aim

From a base of 2016, achieving the Mayor's aim for 80 per cent of trips to be made by active, efficient and sustainable modes by 2041 would require the equivalent of an average 0.7 percentage point shift in mode share per year (18 percentage points overall), although it is recognised that the actual trajectory of change may differ.

From the perspective of the draft MTS, the 2016 values, pre-dating publication of the draft Transport Strategy, act as a 'baseline' for tracking future progress, and slightly intensify the challenge of achievement for 2041.

Person kilometres by mode (journey stage based, London residents only)

Another way of looking at mode shares is the average number of kilometres per day travelled per person. This indicator is only available for residents of Greater London (from the LTDS survey).

The values in table 2.6 are expressed as a daily average value (*365), for all trips with at least one 'end' in Greater London. The indicator relates to personal travel by residents aged 5 or over. It excludes travel where this is a direct corollary of employment (eg bus driver) but includes personal travel made for business purposes. It also excludes freight travel, which is not in scope for the LTDS survey.

Of particular interest from the table are the average walk and cycle distances – around one-fifth of a kilometre and one kilometre, on average, per person per day.

Table 2.6 Person kilometres (average per day) travelled by residents of Greater London.

Year	2010/ 11	2011/ 12	2012/ 13	2013/ 14	2014/ 15	2015/ 16	2016/ 17
National Rail/Overground	2.54	2.58	3.07	2.63	3.01	2.71	2.84
Underground/DLR	2.12	2.07	2.17	2.13	2.29	2.29	2.21
Bus/tram	1.79	1.89	1.67	1.95	1.67	1.59	1.38
Taxi/other	0.20	0.22	0.27	0.17	0.25	0.27	0.23
Car driver	4.58	4.69	4.48	4.39	4.19	3.88	3.36
Car passenger	2.49	2.78	2.67	2.52	2.36	2.36	2.05
Cycle	0.18	0.21	0.21	0.24	0.25	0.23	0.21
Walk	0.99	0.96	0.98	0.96	0.99	0.94	1.09

Source: TfL City Planning, Strategic Analysis.

2.8 Focus on: Night time travel

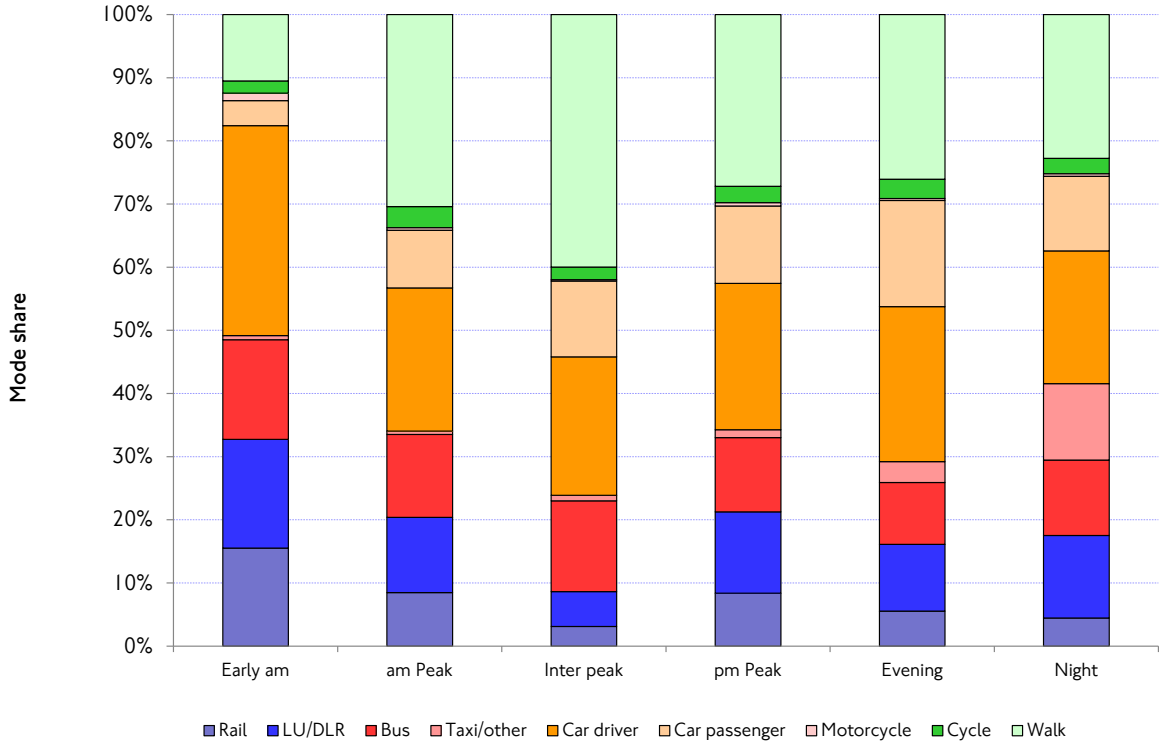
The night time economy is a key driver of economic and cultural regeneration and a magnet for domestic and international visitors. Recent research shows that the night time economy contributes £26.3bn to London's annual GDP and supports 1 in 8 jobs. This figure is expected to rise to £28.3bn by 2029. Transport plays a key role in ensuring both London residents and visitors to London can access the night time economy, with the opening of the Night Tube in August 2016, and the upcoming opening of the Night Overground from December 2017 significantly expanding the public transport offering during the night.

This section uses data from LTDS to examine how travel in London at night by London residents differs from that during the day.

Night time mode shares for residents

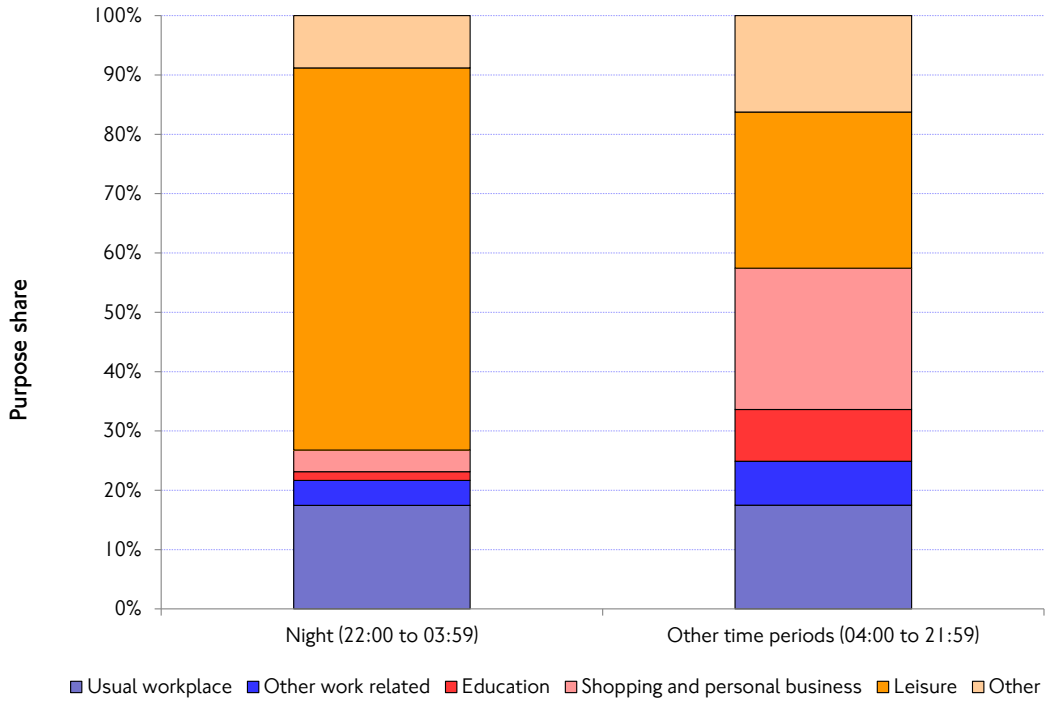
The modes people use at night differ from those they use in the day. Walking makes up 23 per cent of all trips at night, compared with 33 per cent for the whole day, while Underground trips increase in proportion from 9 per cent to 13 per cent. The proportion of car trips at night is similar to during the day. Taxi (including licensed private hire) mode share increases significantly at night, from 1 per cent to 12 per cent - the same mode share as bus for this time.

Figure 2.11 Comparative mode share of trips by time period, LTDS 2016/17.



Source: TfL City Planning, Strategic Analysis.

Figure 2.12 Purpose share of trips at night, LTDS 2016/17.



Source: TfL City Planning, Strategic Analysis.

Night time journey purpose for residents

The reasons people travel at night differ from during the day (figure 2.12). The majority of trips made at night (64 per cent) are for leisure purposes. There are still a significant proportion of commute trips at night – 17 per cent of all trips, compared with 18 per cent during the day.

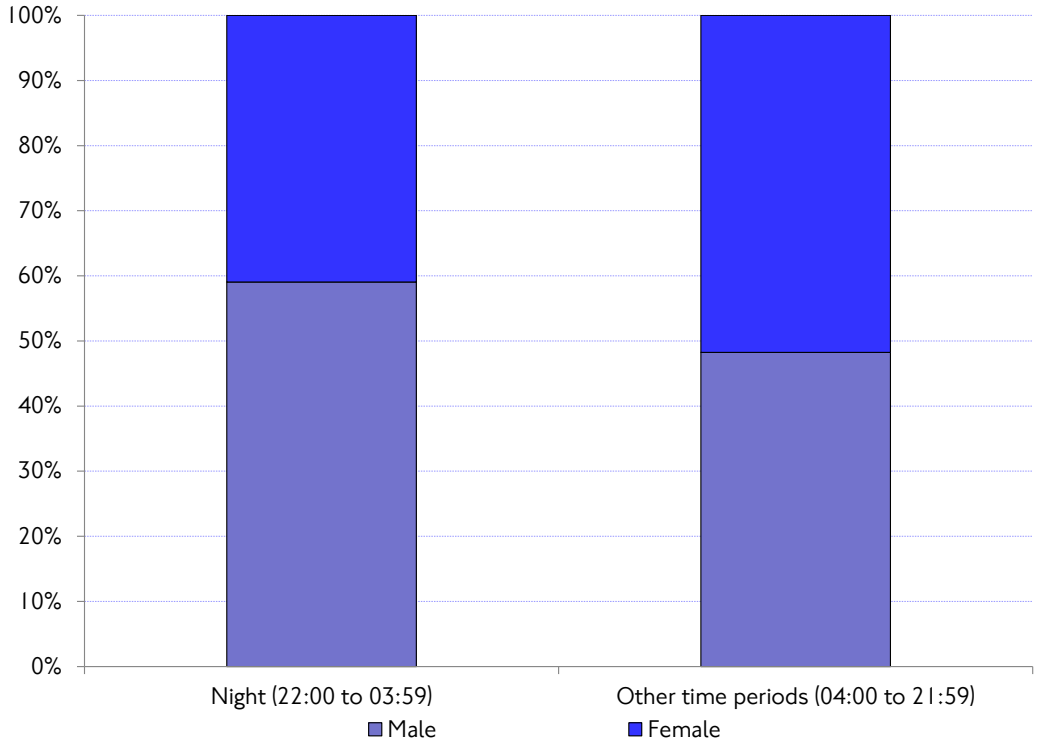
Night time journeys by gender, age and geography

Women made up 50.2 per cent of London's population in 2016, but 59 per cent of trips at night are by men, compared with 48 per cent during the day (figure 2.13).

London residents who travel at night are younger on average than those who travel in the day, with 18 per cent of trips at night made by 17-24 year olds, compared with 9 per cent during the day. Almost half of all trips at night are made by those aged 25-44 (figure 2.14).

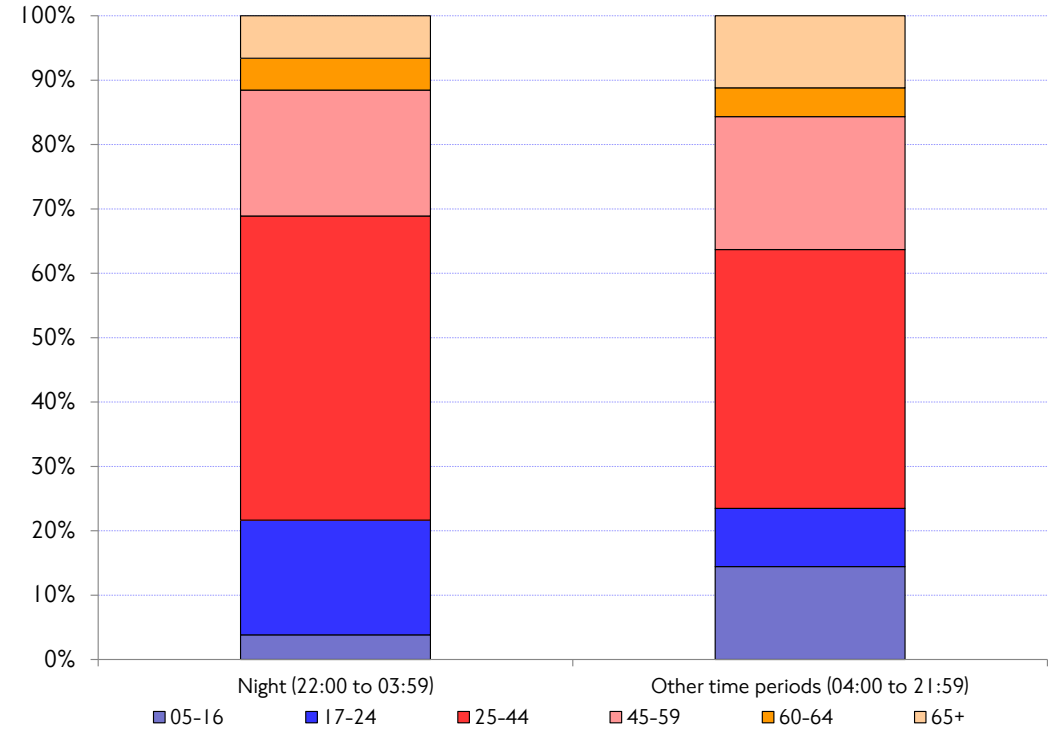
Looking at basic geographical patterns, there are a higher proportion of trips to and from central London at night, with 19 per cent of trips at night between central and inner/outer London, compared with 12 per cent during the day. Only 33 per cent of trips at night are wholly within outer London, compared with 43 per cent during the day (figure 2.15).

Figure 2.13 Gender split of night trips, LTDS, 2016/17.



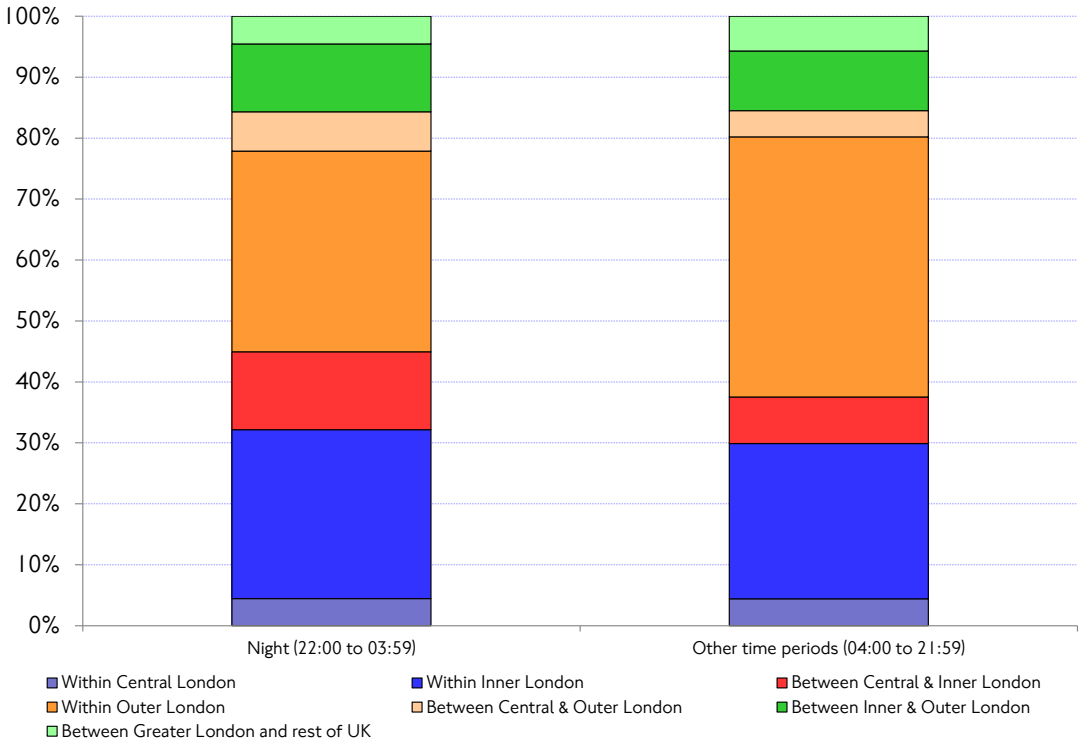
Source: TfL City Planning, Strategic Analysis.

Figure 2.14 Age split of night trips, LTDS 2016/17.



Source: TfL City Planning, Strategic Analysis.

Figure 2.15 Origin and destination of night trips, LTDS 2016/17.



Source: TfL City Planning, Strategic Analysis.

3. Travel demand trends by principal travel mode

3.1 Introduction

Chapter 2 of this report looked at trends in aggregate travel demand and mode shares in London, and considered some of the factors underlying recent changing travel patterns. The overall picture since 2000 has been one of strong growth in London's population and travel demand – a pattern that is expected to continue into the foreseeable future. This growth has been at a faster rate than previously envisaged, and has affected the main travel modes in different ways. This growth in demand has also been accompanied by improvements to the capacity of London's transport networks and also improvements to the wider level and quality of service offered.

The draft MTS sets out a future prospectus for each of the travel modes, with the overall aims of providing for London's future growth and prosperity and encouraging a continued shift in mode share towards active, efficient and sustainable travel modes. Each of the travel modes has a role to play in achieving this vision.

This chapter looks specifically at trends in travel volumes (demand) affecting each of the principal travel modes. The focus is generally on the period since 2010, although longer-term trends are highlighted where the available data permit. Whilst forming a set of baseline conditions for the future monitoring of progress towards the outcomes of the draft MTS, the position in 2016 differs in some important respects however from long-established trends. These instances are discussed in more detail under the relevant headings below, which consider firstly the public transport modes, secondly the 'active modes' of walking and cycling and, thirdly, demand trends affecting road traffic in London. Behavioural aspects relating to the different modes of travel, as opposed to overall volumes, are considered elsewhere in this report and have also been explored extensively in previous Travel in London reports.

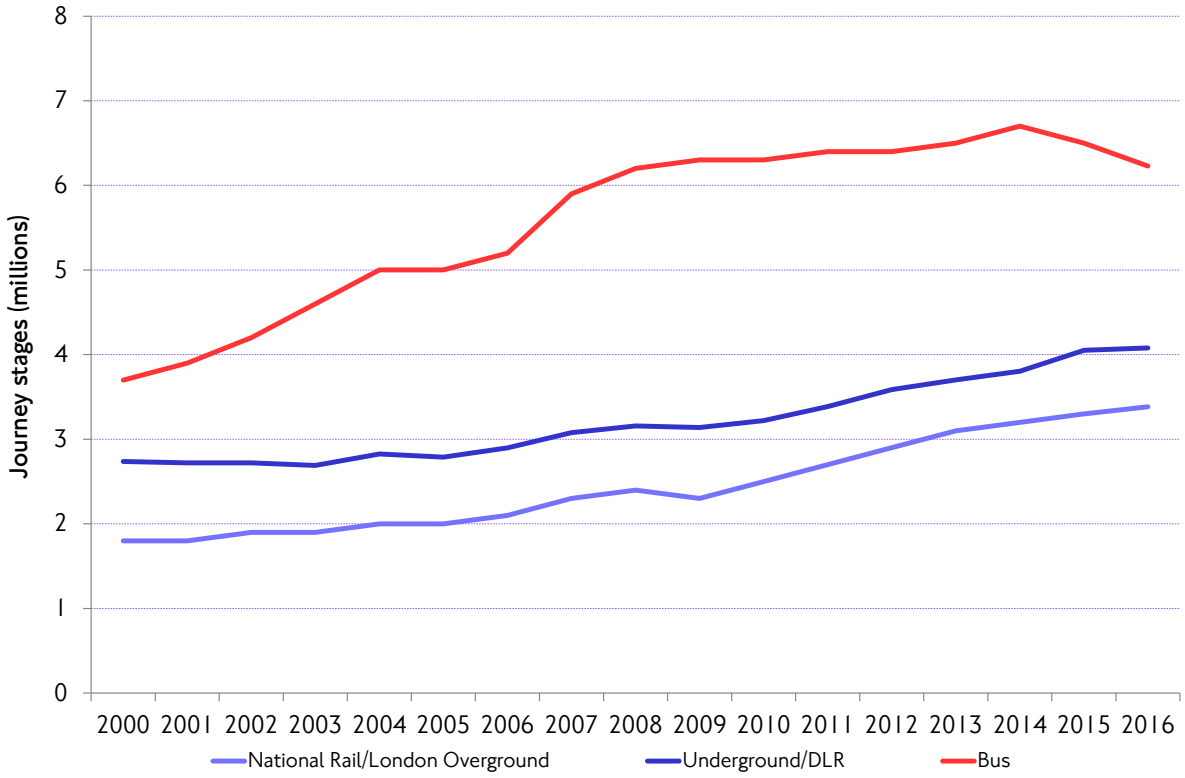
3.2 Public transport: Overall trends

Historic trends

Considering the period 2000 to 2016, the total demand for public transport in London – measured in terms of journey stages – grew by 64 per cent. In the longer-term historic context this level of growth was unprecedented. TfL's projections of future travel demand suggest that growth is likely to continue at a similar rate for the foreseeable future.

However, the growth has been focused on particular modes at different points in time. Figure 3.1 shows the demand growth trend for each of the principal public transport modes over this period. The figure is in terms of the absolute number of journey stages per year, by all travellers in London, and therefore it also illustrates the differences in scale – in terms of the total volume of travel – across these modes.

Figure 3.1 Trend in journey stages on selected modes, 2000 to 2016.



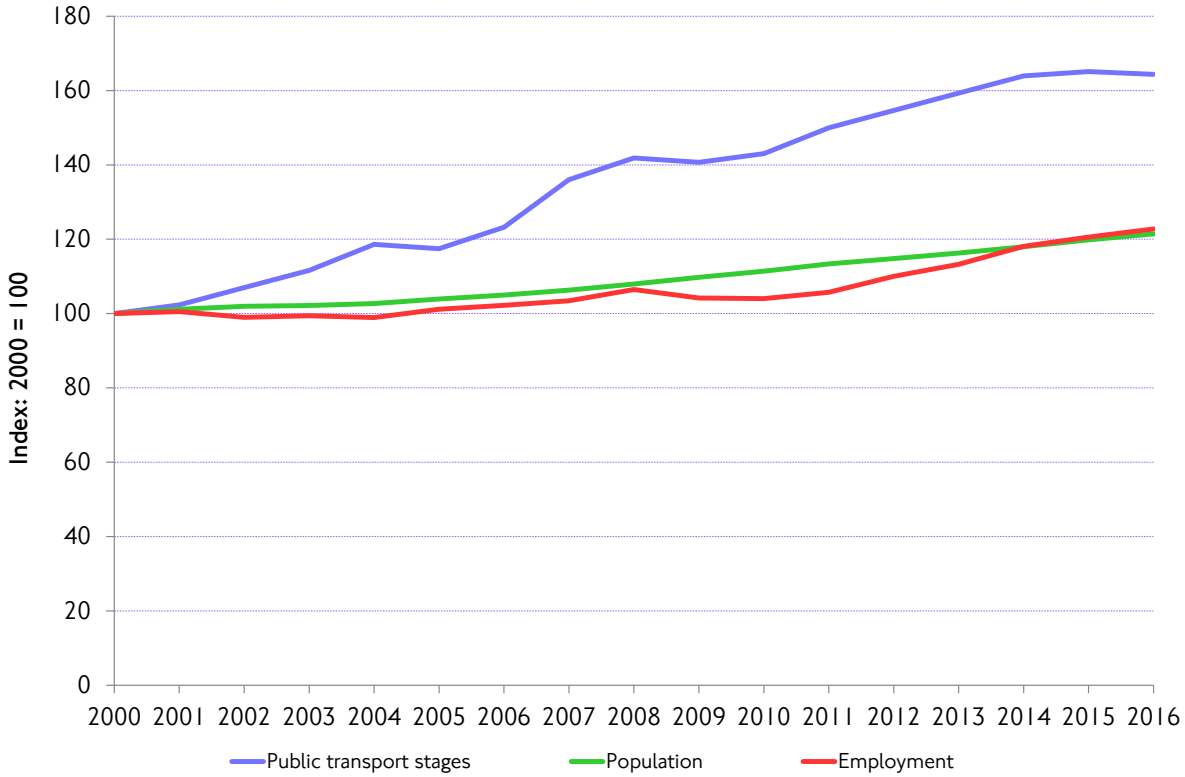
Source: TfL City Planning, Strategic Analysis.

All modes have seen a growth in demand between 2000 and 2016, with the greatest growth on rail (85.0 per cent over the period), followed by bus (69.4 per cent) and Underground/DLR (49.0 per cent). Growth in bus demand was particularly strong between 2000 and 2008, corresponding to a period of particular investment in the bus network, and, after a period of levelling off, has declined by 6.6 per cent since 2014. Despite the slower growth rate and the decline in the latest two years, the absolute number of journeys made on the bus network is still much higher than the number of journeys made on rail or Underground/DLR.

Rail demand was most noticeably affected by the economic recession, dropping by 2.9 per cent between 2008 and 2009. Between 2009 and 2015, however, rail demand has been strong, increasing by 44.1 per cent over that period. However, growth in 2016 was just 0.7 per cent, a much lower rate of growth than typical over recent years. Underground demand also increased between 2009 and 2016, by 30.0 per cent. Growth in Underground demand was slower than usual in the latest year, increasing by just 0.7 per cent between 2015 and 2016 compared to 7.2 per cent between 2014 and 2015.

The growth in demand for public transport in part reflects London's population growth. However, while population grew by 21.4 per cent between 2000 and 2016, public transport demand grew by 64.1 per cent – this shows that public transport demand is growing much faster than population growth (figure 3.2), reflecting an underlying change in mode share towards public transport.

Figure 3.2 Growth in demand (journey stages) on the principal public transport modes compared with growth in population and employment in London, 2000 to 2016.



Source: TfL City Planning, Strategic Analysis.

Public transport trips by mode, annual totals (millions)

Patronage trends on London's public transport networks are described in more detail below. Table 3.1 is a summary of key patronage trends for the principal modes since 2010.

Table 3.1 Patronage on the principal public transport modes 2010-2016. Millions of trips per day.

Year	2010	2011	2012	2013	2014	2015	2016
National Rail	2.25	2.39	2.59	2.69	2.84	2.96	2.96
Underground/DLR	2.11	2.21	2.38	2.49	2.59	2.82	2.85
Bus/tram	4.04	4.10	4.05	4.13	4.14	3.85	3.75
Total	8.40	8.71	9.02	9.30	9.57	9.63	9.56

Source: TfL City Planning, Strategic Analysis.

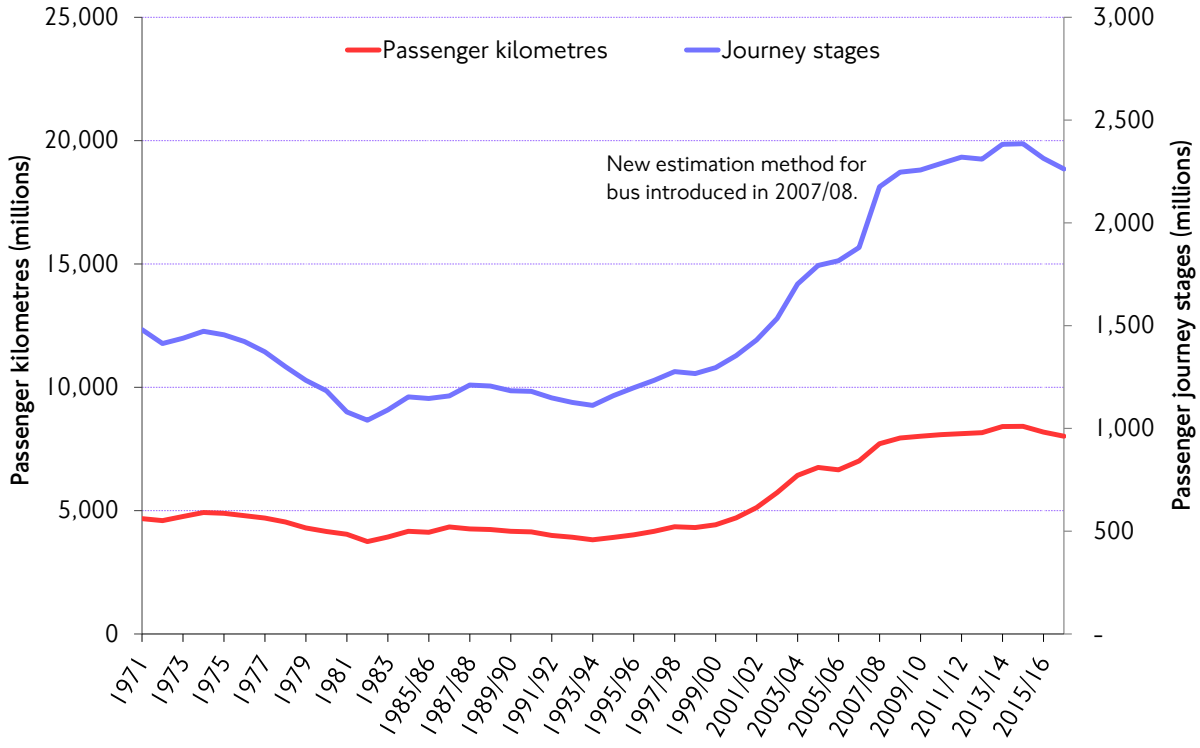
3.3 Public transport modes: Bus

Long-term trend in bus patronage

Figure 3.3 shows the long-term trend for bus patronage in London. The pattern of strong growth from the late 1990s has stabilised in more recent years, with a generally flat picture from the end of the last decade up to 2013/14. Following a 2.7 per cent decline in both journeys and passenger kilometres in 2015/16, there has been a further fall in patronage in the most recent (financial) year, with a 2.3 per

cent decline in terms of bus journey stages and 2.1 per cent in passenger kilometres.

Figure 3.3 Passenger kilometres and journey stages travelled by bus.



Source: TfL Service Performance data.

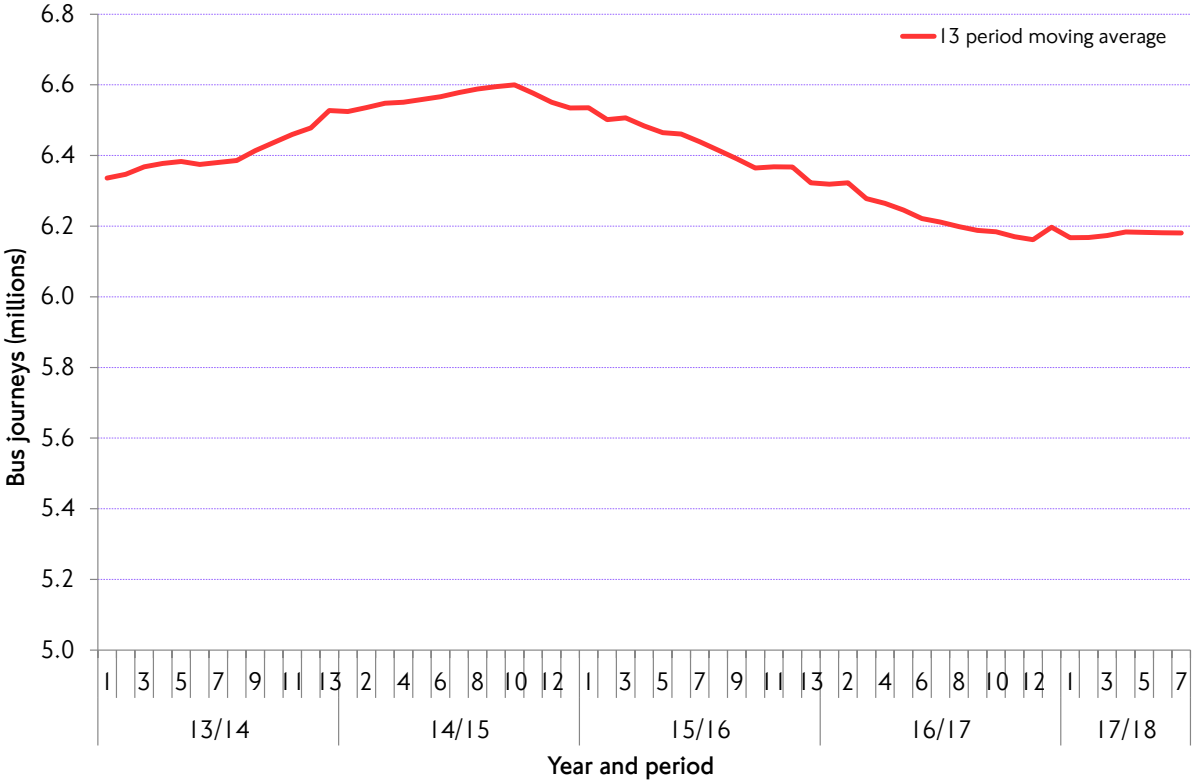
Recent factors affecting bus patronage

The most recent financial year was notable for a decline in the number of bus trips made in London. Because the bus network carries around 15 per cent of all trips in London on a typical day, this was the major factor underlying the overall change in mode shares as described in chapter 2 of this report. However, it is not the case that people have simply moved from bus to car, or that this change is wholly a direct reflection of factors specific to the bus network itself. This section describes in more detail what is known about the factors underlying this recent change.

Figure 3.4 shows the short-term trend in bus passenger demand over the most recent four years, and also includes available recent data from the 2017/18 financial year. Note that the values are moving averages across 13 four-week financial periods. It is seen that:

- The start of the interruption to the long-term trend of growth occurred during the 2014/15 financial year.
- By the end of the 2016/17 financial year, patronage had fallen by 6.1 per cent from the high point.
- During 2017, bus patronage has been fairly flat, increasing by 0.2 per cent. Nevertheless, the previous decline appears to have been stabilised.
- The recent fall in patronage should also be seen in the context of continuing growth to London's population, which would otherwise have resulted in patronage growth each year.

Figure 3.4 Recent trend in bus passenger journeys per day, 13 financial period moving average.



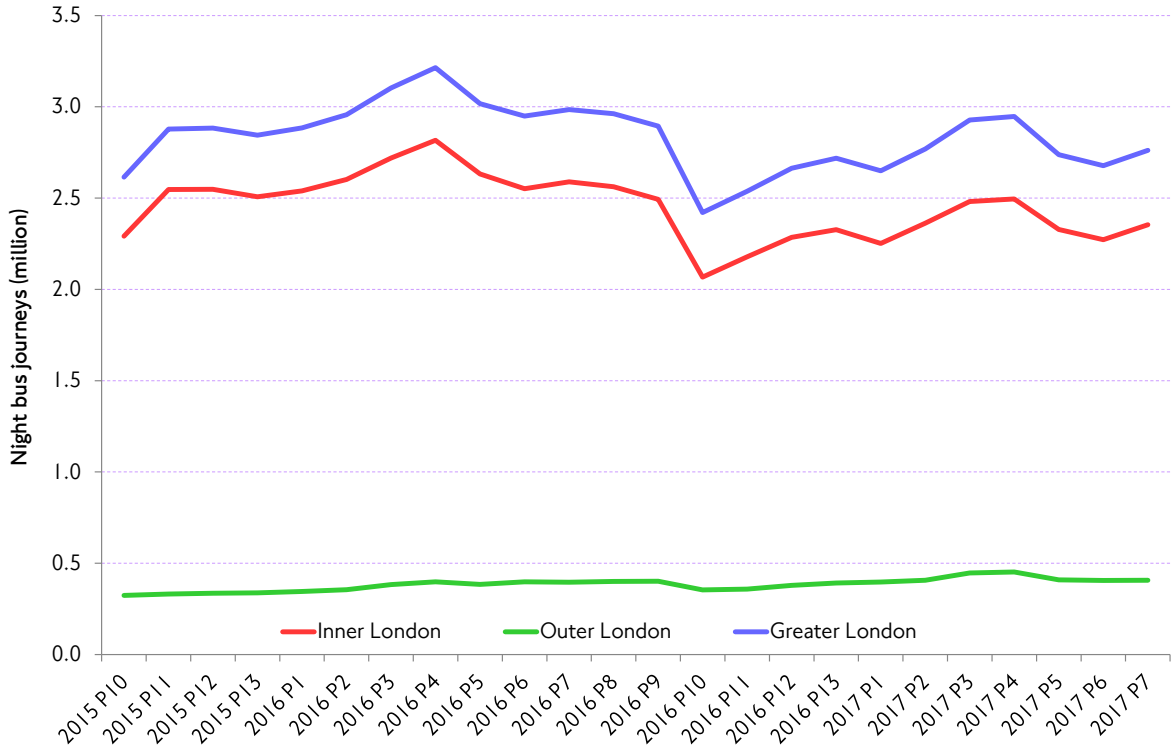
Source: TfL fares & ticketing.

The reasons underlying this change in trend are complex and are still being evaluated by TfL. In terms of potential explanatory factors:

- Bus service supply and quality have been broadly maintained at similar levels to those previously applying. The recent patronage declines are not therefore thought to primarily reflect these factors.
- Bus journey speeds have however seen a substantial impact from road works. It is known that, over the shorter term, bus patronage responds fairly directly to changes in average bus speeds – a factor that is particularly key to the 'competitiveness' of this mode alongside other modes such as walk or rail. The recent slowing of the rate of decline in patronage is also thought, largely, to reflect an improvement over recent months in average bus speeds, reflecting action by TfL to further ameliorate the impact of works.
- There have also been factors primarily affecting other modes that have impacted on bus patronage. Examples have included the prolonged reconstruction of London Bridge station, and the Southern rail strikes, which will for example have significantly reduced onward bus travel by rail passengers from the stations affected, albeit on a temporary basis.
- The trend seen in London is paralleled by a similar trend for bus patronage in the rest of England. Passenger journeys on local bus services in England outside of London have declined by 4.8 per cent in the last ten years, with a 1.1 per cent decrease in the latest year. Although specific factors applying in London are not necessarily reflected in other parts of the country, this is interesting in that it could suggest that wider societal factors are at play.

- It is notable (see chapter 4 of this report) that the recently observed trend towards lower average per person trip rates particularly affects leisure and shopping trips, which may have particularly impacted on bus patronage.
- Furthermore, the introduction of the Night Tube at weekends from August 2016 also abstracted patronage from the Night Bus network, which has since been modified to reflect the new demand patterns (see figure 3.5).

Figure 3.5 Recent trend in night bus patronage.



Source: TfL Service Performance data.

Implications for overall mode shares in London

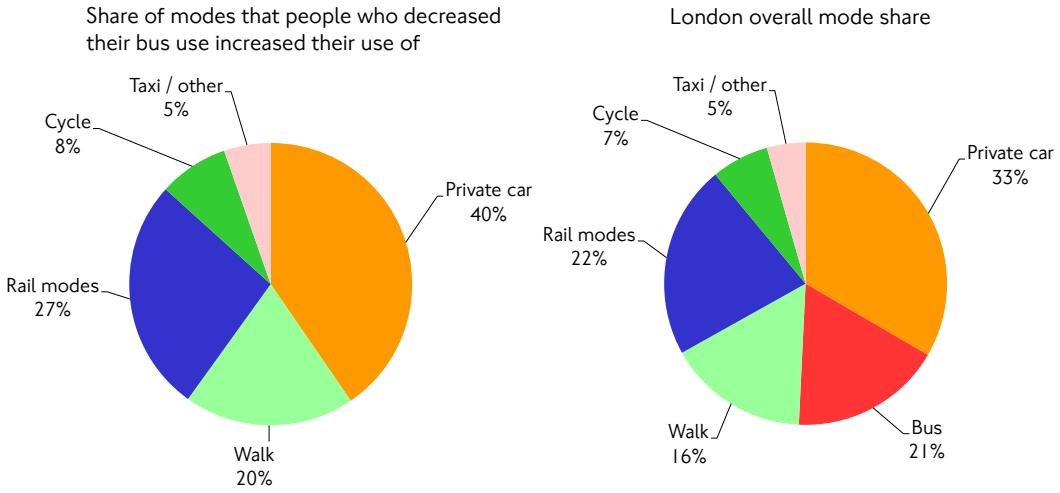
Although these changes to bus patronage are a significant factor underlying the overall change to mode shares in London, it is not the case that former bus passengers have simply shifted to the car. In fact, data from TfL's LTDS survey shows that this is very much a minor effect (Figure 3.6). Looking at the mode share of those individuals who stated in the 2015/16 survey that they had reduced their bus use, the data suggests that people have redistributed across the modes in approximate proportion to the prevailing overall mode shares for travel in London.

This suggests that the increase in car use in London, as also seen more widely outside London, has different primary causes. The relative attractiveness of car as a mode is of course also affected by the very changes to average traffic speeds that are thought to have affected the bus network. Although on the basis of this analysis the transfers to bus and cycle look disproportionately high, these two modes are affected by low sample sizes in the context of this survey.

A significant factor uncovered by the LTDS data, however, is that people who reported reducing their bus use contributed disproportionately to the growing number of people in London who report making no trips on the LTDS survey day

(the growing phenomenon of 'non travel' – see also chapter 4 of this report). This suggests that the decline in bus travel may reflect a decrease in 'discretionary' trips or, equally possible, an increase in working from home, perhaps because of the rail disruptions noted above.

Figure 3.6 Reported change in mode use of LTDS survey respondents who reported reducing their bus use (2015/16).

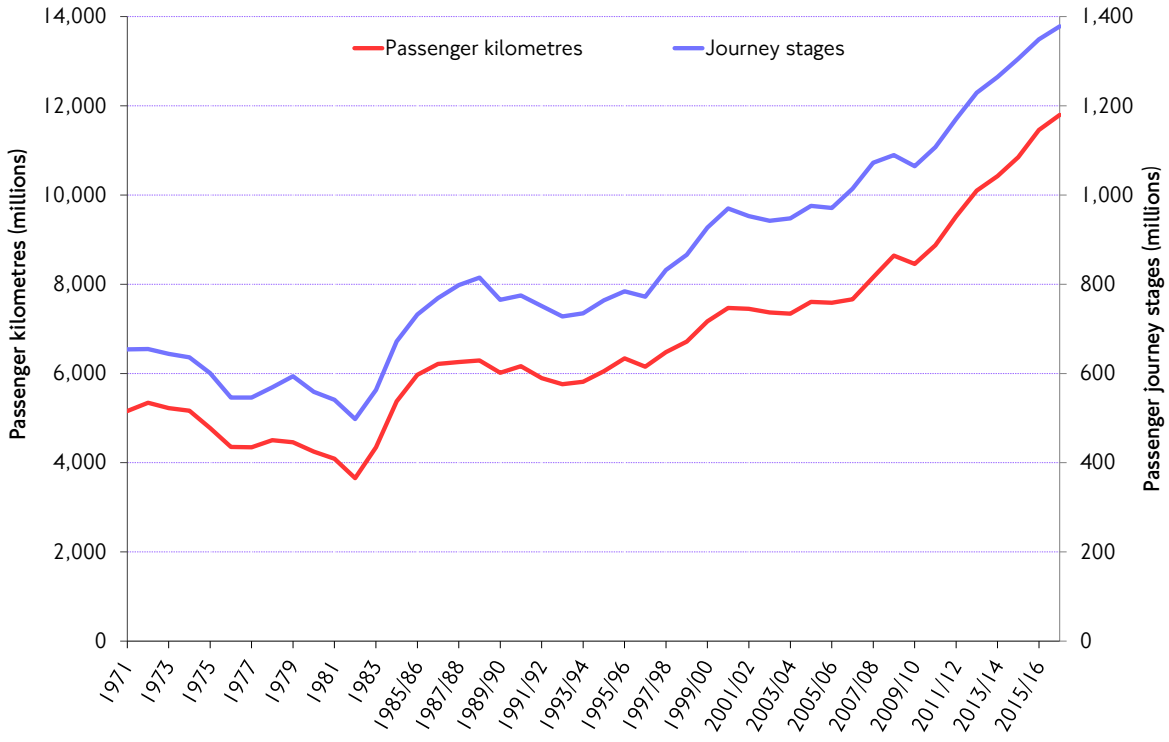


Source: TfL City Planning, Strategic Analysis.

3.4 Public transport modes: Underground

The number of people using the Underground in 2016/17 was the highest ever (figure 3.7), with 1,378 million passenger journeys (journey stages), a 2.1 per cent increase on the previous (financial) year. Passenger kilometres increased by 3 per cent over the past year. This rate of growth is slightly slower than in previous years, and compares to an increase of 3.4 per cent in journey stages and 5.6 per cent in passenger kilometres between 2014/15 and 2015/16.

Figure 3.7 Passenger kilometres and journey stages by Underground.



Source: TfL Service Performance data.

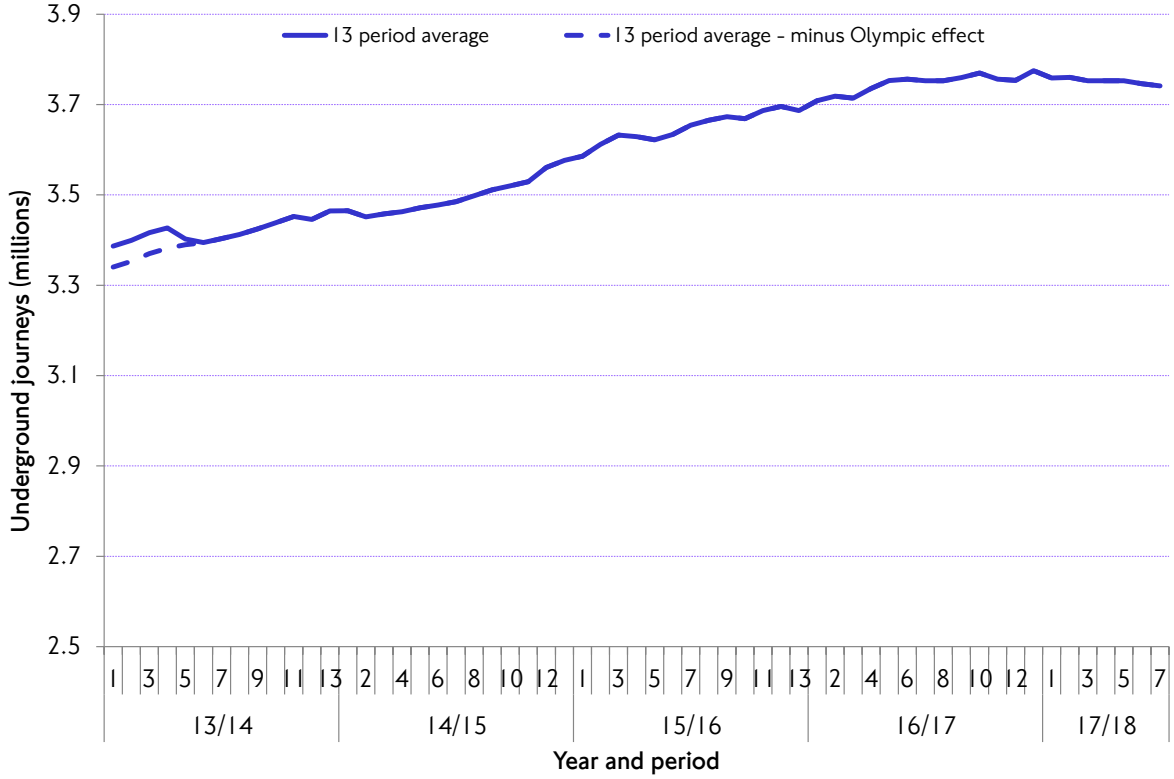
Very recent trends in Underground patronage

Given the recent decline in bus patronage, and the smaller-than-trend growth in Underground travel in 2016/17, it is instructive to look at more recent patronage data for this mode.

Figure 3.8, moving into the current (2017/18) financial year, does indeed show more definite evidence of a slowdown in the rate of growth of Underground patronage. Bearing in mind that the graph shows a 13 financial period moving average, average patronage in period 6 of the 2017/18 financial year was 0.3 per cent below the average for the corresponding period in 2016/17. As with bus, the actual trend must be viewed in the context of previously forecast growth over this period.

It is too early to properly explain this apparent trend or to understand whether it will be sustained for the longer term; however, it is thought that prolonged disruption to parts of the National Rail network, affecting onward travel by Underground, will have been a significant factor, alongside more general security concerns.

Figure 3.8 Recent trend in Underground passenger journeys per day, 13 financial period moving average.



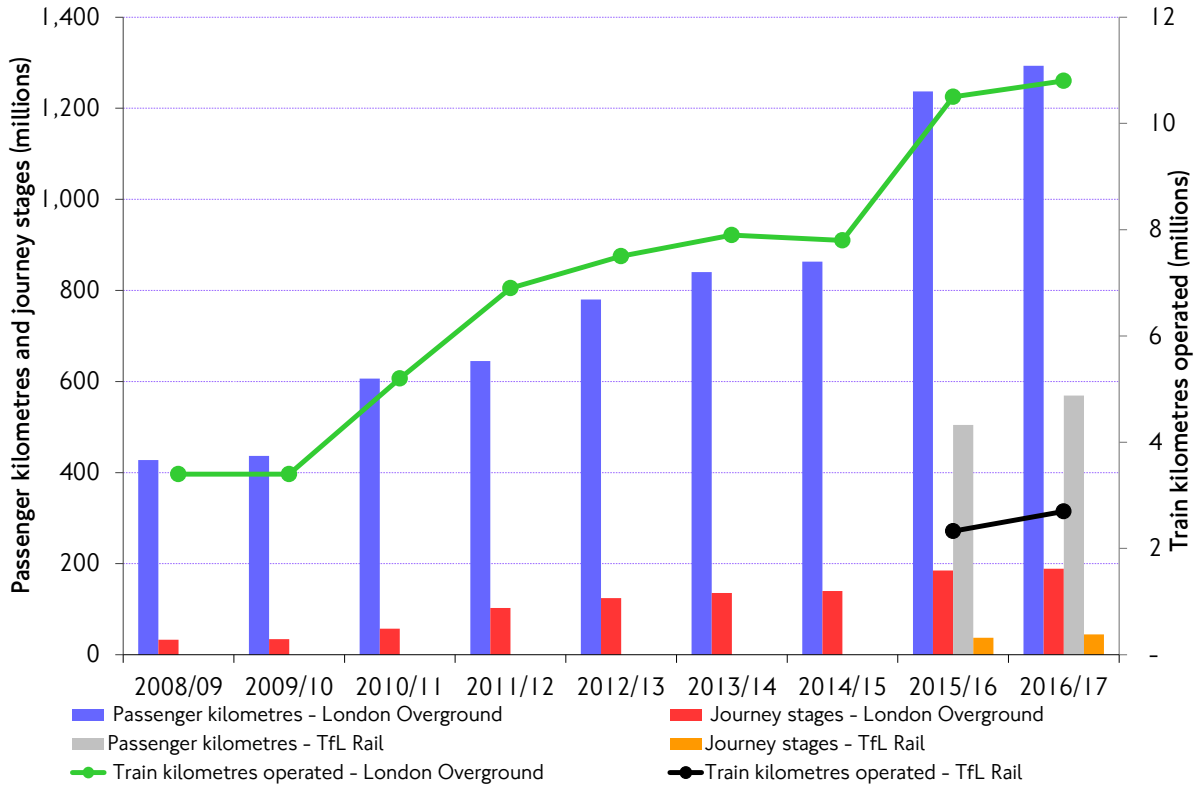
Source: TfL fares & ticketing.

3.5 Public transport modes: London Overground

Since the first full year of operation of the London Overground, in 2008/09, to 2016/17, passenger kilometres have increased by 203 per cent, with a 469 per cent increase in passenger journey stages and a 218 per cent increase in train kilometres operated. This reflects the progressive expansion of the network coupled with a shortening of journey stage lengths following the extensions of the network to a number of main travel interchanges, such as Clapham Junction. In May 2015, London Overground took over the operation of services between Liverpool Street and Enfield Town, Cheshunt (via Seven Sisters) and Chingford as well as those on the Romford to Upminster line. Inclusion of this significant network contributed to an overall 32.4 per cent increase in patronage in 2015/16 compared to 2014/15, with a further increase of 1.9 per cent between 2015/16 and 2016/17.

TfL also assumed operation of the core Shenfield to Liverpool Street local service in May 2015. Currently operating as TfL Rail, this service will form part of the Elizabeth line, which will open fully in December 2019. Passenger kilometres on TfL Rail increased by 12.8 per cent between 2015/16 and 2016/17, with a 19.1 per cent increase in the number of journey stages. As the TfL Rail concession began part way through the 2015/16 financial year, the 2015/16 figures are not directly comparable with 2016/17 (the first full financial year of operation as TfL Rail).

Figure 3.9 Passenger kilometres and journey stages by London Overground and TfL Rail.



Source: TfL Service Performance data.

In 2016/17 total patronage across both the London Overground and TfL Rail networks stood at 233 million journey stages and 1,863 million passenger kilometres, around 5 per cent of all public transport journeys made in London. Because of the addition of these two substantial rail networks to the portfolio, it is not definitively possible to establish an underlying rate of change in patronage for these services.

3.6 Public transport modes: National Rail in London

National Rail travel has grown strongly at the national level over the past decade, with only a brief slowdown during the recent recession. This pattern is reflected for travel on services defined by the Office of Rail and Road (ORR) as 'London and South East' (L&SE) operators, although this service group is not an exact match for rail trips affecting London. The average rate of growth between 2000 and 2016 was 3.7 per cent per year in terms of passenger kilometres and 5 per cent per year in terms of passenger journeys.

In common with other public transport modes however there is also evidence of a slowdown in the historic high levels of growth for National Rail travel in the most recent year. Passenger kilometres increased by 0.4 per cent in 2016, a much lower level of growth than had been typical of the previous five years. Passenger journeys actually decreased by 0.5 per cent, compared to typical growth rates in the range of four to 9 per cent over the previous six years (table 3.2).

Table 3.2 Passenger kilometres and passenger journey stages by National Rail – operators classified by ORR as London and South East operators.

Year	Passenger kilometres (billions)	Year-to-year percentage change	Passenger journeys (millions)	Year-to-year percentage change
2000/01	19.2	4.4	664	4.0
2001/02	19.3	0.3	663	-0.1
2002/03	19.8	2.8	679	2.4
2003/04	20.1	1.7	690	1.6
2004/05	20.5	1.9	704	2.1
2005/06	20.7	1.1	720	2.2
2006/07	22.2	7.1	769	6.9
2007/08	23.5	6.1	828	7.7
2008/09	24.2	2.9	854	3.1
2009/10	23.8	-1.8	842	-1.4
2010/11	25.0	5.2	918	9.0
2011/12	26.4	5.3	994	8.3
2012/13	27.3	3.4	1,032	3.9
2013/14	28.6	4.9	1,107	7.2
2014/15	29.6	3.4	1,155	4.3
2015/16	30.5	3.0	1,203	4.2
2016/17	30.6	0.4	1,197	-0.5

Source: Office of Rail and Road.

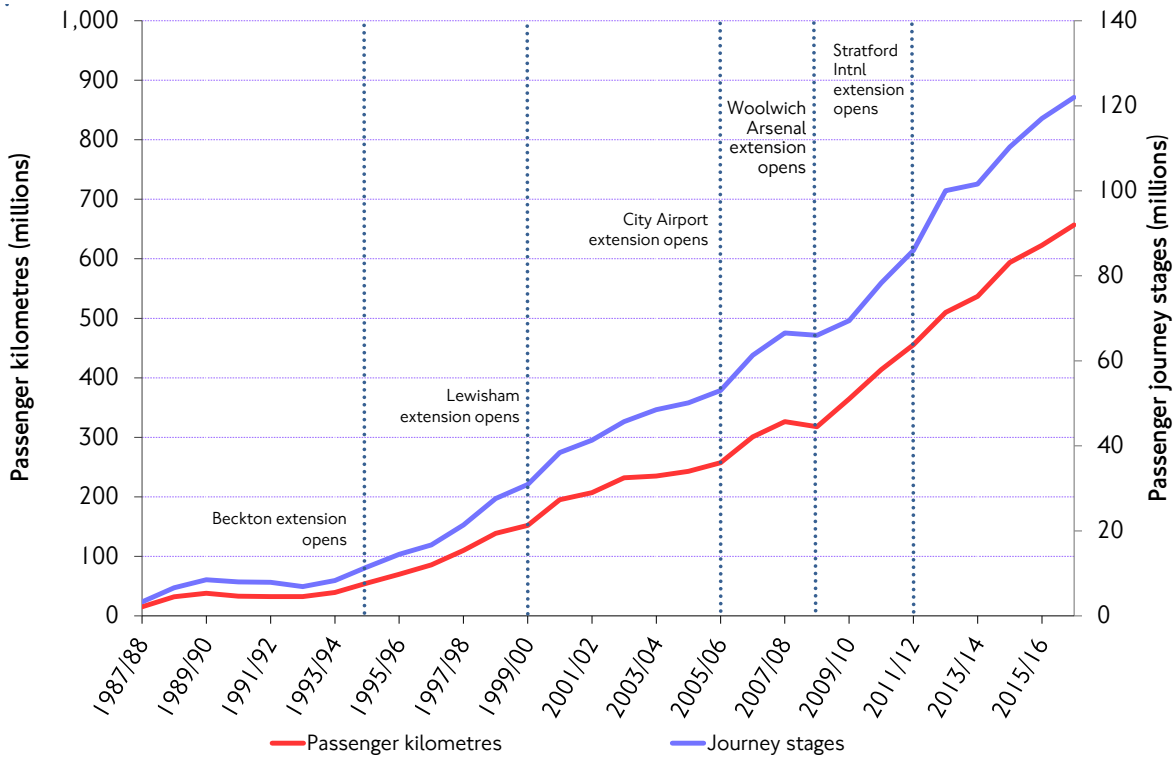
Although it is likely that disruption to parts of the National Rail network in London, notably the prolonged strike at Southern, are a factor here it is notable that growth in rail appears also to have stalled at the national (all operators) level, with growth of 0.8 per cent in 2016/17 compared with growth rates of 3 to 8 per cent in the previous six years.

3.7 Public transport modes: Docklands Light Railway

Figure 3.10 shows the trend for travel by DLR since its initial opening in 1987. Patronage has grown rapidly over this period as the network has progressively expanded. Principal milestones in the development of the network are shown in the figure to aid interpretation.

In 2016/17, 657 million passenger kilometres were travelled on the DLR, equivalent to 122 million journey stages. The number of passenger kilometres has increased by 5.5 per cent since 2015/16 while the number of journey stages has increased by 4.6 per cent. This trend continues the strong growth seen over recent years and is in contrast to recent trends on other parts of the rail and bus network.

Figure 3.10 Passenger kilometres and journey stages by DLR.



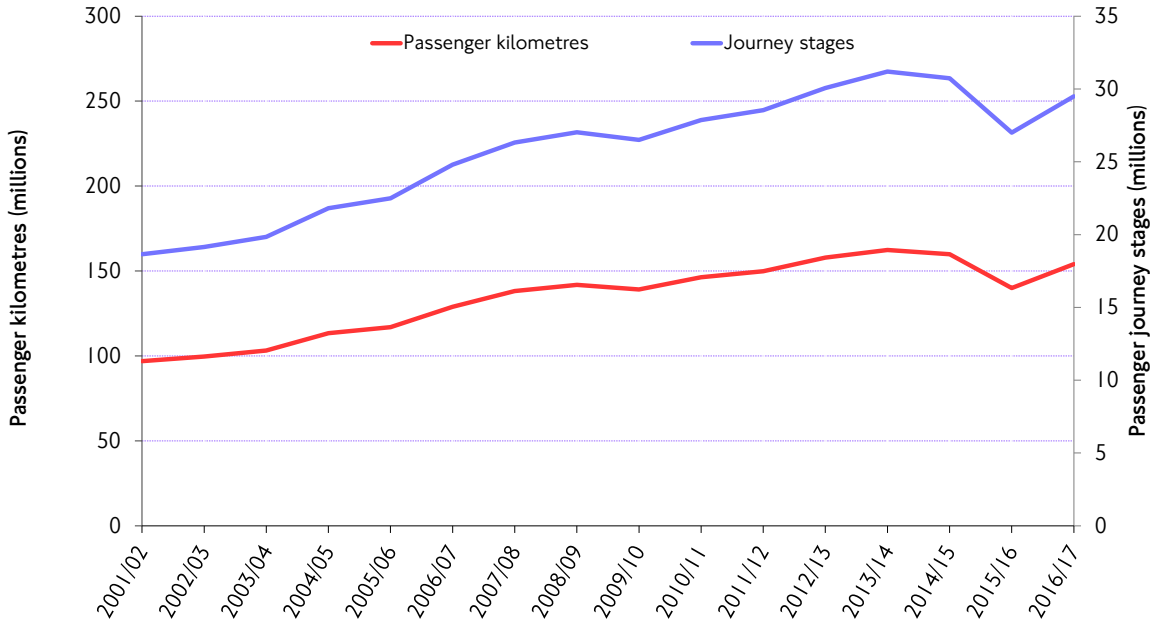
Source: TfL Service Performance data.

3.8 Public transport modes: London Trams

London Trams initially opened in 2000 and the network has been relatively stable in extent since, albeit with a service restructuring in 2006. Figure 3.11 shows steady patronage growth averaging 4 per cent for passenger kilometres and journey stages over the period since opening although journey stages did decrease slightly, from 31.2 million in 2013/14 to 30.7 million in 2014/15.

This decline in journey stages and passenger kilometres continued into 2015/16, decreasing by 12.2 per cent respectively. This was due to part closures of the lines as a result of town centre pedestrian ambience works as well as line improvement works. In 2016/17, passenger kilometres were up 9.4 per cent to 154 million and journey stages were up by 9.3 per cent to 30 million overall.

Figure 3.11 Passenger kilometres and journey stages by London Trams.



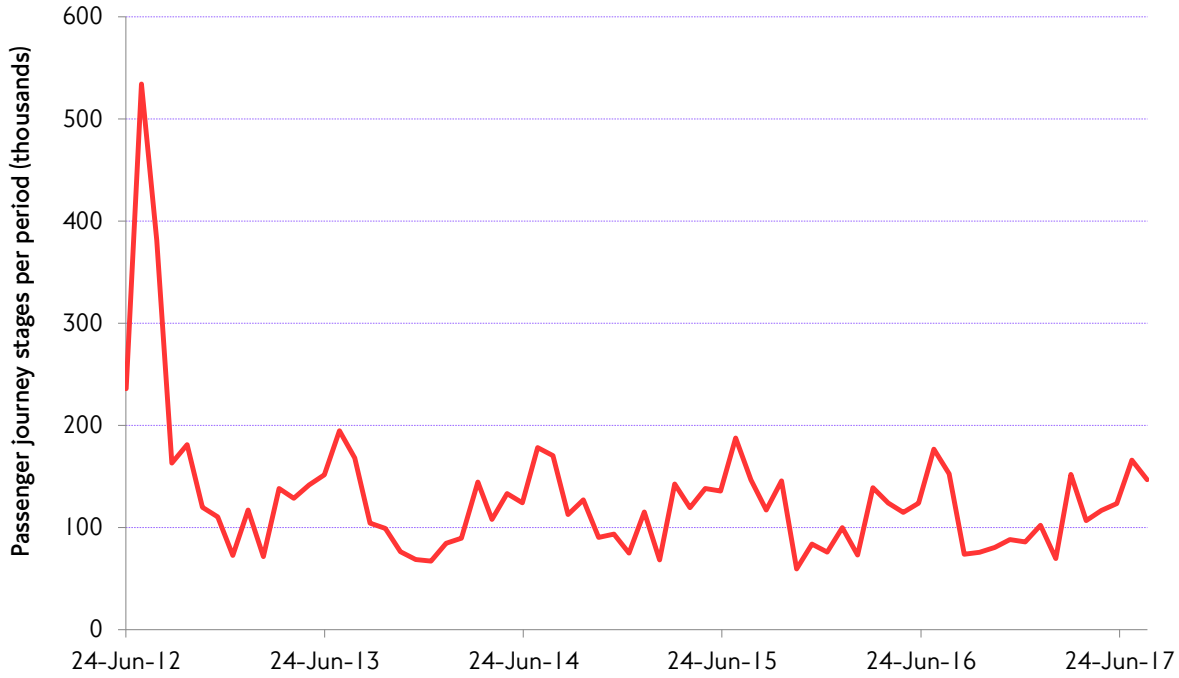
Source: TfL Service Performance data.

3.9 Public transport modes: Emirates Air Line

The Emirates Air Line, providing a cable car service across the Thames between the Greenwich Peninsula and the Royal Docks, opened in June 2012, just prior to the London 2012 Games.

Figure 3.12 shows that, following the exceptional conditions of summer 2012, the Emirates Air Line has settled into a more regular pattern of use, typically between 80,000 and 200,000 passengers per four-week period, with more passengers seen during school holidays. In 2016/17, 1.4 million journeys were undertaken on the Emirates Air Line, similar to the previous few years.

Figure 3.12 Number of journey stages by Emirates Air Line.



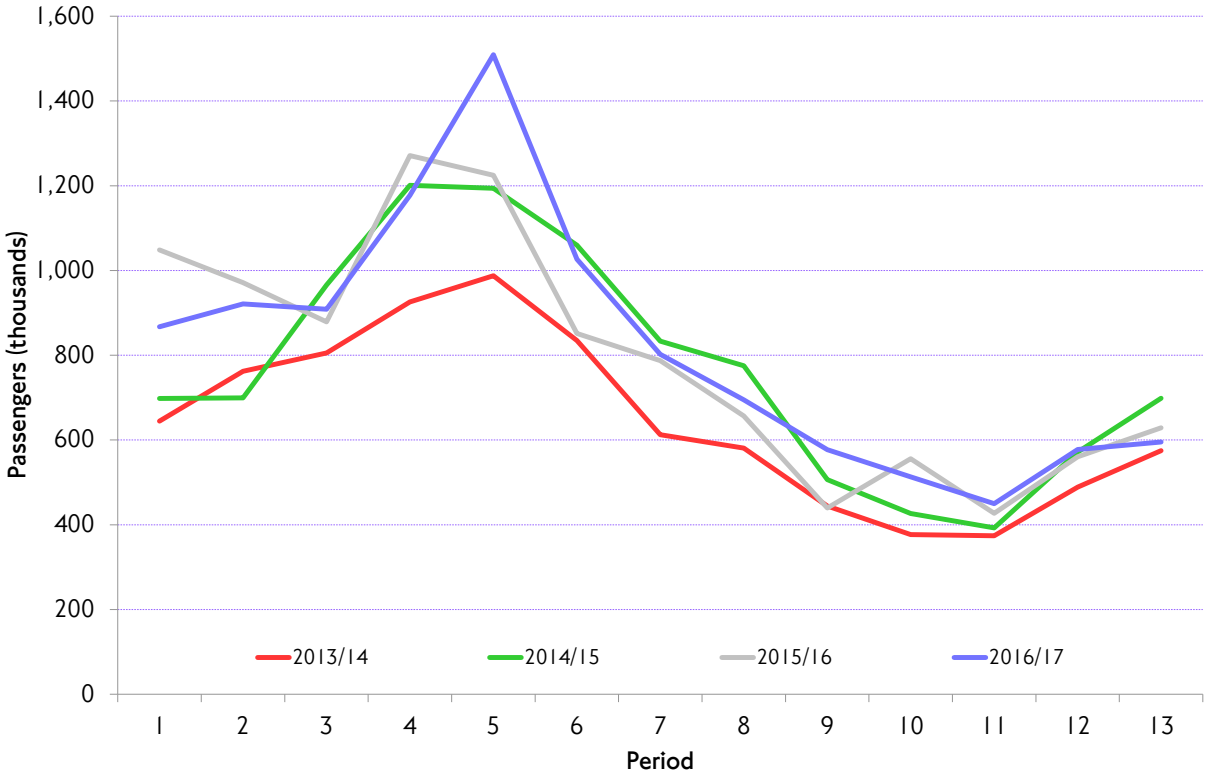
Source: TfL Service Performance data.

3.10 Public transport modes: River Services

Passenger traffic on the Thames

Patronage on TfL's River Services has seen strong growth in recent years, with more than 10 million passengers carried in 2016/17. Figure 3.13 shows that the number of passengers increased by 3.1 per cent between 2015/16 and 2016/17.

Figure 3.13 Passengers using TfL's River Services.



Source: TfL River Services.

3.11 Active travel: Overall trends

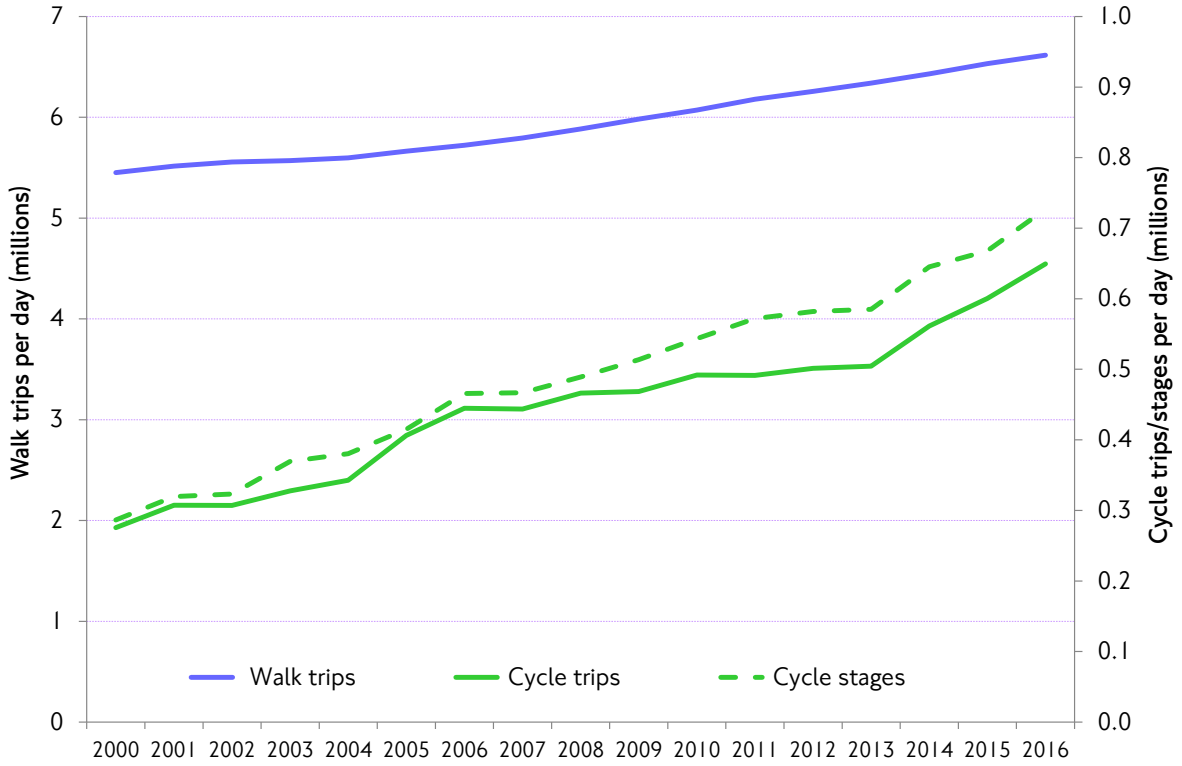
This section considers recent travel demand trends for walking and cycling in London.

Historic trends

Building on the commentary in chapter 2 of this report, figure 3.14 shows the historic trend in the number of trips in London made by active modes – walking and cycling – on an average day. Whilst the absolute numbers of each differ in scale (note the dual axes of the graph) the trend for both has been steadily upwards over the period since 2000. This in part reflects population growth, particularly for walking, but also reflects, particularly more recently, enhancements to the walking and cycling networks to improve their attractiveness as a means of travel.

The average annual rate of growth for walking since 2000 has been 1.2 per cent and for cycling the average annual growth rate was 5.5 per cent. Since 2010 the average annual growth rates were 1.4 and 4.8 per cent respectively, and over the latest year they were 1.3 and 8.2 per cent respectively. The figure is suggestive of a significant and sustained up-turn for cycling in comparison with prevailing trends up to 2013.

Figure 3.14 Number of walk and cycle trips in London on an average day, 2000-2016.



Source: TfL City Planning, Strategic Analysis.

3.12 Active travel modes: Cycling

Overall levels of cycling in London

In 2016, there were 730,000 cycle journey stages in London on an average day, which is an 8.8 per cent increase on 2015. This follows a 3.5 per cent increase in the previous year, with an overall 75 per cent increase in cycle stages since 2005 (table 3.3) and an increase of 154 per cent increase since 2000. Cycle stages are the preferred measure of cycling activity, and this measure has grown strongly and relatively consistently over the last decade or so at a much faster rate than population growth. The (broadly similar) trend for cycle-all-the-way trips only is also shown on the table.

Table 3.3 Daily average cycle stages and trips in London.

	Cycle stages		Cycle trips
	Millions	Year-on-year change %	Millions
2005	0.41	9	0.39
2006	0.47	12	0.42
2007	0.47	0	0.42
2008	0.49	5	0.44
2009	0.51	5	0.47
2010	0.54	6	0.49
2011	0.57	5	0.49
2012	0.58	2	0.50
2013	0.58	1	0.50
2014	0.65	10	0.56
2015	0.67	4	0.60
2016	0.73	9	0.65

Source: TfL City Planning, Strategic Analysis.

Note: A cycle trip is defined as a one-way movement to achieve a specific purpose that is conducted entirely by bike. A cycle journey stage includes these trips, but also includes shorter cycle legs undertaken as part of a longer trip using another mode – for example, cycling to a station to catch a train. Cycle journey stages therefore gives the best indication of total cycling activity.

This total applies to the whole of Greater London. It is the case that levels of cycling vary considerably across London, and there has in particular been strong and consistent growth in cycling in and around central London. This variability is explored in the next section below.

Cycle trips and stages in Greater London

Given the limitations of on-street observational surveys at the London wide level, cycling activity is also measured using TfL's LTDS survey on the basis of London residents only. This is an established survey with comparable data back to 2005/06.

Table 3.4 summarises a range of applicable indices. They relate to London residents aged 5 and over, and all trips undertaken with at least one end within the GLA area, on the basis of an average (*365) day in the survey year.

Table 3.4 Cycle trips and journey stages (trip/stage rates per person per day) performed by London residents aged 5 years and over.

Year	2010/ 11	2011/ 12	2012/ 13	2013/ 14	2014/ 15	2015/ 16	2016/ 17
Cycle trip rate average day (London residents aged 5+ years)	0.05	0.07	0.06	0.07	0.07	0.06	0.06
Cycle stage rate average day (London residents aged 5+ years)	0.06	0.07	0.07	0.07	0.07	0.06	0.06
Total population aged 5+	7.47m	7.61m	7.74m	7.84m	7.95m	8.04m	8.19m
Implied total number of cycle trips per day – residents only	402,952	526,273	489,427	527,003	550,433	463,871	457,926

Source: TfL City Planning, Strategic Analysis.

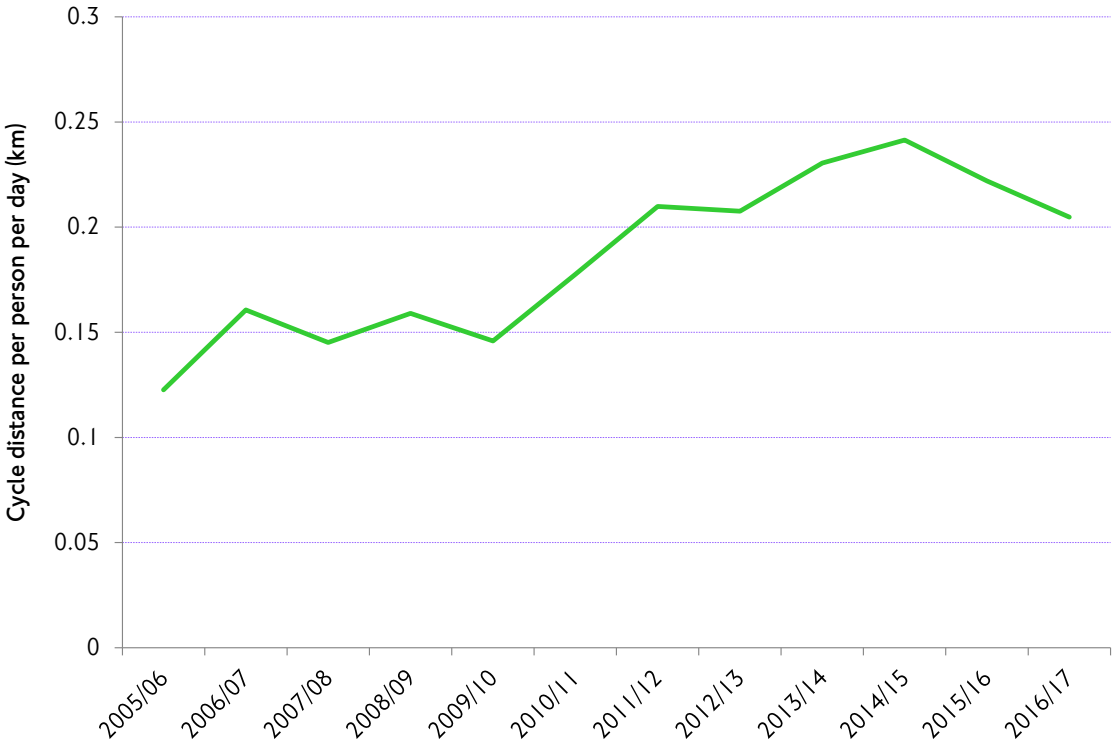
As of 2016/17, cycle trips accounted for 2.5 per cent of all Londoners' trips (on a trip rate basis). The relatively small number of observations in the survey act to limit the precision for detecting small changes in this indicator and the historic trend is therefore relatively inconclusive, with around 0.06 – 0.07 cycle trips made, on average, per person per day. Taking growing population into account, in 2016/17 there were typically 457,900 cycle trips made in total by London residents on an average day.

Additional information

It is of interest to understand further how this average value is comprised, and previous Travel in London reports have detailed many aspects of the relationship between cycling behaviour and socio-demographic factors. In future years, it will also be important to understand, for example, the extent to which any increase in average cycle trip rate is driven by those who currently cycle cycling more, or the extent to which it reflects 'new' people cycling.

Figure 3.15 below illustrates one of these subsidiary indicators, looking at the mean cycle distance travelled per day by London residents. It is seen from this perspective that the mean cycle distance has generally increased over the period. However, the trend for the last two years has been different – perhaps indicating a greater incidence of 'new' people cycling, as opposed to established cyclists making longer trips.

Figure 3.15 Mean cycle distance (per person) for cycle trips undertaken by London residents aged 5 and over.



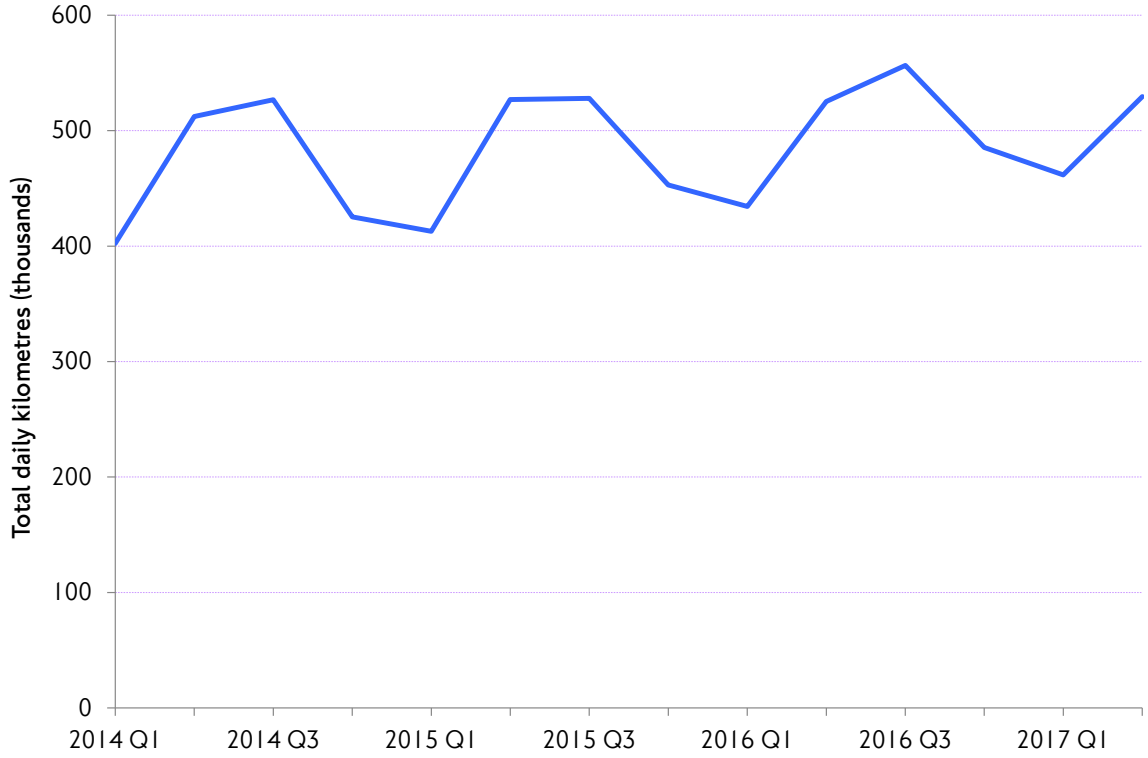
Source: TfL City Planning, Strategic Analysis.

Cycling in central London

Representative measurement of the total number of kilometres cycled each day in central London, as defined by the Congestion Charging zone (CCZ), has been in

place since quarter 1 of 2014 and is presented as a percentage change from the 2014 annual baseline. The most recent figures show that a daily average of 508,331 kilometres was cycled in the CCZ in the year to the end of quarter 2 of 2017 (figure 3.16). This is an 8.9 per cent increase in cycling within central London when compared to a 2014 baseline, and a 4.8 per cent increase on the previous year.

Figure 3.16 Total daily cycle kilometres in central London.



Source: TfL Surface Transport, Outcomes, Insight and Analysis.

Cycling flows across strategic counting cordons and screenlines

Figure 3.17 shows the number of cycles crossing the three strategic counting cordons in London (central, inner and London boundary) and the Thames screenline between 1976 and 2016. These data are the total number of cycles crossing the cordon in a full weekday (24-hours). Surveys are taken at the same time of year, to minimise seasonal bias.

The long-term trends are clear, with cycling levels at all cordons remaining broadly constant until the year 2000, after which they started to increase. Rates of growth are highest at the central cordon and on the Thames screenline, with cycle flows at the Thames screenline (which extends across the whole of Greater London, following the Thames) growing by 210 per cent between 2000 and 2016. Flows across the central cordon, surrounding central London (not the same as the CCZ), grew by 244 per cent between 2000 and 2016, with strong growth of 17 per cent in 2016 following a fall of 8.7 per cent in 2015.

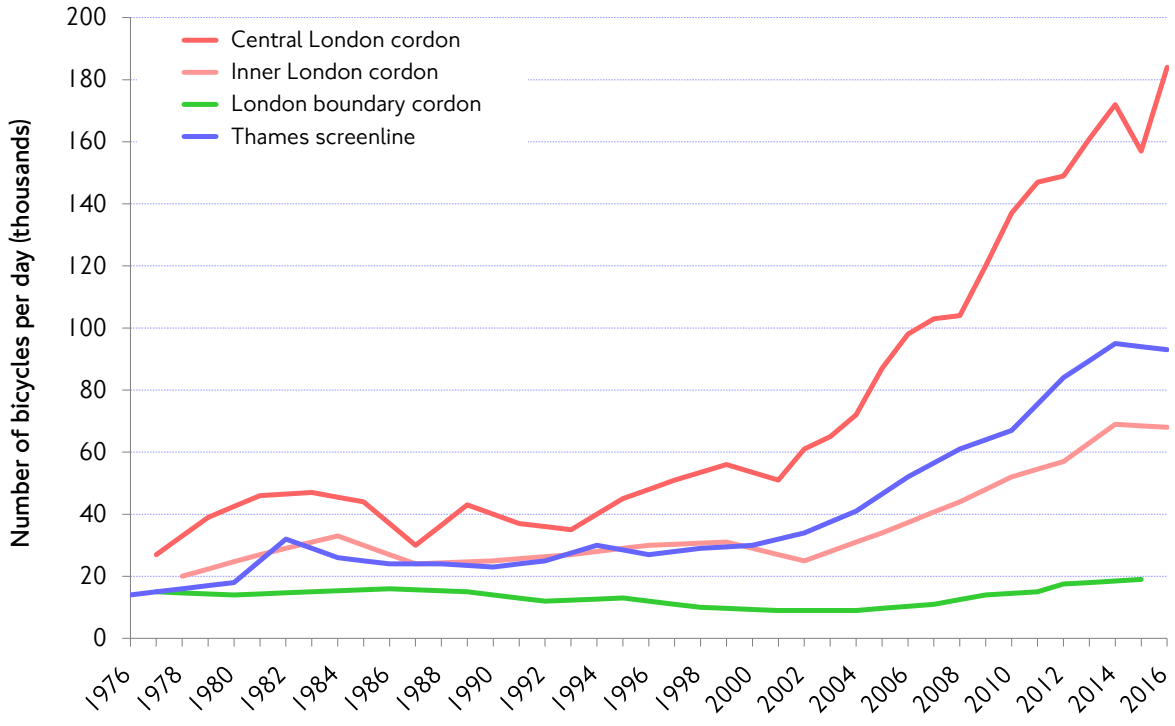
Growth has also occurred at the inner and boundary cordons, although the growth started later and has been at a lower rate than in central London. Cycle flows at the inner cordon increased by 172 per cent between 2002 and 2016. Flows at the

boundary cordon increased by 104 per cent between 2000 and 2015 (the latest available survey year).

Reflecting these spatial differences, cycle flows across the central cordon are more than twice as high as the inner and boundary cordon flows combined. This difference appears to be increasing in recent years, with flows across the inner cordon decreasing slightly in 2016, compared with the strong growth seen in flows across the central cordon.

It is notable that cycle flows at the inner cordon and Thames screenline fell in the most recent year, when other indicators of cycling showed a strong increase. This could be a manifestation of seasonal bias as, although these surveys are undertaken at the same general time of the year, they cover a short period of time, the weather within which can be either 'favourable' or 'unfavourable' to cycling in any one year.

Figure 3.17 Long-term trends in cycling across strategic cordons and screenlines in London, 24-hour weekdays, both directions.



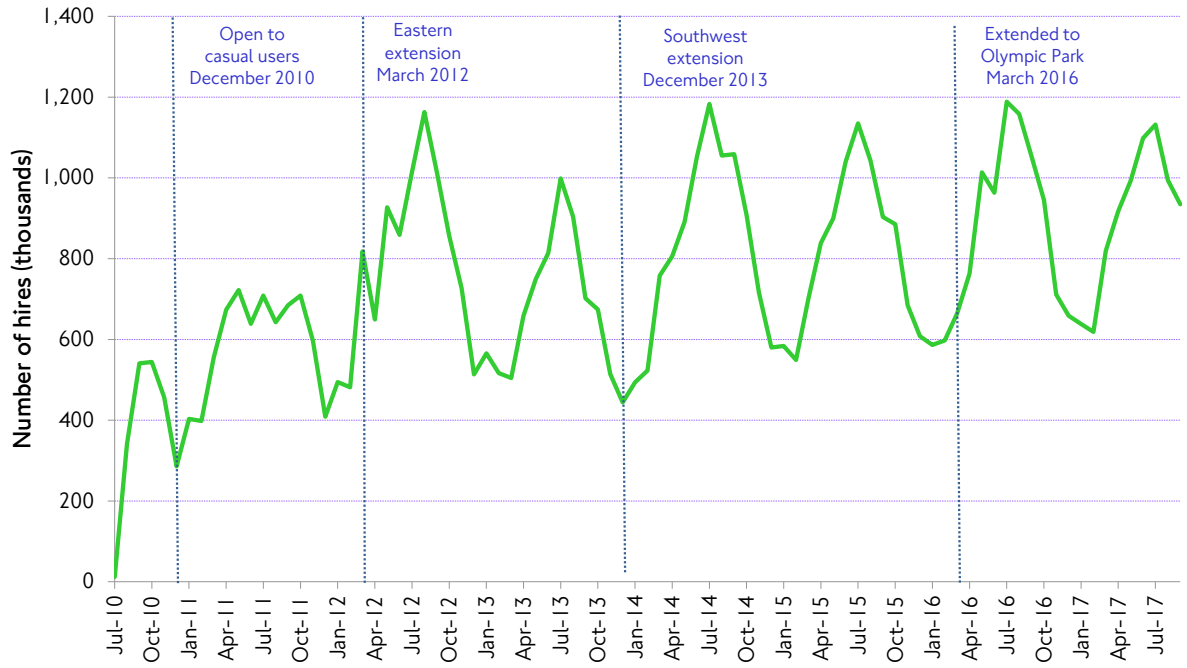
Source: TfL Surface Transport, Outcomes, Insight and Analysis.

Santander Cycles hire scheme

The cycle hire scheme began in July 2010 in central London. Since then there have been progressive enhancements, including the opening up of the scheme to casual members in December 2010, an expansion to the east in 2012 and an expansion to the south west in late 2013. From April 2015, the name of the scheme changed to Santander Cycles, to reflect a change of sponsor, although the operational aspects of the scheme remained substantially the same.

In 2016/17, there were a total of 10.5 million cycle hires, up from 9.9 million in 2015/16, an increase of 6.5 per cent. This is the highest number of hires since the scheme began, with July 2016 seeing the highest number of monthly hires (figure 3.18).

Figure 3.18 Santander Cycles hire. Trend in monthly cycle hires.



Source: TfL Surface Transport, Outcomes, Insight and Analysis.

3.13 Active travel modes: Walking

Limitations of current measures of pedestrian activity

Previous Travel in London reports have explored the available data for measuring walking in London, and have drawn out key trends from these data. Broadly, there are good data relating to the characteristics of walk trips and walk stages by Greater London residents, through our LTDS survey. These allow us to comprehensively examine the relationship of walking behaviour to a wide range of socio-demographic characteristics, including, as described in Travel in London report 9 (see section 7.6 of that report) to quantify the potential for increasing levels of walking by examining the 'walking propensity' of London residents in relation to the range of trips that they make.

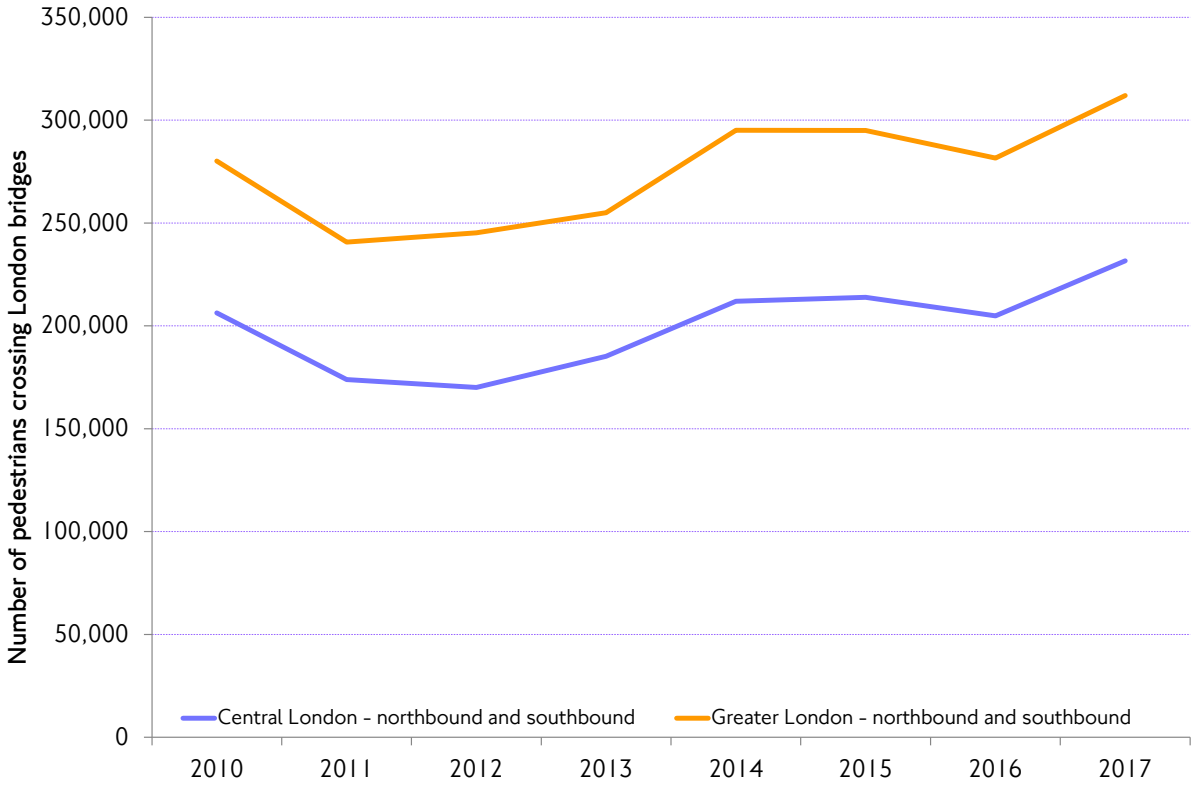
However, these do not provide good volumetric indicators of walking at the aggregate level, because not all people walking in London, especially in central London, are in-scope for the survey, and there are well-known methodological difficulties relating to the consistent definition of a 'walk trip' (as opposed, to for example, browsing shops in a retail centre or deliberately walking up a lengthy flight of stairs in an office in order to 'keep fit'). Furthermore, Healthy Streets policies are partly designed to encourage people to 'spend more time on the street', undertaking a range of essentially non-transport activities, which are not susceptible to quantification through conventional travel diary surveys.

Existing strategic-level volumetric indicators of walking

Long-standing quantitative indicators of pedestrian volumes at the strategic level are limited to TfL's Thames Screenline, which counts all people walking over the 32 Thames crossing points (mostly bridges) within the Greater London area each year. Figure 3.19 shows the available time-series for this indicator, from which it can be

seen that the overall trend has been upwards since 2010. This is to be expected given the growth in London's daytime population over the period.

Figure 3.19 Trend in number of pedestrians crossing River Thames in Greater London and central London between April and July.



Source: TfL Surface Transport, Outcomes, Insight and Analysis.

Pedestrian trips London wide

Given the limitations of on-street observational surveys of walking, the best available measure uses TfL's LTDS survey on the basis of London residents only. Table 3.5 summarises a range of applicable indices from the 2010/11 financial year to the most recent year. They relate to London residents aged 5 and over, and all trips undertaken with at least one end within the GLA area, on the basis of an average (*365) day in the survey year.

Table 3.5 Walk trips and stages (trip/stage rates per person per day) performed by London residents aged 5 years or more.

Year	2010/ 11	2011/ 12	2012/ 13	2013/ 14	2014/ 15	2015/ 16	2016/ 17
Walk trip rate (London residents aged 5+ years)	0.73	0.76	0.78	0.75	0.72	0.68	0.73
Walk stage rate (London residents aged 5+ years)	3.22	3.26	3.28	3.35	3.23	3.12	2.91
Total population aged 5+	7.47m	7.61m	7.74m	7.84m	7.95m	8.04m	8.19m
Implied total number of walk trips per day – residents only	5.47m	5.80m	6.05m	5.87m	5.73m	5.49m	5.94m

Source: TfL City Planning, Strategic Analysis.

In 2016/17, there were about 5.94 million walk all the way trips made by London residents on an average day, up from 5.49 million in 2015/16 (taking growing population and variability between surveys into account). This equates to around 0.7 trips per person per day and walk trips (walk all the way trips) accounted for 32.6 per cent of all Londoners' trips (on a trip rate basis).

The picture for walk stage rates is however different, these showing a marked decline over the most recent two years. The reasons for this are not immediately clear, however there is thought to be a link to the recent trend towards lower overall per-person trip rates because almost all public transport trips include at least one walk stage and therefore if London residents are making fewer public transport trips, this will be reflected in the number of walk stages made.

Developing a new volumetric indicator of walking

The trend shown by the Thames screenline in figure 3.19 above is informative, but cannot be taken as either a definitive indicator of change at a wider level nor do the number of pedestrians counted have any meaning in a wider sense, as the quantitative relationship of pedestrians crossing the Thames to all pedestrians in London is not known. Thames Crossings offer an economical way of enumerating all people crossing an arbitrary line, albeit that formed by the river, but they are not representative of the whole walk network in London.

Furthermore, although surveys are carried out at consistent times of the year to minimise seasonal effects, these will still be significant (eg the difference between a 'wet, cold' Autumn or a 'dry, sunny' Autumn). Further confounding factors are London's growing population that, all things being equal, would result in a proportionate increase in the number of people walking, and variability in visitor numbers. Healthy Streets policies will also impact spatially to different extents (eg local improvement schemes), and also may change the fundamental nature of walk trips, for example by encouraging people to walk further per trip, on average, than previously.

Over-arching all of this is the sheer extent and diversity of London's walk network, where it is not reasonably possible to survey on a scale that would produce indicators that are statistically representative of either the network as a whole, or specific 'types' of location within it.

Nevertheless, the Healthy Streets Approach does demand better indicators of walking and pedestrian activity than are currently available. TfL is taking forward this enhancement on four levels:

- Improvements to the range of questions on walking in the LTDS survey, aligned to better reflect emerging priorities.
- Development of a new pedestrian volumetric survey in central London.
- Investigating ways of better linking available sources of data on people walking and walking activity, to obtain better estimates at the strategic level of walking trends and changes to the nature of walking.
- Exploring the use of new technologies, such as mobile phone data, to provide volumetric indicators of walking activity and walking activity change.

3.14 General road traffic: Overall trends

Scope

This section considers trends in the volumes of road traffic in London. In 2016, 36.5 per cent of all trips in London were made by private transport, principally the car. The Mayor's outcome of an 80 per cent mode share for active, efficient and sustainable modes by 2041 requires a reduction in this percentage share to 20 per cent by 2041. However, it is necessary to recognise that London's population is expected to continue to grow strongly over this period, and that a growing, more prosperous city will continue to put increasing demands on London's limited road space to accommodate more journeys by car.

This section first looks at vehicle-kilometre based estimates for London from the Department for Transport (DfT), and then looks at complementary traffic flow data from TfL's own traffic counts, in order to characterise key traffic trends in London.

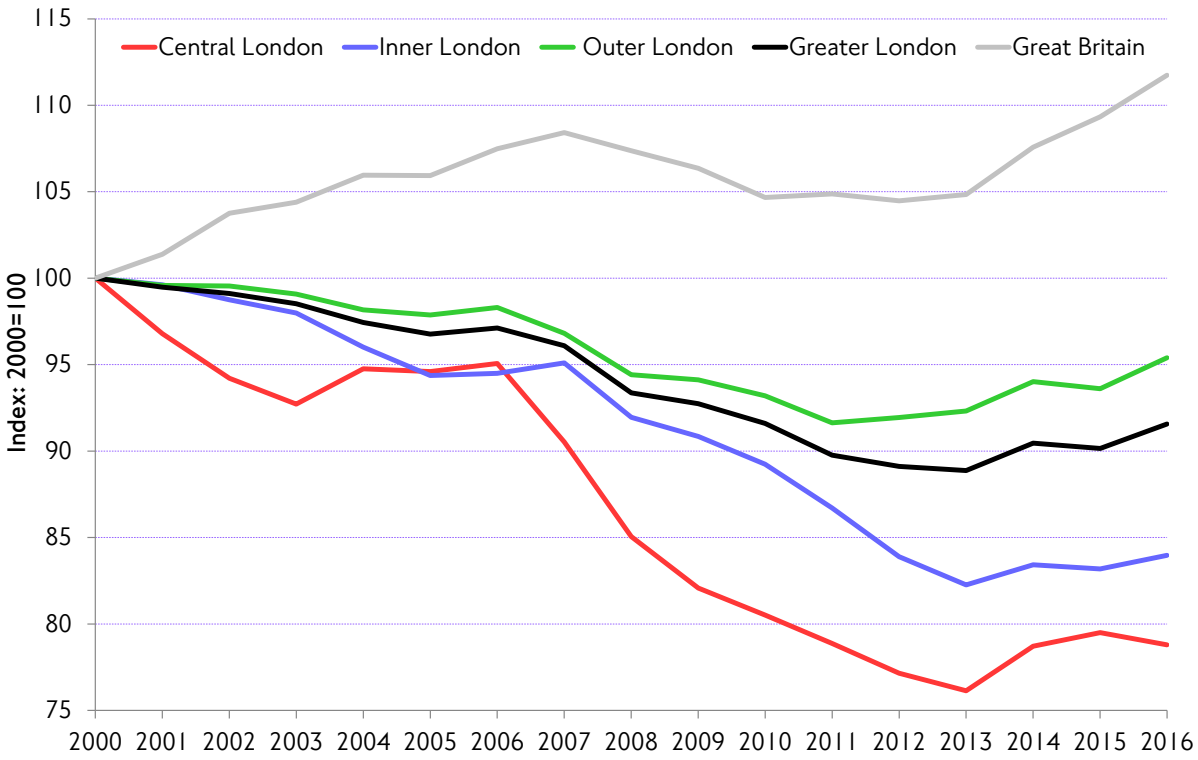
Traffic trends since 2000 (DfT data)

The DfT produce an annual estimate of vehicle kilometres in London. This is part of a wider national traffic survey, but does provide a good long-term indicator of traffic trends in the Capital. The latest available DfT data is for the 2016 calendar year, and shows an increase in vehicle kilometres compared to 2015.

In 2016, vehicle kilometres in London were up by 1.6 per cent overall against 2015. This contrasts with an annual average rate of decline over the period since 2010 of 0.3 per cent per year, and is a change similar in scale, although not directly connected, to the change in trend for public transport patronage seen in 2016. While traffic in central London decreased by 0.9 per cent, traffic in inner London increased by 0.9 per cent and traffic in outer London, which accounts for about 70 per cent of traffic in London, increased by 1.9 per cent (figure 3.20). Note that the definition of central London used for the DfT data is different to the Congestion Charging zone.

DfT data shows that vehicle kilometres in London in 2016 were 8.4 per cent lower than in 2000. In central London, vehicle kilometres in 2016 were 21.2 per cent below the 2000 level. In inner London, the equivalent aggregate fall was 16 per cent, while vehicle kilometres in outer London are down over the period by 4.6 per cent. At the national level, road traffic volumes increased by 2.2 per cent in 2016, the fourth successive year of increase, and it can be seen from the figure how traffic volume change in London tends to mirror that nationally.

Figure 3.20 Trends in road traffic (vehicle kilometres), all motor vehicles in central, inner, outer and Greater London with national comparison. Index: Year 2000=100.



Source: Department for Transport.
In interpreting the trend for central London shown by figure 3.20, it is important to recognise that this reflects a different area and set of conditions to that previously reported by TfL through the Congestion Charging impacts monitoring reports.

Table 3.6 London road traffic (billion vehicle kilometres) by central, inner and outer London. All motor vehicles, with Great Britain comparison.

Year	Central London	Inner London	Outer London	Greater London	Great Britain
2000	1.3	9.0	22.1	32.4	466.2
2001	1.2	9.0	22.0	32.3	472.6
2002	1.2	8.9	22.0	32.1	483.7
2003	1.2	8.8	21.9	31.9	486.7
2004	1.2	8.7	21.7	31.6	493.9
2005	1.2	8.5	21.7	31.4	493.9
2006	1.2	8.5	21.8	31.5	501.1
2007	1.2	8.6	21.4	31.2	505.4
2008	1.1	8.3	20.9	30.3	500.6
2009	1.0	8.2	20.8	30.1	495.8
2010	1.0	8.0	20.6	29.7	487.9
2011	1.0	7.8	20.3	29.1	488.9
2012	1.0	7.6	20.3	28.9	487.1
2013	1.0	7.4	20.4	28.8	488.8
2014	1.0	7.5	20.8	29.3	501.5
2015	1.0	7.5	20.7	29.2	509.7
2016	1.0	7.6	21.1	29.7	520.9

Source: Department for Transport.

Table 3.7 Index of London road traffic (all motor vehicles, based on vehicle kilometres). Index: Year 2000=100. With Great Britain comparison.

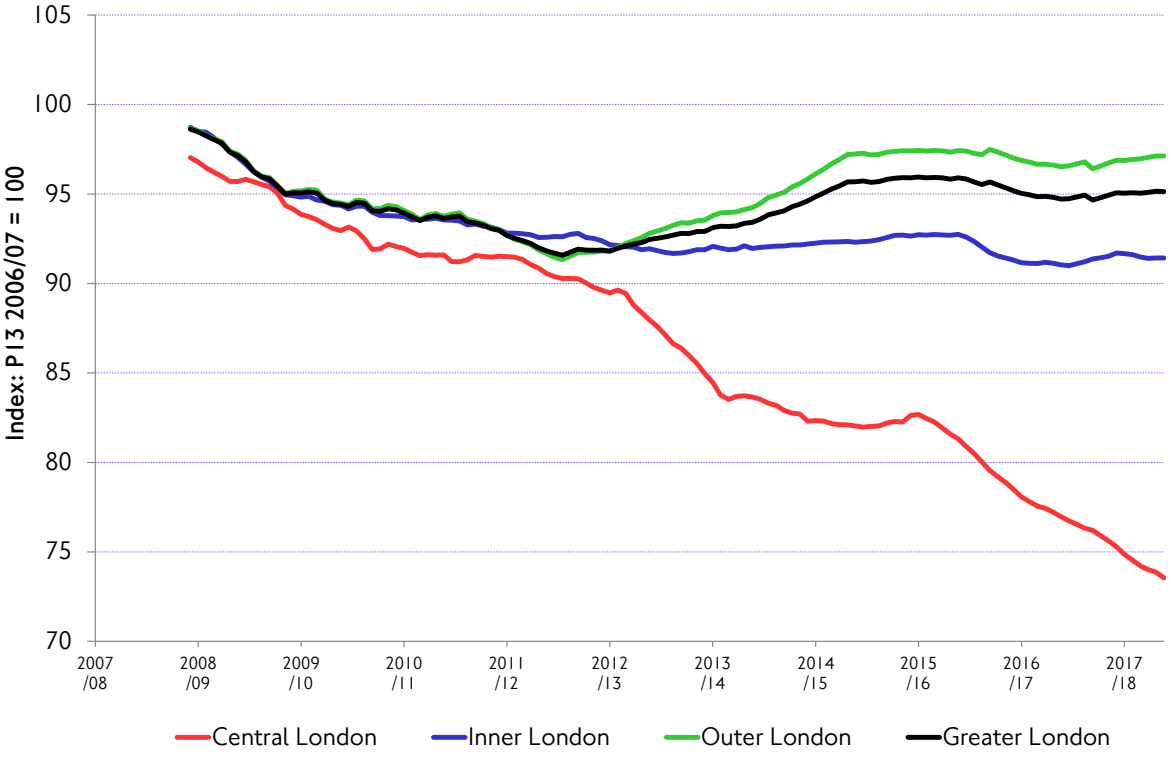
Year	Central London	Inner London	Outer London	Greater London	Great Britain
2000	100.0	100.0	100.0	100.0	100.0
2001	96.7	99.6	99.6	99.5	101.4
2002	94.2	98.8	99.6	99.1	103.8
2003	92.6	98.0	99.1	98.5	104.4
2004	94.7	96.0	98.2	97.4	106.0
2005	94.5	94.4	97.9	96.8	105.9
2006	95.0	94.5	98.3	97.1	107.5
2007	90.6	95.1	96.8	96.1	108.4
2008	85.1	92.0	94.4	93.4	107.4
2009	82.0	90.9	94.1	92.7	106.4
2010	80.5	89.2	93.2	91.6	104.7
2011	78.9	86.7	91.6	89.8	104.9
2012	77.2	83.9	91.9	89.1	104.5
2013	76.1	82.3	92.3	88.9	104.8
2014	78.7	83.4	94.0	90.5	107.6
2015	79.5	83.2	93.6	90.1	109.3
2016	78.8	84.0	95.4	91.6	111.7

Source: Department for Transport.

Trend shown by TfL's volumetric data

Data from TfL's traffic counts provide a second indicator of traffic trends, although it is important to note that they measure different indices to the DfT counts, although they show broadly similar long-term trends. The data shows a large drop in flows in central London (in this case using a definition aligned with the Congestion Charging zone), with traffic flows almost 30 per cent lower than in early 2007. In inner London, flows declined to 2011/12, and have been relatively stable since then, and are around 8 per cent lower than in 2006/07. Traffic flows in outer London also declined up to 2011/12, and after a return to growth up to 2014/15, flows have been relatively stable.

Figure 3.21 Trends in road traffic (traffic flows), all motor vehicles in central, inner and outer London, 13 period average. Index: P13 2006/07=100.



Source: TfL Surface Transport, Outcomes, Insight and Analysis.

Trend shown by TfL's cordon count data

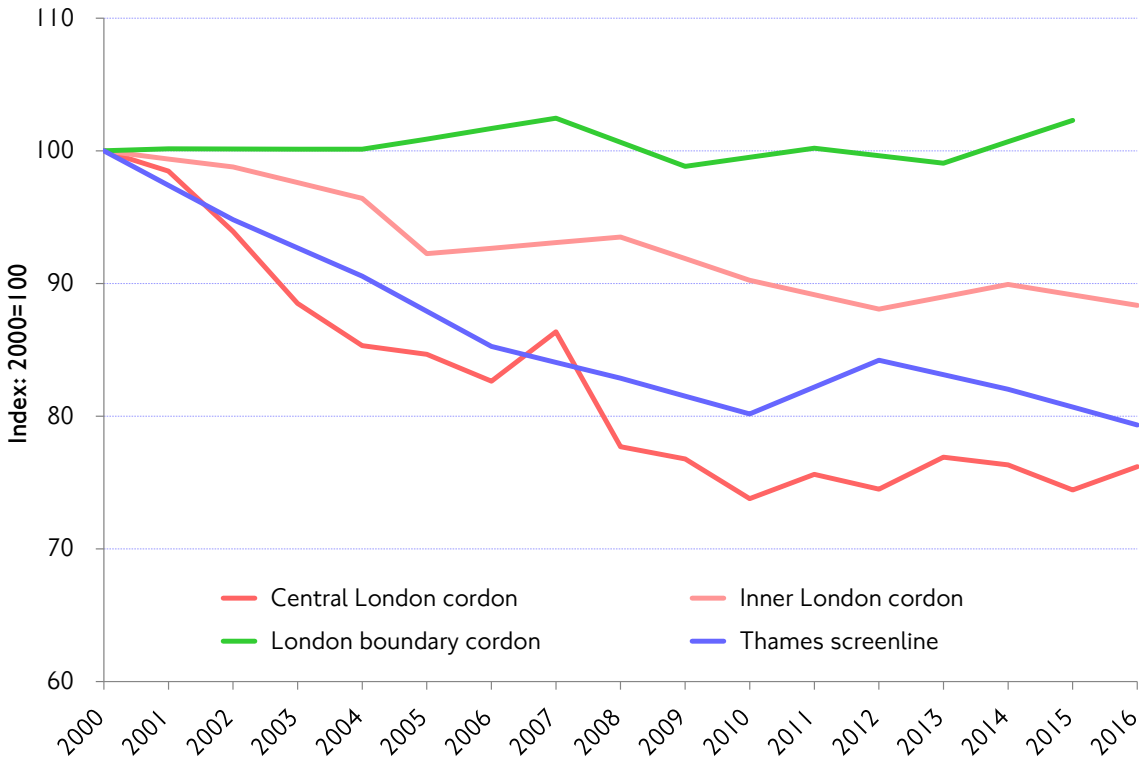
Trends in the numbers of motor vehicles crossing the three London cordons and the Thames screenline provide a third indicator of traffic volumes, and also show a broadly similar pattern to the other indicators.

Since 2000, and bearing in mind that not all cordons are surveyed every year, the number of motor vehicles crossing the central cordon (enclosing a third definition of central London which is not aligned either with the Congestion Charging zone or with the DfT definition) has fallen by 23.8 per cent.

Across the inner cordon, the decline has been 11.7 per cent, while flows at the boundary cordon have been relatively stable, with a 2.3 per cent increase comparing 2015 against 2000. The number of vehicles crossing the Thames has also declined over the same period, with 20.7 per cent fewer vehicles in 2016 compared with 2000. In considering these cordon and screenline counts, it should be noted that there may be considerable variation locally from the trends quoted here, as they include a wide range of locations with differing road network and traffic growth characteristics.

Comparing the cordon data with the DfT traffic data in figure 3.20, the overall trends since 2000 are relatively similar. Both data sources show a drop of more than 20 per cent in central London, although the DfT traffic data suggests larger falls in both inner and outer London.

Figure 3.22 Daily number of motor vehicles crossing at the three cordons and Thames screenline. Index: 2000=100.



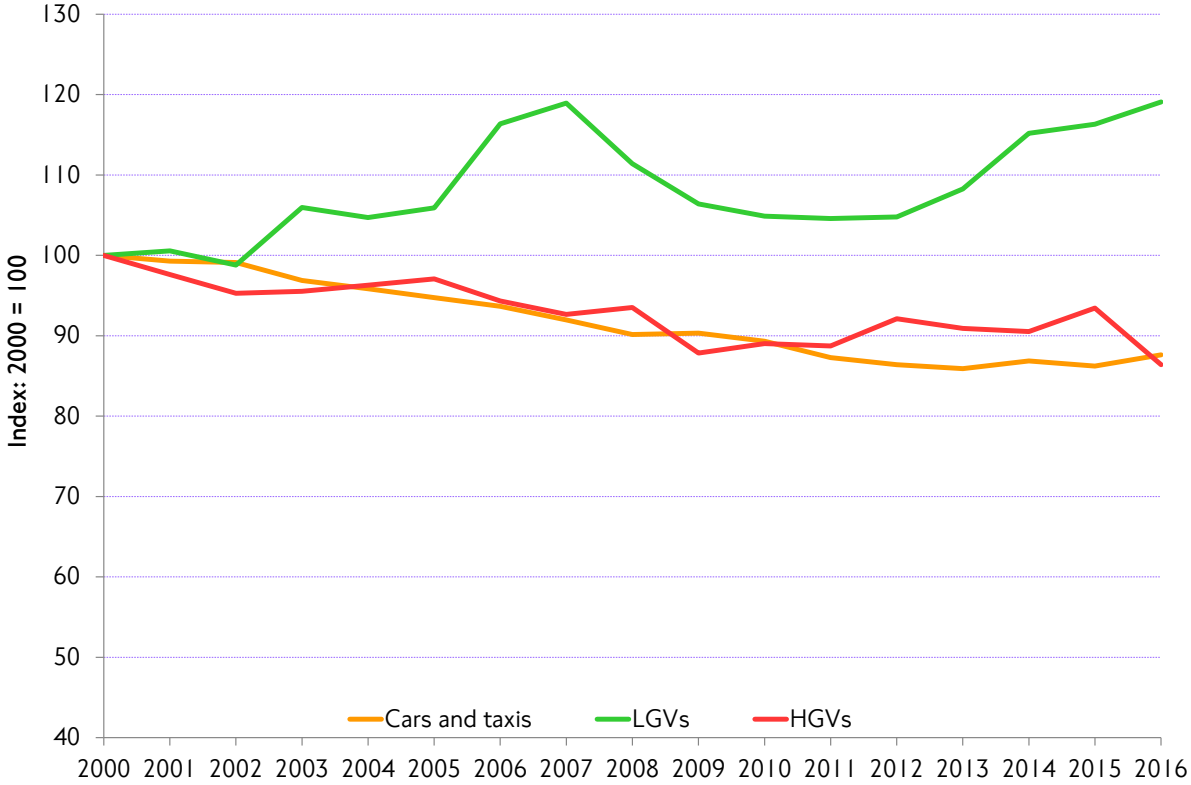
Source: TfL Surface Transport, Outcomes, Insight and Analysis.

Trends for motorised traffic by main vehicle type

Road traffic consists of several different types of vehicle, not all of which have shown the same trends. DfT vehicle kilometre data gives an indicator of trends as they affect the principal motorised vehicle types.

Figure 3.23 shows the basic trend in vehicle kilometres for cars, light goods and heavy goods vehicles over the period since 2000. It is seen from the figure that vehicle kilometres by cars, taxis and HGVs have been declining steadily since 2000, and are both down by about 13 per cent on 2000 levels. In contrast, vehicle kilometres by LGVs increased by 19 per cent between 2000 and 2007, followed by a decline of 12 per cent between 2007 and 2011. Since then, vehicle kilometres have increased fairly sharply, and in 2016 are back to similar levels seen in 2007.

Figure 3.23 Trends in motorised vehicle kilometres in London, 2000-2016, by main vehicle type.



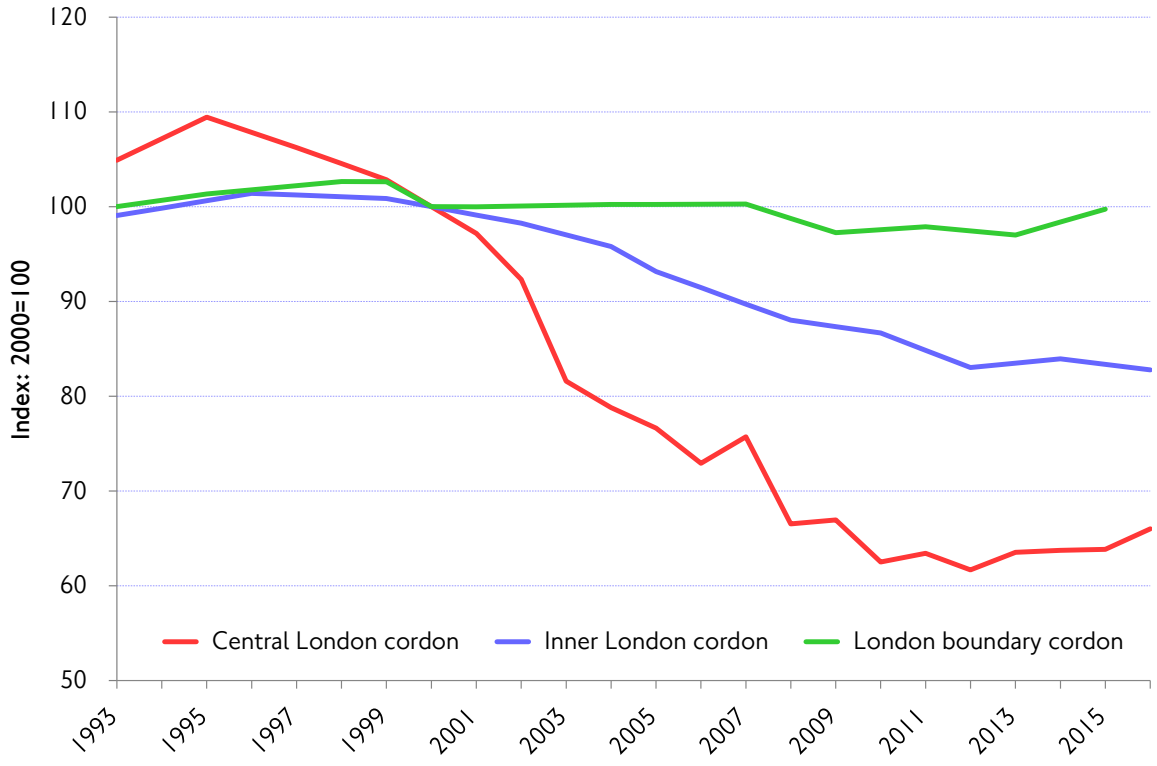
Source: TfL Surface Transport, Outcomes, Insight and Analysis.

With the exception of cycles, which were covered in section 3.12 above, the following sections consider the recent volumetric trends for each of the main types of motorised road traffic in greater detail.

3.15 Road traffic: Car

The overall picture of declining car volumes over recent years as shown by figure 3.23 above has not affected all parts of London in the same way. Figure 3.24 shows the time-series of crossings of the TfL cordons by cars. Note that this includes licensed Private Hire Vehicles, which cannot be distinguished in this type of traffic count, but does not include licensed or 'black' taxis.

Figure 3.24 Trend in cars crossing TfL cordons.



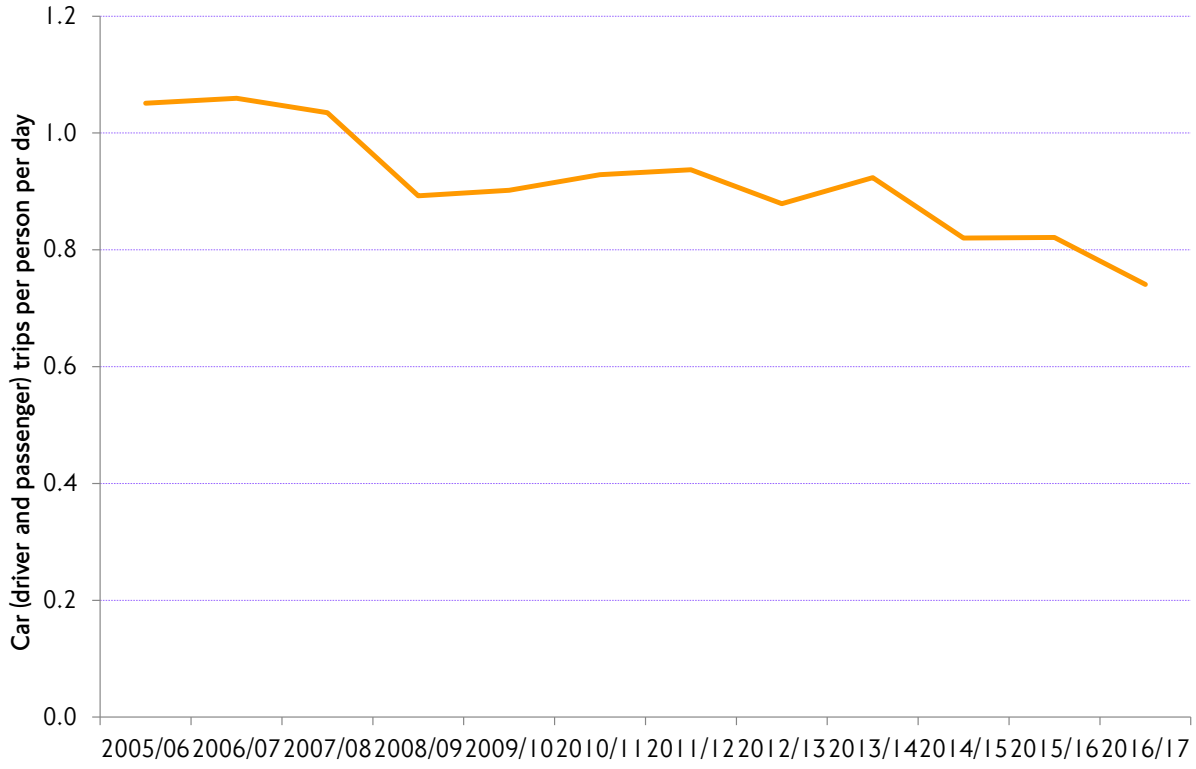
Source: TfL Surface Transport, Outcomes, Insight and Analysis.

The decline has been greatest across the central cordon, with 34 per cent fewer cars crossing the cordon in 2016 compared with 2000. There has been a 17 per cent decline in cars crossing the inner cordon over the same time period, whereas at the boundary cordon, flows are the same as they were in 2000. There is evidence of a recent increase in car flows across the central cordon, which has seen an increase of 7 per cent since 2012. This could be a result of an increase in Private Hire Vehicles over this time period rather than private cars, however, and the central cordon encloses an area larger than the Congestion Charging zone.

Car travel by London residents

A further indicator of recent trends in car use, albeit only applying to London residents, can be taken from TfL's LTDS travel diary survey (figure 3.25). The figure in this case shows the average person trip rate by car (including both as car driver and car passenger) over the period since 2005/06. It is seen that London residents are making substantially fewer car trips per person than they were ten years ago, with a 30 per cent decline in car trip rate since 2005/06.

Figure 3.25 Average person trip rate by car (as driver or passenger) for London residents. LTDS.



Source: TfL City Planning, Strategic Analysis.

3.16 Road traffic: Taxi and Licensed Private Hire vehicles

This section looks at recent trends relating to licensed taxis and licensed private hire vehicles in London.

Licensed taxis

Figure 3.26 shows the trend in the number of licensed taxis and private hire vehicles (PHVs), along with their drivers, within London since 2008/09. The number of licensed taxis in London has shown a gradual decline in recent years, decreasing by a further 2 per cent in 2016/17 to 21,300. The total number of licensed taxi drivers also declined by 2 per cent to 24,487 in 2016/17, the lowest level since 2008/09.

Licensed private hire

The number of licensed PHVs has increased by 77 per cent since 2008/09, up to 87,409 in 2016/17 and up by 13 per cent in the most recent year. Meanwhile the number of licensed PHV drivers has increased by 111 per cent over the same period, up to 117,712 in 2016/17.

From 2008/09 through to 2012/13 the number of licensed PHV drivers grew steadily at an average rate of around 5 per cent per year. In the last year the number of registered PHV drivers has grown by 17 per cent. These substantial recent changes reflect developments in the PHV market in London.

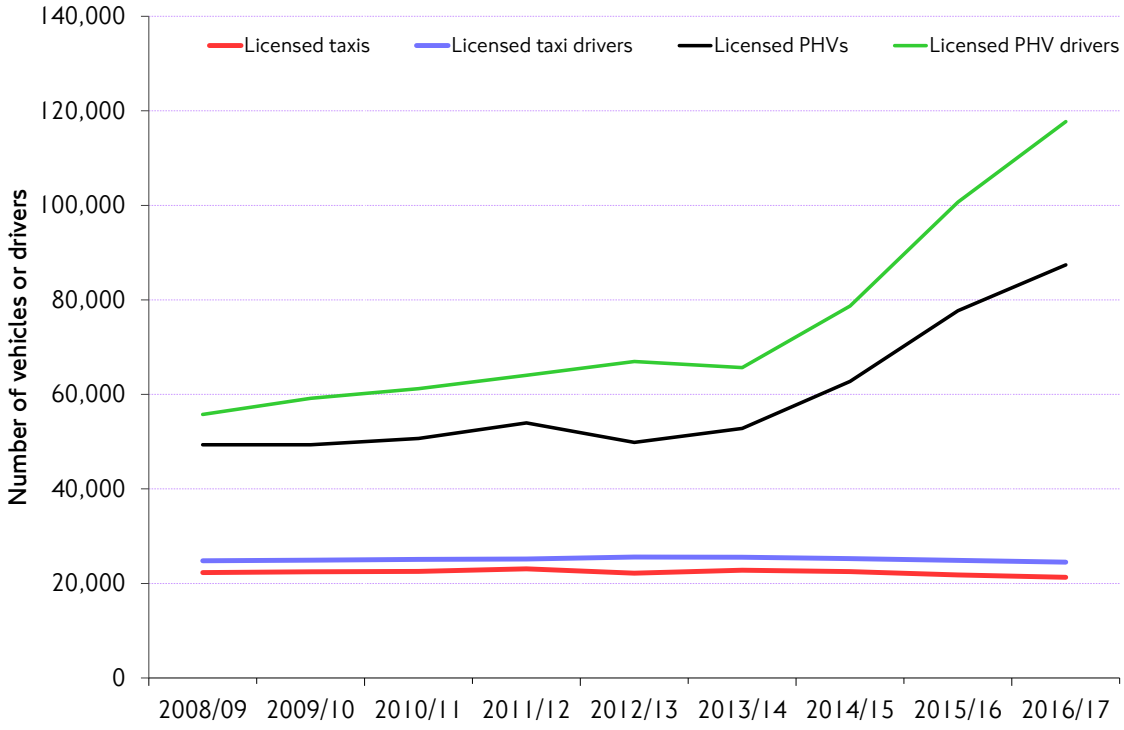
Despite the increase in the number of licensed PHVs and drivers in recent years, the number of private hire operators in London is declining. In 2016/17, there were

2,430 operators in London, a decline of 14 per cent on the previous year and a decrease of 23 per cent since 2012/13.

Taxi and private hire trips

In 2016, taxi and private hire trips increased by 9.8 per cent compared with 2015, following a 2.9 per cent increase in the previous year. This is clearly linked to the increase in licensed PHVs in recent years, although it is notable that the increase in taxi and private hire trips is not as high as the increase in licensed PHVs and PHV drivers. This increase in taxi and private hire trips is particularly focused on central London and in the late evening period.

Figure 3.26 Recent trend of licensed London taxis and private hire vehicles.



Source: Taxi and Private Hire, TfL Surface Transport.

3.17 Road Traffic: Freight

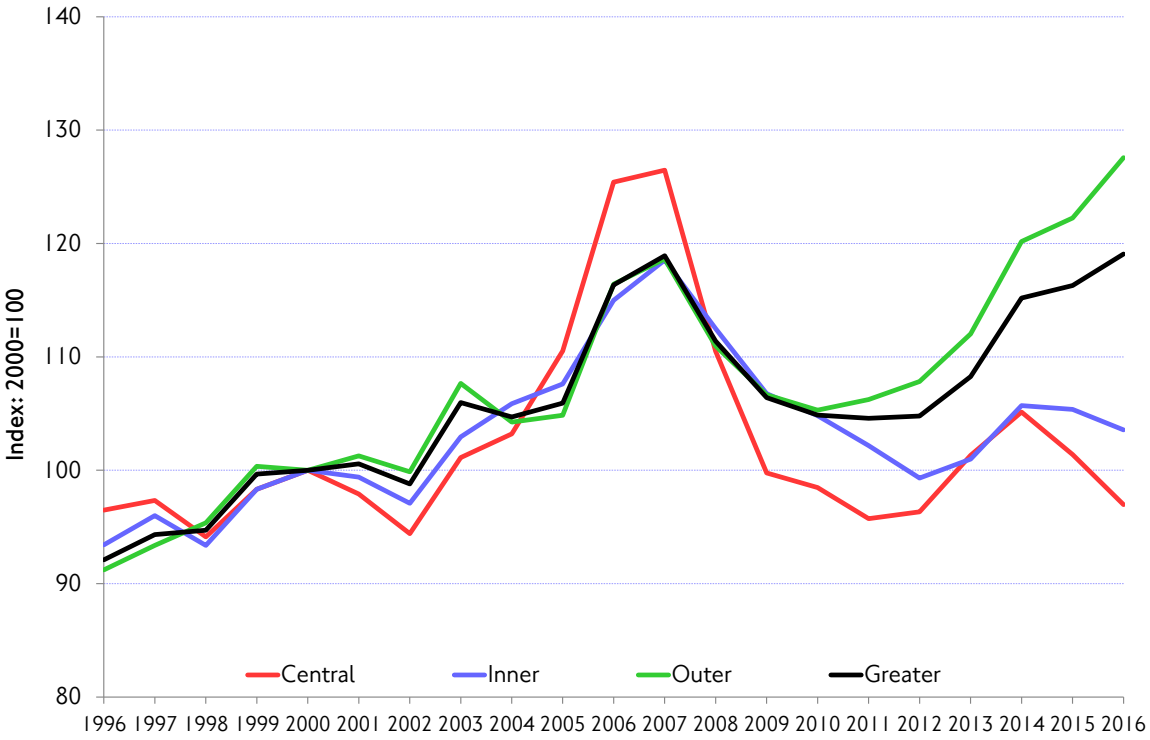
Road is by far the dominant mode for goods transport in London in terms of the weight of goods lifted – accounting for around 90 per cent of all tonnage. This section looks at trends in the volumes of road freight vehicles, in terms of vans or light goods vehicles (LGVs) and lorries or heavy goods vehicles (HGVs).

Trend in volumes of vans

Vans have been increasing in absolute terms and as a proportion of total traffic in London over recent years. Figure 3.27 shows the trend in light goods vehicle traffic (vehicle kilometres) in central, inner, outer and Greater London. Figure 3.28 is the equivalent trend in the volume of light goods vehicles crossing the central, inner and boundary cordons, corresponding to central London, inner London and the GLA boundary respectively. Note that the counting cordons relate to a specific set of locations, which are optimised to measure radial traffic movements. They therefore may not be fully representative of overall traffic trends or levels 'within'

the areas that they enclose, and therefore some differences between the two indicators may be expected.

Figure 3.27 Trends in LGV traffic (vehicle kilometres) in central, inner, outer and Greater London. Index: Year 2000=100.

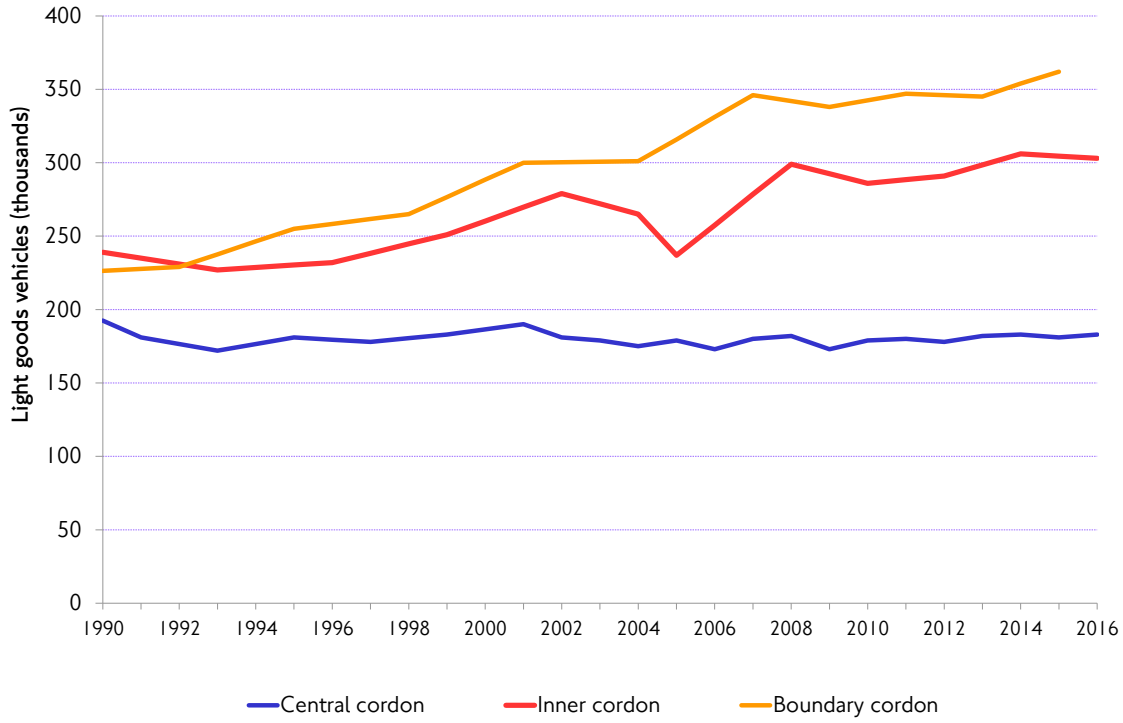


Source: Department for Transport.

Nevertheless, both figures 3.27 and 3.28 show evidence of a progressive if relatively slow increase in vans dating back to at least the mid-1990s. On a long-run basis based on figure 3.27, the average annual increase in vans (annual vehicle kilometres) over the period between 1996 and 2016 has been: no growth in central London, 0.5 per cent in inner London, 1.7 per cent in outer London and 1.3 per cent in Greater London as a whole. Cordon-based data shows a similar general trend, with an overall decrease of 3.7 per cent at the central London cordon since 2001, an increase of 8.6 per cent at the inner cordon (since 2002), and an increase of 20.7 per cent at the London boundary cordon (to 2015).

LGVs were responsible for 14 per cent of the vehicle kilometres travelled by all motorised road vehicles in London in 2016, compared to 10 per cent in 1993 and 11 per cent in 2000.

Figure 3.28 Daily number of light goods vehicles crossings at the three cordons: 24 hour flows, 1990-2016.



Source: TfL Surface Transport, Outcomes, Insight and Analysis.

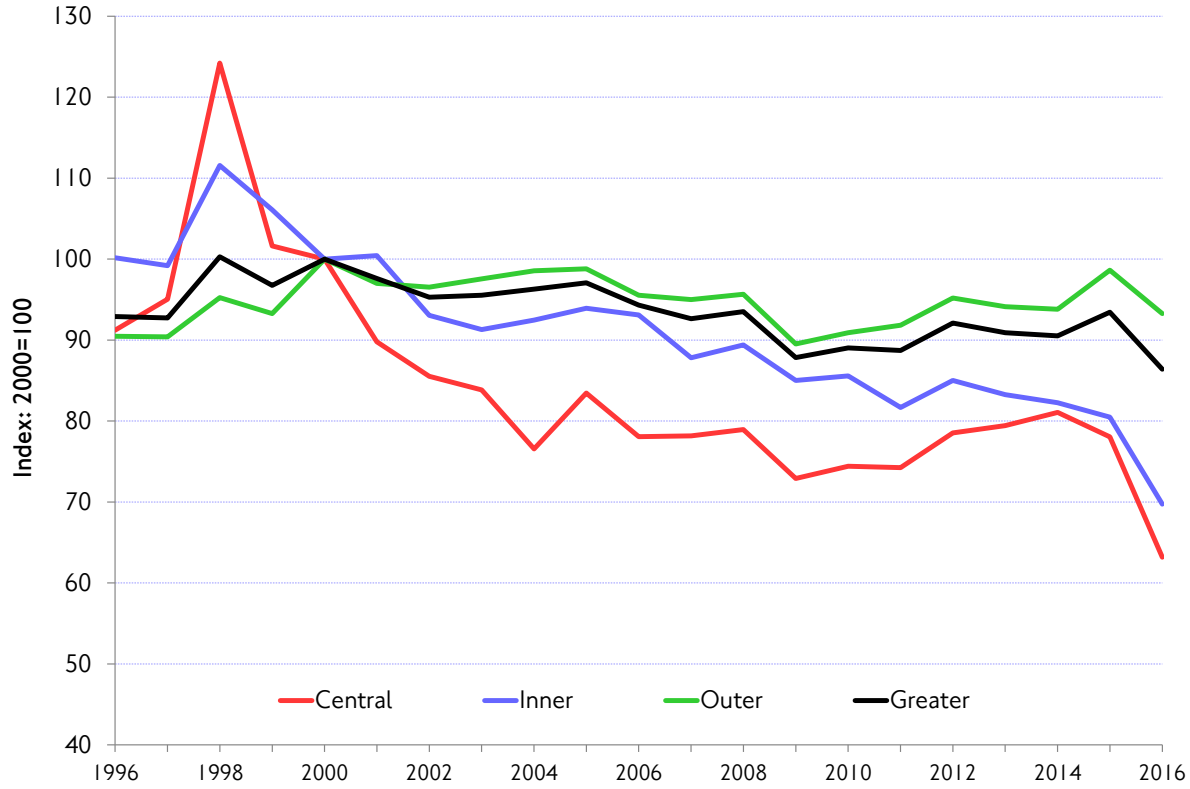
The most notable difference between figures 3.27 and 3.28 is the notional impact of the recession in the latter part of the last decade. Figure 3.27 shows this effect as being significant, with powerful growth pre-recession and an equally steep decline following it. Although perhaps intuitive, given the known connection between goods vehicle traffic and economic activity, the cordon data, however, does not clearly show this feature.

Also notable – evident from both figure 3.27 and 3.28, is that the rate of growth in central London has been relatively muted – the central cordon, for example, suggesting a generally flat trend over the past 25 years, and recent totals below those of the early 1990s. This may be considered surprising, given the acknowledged servicing needs of the growing central London economy, but it is not out of line for the equivalent trend for general traffic at this cordon, which fell by 7.8 per cent between 2006 and 2016.

Trends in the volume of heavy goods vehicles

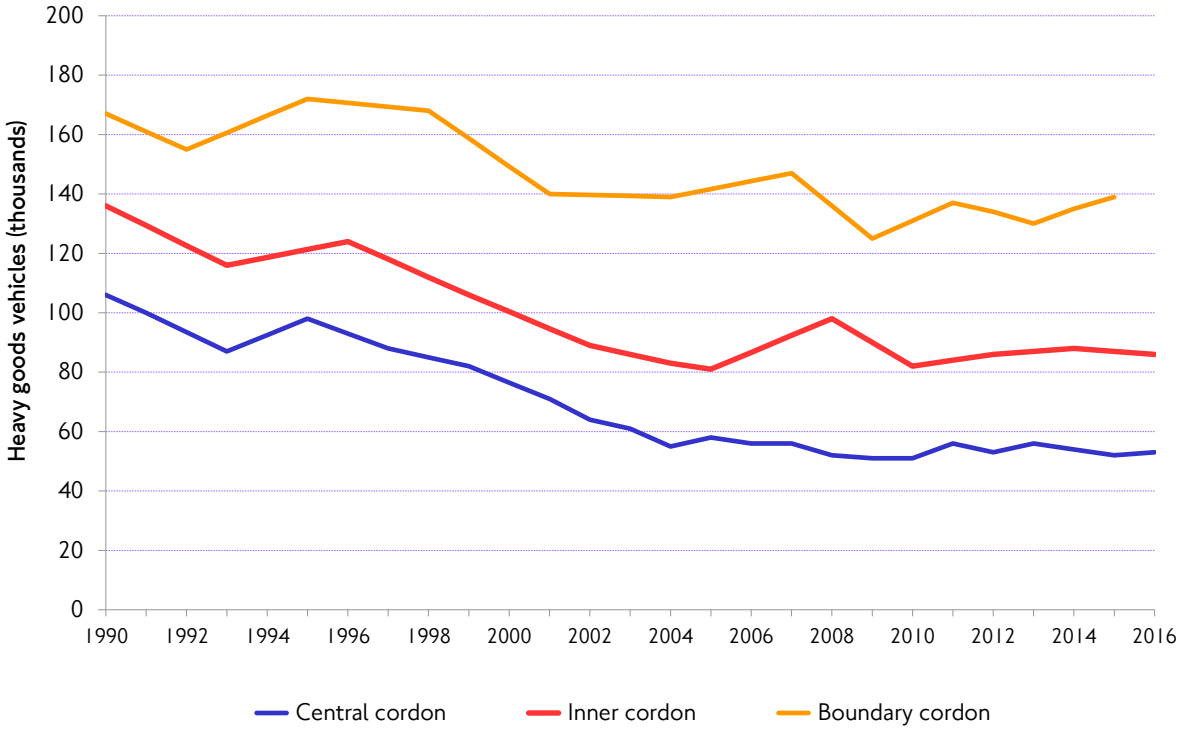
Figure 3.29 shows the trend in heavy goods vehicles traffic (vehicle kilometres) in central, inner, outer and Greater London. Figure 3.30 is the equivalent trend in the volume of HGVs crossing the central, inner and boundary cordons, corresponding to central London, inner London and the GLA boundary respectively.

Figure 3.29 Trends in HGV traffic (vehicle kilometres) in central, inner and outer London. Index: Year 2000=100.



Source: Department for Transport.

Figure 3.30 Daily number of heavy goods vehicles crossing at the three cordons: 24 hour flows, 1990-2016.



Source: TfL Surface Transport, Outcomes, Insight and Analysis.

Looking first at the vehicle kilometre data, HGV traffic has declined steadily across all areas of London, and is 13.6 per cent lower than in 2000 at the Greater London level. There was a particularly sharp decline in HGV traffic in both central and inner London in the latest year, the causes of which are not immediately apparent. In 2016 HGVs accounted for 2.4 per cent of total vehicle kilometres in central London, 2.6 per cent in inner London, 3.6 per cent in outer London, and 3.3 per cent at the Greater London level.

Cordon data (figure 3.30) also shows a long-term trend of decline in HGV volumes, in this case fairly consistently across all parts of London. On this basis the number of HGVs crossing the central cordon in 2016 was 25.4 per cent lower than in 2001, with equivalent reductions of 3.4 per cent for the inner cordon (from 2002), and 0.7 per cent at the London boundary cordon (to 2015).

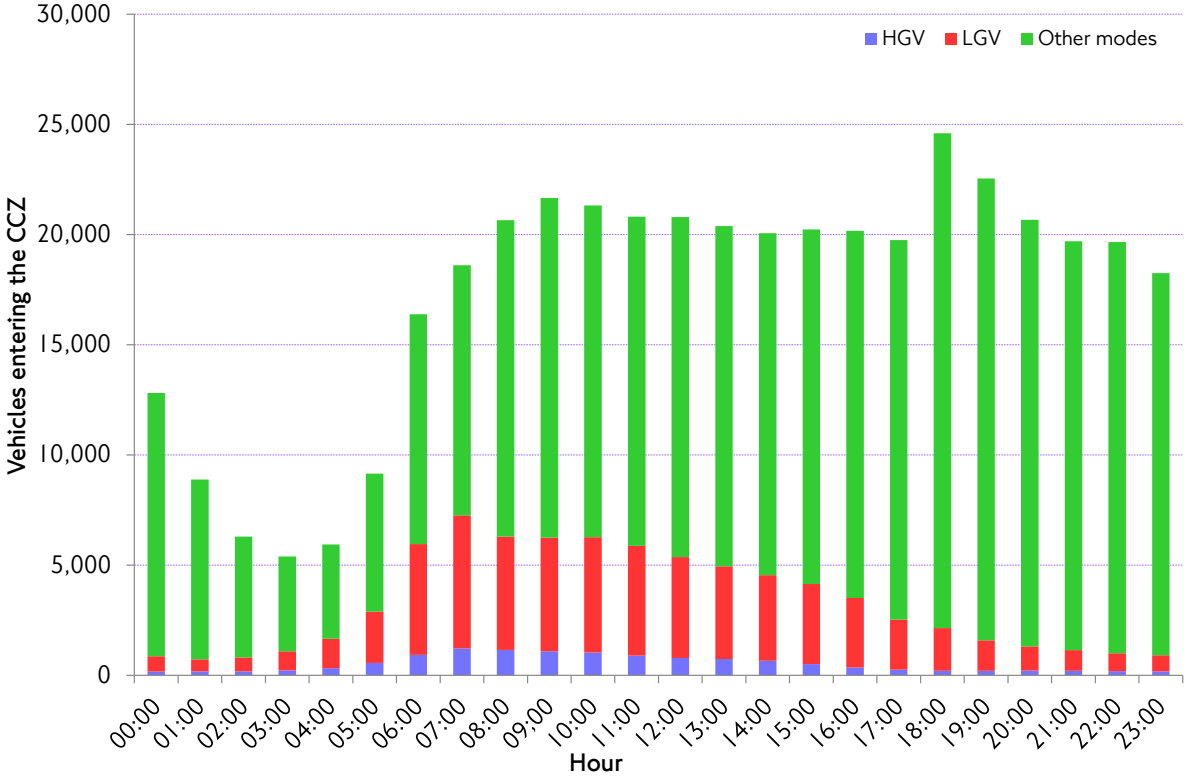
The volumetric trends for HGVs, alongside those for vans, are not what might immediately be expected in the context of a growing city over the past two decades. In central London the long-term trends broadly reflect those for general traffic, but with an apparent 'substitution' effect, with vans making up an increasing proportion of traffic in recent years at the expense of HGVs.

Goods vehicles entering the central London Congestion Charging zone

A specific aim of the draft MTS is to reduce the number of heavy goods vehicles circulating in the central London Congestion Charging zone during the AM peak by 10 per cent by 2026, from current levels. This reflects particular pressures on the road network at this time, and would help to reduce road danger. TfL is able to measure the number of HGVs entering the charging zone using the enforcement cameras relating to the scheme (on a fully anonymised basis) and an indicator has been developed that provides a trend on a quarterly basis.

Figure 3.31 shows the daily profile for the main vehicle types entering the charging zone, as an average for the 2016 calendar year.

Figure 3.31 Weekday AM peak entries to the central London Congestion Charging zone by principal, vehicle type, 2016.

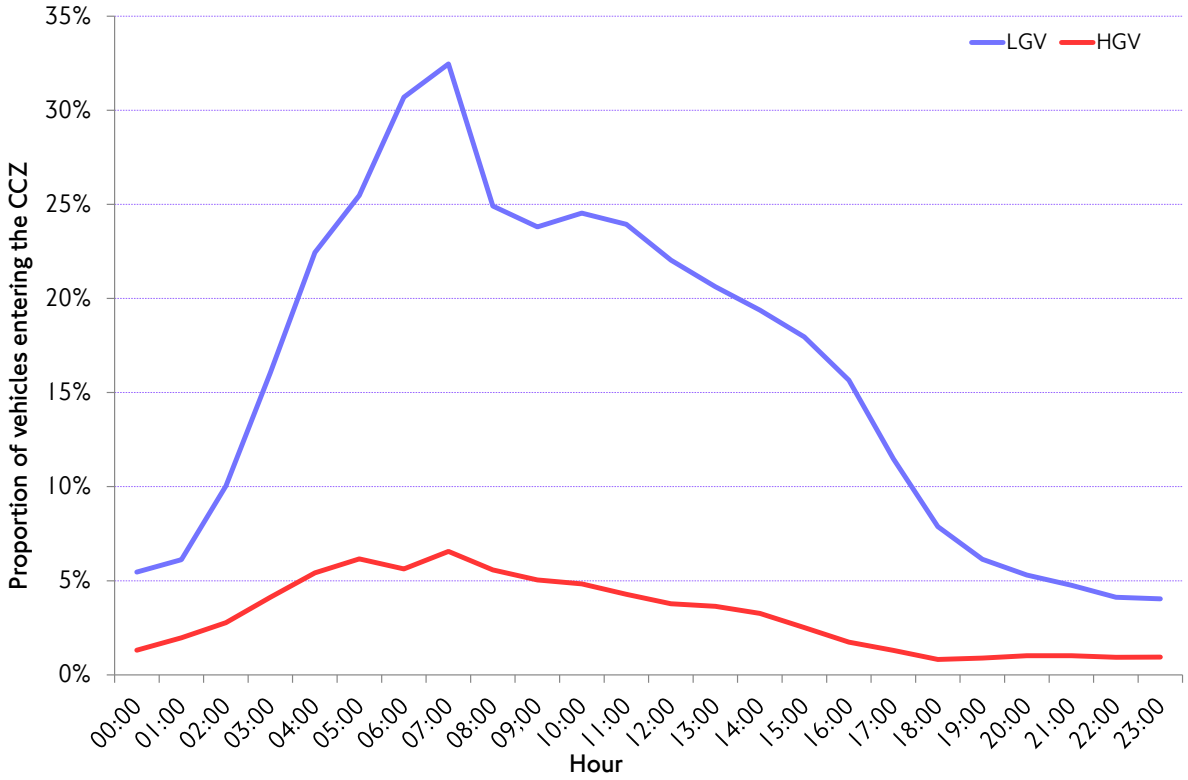


Source: TfL Surface Transport, Outcomes, Insight and Analysis.

It is immediately seen that HGVs comprise only a fraction of the total traffic over the day (blue portion of bars). They are, however, disproportionately concentrated in the early part of the day, when they typically comprise 6-7 per cent of traffic entering the zone. This compares to, typically, 3-4 per cent in the afternoon. Between 07:00 and 10:00, some 3,463 HGVs entered the charging zone on an average weekday in 2016. This was 27.9 per cent of the daily total of 12,397 HGVs and 5.7 per cent of total motorised traffic at that time.

However, it should be noted that total traffic entering the charging zone in the AM peak is relatively low compared to the middle part of the day. So, between 10:00 and 13:00, some 2,706 HGVs enter the zone, this being 21.8 per cent of the daily total and 4.3 per cent of total motorised traffic over this period.

Figure 3.32 Number of goods vehicles entering the central London Congestion Charging zone during the weekday morning peak, 2016.



Source: TfL Surface Transport, Outcomes, Insight and Analysis.

Van traffic is relatively more numerous, vans in 2016/17 accounting for 26.8 per cent of motorised traffic during the weekday AM peak (16,337 vans), with the AM peak accounting for 24.5 per cent of daily van entries. The hourly profile for 2016 for both vehicle types is shown in figure 3.32.

Table 3.8 Goods vehicles entering the central London Congestion Charging zone during the weekday morning peak (07:00 – 10:00).

Year	2016
Number of vans	16,337
Number of lorries	3,463
% AM peak/24 hours - vans	24.5%
% AM peak/24 hours - lorries	27.9%

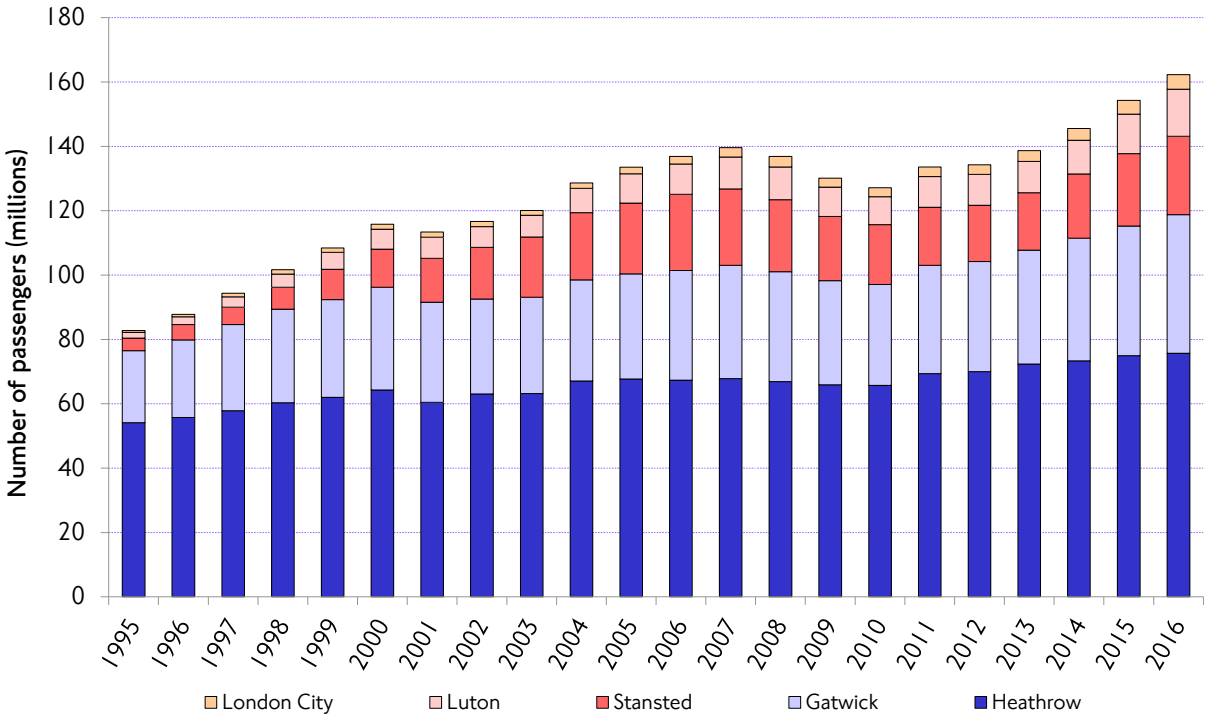
Source: TfL Surface Transport, Outcomes, Insight and Analysis.

3.18 International travel

Air travel volumes

Demand for air travel through London's airports continues to grow strongly year-on-year, reflecting a recovery from the recession in the latter part of the last decade. There were a total of 162.3 million terminal passengers passing through London's five main airports in 2016 – up 5.2 per cent on 2015. Heathrow airport accounted for 46.6 per cent of the total, with Gatwick accounting for 26.6 per cent (figure 3.33).

Figure 3.33 Number of terminal passengers by London area airport.

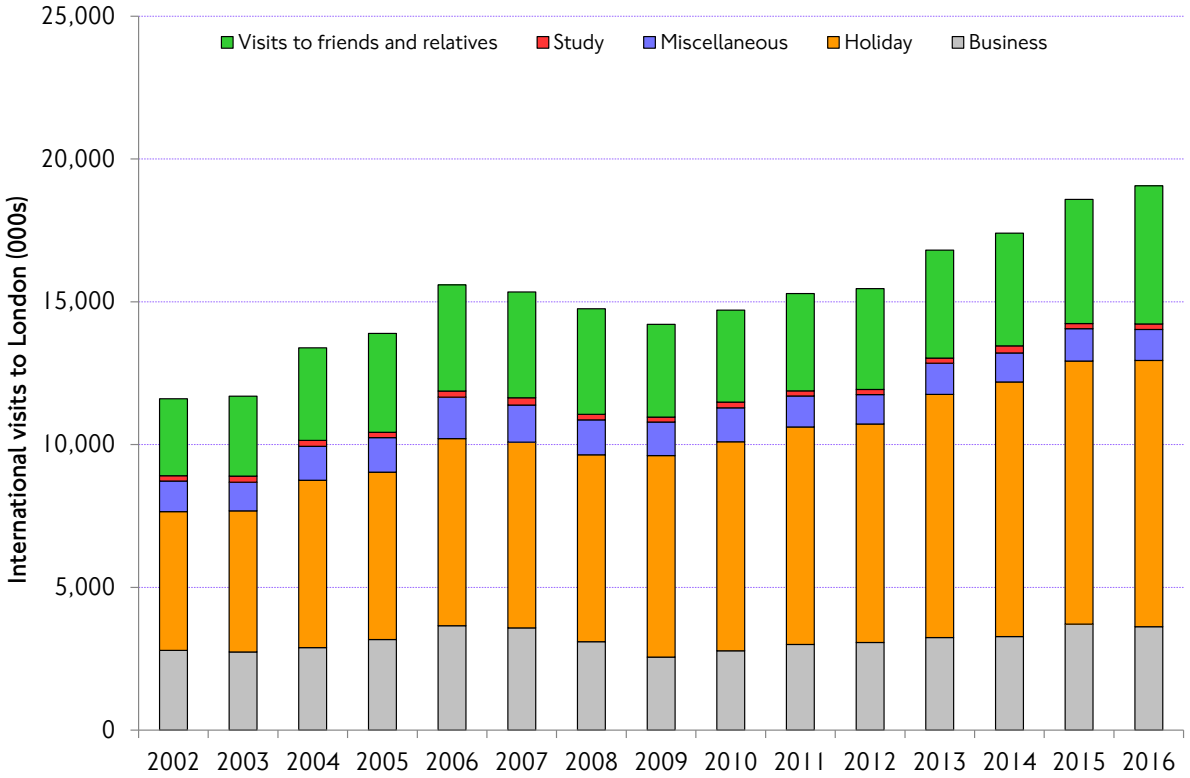


Source: Civil Aviation Authority.

International visitors to London

The number of international visits to London has increased each year since 2009, with a 2.6 per cent increase between 2015 and 2016 (figure 3.34) and an aggregate increase of 34.1 per cent over the period. The number of visits for business declined by 2.5 per cent over the most recent year, while visits for holidays, study and visits to friends and relatives were up by 1.3 per cent, 9.1 per cent and 11.3 per cent respectively. Although not out of line with the longer-term trend, the devaluation of sterling is thought to have been a particular factor during the latter part of 2016.

Figure 3.34 Number of international visits to London.



Source: International Passenger Survey.

4. Understanding the drivers of travel demand in London

4.1 Introduction

This section reviews a selection of topical recent evidence relating to changing travel demand patterns in London, which continue to change in response to developments in the main drivers of travel demand and wider societal factors, and which will be an important consideration in terms of forecasting future travel patterns and in tracking progress towards Draft MTS Outcomes. The material in this section updates an analysis that was previously published in September 2014 (see: http://content.tfl.gov.uk/drivers-of-demand-for-travel-in-london.pdf), and is of particular interest, given the apparent changes to many aspects of travel demand in London that have been observed over more recent years.

4.2 The need to travel – is it changing?

Introduction

Chapter 2 reviewed overall travel demand trends in London in terms of the number of trips made by Londoners and visitors to London. The data shows that the volume of travel in London has grown substantially over the last two decades or so, with sustained mode shift away from the private car and towards public transport, walking and cycling.

However, population growth has been the main driver of this and trip rates – the average number of trips made per person per day – effectively static for most of the last decade – are now beginning to show signs of reducing. Alongside this, the very recent trends in mode shares, as described in Chapter 2 of this report, are an interesting related development. It is too early – in terms of the available data and relatively short timescale – to pronounce on whether either trend is likely to be sustained in the long term. A first step is to better understand the factors underlying these changes.

Declining need to travel?

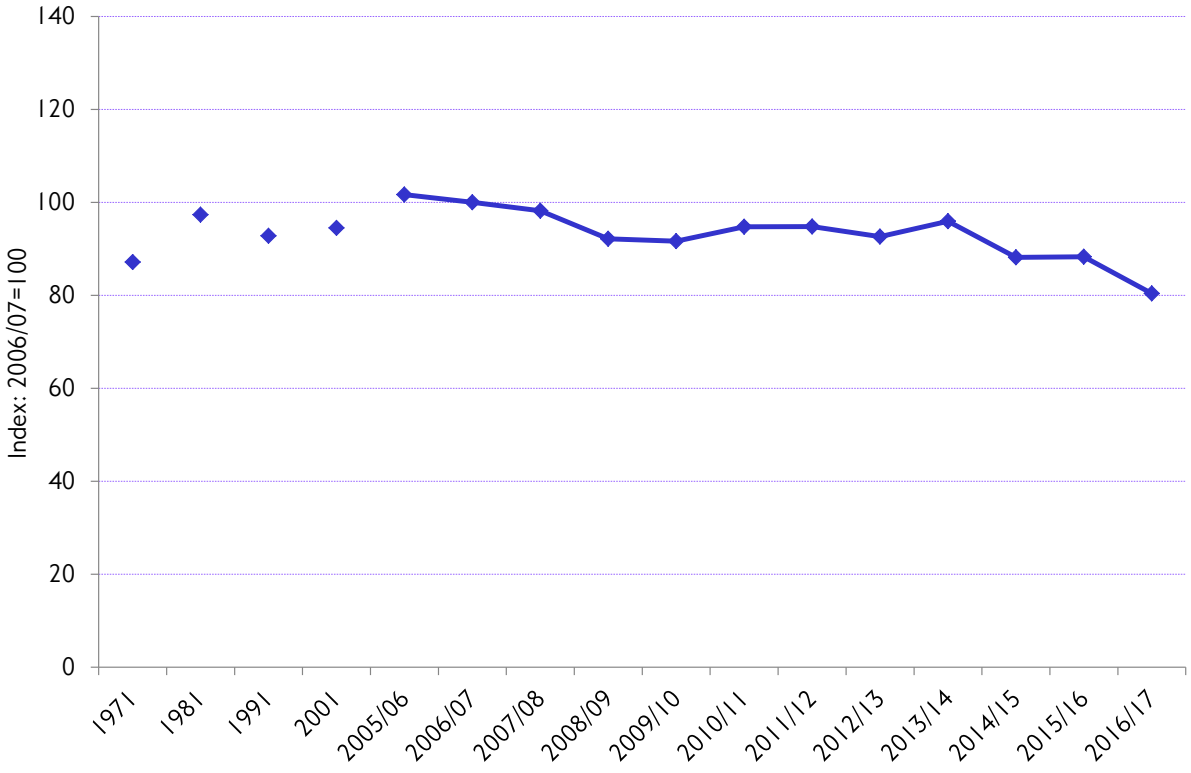
The need and desire to travel is something that is common to all human societies across geographies and through the ages. Travel is a part of everyday life, and it has frequently been observed that the quantity of travel per person per day remains roughly constant in different settings.

In London over the past two decades, there have been large changes in aggregate travel demand (volumes), largely driven by rapid population growth causing more travel at the aggregate level, but also due to a range of factors that led to substantial mode shift away from private car use toward public transport, walking and cycling. Through all of these changes, one thing that remained broadly constant was trip rates – the average number of trips per person per day.

Over the past few years, however, Londoners' trip rates (residents – as measured through the LTDS survey) have been observed to decline. This decline has seen the number of trips per day made by the average Londoner fall from 2.5 in 2013/14, to 2.4 in 2014/15, 2.3 in 2015/16 and then to 2.2 in 2016/17. This represents the lowest average trip rate that has been observed since LTDS was introduced more

than 10 years ago (figure 4.1), and is also lower than those of historic similar surveys (the GLTS/LATS series, originating in 1971).

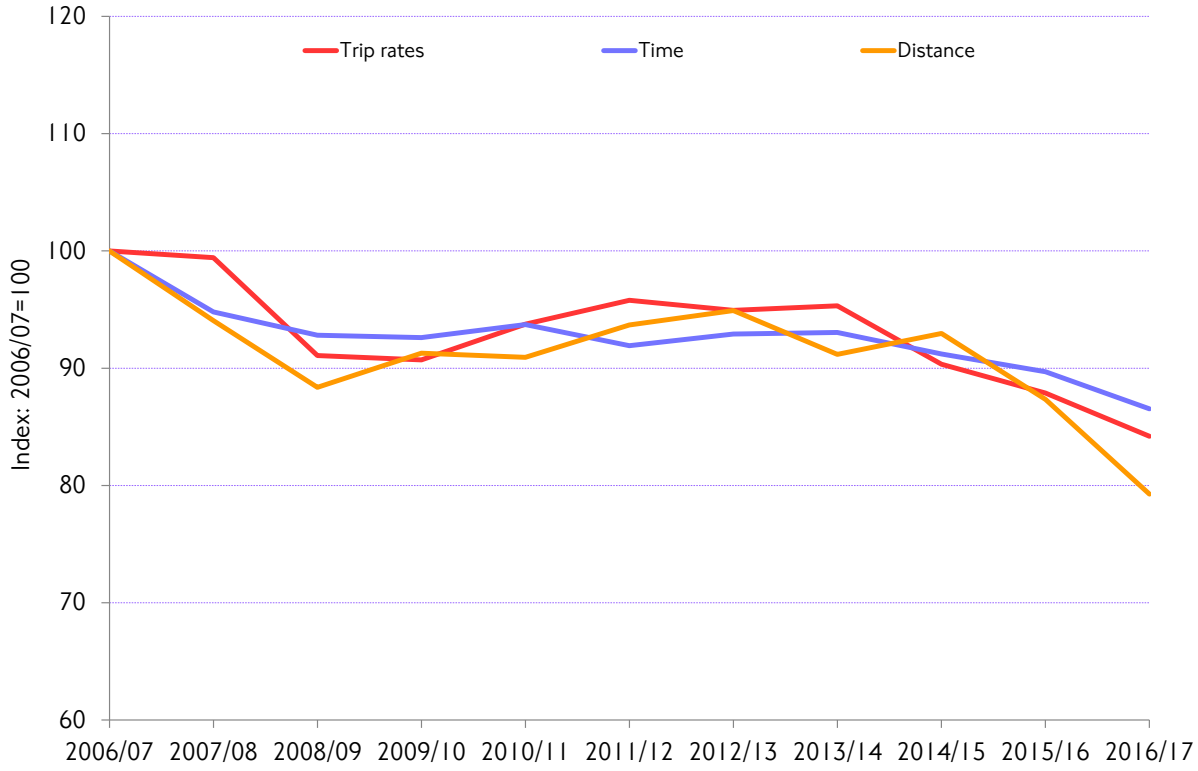
Figure 4.1 Trend in average trips per person per weekday, LATS and LTDS data. Index: 2006/07=100.



Source: TfL City Planning, Strategic Analysis.

In fact, the decline observed in the past three years could be seen as part of a longer term declining trend dating back to at least 2006/07, since which time trip rates have fallen by 16 per cent. Travel per Londoner measured in terms of time spent travelling per day has also declined, with a reduction of 13 per cent seen over the period. In terms of distance, travel per Londoner has declined by 21 per cent (figure 4.2).

Figure 4.2 Trend in trips, time and distance, LTDS. Index: 2006/07=100.

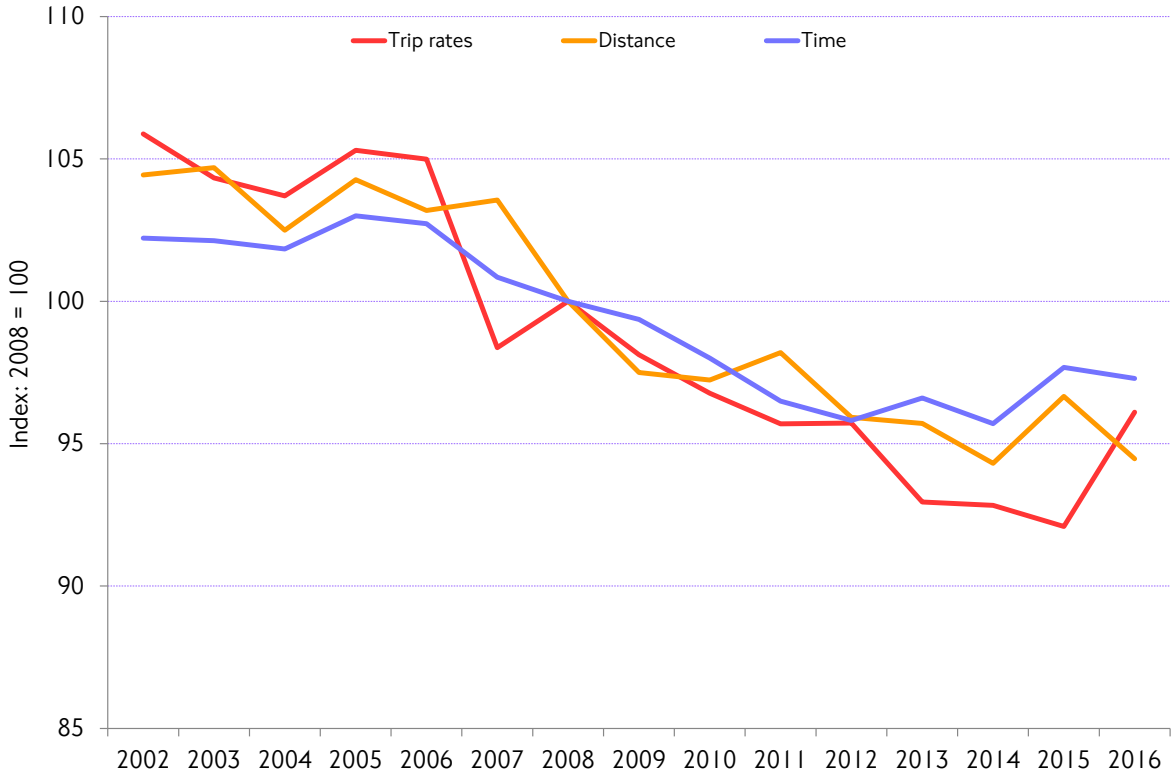


Source: TfL City Planning, Strategic Analysis.

It is not yet possible to know whether the relatively sharp decline in trip rates over the past three years represents part of a long-term trend that is likely to be sustained. Nevertheless, the apparent scale of this recent change is significant in the historic context, and now appears to represent a marked break, albeit evolutionary, with long-established trends.

Looking beyond London, there are indications that a sustained fall in trip rates is a possibility: the National Travel Survey has recorded a long term reduction in trip rates in England of around 9 per cent over the period from 2002 to 2016 (figure 4.3). The patterns being seen in London, therefore, also have parallels at the national scale.

Figure 4.3 Trend in trip rates, travel time and distance travelled, NTS. Index 2008=100.



Source: Department for Transport (2017) National Travel Survey, 2002-2016. 12th Edition. UK Data Service.

Types of travel most affected

In terms of the types of travel that have been most affected by declining trip rates, some clear differences are apparent. By mode, car trip rates in London have been on a trend of long-term decline for more than ten years and bus trip rates have mirrored the all-mode trip rate decline between 2014/15 and 2016/17, having been broadly static since 2006/07 before that. Despite a small decline in the latest year, Underground trip rates increased between 2013/14 and 2015/16.

By journey purpose, trip rates to London residents' usual workplace have declined by 14.2 per cent since 2006/07, although trips made to other destinations for work increased by 5.1 per cent over the same period. Trip rates for education have been broadly stable at around 0.2 trips per person over the period since 2006/07. Trip rates for shopping and personal business have been declining since 2007/08, by a total of 35.4 per cent between 2007/08 and 2016/17. Trips for leisure have also declined, but only in more recent years, by 16.1 per cent since 2013/14. It therefore seems that it is a decline in discretionary trip purposes that has been driving the decline in Londoners' trip rates in recent years.

While there have been different changes in trip rates for different modes and purposes, differences in changes in trip rates among different demographic groups have been less marked. Although different demographic groups show distinct travel behaviour – for example with trip rates peaking in mid-life, or with people in higher income households making more trips – trip rates have declined by similar proportions across all demographic groups. This implies that the change in trip rates

has occurred across demographic groups, as opposed to some groups having been responsible for the overall decline in trip rates while other groups saw no change.

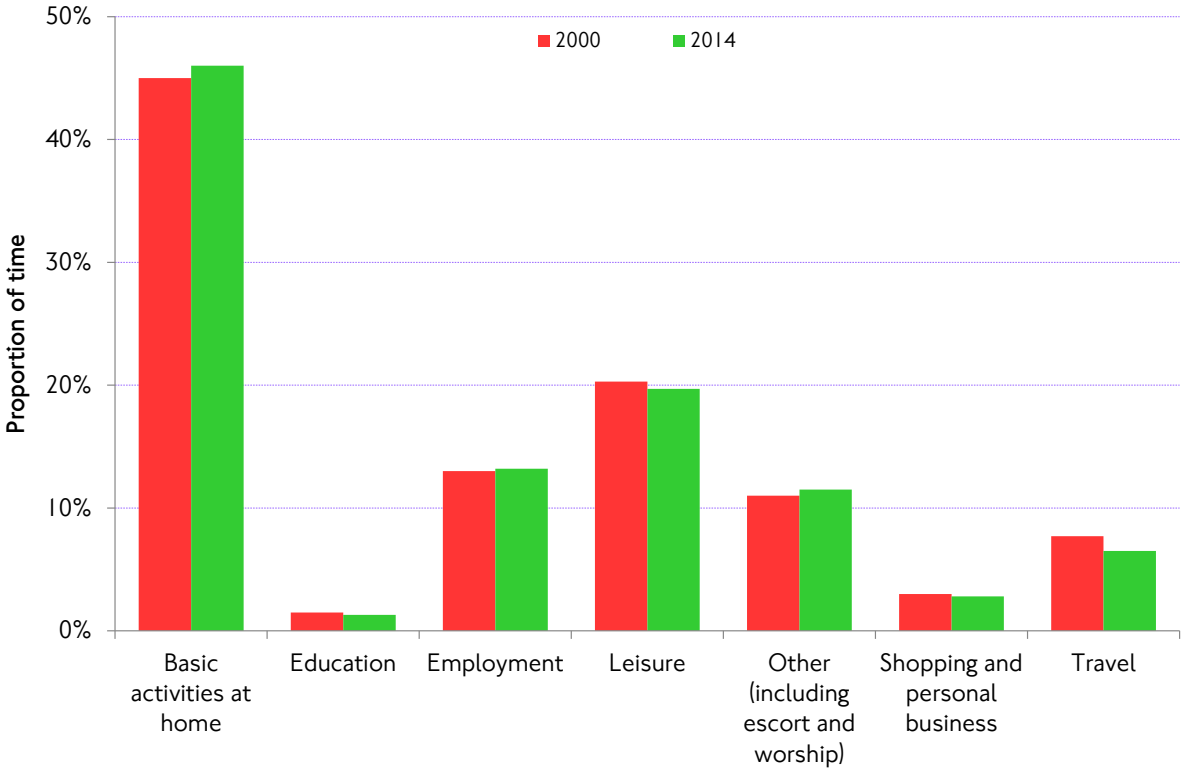
Changing relationship between activity and travel

One phenomenon that is very difficult to analyse through travel surveys is reductions in travel as a result of people being able to carry out their desired activities without travelling: by definition, this type of behaviour will not be captured by a travel survey. To overcome this issue, time use surveys have been analysed to explore the extent to which different activities appear to have seen a weakening of their relationship with travel.

Analysis of the National Time Use Surveys from 2000 and 2014 shows that the share of time London residents spent on different activities remained broadly stable over that period (figure 4.4).

One possible implication of this is that people are generally doing the same things, but that the need to travel in order to do them has reduced. For example, transport data shows that shopping and personal business trip rates are down, but time use data shows that people are spending the same share of time as ever on the equivalent activities. This may be due to technological changes making it possible to carry out the same activities without the need to travel, for example working or shopping from home or forms of entertainment such as computer gaming; or an increase in people being able to carry out multiple activities at the same location.

Figure 4.4 Share of time spent by activity of London residents aged 16+, National Time Use Surveys 2000 and 2014.

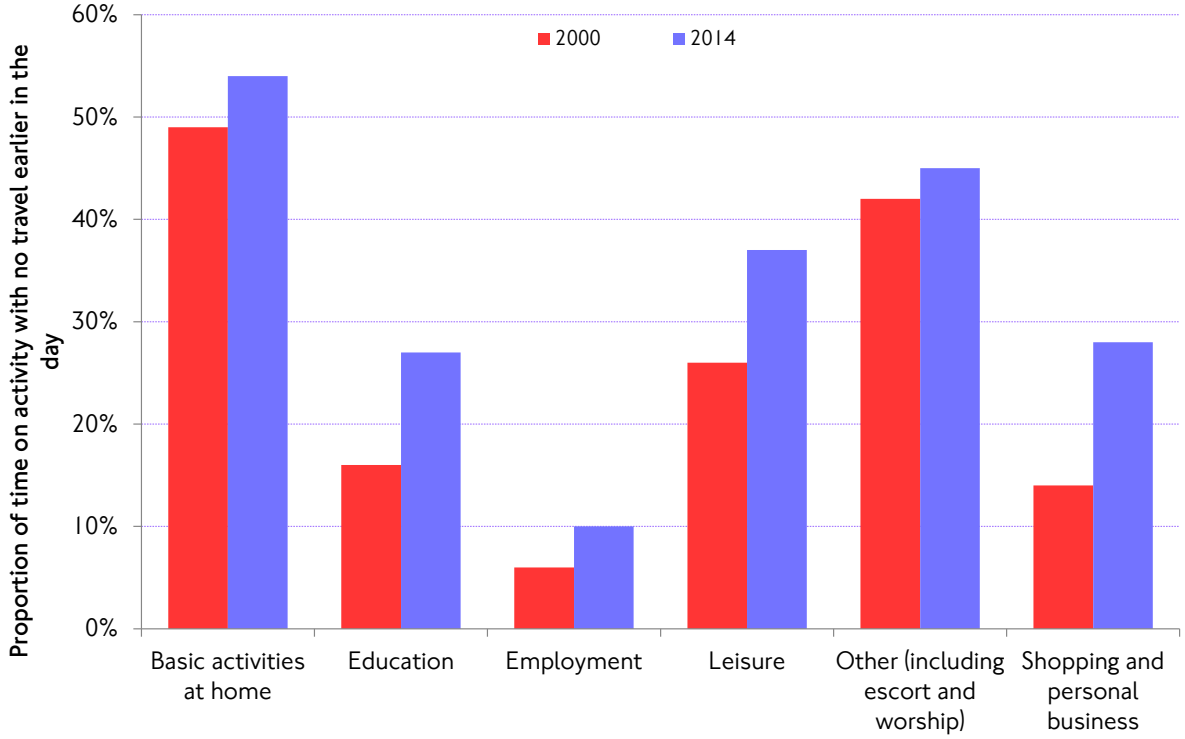


Source: United Kingdom Time Use Survey, 2000 and 2014-15, UK Data Service.

Data from the Time Use Surveys also shows that for all activities, the share of time spent on those activities without having spent any time travelling earlier in the day increased (figure 4.5). This provides further support for the conjecture that the link

between many activities and the need to travel has been weakened in recent years, possibly due to technological changes.

Figure 4.5 Share of time spent by activity of London residents aged 16+ with no travel earlier in the day, National Time Use Surveys 2000 and 2014.



Source: United Kingdom Time Use Survey, 2000 and 2014-15, UK Data Service.

Exploring the growth of 'non-travel'

One noticeable societal change in behaviour that has occurred alongside the fall in trip rates is an increase in 'non-travel', ie the phenomenon of respondents to travel surveys having made no travel on a day when their travel activity is being recorded.

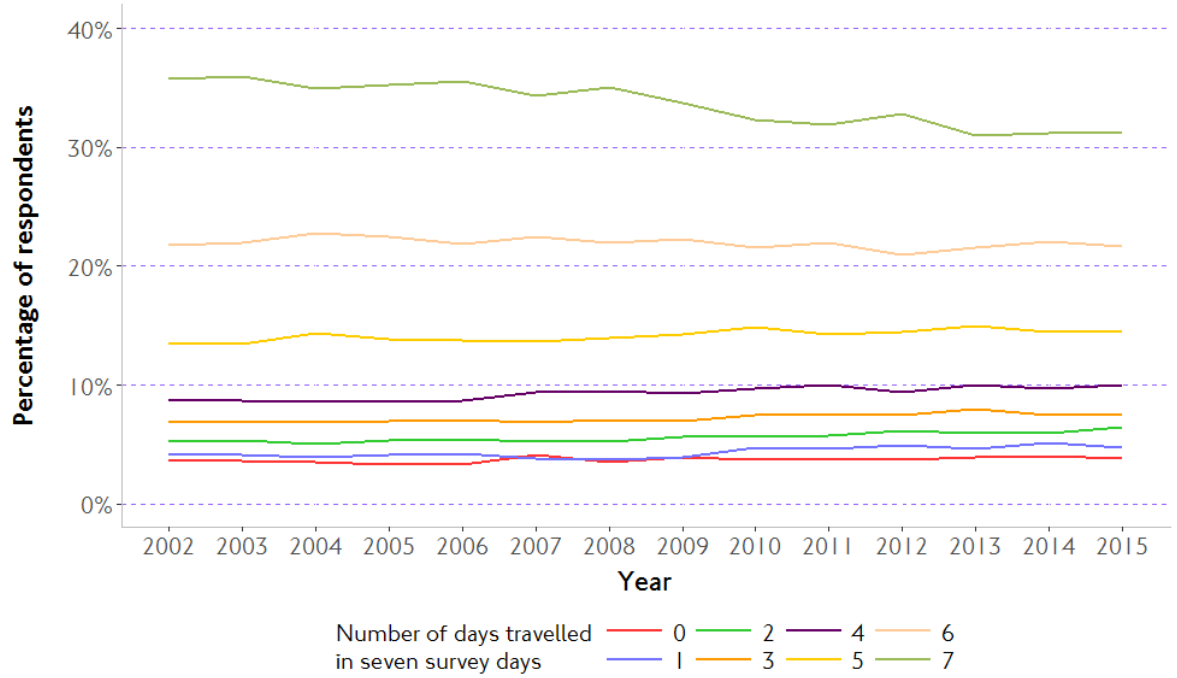
The proportion of people observed in LTDS making no trips on their designated travel diary day increased at a relatively consistent rate from 16 per cent to 25 per cent between 2006/07 and 2016/17. While this has an effect on overall trip rates, pulling the average down, the increase in 'non-travel' alone is not of sufficient magnitude to explain in full the decline in trip rates that has been observed. Nonetheless, non-travel appears to account for a significant element of the decline, and as a consequence has been explored in more detail.

The scope for analysing non-travel through LTDS is limited due to the survey consisting of a single-day travel diary. In contrast, NTS records travel activity of respondents over seven consecutive days. This makes it possible to analyse London respondents' non-travel (as a sub-set of the wider NTS sample) over a longer period, and means that it is possible to establish the number of days over the course of a week that someone made no travel.

Through this analysis of NTS, it is apparent that there has been a substantial reduction in the proportion of respondents who travelled on all seven of their travel diary days (figure 4.6). It is also the case that there has been little growth in the

proportion of NTS respondents who recorded zero or one days where they travelled.

Figure 4.6 Percentage of respondents from London reporting number of days travelled over seven days, NTS 2002 to 2015.



Source: Department for Transport (2017) National Travel Survey, 2002-2016. 12th Edition. UK Data Service.

The net result of this is that the increase in non-travel that has been observed in LTDS appears to be due to a shift in the balance from extremely frequent travellers (ie people making at least some travel every single day) toward moderately frequent travellers (ie people making at least some travel on 4 or 5 days out of 7).

The suggestion that a reduction in travel has occurred as a result of many people changing from travelling extremely frequently – almost every day – to travelling only very frequently – say six days out of every seven – is consistent with the idea that the need to travel has diminished in some way over the past 15 years, perhaps due to technological or societal changes. In this way, perhaps, people optimise their daily 'exposure' to travel, by selectively consolidating tasks across a week.

A potentially important dimension of this is the extent to which 'non-travel', at the personal level, generates travel by others. For example van deliveries or visits by trades people. LTDS is limited in this regard in that it only enumerates personal travel; however features such as the observed growth in van traffic may well be related to this.

4.3 Updated forecasts of London's population and employment growth

The GLA has produced the 2017 round of long-term labour market projections and 2016-based population projections that will form the employment and population projections for the draft London Plan and the final MTS.

Population projection

Total GLA population growth is greater in the new 2016-based projection reaching a total of 10.8 million in 2041 compared to the previous 2015 round projection with a total of 10.5 million in 2041. Inner London 2015-2041 population growth is 1 percentage point greater in the new 2016-based projection (25 per cent), and outer London population growth is 3 percentage points greater in the new projection (23 per cent). Table 4.1 compares the old (2015) and new (2016) projections.

Table 4.1 Latest GLA population projections and comparison with 2015 round.

	Population (000s)		2015-2041 Growth	
Previous (2015) round	**2015**	**2041**	**Population (000s)**	**% growth**
Inner	3,449	4,266	817	24%
Outer	5,188	6,233	1,045	20%
GLA total	8.637	10,499	1,862	22%
New (2016) round	**2015**	**2041**	**Population (000s)**	**% growth**
Inner	3,477	4,358	880	25%
Outer	5,208	6,419	1,211	23%
GLA total	8.685	10,776	2,091	24%

Source: Greater London Authority.

Impact of new forecasts

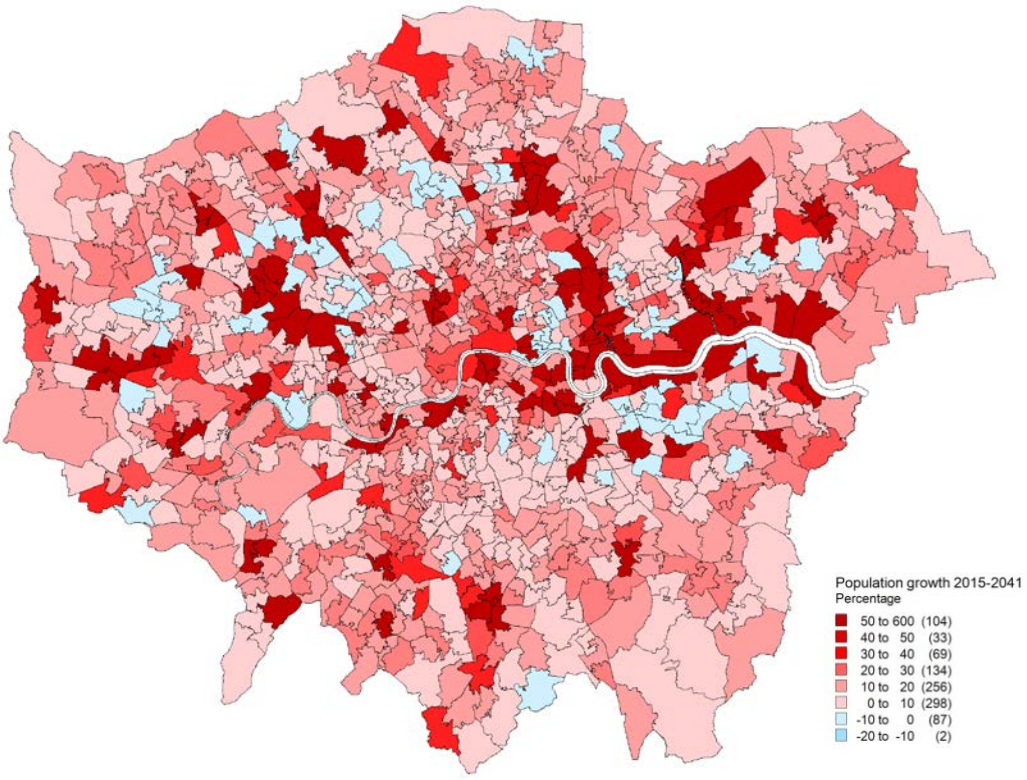
The growth projections produced by the GLA represent its central case best estimate of future population and employment.

The GLA produces high and low variants around a central case. This reflects uncertainty in both the short term and long-term forecasts of output growth, and therefore presents a wider range of possible future travel demand scenarios. TfL has developed an approach for travel demand forecasting which recognises the inherent uncertainty in forecasting. For new project work, TfL plans to review the new 2017 variants and use them in future sensitivity testing. The higher London total employment and population in the new projections are likely to improve the case for strategic schemes and also should contribute to progression towards the 80 per cent active, efficient and sustainable MTS mode share target because of the relationship of travel mode choice to population density.

Distribution of population growth to 2041

Figure 4.7 shows 2015-2041 population growth projected in the new 2016-based population projection.

Figure 4.7 2015-2041 population growth by MSOA from new 2016-based population projection.



Source: Greater London Authority.

Population density is greatest in inner London in 2041, and high population growth from 2015-2041 is occurring across outer and inner London, especially in opportunities areas along the Thames in the east such as Greenwich peninsular, Isle of Dogs, Royal Docks and Beckton Riverside and Bexley Riverside.

The difference in the 2015-2041 population growth by borough between the current and new population projections is shown in table 4.2 below.

Table 4.2 Comparison of current 2015 round housing based and new 2016-based housing-led projected population growth 2015 – 2041. Absolute population growth in thousands - borough level.

	2015 round projection		2016 based projection		Difference
	Absolute	%	Absolute	%	% Growth
Barking and Dagenham	64	32	**114**	56	25
Barnet	113	30	**87**	23	-7
Bexley	32	13	**53**	22	9
Brent	70	22	**75**	23	1
Bromley	42	13	**51**	16	3
Camden	44	18	**44**	18	0
City of London	3	36	**3**	47	11
Croydon	83	22	**84**	22	0
Ealing	78	23	**78**	23	0
Enfield	52	16	**60**	18	2
Greenwich	86	32	**100**	36	5
Hackney	72	27	**55**	21	-6
Hammersmith and Fulham	44	25	**89**	49	24
Haringey	60	22	**47**	17	-5
Harrow	45	18	**45**	18	0
Havering	50	20	**64**	26	6
Hillingdon	38	13	**62**	21	8
Hounslow	53	20	**53**	20	0
Islington	41	18	**41**	18	0
Kensington and Chelsea	30	19	**19**	12	-7
Kingston upon Thames	32	18	**41**	24	5
Lambeth	75	23	**52**	16	-7
Lewisham	64	22	**66**	22	0
Merton	31	15	**40**	20	5
Newham	87	26	**139**	42	15
Redbridge	69	23	**78**	26	3
Richmond upon Thames	27	14	**31**	16	2
Southwark	74	24	**91**	29	5
Sutton	25	13	**39**	19	7
Tower Hamlets	99	34	**104**	35	1
Waltham Forest	57	21	**56**	21	0
Wandsworth	85	27	**86**	27	0
Westminster	38	16	**43**	18	2
Greater London	1,862	22	2,091	24	3

Source: Greater London Authority.

The boroughs with the greatest difference in 2015-2041 percentage growth between the current and new projections are Barking and Dagenham, Hammersmith and Fulham, and Newham, which all have greater population growth in the new 2016-based population projection.

New employment projections

In 2041, total London employment is projected to reach 6.9 million in the new 2017 projection, compared to 6.7 million in the 2016 projection. Table 4.3 summarises the high level difference between the current and new employment projections.

Table 4.3 Latest GLA employment projections and comparison with 2015 round.

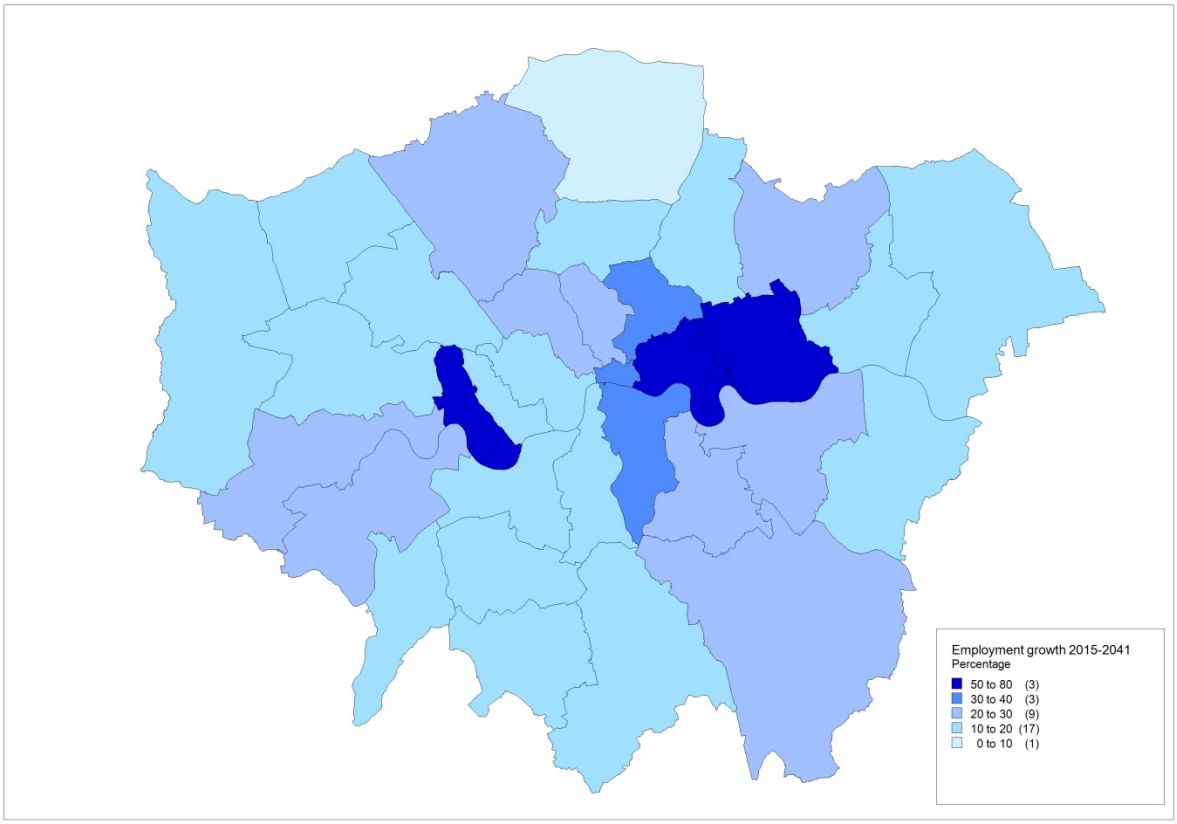
			2015-2041 Growth	
Previous (2016) round	**2015**	**2041**	**Jobs (000s)**	**% growth**
CAZ and NIOD	2,046	2,544	498	24%
Rest of inner	1,343	1,700	357	27%
Outer	2,149	2,503	354	16%
GLA total	5,538	6,748	1,210	22%
CAZ and NIOD	2,088	2,668	580	28%
Rest of inner	1,359	1,755	396	29%
Outer	2,133	2,484	350	16%
GLA total	5,581	6,907	1,326	24%

Source: Greater London Authority.

The GLA London total and sector projections are trend projections and estimate jobs in future years based on the historic productivity relationship between output and jobs, and assumed future output growth. The majority of additional employment growth in the new 2017 projection is in the CAZ (Central Activities Zone) and NIOD (North Isle of Dogs), where 2015-2041 growth is 4 percentage points higher than in the 2016 projection. Outer employment growth in the new 2017 projection remains the same as in the 2016 projection.

In 2041, the greatest employment density is in the central London boroughs, in particular the City of London and Westminster, followed by Camden, Tower Hamlets and Islington. Figure 4.8 shows projected employment growth by borough to 2041.

Figure 4.8 Latest GLA employment projections by borough 2015-2041.



Source: Greater London Authority.

The boroughs with the greatest percentage employment growth from 2015 to 2041 are Newham, Tower Hamlets and Hammersmith and Fulham, with over 50 per cent employment growth. The difference between the current and new employment projections is set out in table 4.4 below.

Table 4.4 Comparison of 2016 and 2017 employment projections for London.

Employment (thousands)					% Growth
Current 2016	**2015**	**2021**	**2031**	**2041**	**2015-2041**
CAZ and NIOD	2,046	2,191	2,379	2,544	24
Rest of Inner	1,343	1,433	1,557	1,700	27
Outer	2,149	2,169	2,317	2,503	16
GLA total	5,538	5,794	6,253	6,748	22
New 2017	**2015**	**2021**	**2031**	**2041**	**2015-2041**
CAZ and NIOD	2,088	2,334	2,527	2,668	28
Rest of Inner	1,359	1,500	1,644	1,755	29
Outer	2,133	2,231	2,379	2,484	16
GLA total	5,581	6,065	6,550	6,907	24
Difference	**2015**	**2021**	**2031**	**2041**	**2015-2041**
CAZ and NIOD	42	143	148	124	3
Rest of Inner	16	66	87	55	3
Outer	-15	62	63	-20	0
GLA total	43	271	298	159	2

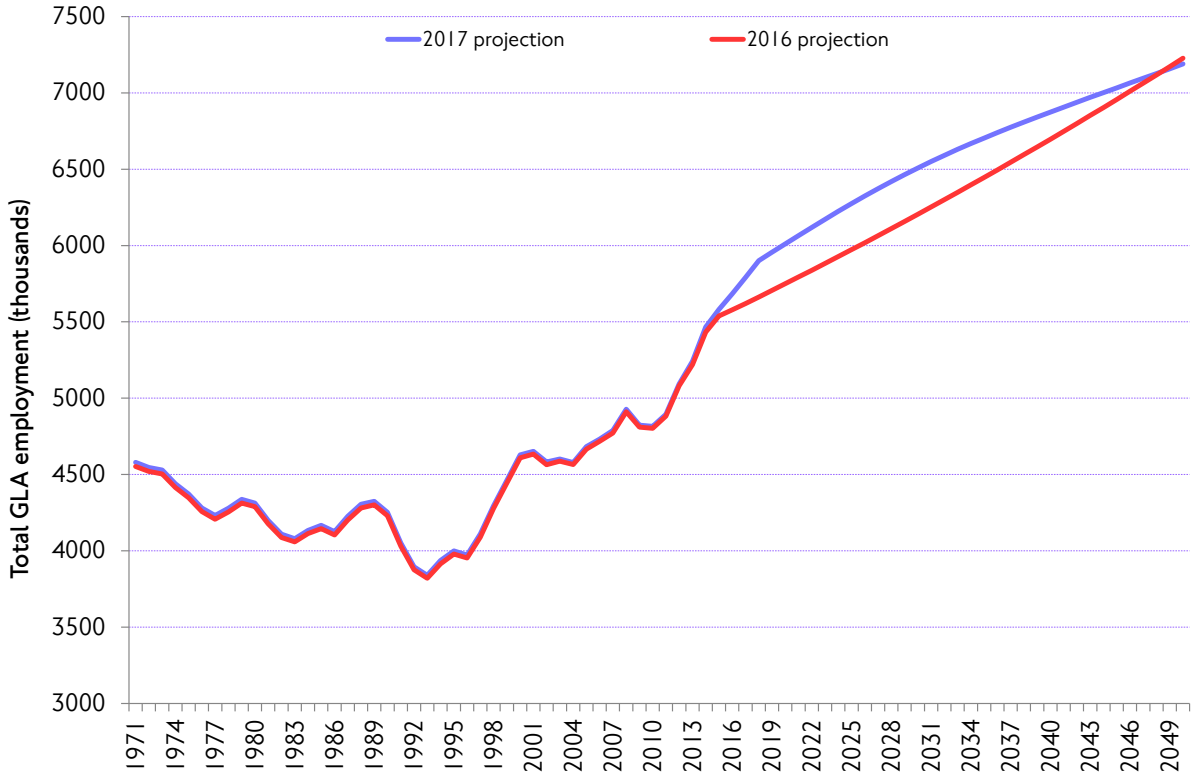
Source: Greater London Authority.

At a London level, the 2015-2041 employment growth in the new 2017 projection is 2 percentage points higher than in the 2016 projection, with total employment reaching 6.9 million in the new 2017 projection compared to 6.7 million in the 2016 projection.

The majority of additional employment growth in the new 2017 projection is in the CAZ (Central Activities Zone) and NIOD (North Isle of Dogs), where 2015-2041 growth is 4 percentage points higher than in the 2016 projection. Outer employment growth in the new 2017 projection remains the same as in the 2016 projection.

At a London level, the main change in the new 2017 projection compared to the current 2016 projection is the profile of jobs growth, which is shown in Figure 4.9 below.

Figure 4.9 Comparison of current 2016 and new 2017 total GLA employment projections.



Source: Greater London Authority.

Total London jobs growth in the new 2017 projection is greater than the 2016 projection in the short and medium term to 2030, slowing down to match the 2016 projection in 2046.

Uncertainty and TfL's approach to using projections

The growth projections produced by the GLA represent their central case best estimate of future population and employment. However, all forecasting must accept that the future is inherently uncertain and that this uncertainty increases as we look further into the future.

Economic growth, the relative success of London and its place in the world, and the location of population and employment all have a direct impact on travel demand. The number of people and jobs in London is a major factor driving total travel demand. The current projections assume continued strong growth, reflecting a continuation of London's success, but a review of historic trends suggests that this is probably subject to some uncertainty.

TfL has developed an approach that recognises the inherent uncertainty in forecasting. Robust assessment involves understanding how changes in the assumptions that form future model reference cases could influence schemes and policies as well as the core challenge.

TfL's approach is to vary the input assumptions in modelling, rather than changing the modelled relationships themselves. Aspects of uncertainty have been tested through sensitivity tests, including varying input assumptions to reflect a range of likely population and employment levels. More details can be found in the MTS

Outcomes Summary Report (see: https://tfl.gov.uk/cdn/static/cms/documents/mts-outcomes-summary-report.pdf).

Previously, TfL has used the GLA low and high variant projections as demand sensitivity test inputs which reflected uncertainty in short term output growth but assume the long term is unaffected. The new 2017 GLA variants reflect both short term and long-term uncertainty and therefore present a wider range of demand sensitivities.

Likely significance of the new projections

These revised projections are important as they change, although not in this case fundamentally, the basis for future travel demand forecasting. Because these forecasts are higher than previous forecasts, on the one hand, they are expected to improve the business case for future proposed strategic schemes. They are also likely to improve prospects for meeting the Mayor's 80 per cent active, efficient and sustainable mode share target, all other things being equal, because of the relationship between population, density and travel mode choice. On the other hand, further increases to population and employment would increase pressures on the overall transport network beyond those foreseen in the draft MTS.

4.4 Wider factors affecting travel demand – an update

When, in 2014, TfL published 'Drivers of demand for travel in London: a review of trends in travel demand and their causes', London had seen fifteen years of falling car use and mode shift away from private car travel towards public transport, walking and cycling. The report reviewed a range of factors that were viewed as possible influences on travel trends, and found that almost all factors that could have had an influence had acted to support mode shift away from car use.

Key points from the 2014 report were that:

- Supply improved on public transport and declined for cars – there were capacity increases on rail and bus, no rise in public transport fares pre-2003 and substantial decreases in bus fares. Highway capacity reduced by about 1 per cent annually from 1999, and fuel costs increased for most of the period, with large increases from 2010 onwards.
- Underlying demand grew more in inner London than in outer London – household incomes in outer London did not increase from 2003 and the inner London economy grew faster than outer London from 1998.
- Structural changes led to more people with lower car-dependency – there was disproportionate population growth in inner London, and increase in non-UK born migrants to London and a decline in driver licence holding among young Londoners.

However, since 2014, there has been a reversal in many of these 'favourable' factors. Aggregate car use has ceased to decline, and while overall public transport use has continued to grow, bus use has declined and there are indications that the growth in public transport use may not continue at the same rate as it has done in recent years.

The following section explores how some of the factors that were analysed in the 2014 report have developed and what influence this has had on travel.

Supply factors

Network capacity has developed differently for different modes

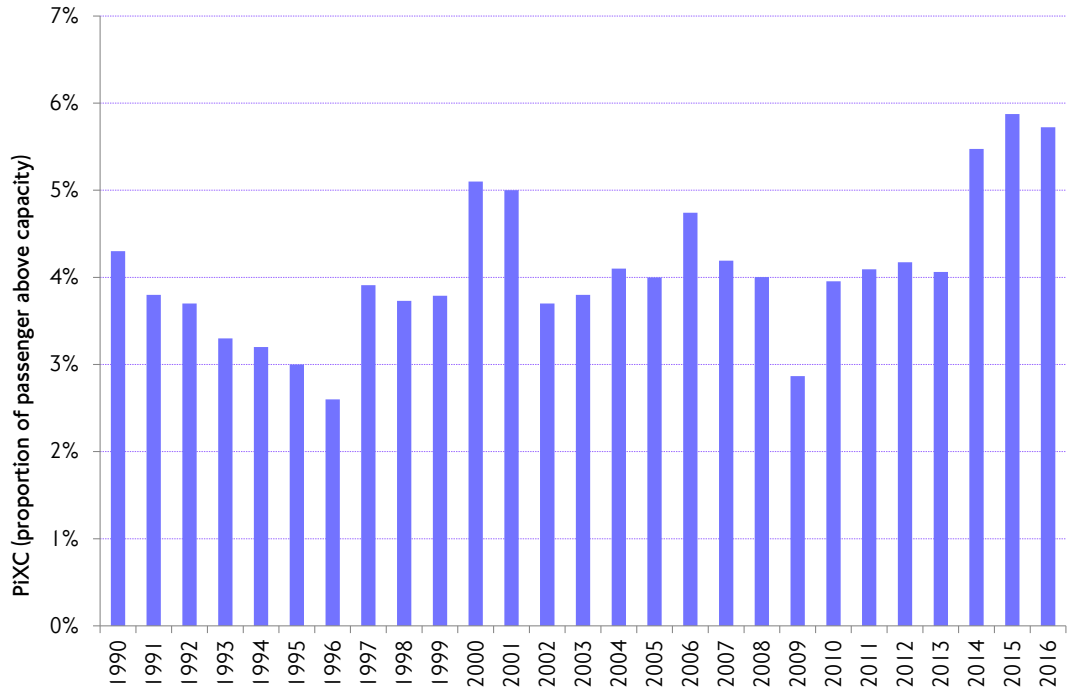
London's public transport network has seen substantial investment since 2000 as well as improvements in overall customer experience, for example through an integrated approach to planning transport and better provision of information.

During the early part of the 21st century, TfL invested heavily in the bus network, resulting in an increase of 20 per cent in bus-kilometres between 2000 and 2003. Bus network capacity continued to increase at a slower but consistent rate between 2003 and 2012, with an additional 10 per cent additional bus kilometres added during this time. Since 2012, however, the increase in bus kilometres has been just 1 per cent. The removal of road network capacity, for example to support cycle infrastructure construction over the short term, has had a direct impact on bus speeds, with a known effect on bus patronage and bus kilometres.

In comparison to the slowing in growth seen in bus capacity, Underground capacity has sustained relatively constant growth since the slight decline in the years immediately preceding the 2012 Olympic Games when a large amount of upgrade work was underway. Between 2000 and 2012, the volume of train kilometres operated increased by 19 per cent. Since 2012, there has been a further 11 per cent growth in the volume of train kilometres.

National Rail services in London are not all operated by TfL, and directly comparable statistics on capacity are not readily available. At the aggregate level, though, crowding levels on rail services in London and the South East since 2014 have been higher than any reported level since 1990 (figure 4.10). This indicates that growth in capacity has not kept pace with the growth in demand, which has increased by 35 per cent since 2012 in terms of passenger numbers.

Figure 4.10 Passengers in Excess of Capacity, London and South East region.



Source: Department for Transport.

In contrast to the growth in Underground capacity, road network capacity in London has been declining over the long term. The decline in road capacity cannot be observed directly, but can be inferred from the relationship between traffic volumes and the average speed of travel on the network.

Figure 3.20 in the previous chapter shows that between 2007 and 2013, the volume of traffic declined across all areas of London, although the rate of decline was faster in central and inner London compared with outer London. However, between 2013 and 2016, the volume of traffic has increased in all areas of London, by 3.5 per cent in central London, 2.1 per cent in inner London and 3.3 per cent in outer London. There has been a corresponding decrease in average traffic speed since 2013 and an increase in average vehicle delay

As well as the increase in traffic volumes, the observed decline in traffic speeds is due to a reduction in effective road network capacity, with space being reallocated from general motor traffic to other purposes, particularly cycle lanes, as well as safety initiatives and improvements to the public realm (for further consideration of this aspect, see Travel in London report 4, section 4.13).

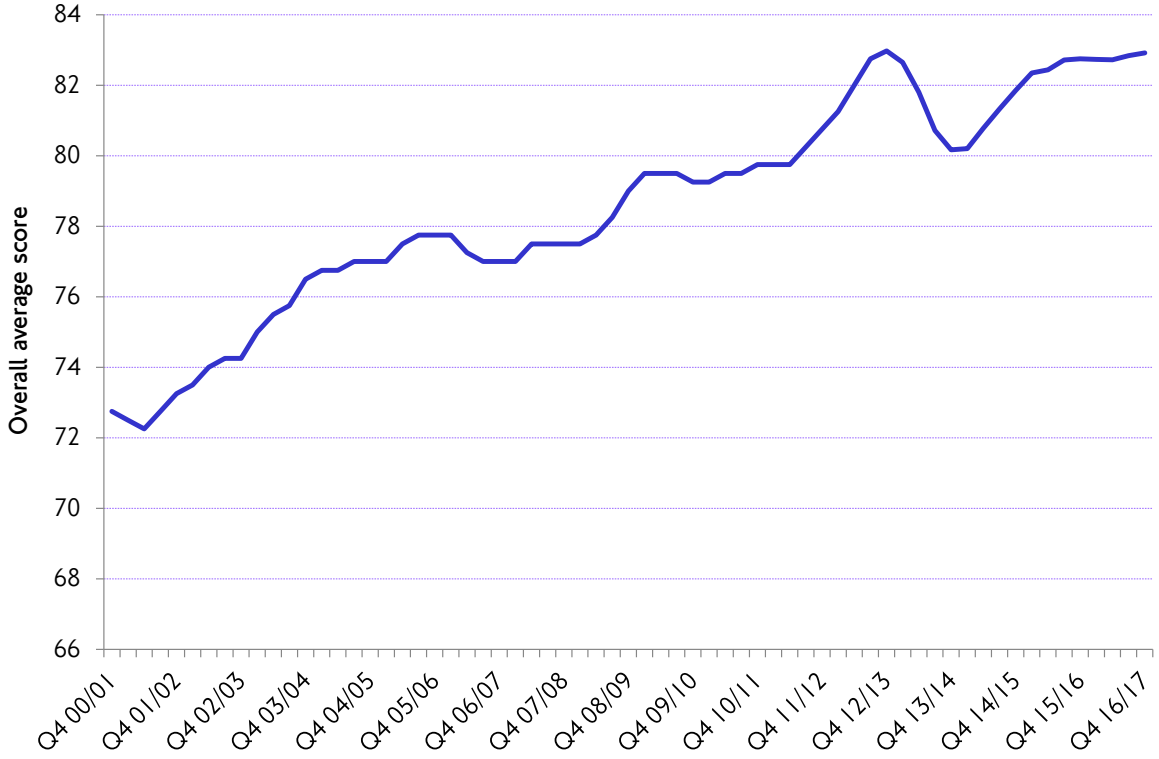
Quality of service on public transport

Many aspects of public transport service quality have been transformed since 2000, for example:

- The introduction of live bus information at more than 2,500 bus stops, and audio-visual technology on all TfL buses to help people to navigate their journeys around London.
- Live public transport service information available to customers on their mobile phones.
- Introduction of WiFi, which is now available at more than 260 Tube and 79 London Overground stations across the network.
- Ease of payment – for example the introduction of Oyster and contactless payment.
- Improving accessibility on the Tube and London Overground by making more stations step-free.

Figure 4.11 shows the long-term increase in customer satisfaction on the Underground, with a peak during the Olympic Games, reflecting improvements to many elements of customer experience. There was a slight decline in overall satisfaction with the Underground following the Olympic Games, but satisfaction scores have increased since then.

Figure 4.11 Customer satisfaction - overall average score, London Underground.



Source: TfL Customer & Employee Insight.

Cost of travel

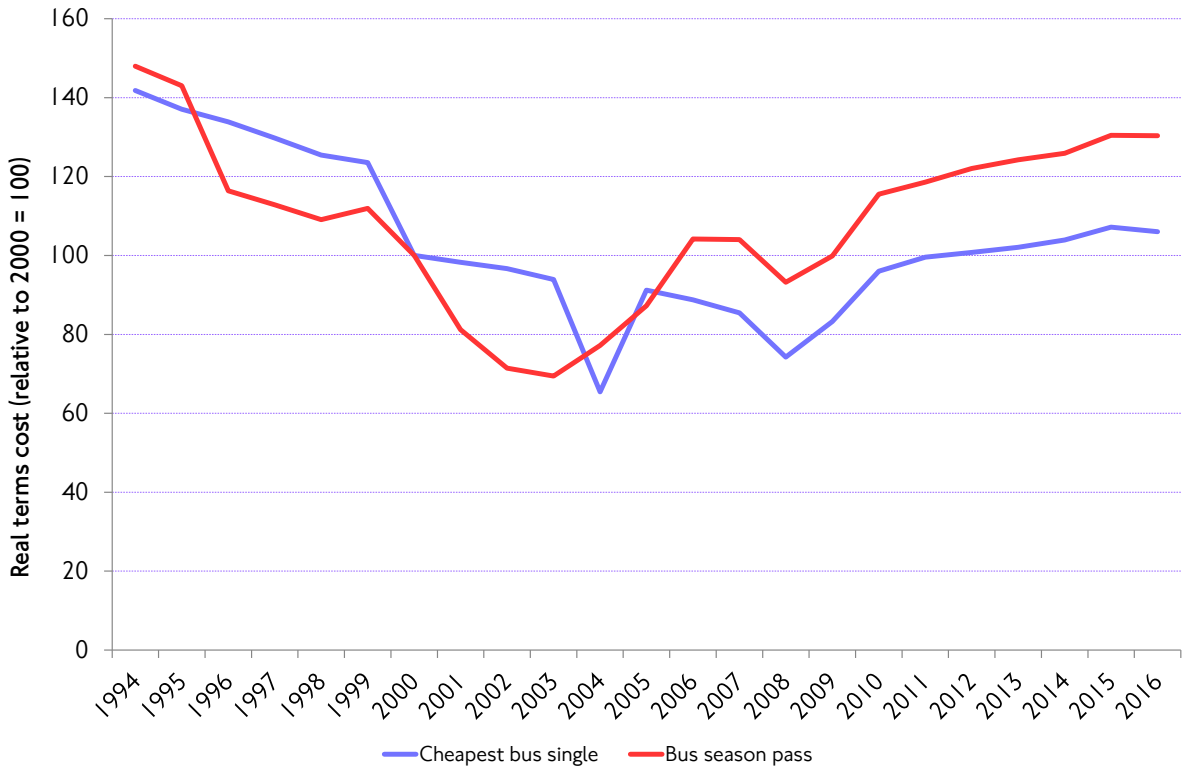
Cost of travel is a major factor in the modes of transport people choose to use and in the frequency of which they choose to travel.

Single fares for both bus (figure 4.12) and Underground (figure 4.13) cost approximately the same in 2012 as they did in 2000 in real terms. However, since 2012, the cost of bus and Underground single fares have increased in real terms, by about 5 per cent and 3 per cent respectively. This pre-dates the imposition of a fares freeze by the Mayor.

The cost of season tickets have been steadily rising over a longer time period, with the cost of a bus season ticket increasing by 8 per cent since 2012 and Underground season tickets increasing by 6 per cent over the same period.

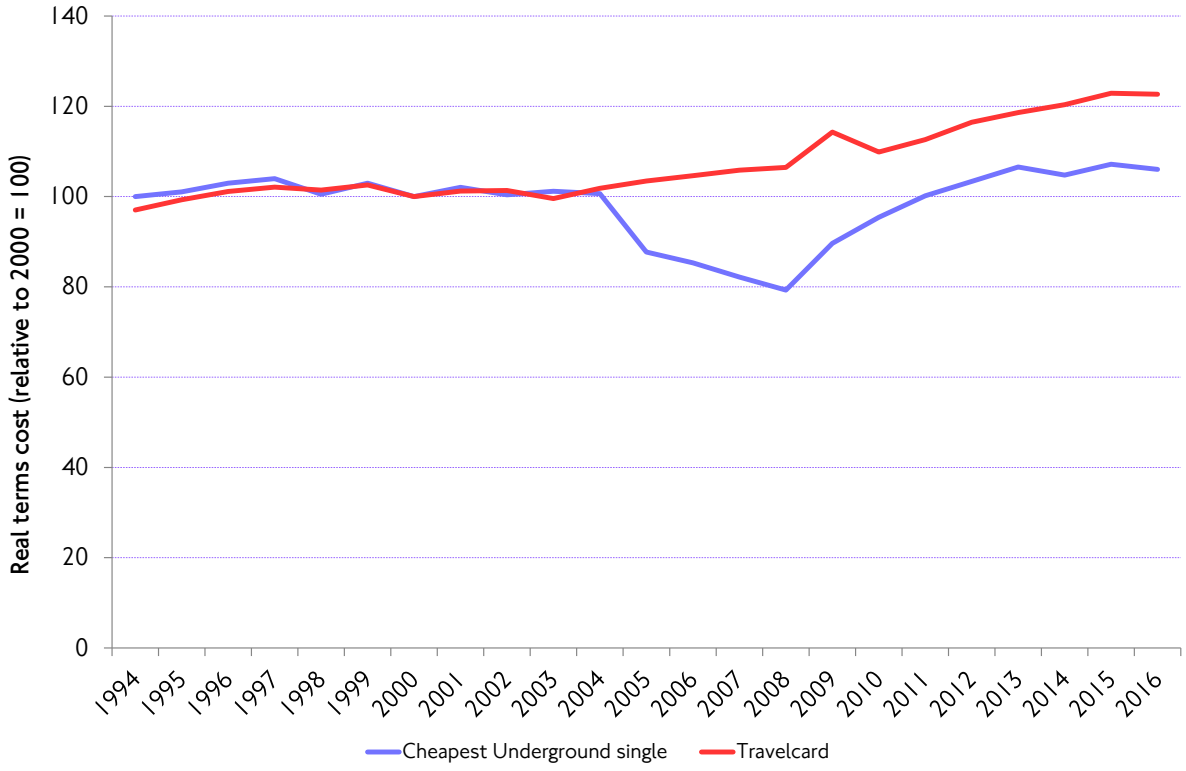
Rail fares have also increased in real terms (figure 4.14) with season tickets and single fares rising by about 6 per cent since 2012, despite the small decrease in the latest year.

Figure 4.12 Trend in real terms bus ticket costs (indexed by RPI).



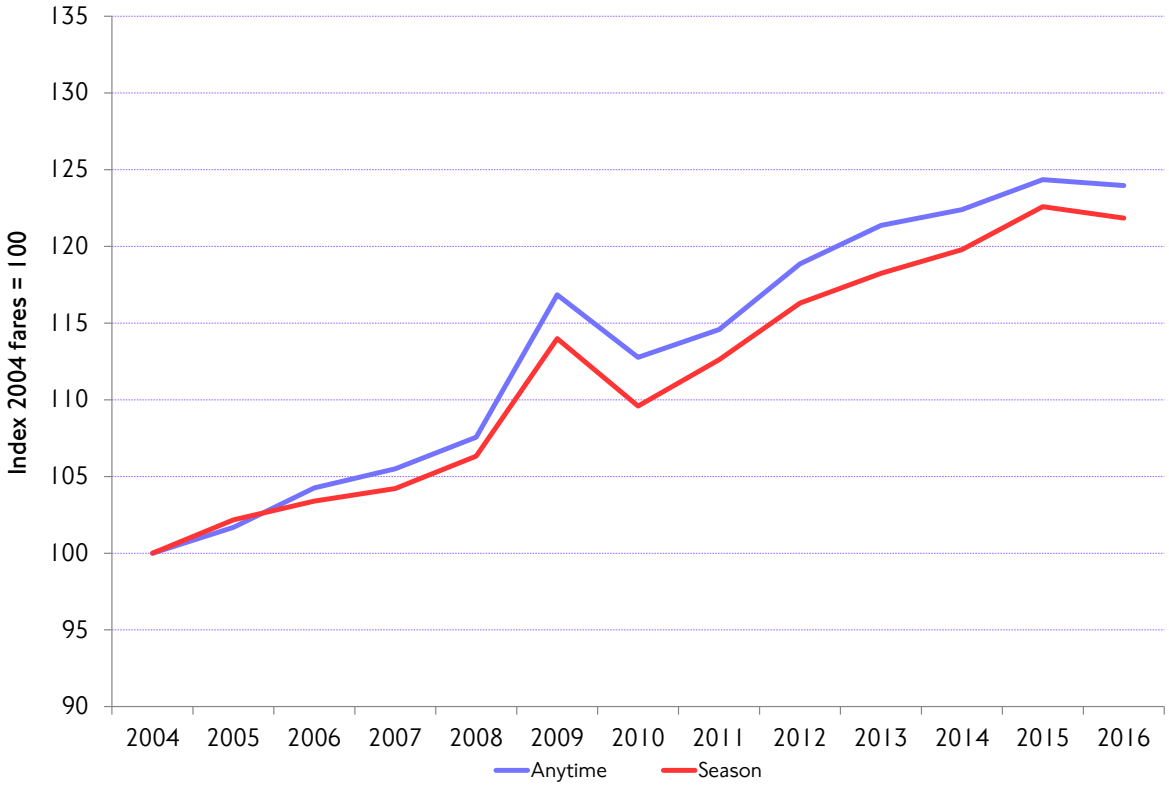
Source: TfL fares data.

Figure 4.13 Trend in real terms Underground ticket costs (indexed by RPI).



Source: TfL fares data.

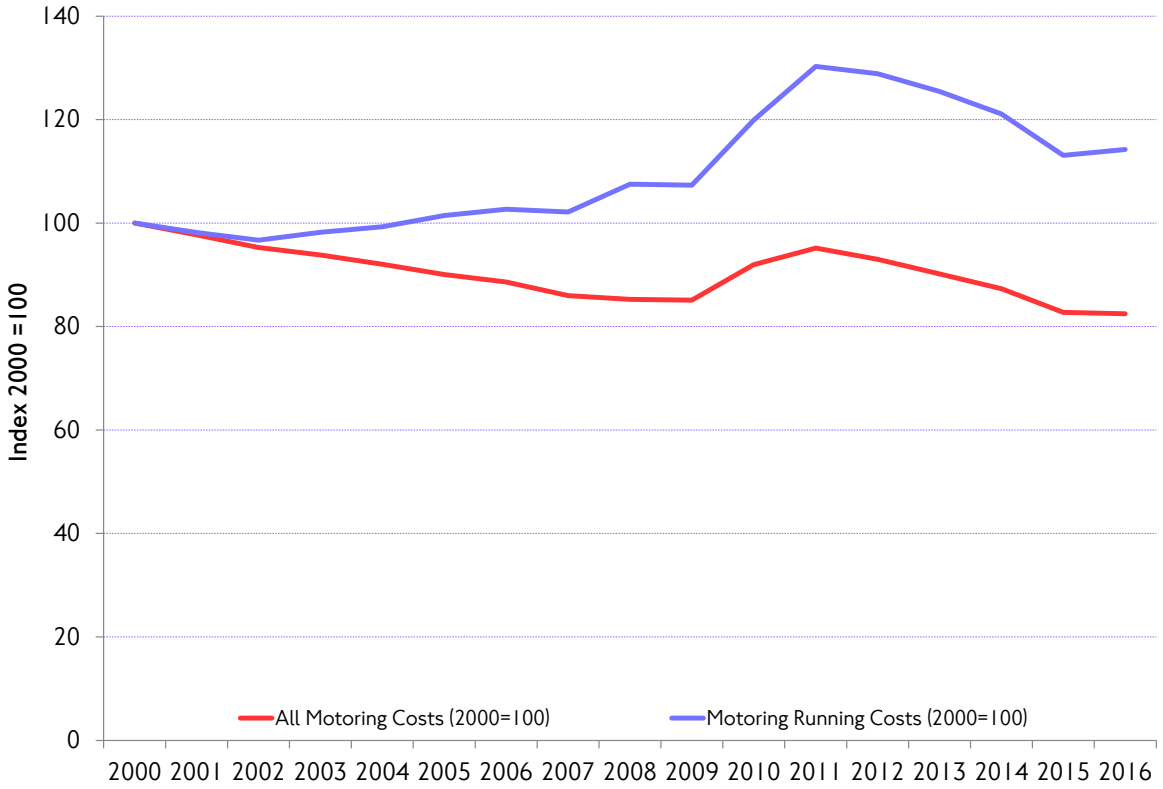
Figure 4.14 Rail fares index in real terms, London & South East region (indexed by RPI).



Source: Department for Transport.

Since 2000, motoring costs as a whole have grown at a slower rate than RPI ie the growth in the cost of owning and running a car has been slower than growth in the cost of living in general (figure 4.15). Motoring running costs increased substantially (by 29 per cent) between 2000 and 2012, however since 2012 there has been a reversal in this trend, with motoring running costs decreasing by 14 per cent.

Figure 4.15 Motoring costs relative to RPI.

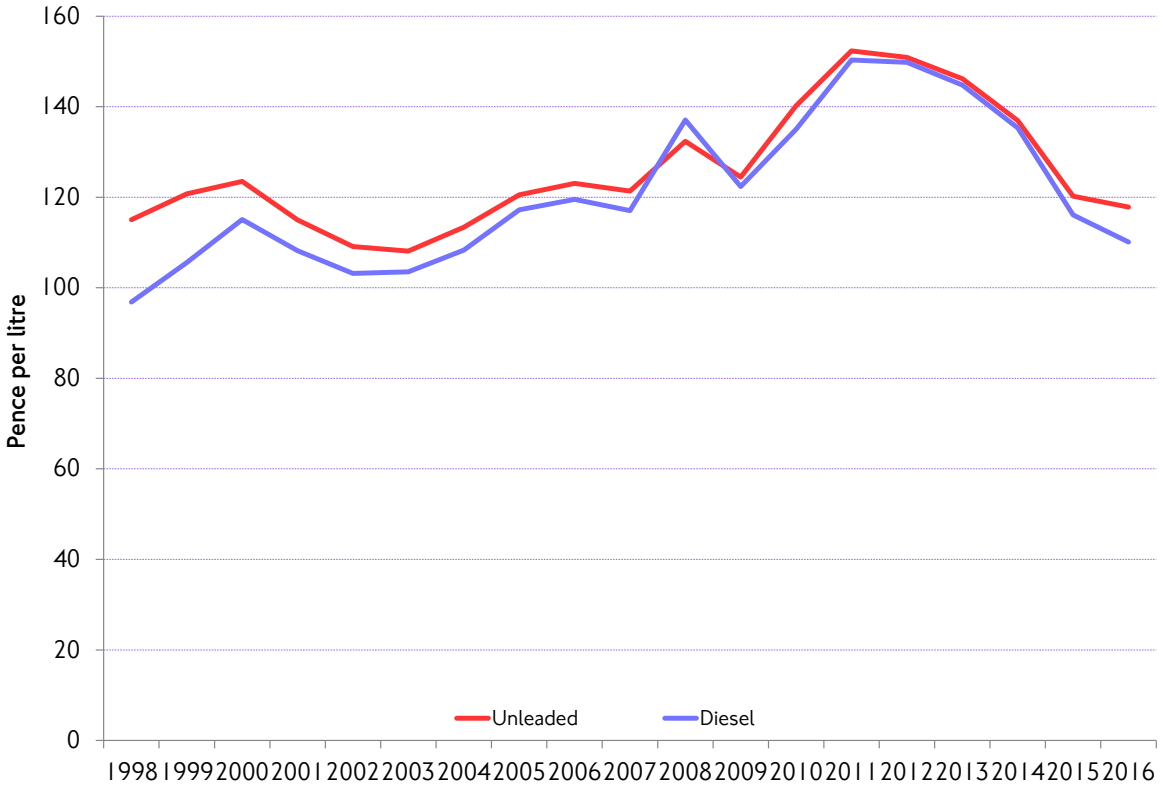


Source: Department for Transport.

Following a sharp rise in real term fuel costs between 2009 and 2011, fuel prices have declined substantially, with a 35 per cent decline in real term Unleaded costs and a 40 per cent decline in real term Diesel costs (figure 4.16).

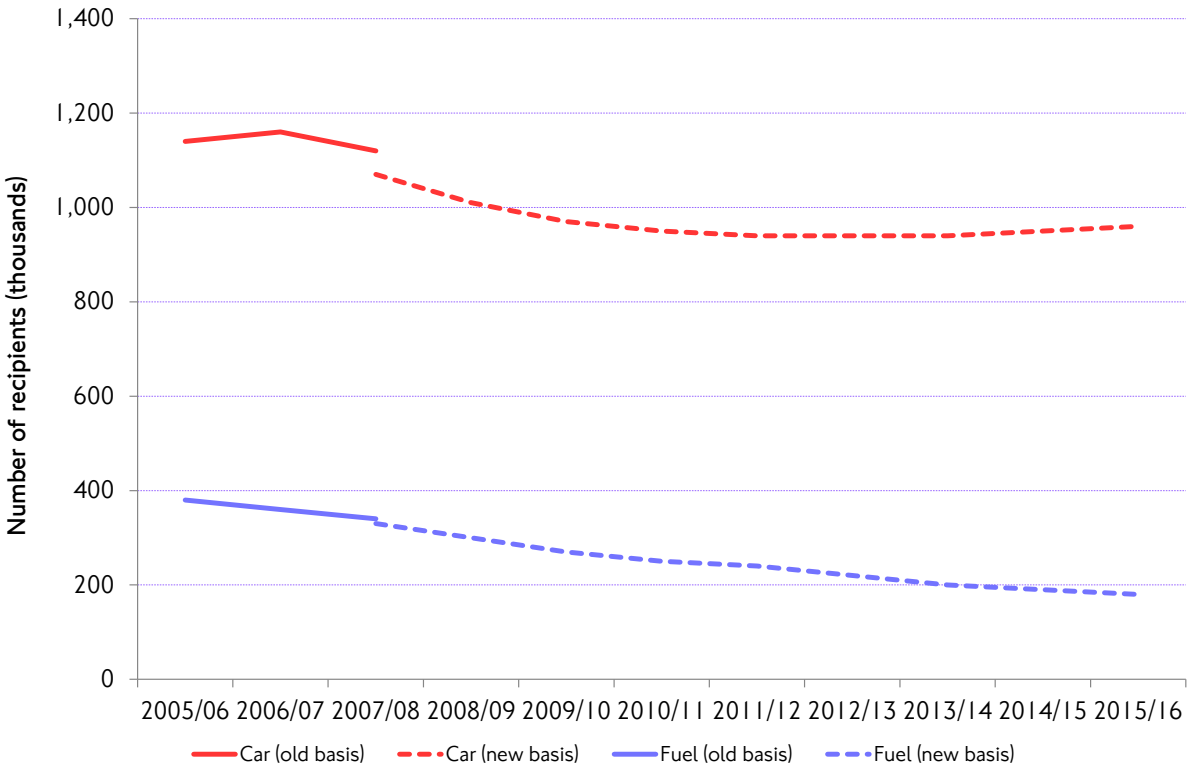
The number of people provided with company cars in the UK has been declining, with a 10 per cent reduction in the number registered between 2007/08 and 2015/16 (figure 4.17). An even greater reduction has taken place in the number of people receiving car fuel benefit, with a 45 per cent decline over the same period.

Figure 4.16 Fuel cost at 2016 prices (indexed by RPI).



Source: Department for Energy and Climate Change.

Figure 4.17 Recipients of company car and fuel benefits.



Source: Department for Transport.

Licence holding

The previous Drivers of Demand report highlighted the trend of declining licence holding amongst the youngest generations of Londoners. In 2016/17, the percentage of London residents aged 17-24 who hold a full driving licence was 34.8 per cent, much lower than all other age groups, and a slight decline from 35.2 per cent in 2012/13. This continuation of the trend in lower levels of licence holding among the youngest generation of Londoners means that car trip rates per person could fall in the future, although this will also be influenced by the relative attractiveness of public transport in relation to car travel going forward.

Parking policy

While monetary cost of travel and time costs incurred during travel are factors common to both car travel and public transport, car travel involves a further supply-constrained element: parking. Parking can involve monetary costs, for example metered parking or residents' parking permits, and time costs, where difficulty finding a parking space leads to more time spent searching for a space or it being necessary to park further from the destination.

Although parking accounts for a significant element of the generalised cost of travel by car, there is a lack of robust data relating to either the cost of parking or the extent to which policy has affected its supply over the long term.

There were substantial changes to on- and off-street parking regulations in the 1990s. Maximum parking standards were introduced for new developments, which has constrained parking supply over the last ten to fifteen years. The transfer of responsibility for on-street parking from the police to Local Authorities in 1993/94 led to the spread of spatial and temporal restrictions on parking.

There have not been any substantial changes to parking policy that would have significantly affected car travel demand since the publication of the previous Drivers of Demand analysis as of the London Plan published in March 2016.

Summary of supply changes

Since 2012, therefore, there has been a reversal of many of the long-term trends affecting the traditional drivers of travel demand. The growth in capacity on public transport modes has either slowed or stalled, and crowding on the London & South East rail networks is at its highest levels since 1990. Road network capacity has also declined though, resulting in a decrease in average traffic speeds and a resulting increase in delay.

The real term costs of public transport have increased since 2012, and coupled with the fairly dramatic decline in motoring and fuel costs may mean that car travel is become relatively more attractive in relation to public transport travel than in previous years. Having said that, overall satisfaction with the public transport networks continues to increase, indicating that public transport is still attractive to use, perhaps due to the improvements in information provision, integration and safety.

Demand factors

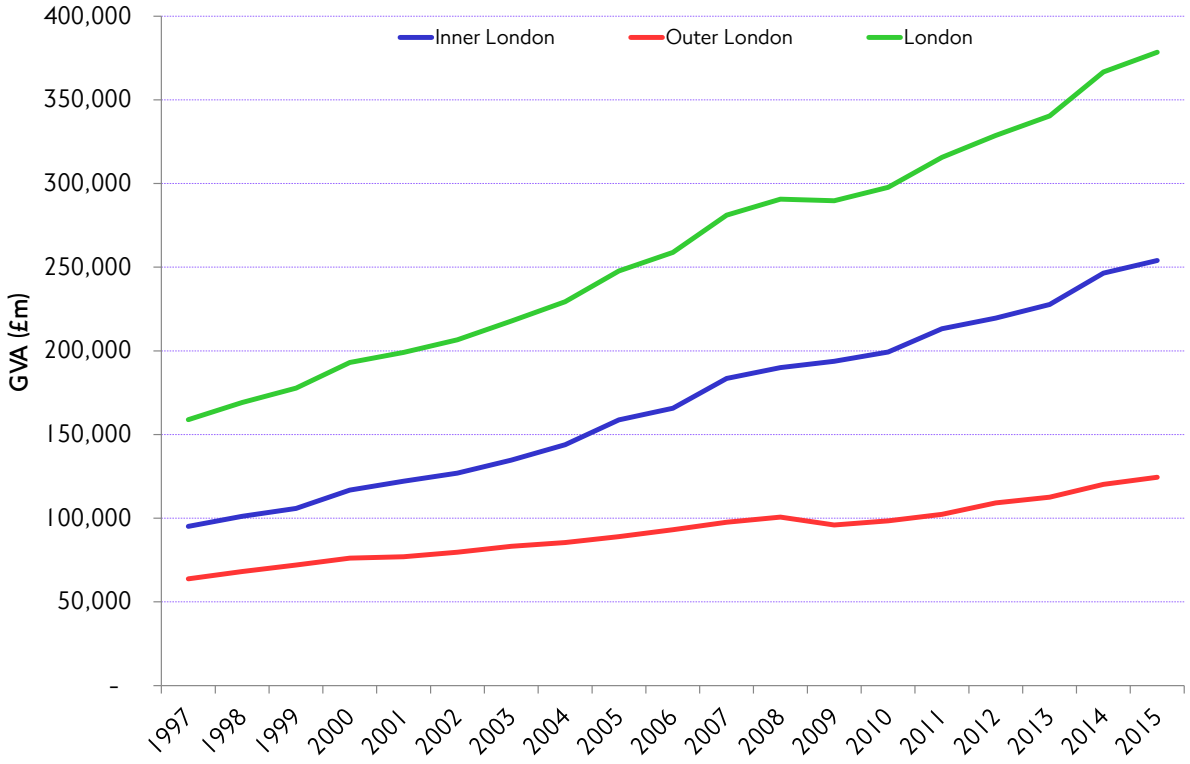
Unlike the supply factors, the underlying demand factors that have influenced travel patterns do not relate to changes within the immediate realm of transport. These

factors relate to the number of people who want to travel in London and how much they want to travel.

Economic performance in inner and outer London has differed

The productivity of London's economy, measured in Gross Value Added (GVA) increased steadily between 1997 and 2007 (figure 4.18). The majority of the growth in productivity in London as a whole over this period was down to strong growth in inner London. Growth slowed in inner and outer London between 2007 and 2011, and since then, growth in inner and outer London has been much more even, increasing by 19 per cent in inner London and 22 per cent in outer London.

Figure 4.18 Gross Value Added (Income Approach) at current basic prices.

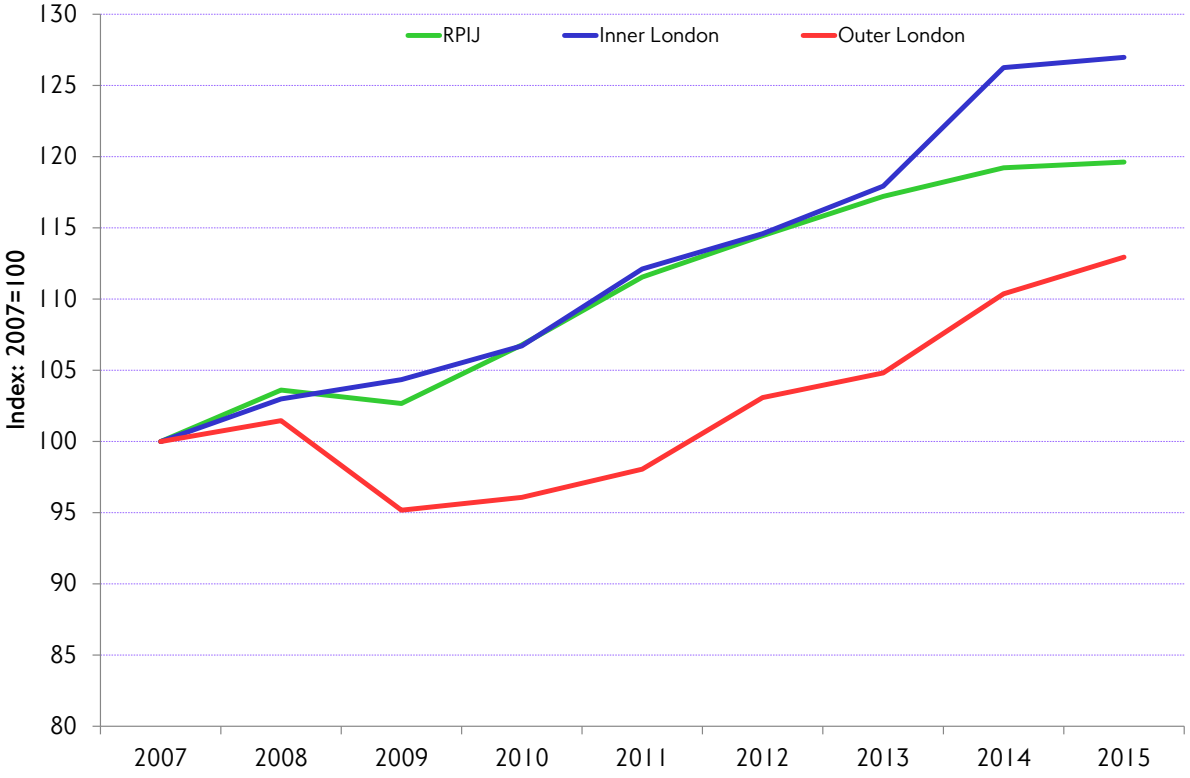


Source: Office for National Statistics.

The growth seen in inner and outer London's economies during the recession was in part due to the continued growth in population in both regions.

Looking at production per capita, inner London's productivity grew at a similar rate to inflation as measured by RPIJ (a Retail Prices Index based measure of consumer price inflation) over the period from 2007 to 2013 and grew in real terms between 2013 and 2015 (figure 4.19).

Figure 4.19 Gross Value Added (Income Approach) per head of population at current basic prices (Index: 2007=100).



Source: Office for National Statistics.

The UK economy is stagnating

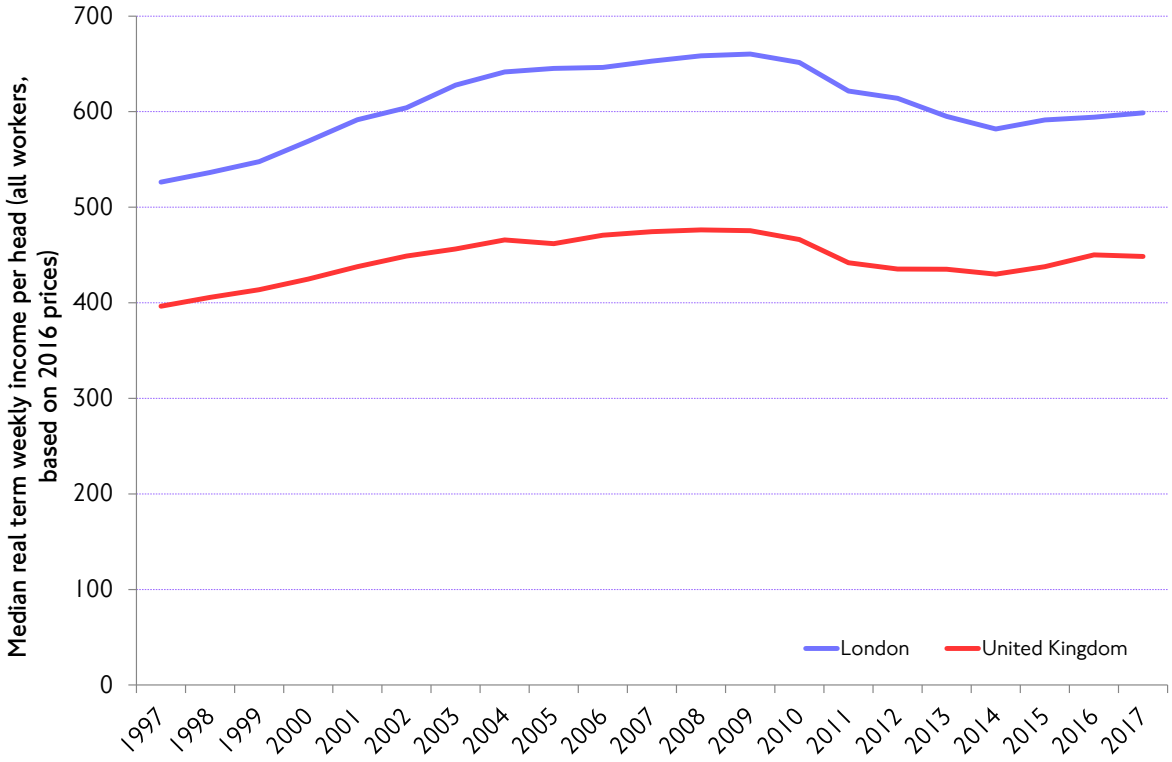
Although London's economy has shown growth over the last four years, more recent trends in the UK indicate that economic conditions are stagnating. GDP fell significantly in 2017 and per capita GDP growth was close to zero, with any growth mostly a result of increasing population. Following the EU referendum in June 2016, the value of the pound fell to a historic low, leading to higher import prices, higher inflation and interest rate rises. It also means that the UK is less attractive to foreign workers due to lower pay, but more attractive to foreign visitors due to cheaper costs.

Real-term incomes have been increasing following the recession

Following a period of increase between 1997 and 2009, real weekly incomes per capita declined between 2009 and 2014 (figure 4.20). Since 2014 though, real incomes have started to rise very slightly in London. Since car ownership and use are linked to higher incomes, the fact that real incomes have increased in recent years coupled with the changes in the supply factors described above could have contributed significantly to the recently-observed increase in the volume of road traffic in London.

At the national level, very recent trends show that earnings growth has failed to keep pace with inflation in 2017, meaning that incomes have fallen in real terms in the last year. UK retail sales growth has stalled over the last year, which is consistent with the fall in real term incomes, and has meant that there has been a decline in discretionary purchases.

Figure 4.20 Median real term weekly income per head.



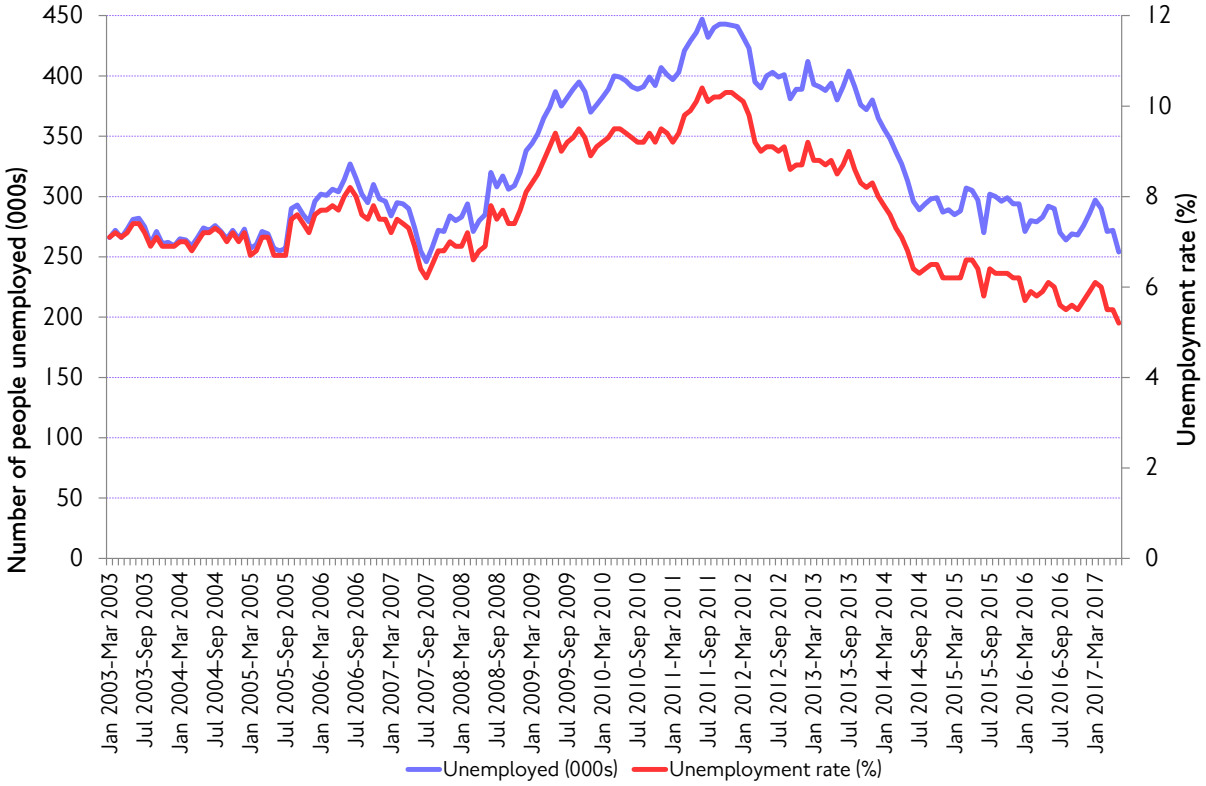
Source: Office for National Statistics.

Unemployment has decreased steadily since 2011

Unemployment in London increased during the recession, rising from a low of 6.4 per cent in summer 2007 to a peak of 10.4 per cent in summer 2011. Since 2011, the unemployment rate has continued to fall, and is currently at the lowest rate recorded (5.2 per cent in Summer 2017) since before 2003 (figure 4.21).

Travel behaviour amongst unemployed people is significantly different to that of the rest of the working age population, with the unemployed making fewer trips by mechanised transport compared to those in full-time employment. Given the decrease in the unemployment rate since 2011, an increase in the demand for public transport and car trips would be expected, although the impact of this may have been somewhat offset by the emerging trend of declining travel among London residents explained in section 4.2.

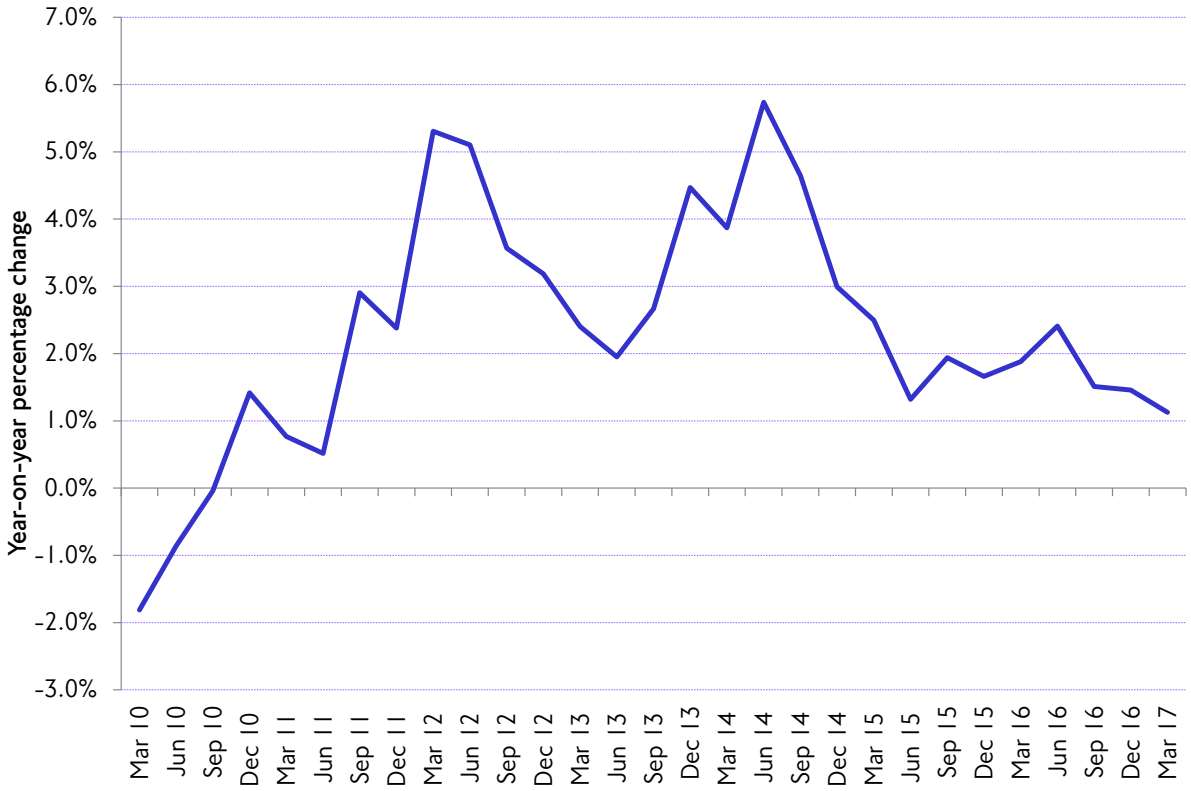
Figure 4.21 Unemployment in London 2003-2017.



Source: Office for National Statistics.

Although unemployment has decreased significantly over the last few years, the rate of employment growth in London has slowed. In Q1 of 2017, growth in London workforce jobs fell to 1.1 per cent, the lowest rate since 2011 (figure 4.22).

Figure 4.22 Year-on-year change in London workforce jobs.

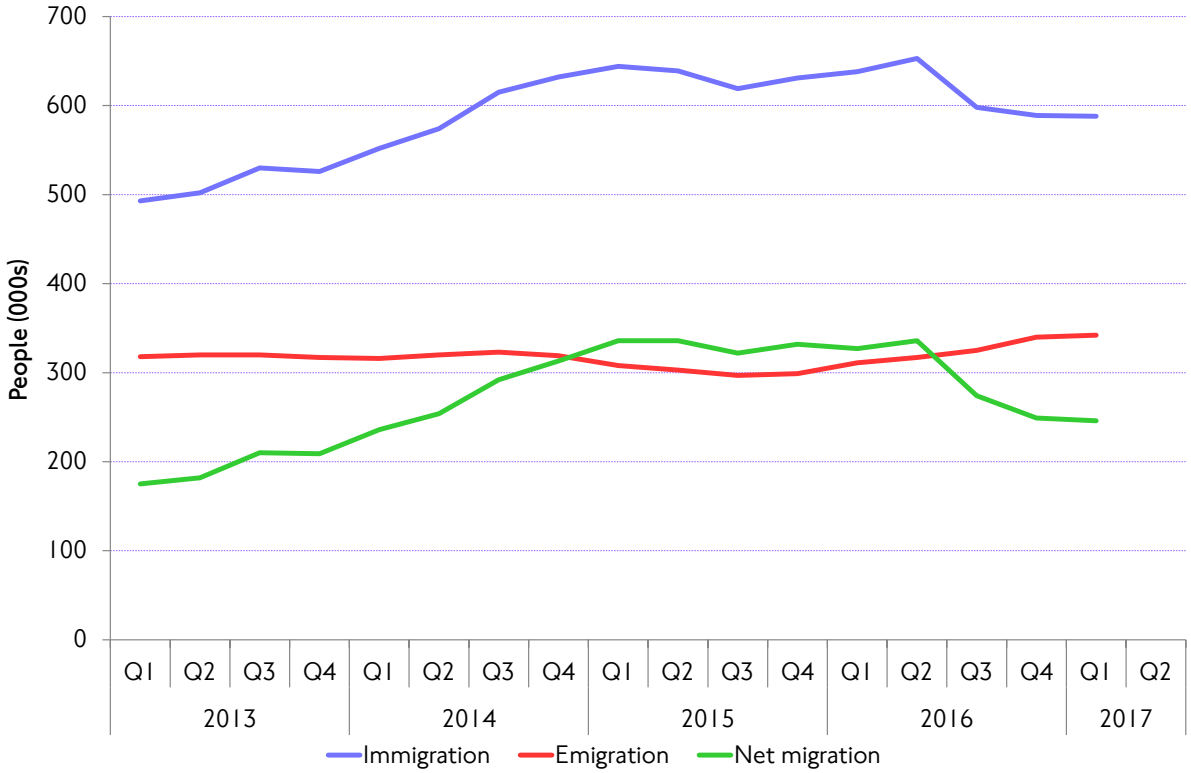


Source: Office for National Statistics.

Net migration in the UK has fallen

Since the European Union (EU) referendum, net migration in the UK has fallen significantly as immigration has fallen and emigration has risen (figure 4.23). London has a proportionately high immigrant population – 13 per cent of workers were born in another EU country, compared to around 5 per cent nationally – and therefore if this trend continues, London's supply of labour is likely to be constrained. This could have a significant impact on travel demand, as travel patterns differ according to place of birth – London residents born outside of the UK have low car ownership, the lowest car use and the highest bus use of all Londoners (see section 2.7 in Travel in London report 9 for more detail on this aspect).

Figure 4.23 UK migration flows.



Source: Office for National Statistics.

Summary of demand factors

At the individual level, many of the established theories linking personal incomes to the quantity of travel and mode choice remain true, even as London has changed. The total quantity of travel is higher amongst those with higher incomes, and the elasticity of demand for travel with relation to income differs by mode: demand for rail modes increases while demand for bus travel decreases as incomes rise.

The recession had a substantial effect on travel, as changes in economic activity, incomes and productivity led to reduced travel. However, since 2012, economic growth in inner and outer London has been steady, increasing by 19 per cent in inner London and 22 per cent in outer London.

The productivity of inner London grew in real terms between 2013 and 2015, and since 2014 real incomes have risen very slightly in London. Unemployment rates have fallen steadily since 2011 and are currently at their lowest level since before 2003. All of these factors point to an increase in the demand for travel, which again seems to have been somewhat offset by the emerging trend of declining travel per person outlined in section 4.2 above.

However, very recent trends suggest that the UK economy is performing poorly, and despite high employment, growth in workforce jobs has slowed.

Conclusions

In the broadest terms, travel demand remains dependent on a range of exogenous factors such as the economy, population and demographics. The review of the factors affecting travel demand in the 2014 report found that almost all factors that could have had an influence had acted to support mode shift away from car use.

However, since 2012, there has been a reversal in a number of established trends, for example:

- Slower growth in public transport capacity, particularly on the bus network and increased crowding on rail services.
- Real terms increases in public transport fares, alongside declining motoring and fuel costs.
- An increase in the volume of motorised road traffic, as well as declines in average traffic speeds.
- A substantial decline in rates of unemployment and a small increase in real term incomes.

The combination of these factors does not support mode shift away from car use as public transport is becoming less attractive in comparison with the car. The rise in real term incomes and decline in unemployment may generate desire for increased car ownership and use, particularly if growth in public transport capacity does not increase and real terms fares continue to rise. However, the relative decline in road network capacity and the increase in traffic volumes may mitigate an increase in car use to an extent.

It remains to be seen whether the reversal in a number of long-term trends affecting travel demand in London will continue. The future trajectory of the UK economy is highly contingent on the nature of the long-term relationship with the EU and this unprecedented uncertainty leaves London in a vulnerable position, particularly in terms of labour supply. London's economic position could have a significant impact on travel demand going forward, as well as other factors such as the emerging decline in travel among Londoners.

Section 2: Healthy Streets and healthy people

5. Physical activity and travel

5.1 Introduction

The Mayor has made it his ambition that every Londoner walks or cycles for twenty minutes every day (in periods of at least 10 minutes). This is important because everyone needs to be active every day helps to prevent a wide range of diseases. The easiest way for Londoners to keep active is to build walking or cycling into their daily travel, either through walk and cycle trips or as part of a public transport trip. The Healthy Streets Approach provides the framework of policies and strategies that are needed to help Londoners achieve this. Active travel, and encouraging active travel through transport strategies and plans, therefore has a major role to play in improving the health of Londoners.

5.2 Physical activity and travel

Previous Travel in London reports explored active travel among different socio-demographic groups. For example, Chapter 9 in Travel in London report 7 developed the evidence base for the importance of active travel and the Healthy Streets Approach. It also summarised how levels of active travel vary according to household income, car ownership, ethnic group, borough of residence and age.

Key points were that:

- More than 40 per cent of Londoners do not achieve the recommended 150 minutes of physical activity a week.
- Around 28 per cent of Londoners do less than 30 minutes of physical activity a week.
- Four in 10 children in London are considered to be overweight or obese and the number of teenagers with depression has doubled since 1980.
- Eight in 10 children in London do not achieve the minimum recommended (for them) physical activity level of one hour per day.

Reducing inactivity through active travel

- LTDS shows that an estimated 60 per cent of Londoners would achieve the recommended levels of physical activity if all of the trips that could potentially be walked or cycled were made actively.
- Most of the people currently not achieving two sessions of 10 minutes of physical activity are less than 50 years of age (although the proportion of residents achieving the target decreases with age, the younger age groups have larger populations, so in terms of absolute numbers there are more people who are not achieving the target).
- Some 72 per cent of Londoners say that they would walk more if there was improved safety and security and 66 per cent say that they would walk more if streets were cleaner and more attractive.
- Car owners are 2-3 times less likely to achieve minimum recommended physical activity levels.

The role of public transport in active travel

Section 5.5 in Travel in London report 9 summarised the role of public transport in active travel. The transport system in London plays a very important part in people's health by enabling them to be physically active through everyday walking

and cycling - almost all (97 per cent) trips by public transport include at least one walk or cycle stage. This is the main way that many people stay physically active, and increasing active travel is likely to be the easiest way for relatively inactive Londoners to incorporate more activity into their daily routine to meet their physical activity needs.

5.3 Achievement of recommended daily physical activity through active travel

How do we currently measure physical activity?

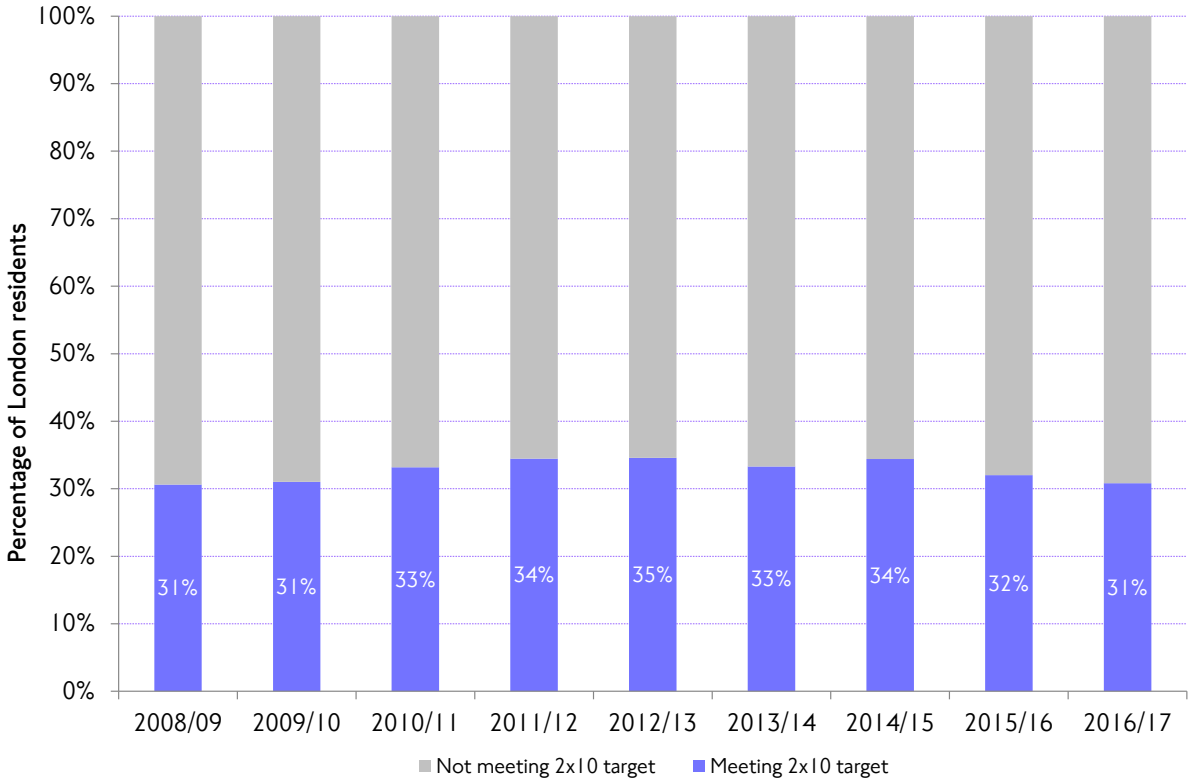
By measuring the number of people who report doing two ten-minute sessions of walking or cycling on the previous day, we can show how many Londoners are achieving minimum healthy levels of activity through active travel alone. This does not include other forms of physical activity, such as sport, which are additional to this measure.

Achievement of two ten-minute sessions of active travel – recent trend

The LTDS survey offers the best available data source on active travel in London, giving a daily snapshot of travel behaviour by London residents. From this source, we see that approximately one-third of Londoners have reported achieving two ten-minute periods of active travel per day over recent years. Some variability is to be expected on a year to year basis, but the balance of the trend over the most recent two years has been downwards – in the wrong direction in terms of the Mayor's target. It is thought that this is likely a reflection of the wider trend towards lower overall trip rates for Londoners, discussed in section 4.2 of this report. LTDS data shows that the number of walk stages made as part of trips with bus as a main mode (which account for around one-fifth of all walk stages) are down 15 per cent in 2016/17 compared to 2015/16. Walk stages made as part of Underground/DLR trips (accounting for around 17 per cent of all walk stages) are also down by 3 per cent in the latest year.

It should be noted that although the percentage of London residents who meet the physical activity target through active travel alone has decreased in the last few years, people are also active in other ways, for example through their normal daily activities or through leisure activities. Intermediate walk stages of longer public transport trips also contribute to people's total daily activity.

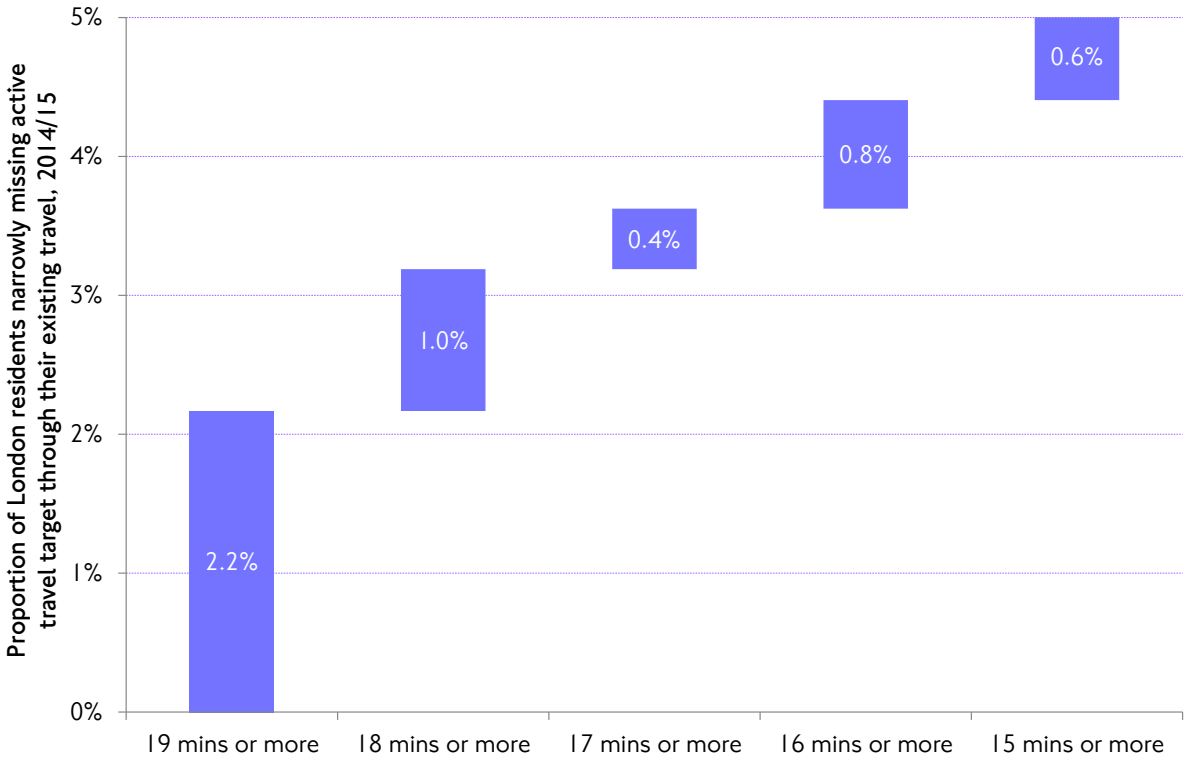
Figure 5.1 Proportion of London population achieving two ten-minute periods of active travel, by year, LTDS London residents aged 20 and over.



Source: TfL City Planning, Strategic Analysis.

Figure 5.2 shows the proportion of London residents who are narrowly missing the active travel target through their existing travel (those who are currently achieving just less than 20 minutes of active travel per day in periods of 8 minutes or more). The chart shows that there are relatively few people (about 5 per cent of Londoners) who are close to meeting the active travel target through their existing travel. This means that TfL needs to focus on other ways to increase the proportion of Londoners who meet the active travel target, for example switching car trips to active modes or public transport, and replacing longer trips with several shorter trips by active, efficient and sustainable modes.

Figure 5.2 Proportion of London population nearly achieving two ten-minute periods of physical activity per day, LTDS 2014/15.

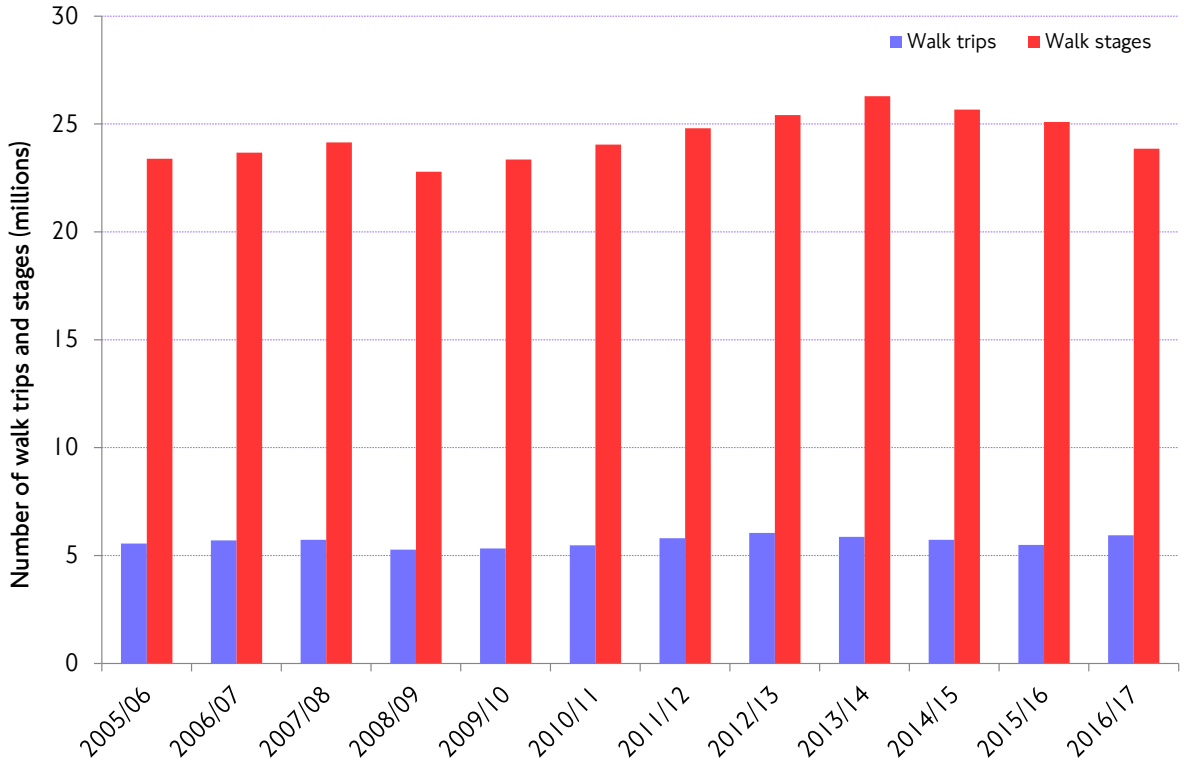


Source: TfL City Planning, Strategic Analysis.

Walk trips and stages – London residents

Figure 5.3 shows that the number of walk-all-the-way trips by London residents has remained fairly stable over the last 12 years at around 5.5 million trips per day, with an increase of 6.9 per cent over the period. The number of walk stages made by London residents per day is much higher than trips (as it includes walk journeys made as part of a trip made by another main mode) and accounts for more than half of all journey stages made by London residents on an average day. Despite a steady increase in the number of walk stages between 2008/09 and 2013/14 of 15.4 per cent, the number has been declining since 2013/14 in line with the wider context of declining travel among Londoners. The reduction in public transport use in 2016/17 will also have contributed to the decline in walk stages, as people typically walk to access public transport.

Figure 5.3 Trend in number of walk trips and stages by London residents, LTDS.



Source: TfL City Planning, Strategic Analysis.

Although the trends over recent years do not show a significant upward trajectory for active travel, results from TfL's attitudinal surveys indicate that Londoners want to walk more:

- 1 in 7 Londoners are thinking about walking more.
- 94 per cent of Londoners believe that walking is a good way to get fit.
- 91 per cent find walking enjoyable.
- 89 per cent of Londoners find that walking is a convenient way of getting around.

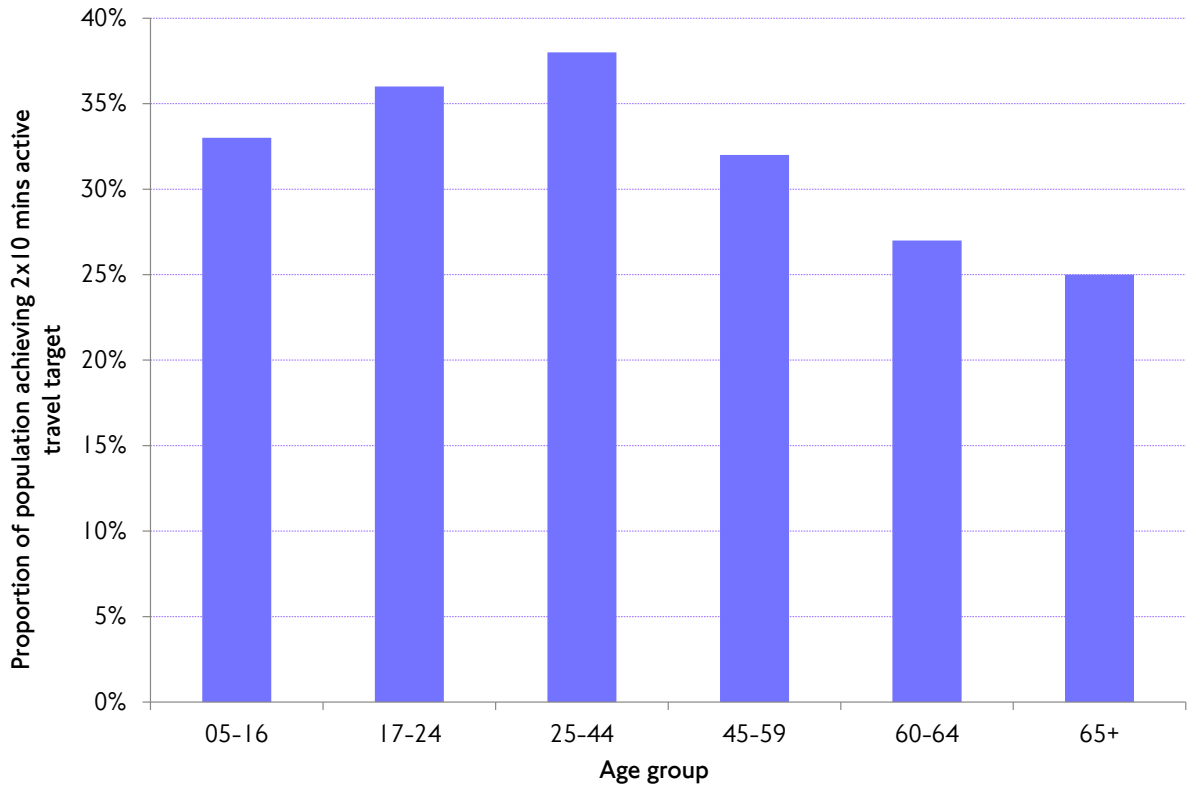
5.4 Who is currently 'active'?

This section explores the relationship of various socio-demographic factors to the achievement of this minimum recommended level of physical activity, based on LTDS data for London residents.

Age

London residents aged 25-44 are the age group with the highest proportion of people who are achieving the recommended physical activity target (38 per cent) through active travel. The percentage of the population meeting the requirement through active travel alone generally decreases with age, with just 25 per cent of residents aged 65 and over achieving two ten-minute periods of active travel per day (figure 5.4).

Figure 5.4 Proportion of London population achieving two ten-minute periods of active travel, by age, LTDS 2012/13-2014/15.

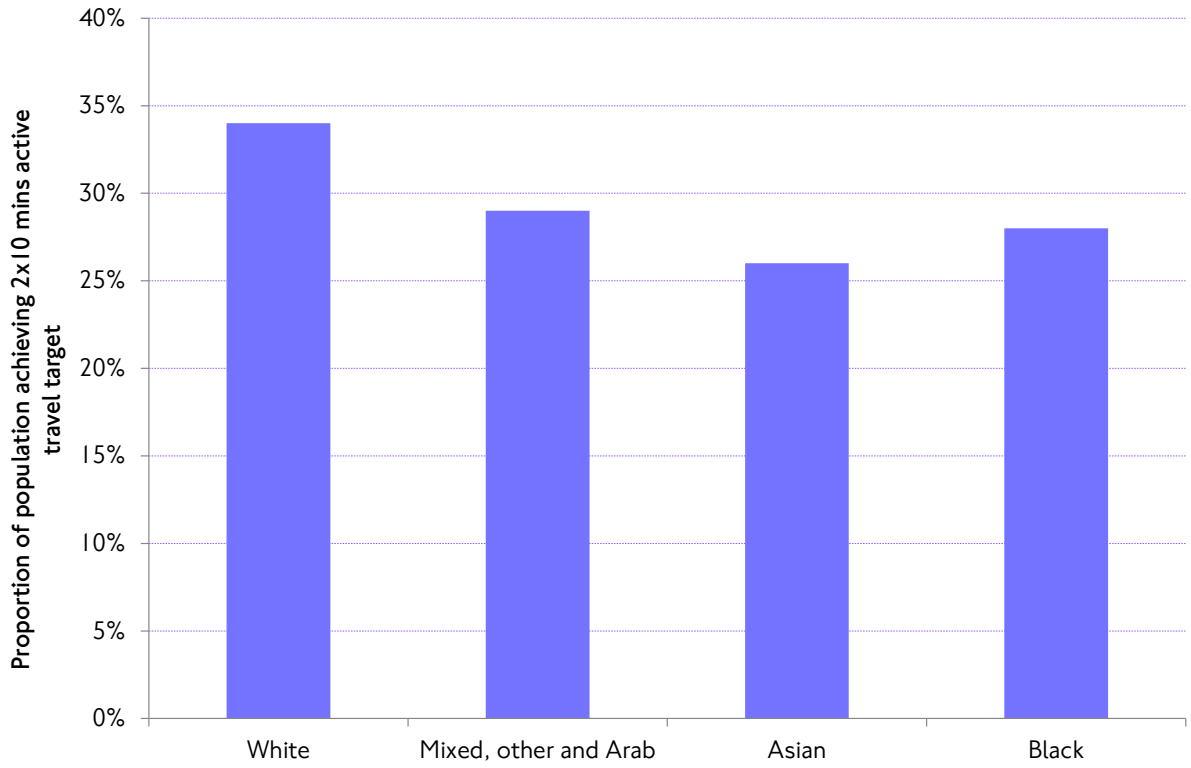


Source: TfL City Planning, Strategic Analysis.

Ethnicity

There is little difference between the proportion of residents meeting the target across ethnic groups (figure 5.5). Some 34 per cent of White residents achieve two ten-minute periods of daily activity, compared to 29 per cent of Mixed, other and Arab residents, 26 per cent of Asian residents and 28 per cent of Black residents.

Figure 5.5 Proportion of London population achieving two ten-minute periods of active travel, by ethnicity, LTDS 2012/13-2014/15.

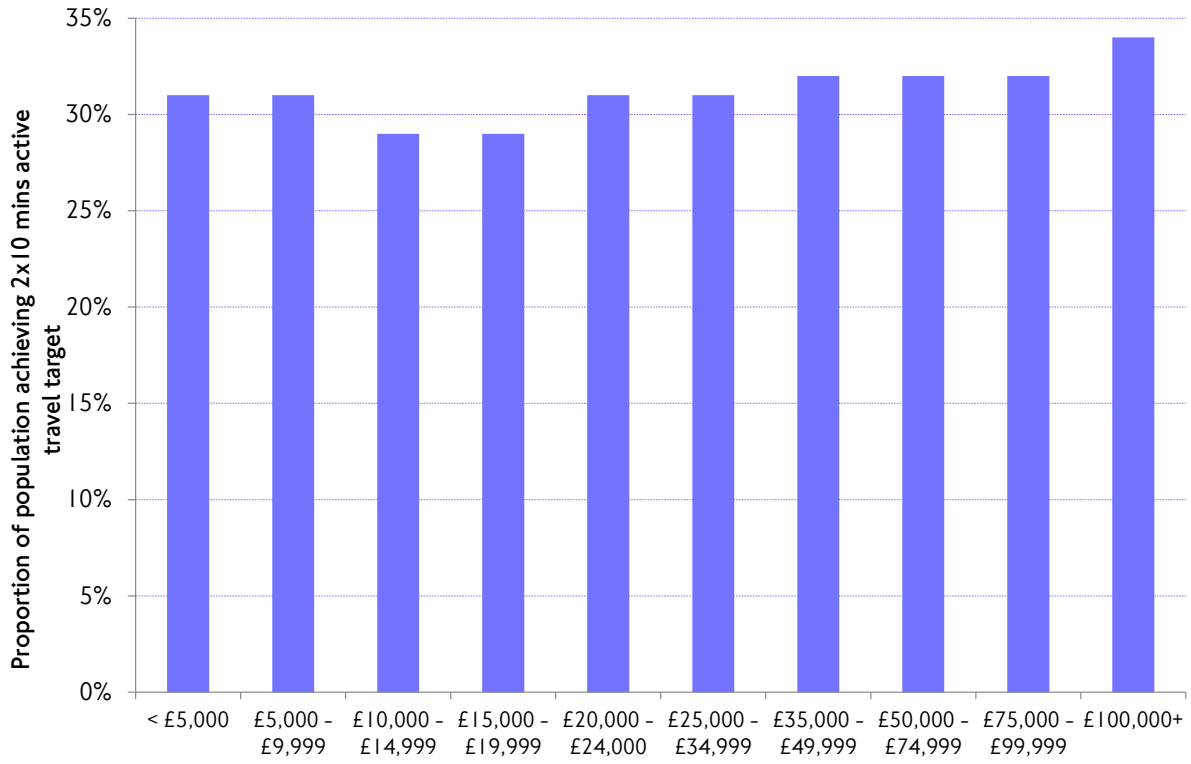


Source: TfL City Planning, Strategic Analysis.

Household income

There is also little difference in the proportion of residents achieving the recommended levels of activity by household income, with between 29 and 34 per cent of residents achieving the target across all household income groups (figure 5.6).

Figure 5.6 Proportion of London population achieving two ten-minute periods of active travel, by household income, LTDS 2012/13-2014/15.

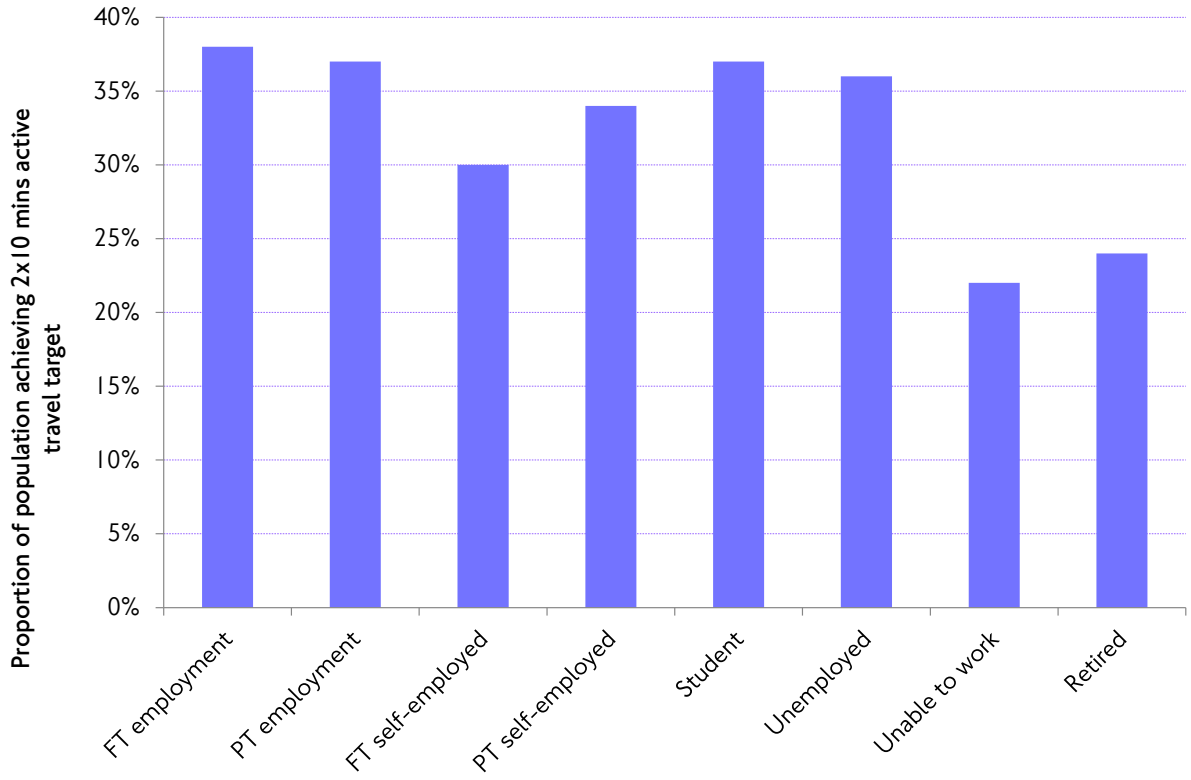


Source: TfL City Planning, Strategic Analysis.

Employment status

There is more variation in the percentage of people achieving two ten-minute periods of active travel by employment status. Those who are not in employment or are self-employed full-time are less likely to achieve the minimum recommended physical activity levels because they tend to make fewer trips on average (figure 5.7).

Figure 5.7 Proportion of London population achieving two ten-minute periods of active travel, by employment status, LTDS 2012/13-2014/15.



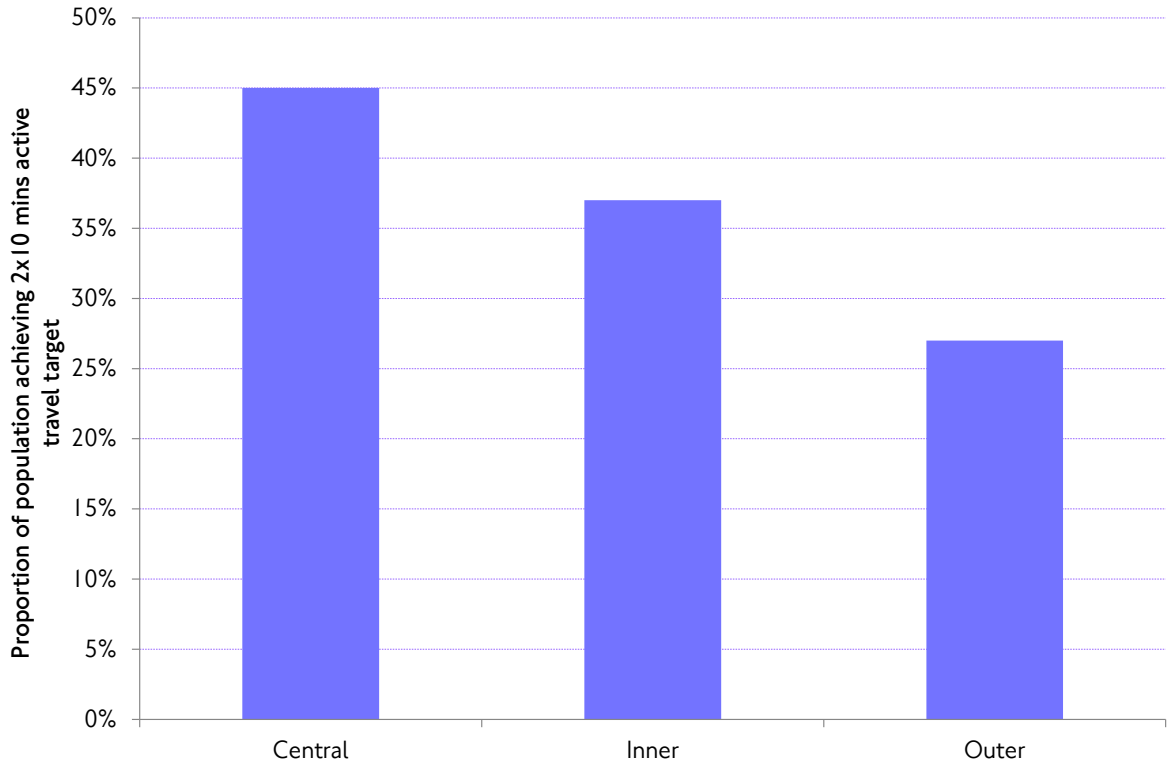
Source: TfL City Planning, Strategic Analysis.

Home location

Residents of central and inner London are more likely to achieve two ten-minute periods of physical activity than outer London residents. Some 45 per cent of central London residents achieve the target, compared to 37 per cent of inner London residents and 27 per cent of outer London residents (figure 5.8).

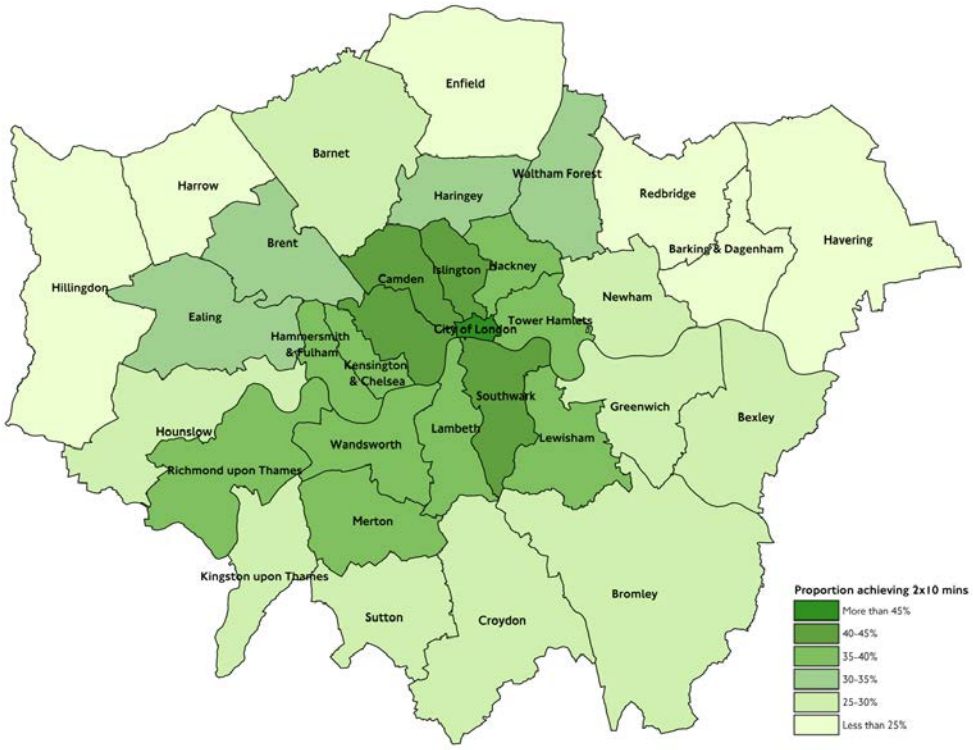
The boroughs with the highest proportion of residents achieving two ten-minute periods of activity are: Camden (44 per cent), Southwark (41 per cent), Islington (41 per cent) and Westminster (40 per cent). The boroughs with the lowest proportion of residents achieving two ten-minute periods are all in outer London, and particular in the east. They are Havering (18 per cent), Barking & Dagenham (21 per cent), Hillingdon (22 per cent) and Redbridge (23 per cent) (figure 5.9).

Figure 5.8 Proportion of London population achieving two ten-minute periods of active travel, by home location, LTDS 2012/13-2014/15.



Source: TfL City Planning Strategic Analysis.

Figure 5.9 Proportion of London population achieving two ten-minute periods of active travel, by borough, LTDS 2012/13-2014/15.



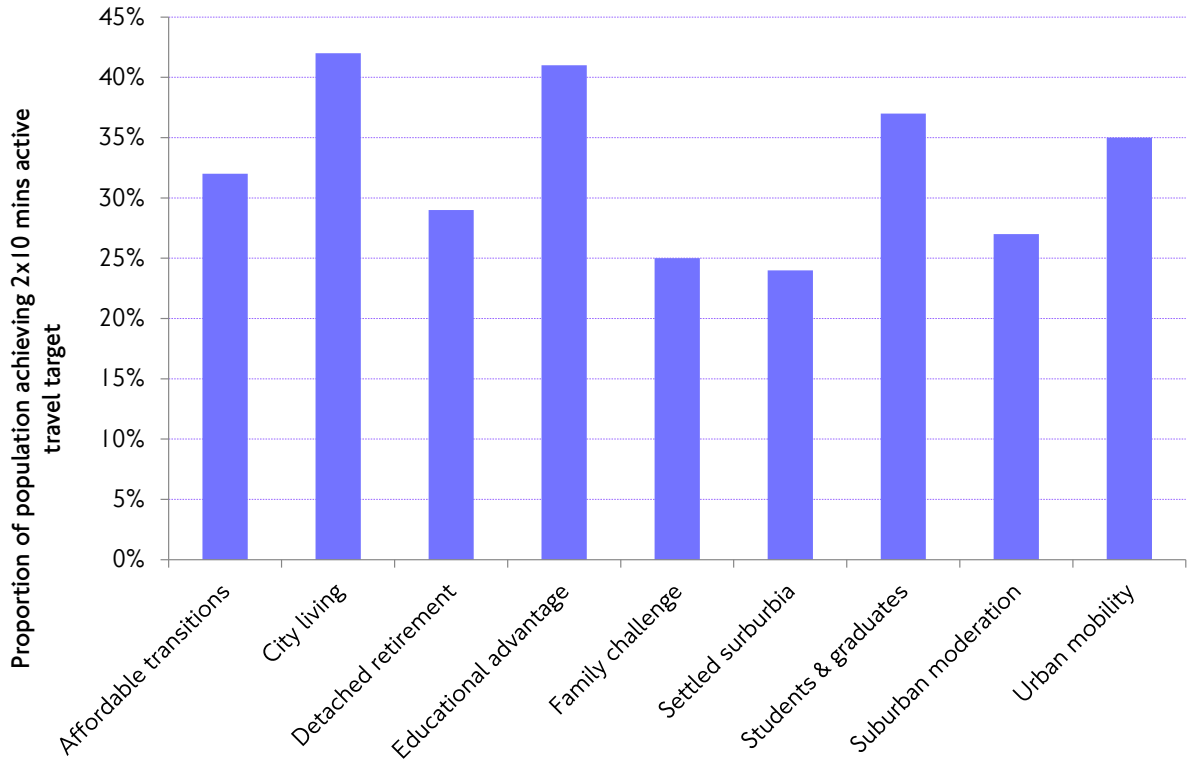
Source: TfL City Planning Strategic Analysis.

Population segment

Using the Transport Classification of Londoners (see Chapter 7 of Travel in London report 9) to assess who is achieving two ten-minute periods of active travel per day, it is clear that the segments typically found in central London (City Living and Educational Advantage) are most likely to be meeting the target (figure 5.10).

Those segments in outer London (such as Settled Suburbia) or with a higher proportion of low-income households (such as Family Challenge) are the least likely to be meeting the target.

Figure 5.10 Proportion of London population achieving two ten-minute periods of active travel, by population segment, LTDS 2012/13-2014/15.

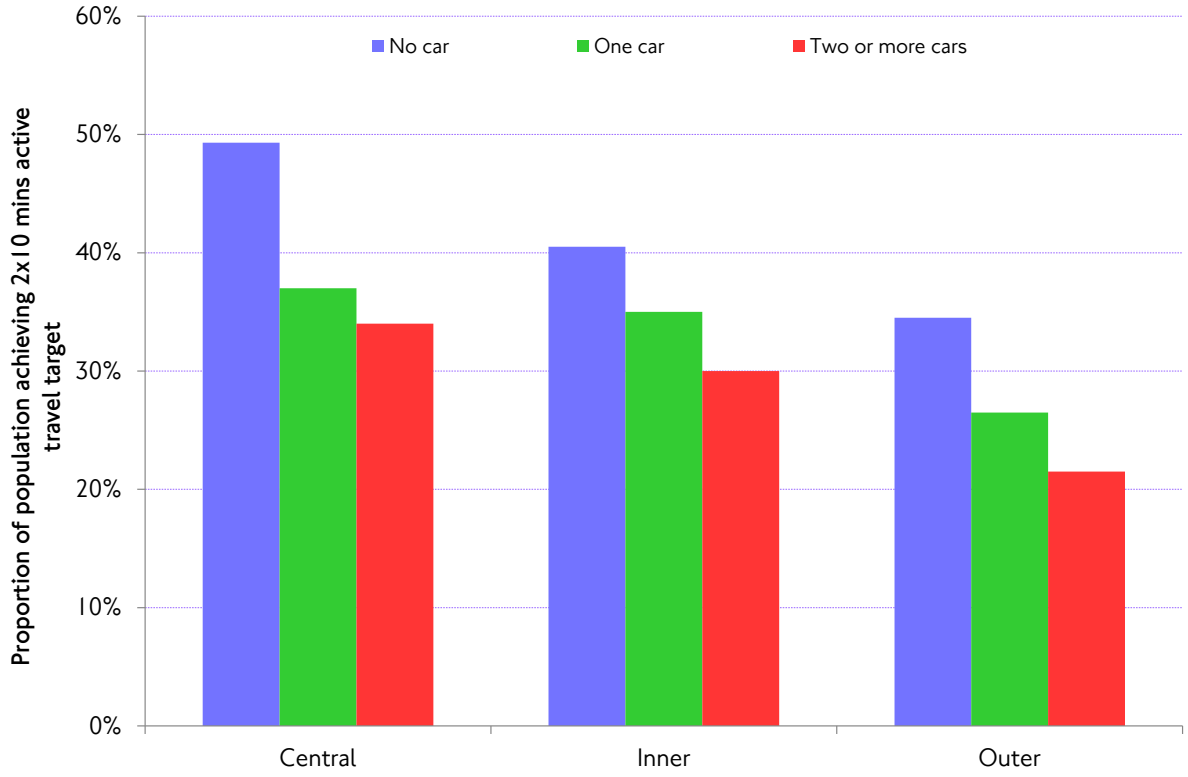


Source: TfL City Planning, Strategic Analysis.

Car ownership and use

London residents living in households without a car are more likely to meet the target, and this trend is consistent across the different areas of London (figure 5.11). Overall, the share of population meeting the target in two-car central London households is the same as one-car inner London households and households without a car in outer London.

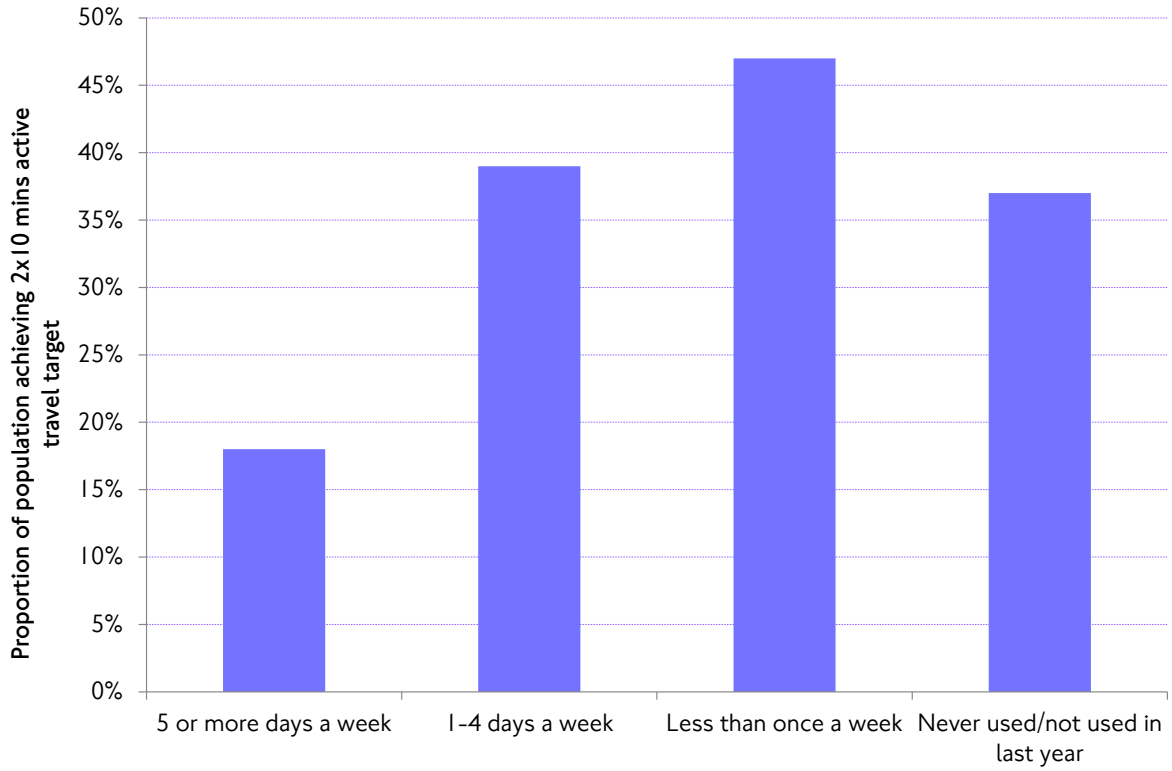
Figure 5.11 Proportion of London population achieving two ten-minute periods of active travel, by car ownership and household location, LTDS 2012/13-2014/15.



Source: TfL City Planning, Strategic Analysis.

Less than 1 in 5 people who drive five or more days a week are meeting the active travel target, equating to about 1.4 million frequent car users who do not walk or cycle for two ten-minute periods a day. Some 80 per cent of these regular car users live in outer London. London residents who drive less frequently are much more likely to meet the active travel target - 39 per cent of those who drive 1-4 days a week and 47 per cent for those who drive less than once a week (figure 5.12).

Figure 5.12 Proportion of London population achieving two ten-minute periods of active travel, by frequency of driving a car, LTDS 2012/13-2014/15.



Source: TfL City Planning, Strategic Analysis.

5.5 What is the potential for increasing the proportion of active people?

We cannot significantly increase the proportion of Londoners who achieve two ten-minute periods of active travel by encouraging those who are walking or cycling for periods of eight and nine minutes to walk or cycle a little more (as shown by figure 5.2). However, many Londoners are willing to walk and cycle more as part of their daily lives so the potential lies with switching short trips and trip stages from inactive to active modes.

To explore this potential, LTDS was analysed to assess whether short trips or stages currently made by other modes could feasibly be walked or cycled, based on the characteristics of the trips or stages themselves as well as the individual who is making them. The analysis took a two-tiered approach, looking at walking and cycling potential based on current behaviour (ie trips that are currently made by other modes but which have similar characteristics to existing walk and cycle trips made in London) and total potential (ie all trips that could feasibly be walked or cycled).

The results from this analysis show that:

- There are just over 3.3 million trips that are potentially cyclable, based on current cycling behaviour.
- Overall, just over 9 million trips currently made by mechanised modes could feasibly be cycled.

- There are around 3.1 million trips that are potentially walkable based on current walking behaviour.
- Overall, around 3.3 million trips currently made by mechanised modes could feasibly be walked.

If the walking potential based on current behaviour were realised, approximately 39 per cent of Londoners would achieve two ten-minute periods of active travel per day. If all trips identified as feasibly walkable were realised, this figure would rise slightly to 40 per cent.

If the cycling potential based on current behaviour were realised, again 39 per cent of Londoners would achieve the active travel target, rising to 40 per cent if all potentially cyclable trips were cycled.

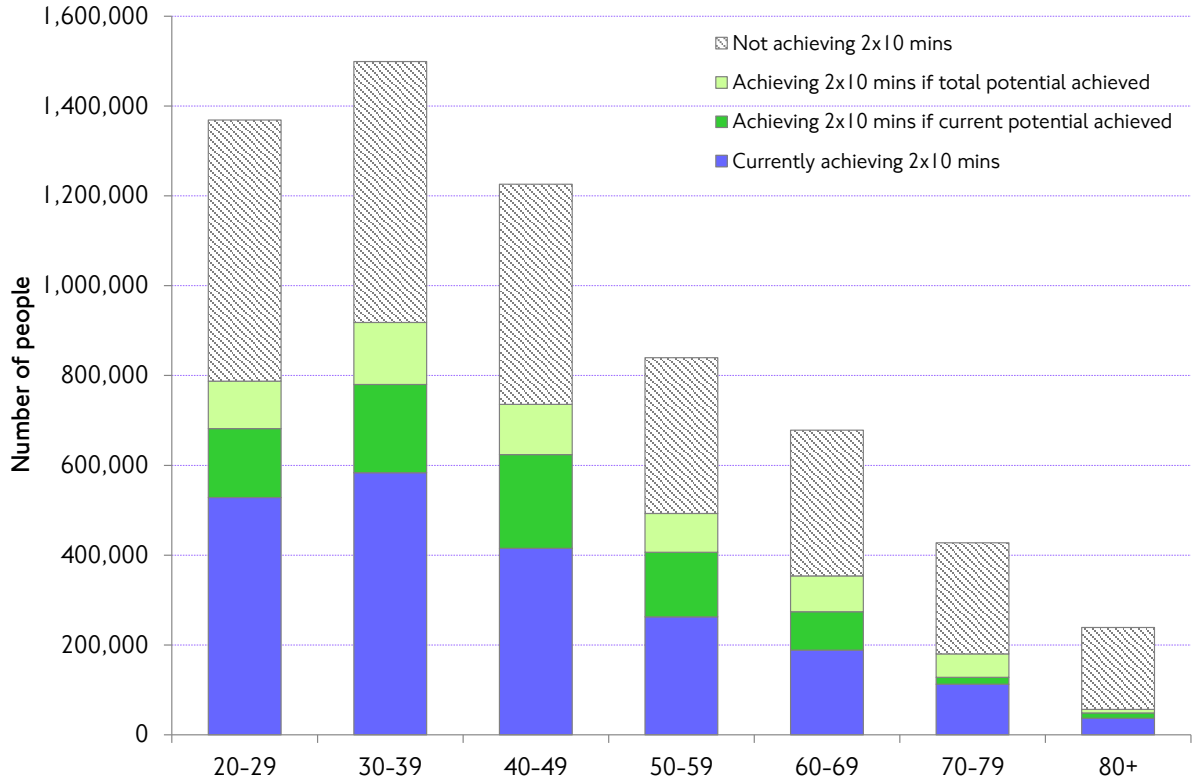
If all walking and cycling potential based on current behaviour were realised, then 47 per cent of Londoners would achieve the active travel target, rising to 56 per cent if the total potential for walking and cycling were realised.

The draft MTS sets the ambition that 70 per cent of adults will be reporting two ten-minute periods of active travel per day by 2041, therefore even if the total walking and cycling potential were realised, further interventions would still be needed to meet the ambition.

Where is the potential for increasing the proportion of people achieving the active travel target through switchable trips and stages?

Figure 5.13 shows the number of people by age group who could achieve two ten-minute periods of active travel per day if the total walking and cycling potential is realised. The largest target market is London residents aged 30-39 because this age group has the largest number of people who are not currently meeting the target.

Figure 5.13 Number of people who are achieving or could achieve two ten-minute periods of active travel per day if walking and cycling potential is realised, by age group, LTDS 2012/13-2014/15.



Source: TfL City Planning, Strategic Analysis.

Table 5.1 shows the propensity to increase walking and cycling by Transport Classification of Londoners (TCoL) segment (see section 7.6 in Travel in London report 9) as well as the share of switchable trips over ten minutes attributable to each group.

The 'Affordable transitions' and 'Urban mobility' segments are the strongest near market because they have the highest propensity to increase cycling and a high propensity to increase walking. Between them they have 17 per cent of the share of switchable trips and stages over ten minutes. The next near market is 'Students and graduates' and 'Suburban moderation' segments, who have a 33 per cent share of the switchable trips and stages and a higher than average propensity to increase cycling. The 'Settled suburbia' and 'Detached retirement' segments are not a near market, as although they have a 29 per cent share of the switchable trips, their propensity to increase walking and cycling is much lower than average.

Table 5.1 Walking and cycling potential by Transport Classification of Londoners (TCoL) segments.

Segment	Share of switchable trips and stages over 10 mins	Propensity to increase cycling (100=average)	Propensity to increase walking (100=average)
Affordable transitions	6%	164	130
Urban mobility	11%	142	141
Suburban moderation	20%	138	90
Educational advantage	6%	113	171
Students & graduates	13%	106	83
City living	7%	102	91
Detached retirement	21%	55	68
Family challenge	7%	55	144
Settled suburbia	9%	42	72

Source: TfL City Planning, Strategic Analysis.

In terms of location, table 5.2 shows that most of the potential switches that would contribute to the physical activity target are within outer London (46 per cent) and inner London (25 per cent). Central London should not be a focus for switching current trips and stages, as only 5 per cent of the switchable journeys take place there. At the borough level, the switchable trips and stages are fairly evenly distributed – most boroughs contribute about 4-5 per cent of the total switchable trips and stages. Inner London boroughs have slightly more switchable trips than outer London, and this is advantageous for increasing physical activity because inner London is currently structurally more walkable and cyclable than outer London.

Table 5.2 Walking and cycling potential by area of London.

Location	% of switchable trips and stages over 10 mins
Within central London	5%
Within inner London	25%
Between central and inner London	11%
Within outer London	46%
Between central and outer London	1%
Between inner and outer London	9%
Between Greater London and the rest of UK	2%
Wholly outside Greater London	0.3%

Source: TfL City Planning, Strategic Analysis.

6. The wider street environment

6.1 The Healthy Streets Approach

The Healthy Streets Approach is central to the Mayor's vision to create a better city for all Londoners. The Healthy Streets Approach is an over-arching framework for the design and management of London's streets, incorporating measures to encourage walking, cycling and use of public transport, to reduce road danger, tackle poor air quality, reduce car dependency, improve the environment and deliver an accessible and inclusive transport system. The Healthy Streets Approach is an approach to improving Londoners' experiences of the Capital's streets, helping everyone to be more active and to enjoy the health benefits that this brings. This chapter sets out a range of evidence that will assist in framing these policies.

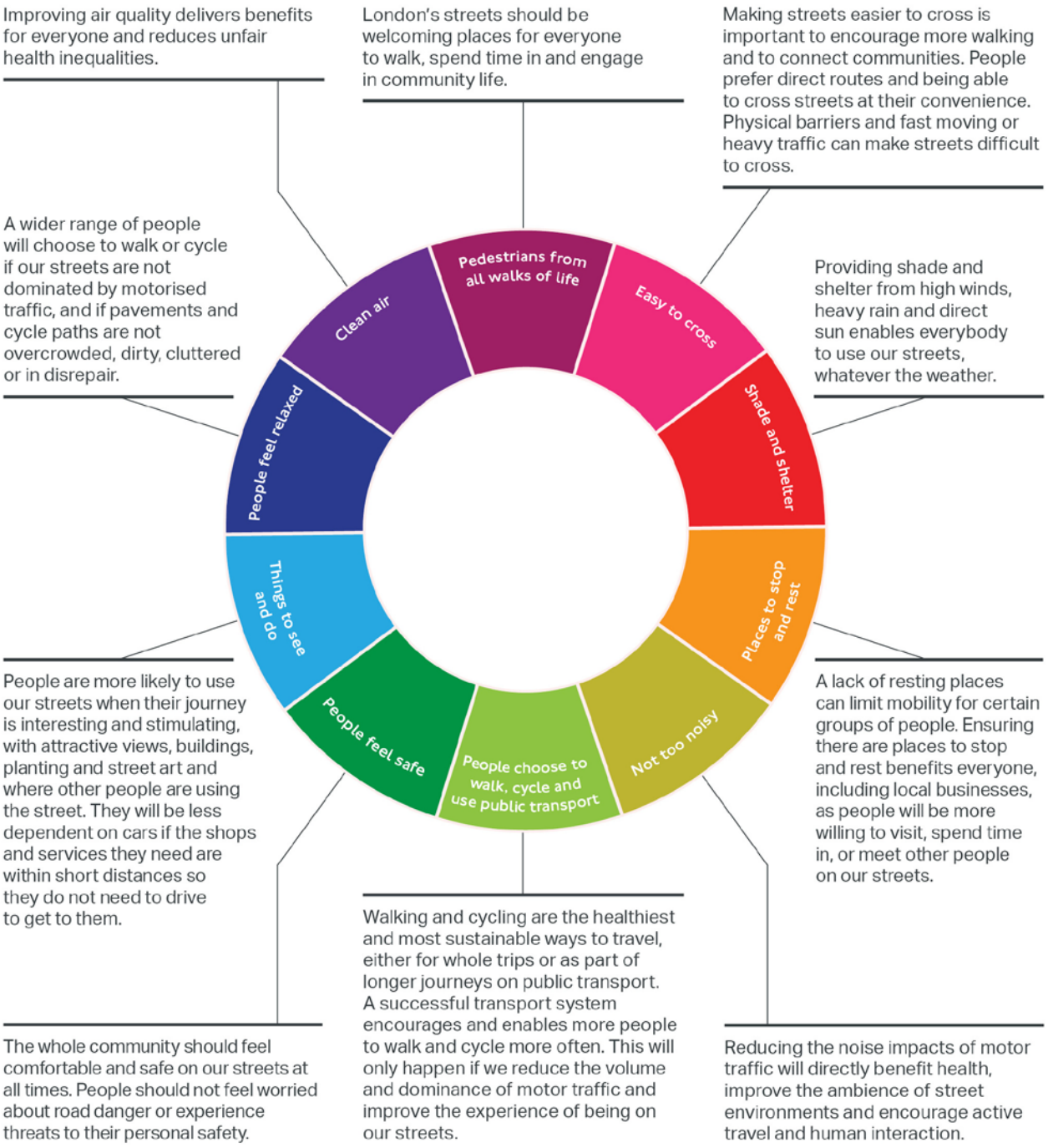
The Healthy Streets Approach also has wide applicability, including implications for the development of the wider public transport system to encourage active, efficient and sustainable travel, and for the planning of transport for new developments, homes and jobs.

London's streets provide the opportunity for people to stay active. Their design and management can facilitate walking and cycling, and reduce the impact of motorised traffic. Most journeys made by Londoners start, end or happen entirely on our streets. To enable these streets to function in the way we want them to, we have to make them work for walking, cycling and public transport, so both individuals and the city as a whole can benefit. The Healthy Streets Approach provides a framework to inform our decision making – in our own schemes, our relationships with the boroughs, and our role in planning for London's growth. More details on this approach and how it is being taken forward in terms of strategic and local planning in London can be found at: https://tfl.gov.uk/corporate/about-tfl/how-we-work/planning-for-the-future/healthy-streets.

6.2 Healthy Streets Indicators

There are 10 Healthy Streets Indicators (figure 6.1), which summarise the essential elements that make a street an inclusive and healthy environment. To deliver these 10 indicators a wide range of measures can be needed. One of the best ways to assess the health of a street is to spend time on the street, observing how it looks and feels, and how it is being used by people. However the indicators can be assessed through more formal quantitative measures as well.

Figure 6.1 The 10 Healthy Streets Indicators.



Source: TfL City Planning.

6.3 Measuring the healthiness and attractiveness of London's streets

TfL's exploratory Healthy Streets surveys

Travel in London report 7 described exploratory surveys that TfL developed to measure and assess the performance against eight of the ten Healthy Streets Indicators, set out in figure 6.1 above, in the context of specific street locations across London. The surveys were based on the perception of these aspects as reported by a representative sample of people walking or spending time on the street at that location. The surveys aimed to provide insight into how people perceive the street, including how attractive and enjoyable they found it to be

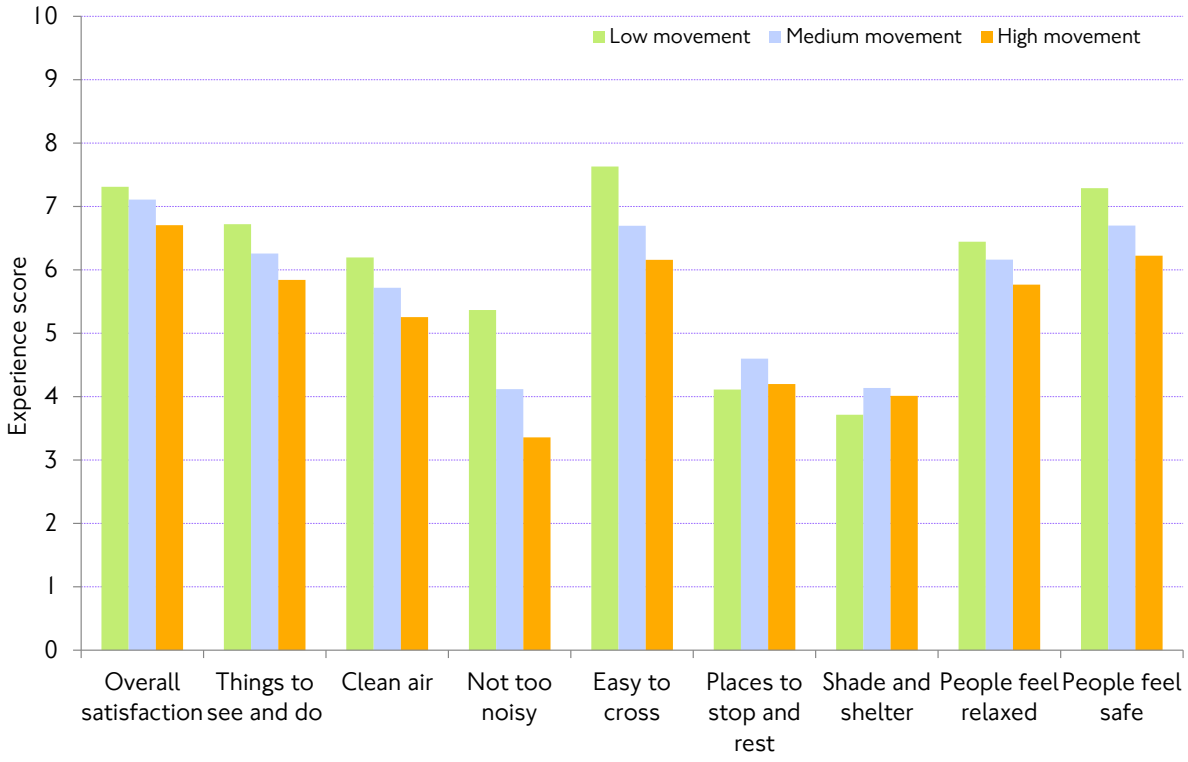
there, how easy it was to cross the road and how safe it felt, including how their actual experience differed from expectation.

Key insights from these surveys, which were completed at around 80 sites, were that:

- Average scores were a good intuitive reflection of conditions across the nine street types, reflecting differing degrees of 'movement' and 'place' functionality at each.
- People's expectations of conditions were also a good reflection of actual conditions, these appearing to be realistic, on average, given the function of the street, albeit always higher (on average) than the achievement score.
- The relative scores and distributions for each of the street types allowed identification of the main 'drivers' behind satisfaction with aspects of street health, which can be fed back into improvement initiatives.
- The surveys were also useful in demonstrating a basic measurement method that could potentially be applied in a consistent way across different street locations.

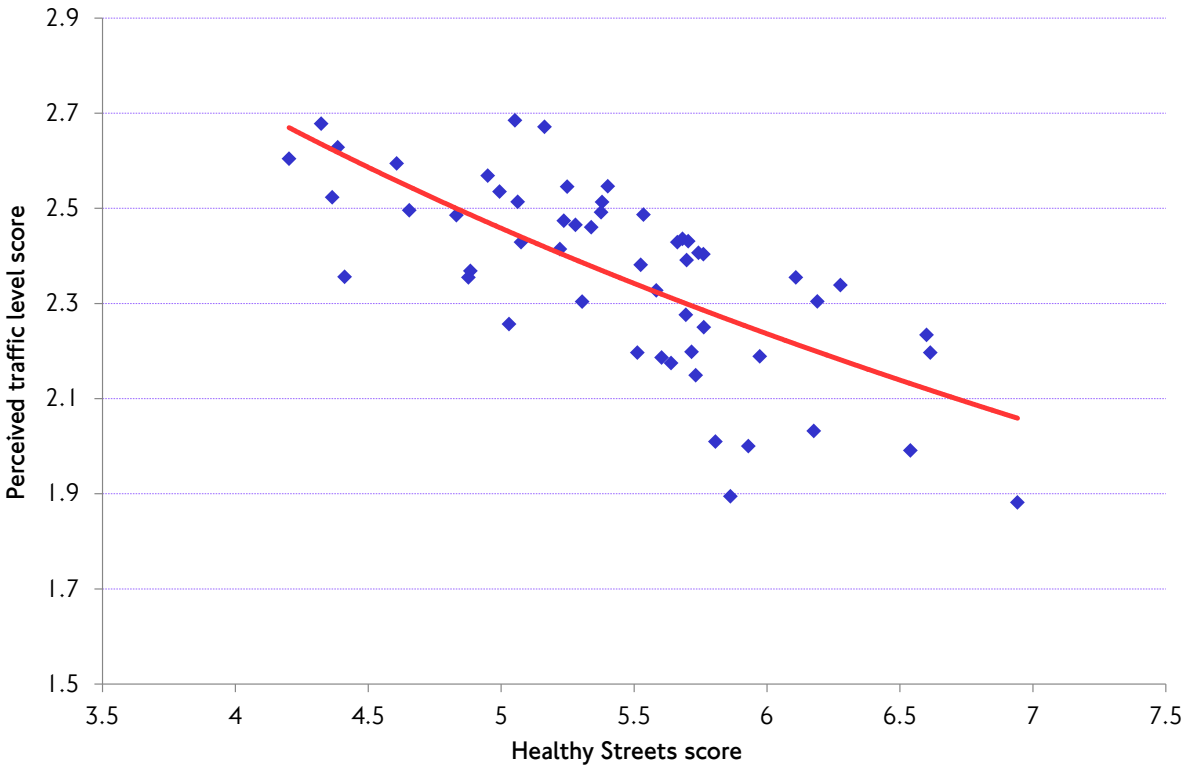
Figure 6.2 shows the general scope of the Healthy Streets 'experience' scores as they applied to the nine street types grouped by the three 'movement' categories. It shows that, for each for each of the indicators and as would be expected, there is a reduction in average score with increased movement function (see also figure 6.3). Features such as air quality, noise and, particularly, availability of shelter and places to stop and rest tended to score lowest overall with (interestingly) little differentiation in the latter two according to movement function.

Figure 6.2 Mean health experience score (out of 10) by individual Healthy Streets Indicator and 'movement' category of street.



Source: TfL City Planning, Strategic Analysis.

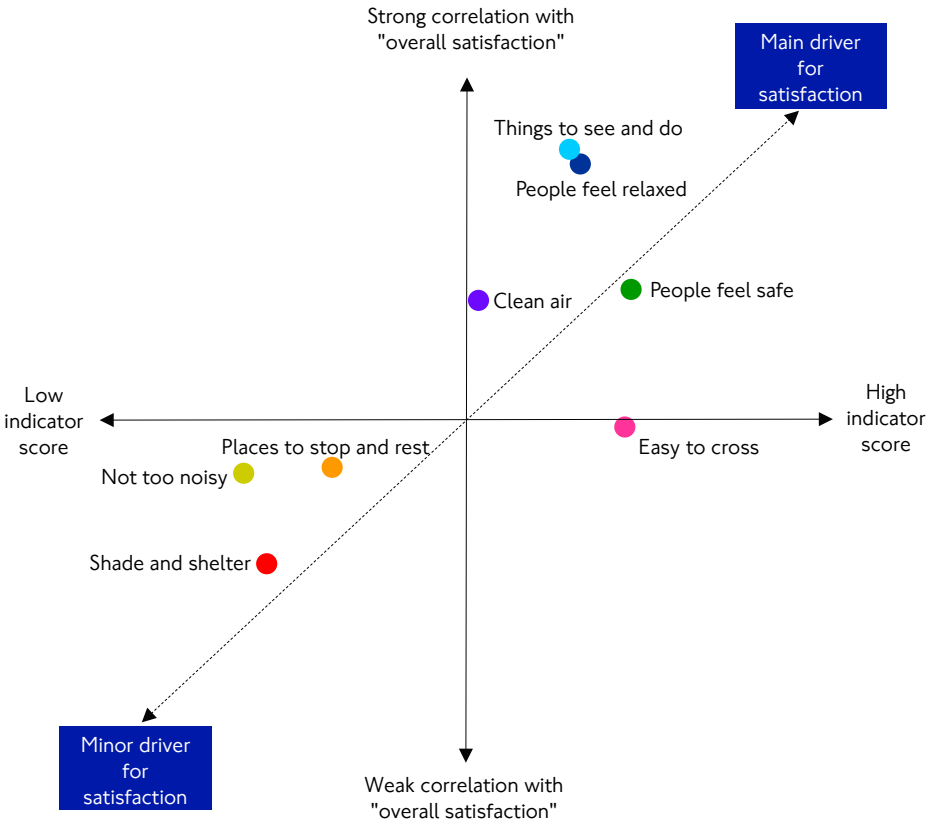
Figure 6.3 Correlation between overall Healthy Streets score and perceived traffic level.



Source: TfL City Planning, Strategic Analysis.

Figure 6.4 shows an example of these insights in terms of using the surveys to identify the influence of the specific indicators on overall customer satisfaction with the street environment (which was also ascertained as part of the survey). About 80 per cent of the customer satisfaction score can be 'explained' by the ten Healthy Streets Indicators, although not all of the indicators have an equal influence on overall customer satisfaction.

Figure 6.4 Influence of individual Healthy Streets Indicators on overall customer satisfaction score with street.



Source: TfL City Planning, Strategic Analysis.

Looking at the figure, the influence of an Indicator is based on its average score and its correlation with customer satisfaction. If an Indicator has a good average score and has a strong correlation with the satisfaction score, then it is a main driver of customer satisfaction (eg "Things to see & do"; "People feel relaxed"; "People feel safe"). If an Indicator has a poor average score and has a weak correlation with satisfaction, its influence on customer satisfaction is limited ("Shade & shelter"; "Not too noisy"; "Places to stop and rest"). It should however be noted that, even though some Indicators are not main drivers of satisfaction, they are still critical to a healthy environment. For example places to stop and rest are vital to an inclusive environment and reducing noise is essential to reducing stress. These insights are set out in more detail at: https://tfl.gov.uk/corporate/about-tfl/corporate-and-social-responsibility/transport-and-health.

Developing the Healthy Streets surveys – experiential aspects

The main shortcoming of these surveys was that they were intensive at a very small number of locations, which could not be widely extended or generalised to represent the entire street/walk network in London. They also had the potential to generate very similar scores if applied across a large number of similar sites, which suggested an element of 'averaging' by respondents based on general experience, rather than with strict reference (as the survey intended) to a nominal space within 50 metres each side of the specific survey location. Also, the surveys as completed did not include provision for examining change in relation to locations that had

undergone specific improvement works – a key requirement to enable the success of Healthy Streets initiatives to be assessed.

Gaining a greater representation of London's diverse street network cost-effectively and using the surveys to track change in relation to improvement schemes therefore emerged as two development priorities from the exploratory work.

A possible method that meets these requirements is to use a 'mystery shopper' type survey to assess performance against the Healthy Streets Indicators during a short surveyor visit to the site, rather than to seek feedback from a large number of respondents. Mystery shopper methodologies are well established and are widely used by TfL to assess the quality/performance of other aspects of the transport environment, for example aspects of bus services such as bus driver behaviour. They use evaluations of trained surveyors and are designed to give consistent feedback across a wide range of contexts, and can therefore be developed for this purpose. They are not the same as an 'audit', which merely looks to confirm the presence or function of specific elements (for example, are there so many seats or does the pedestrian crossing function as per specification?)

In this way a much larger number of sites could cost-effectively be included in the survey. This does not mean that the surveys could ever be statistically representative of London's streets, but the greater sample that is possible would give coverage that is usefully representative from a strategic monitoring point of view. Crucially, it also gives the ability, alongside and within a sample structure designed to be broadly representative, to more intensively target sites that have undergone specific improvements or that are of particular interest (through equivalent before/after surveys). This could be applied to schemes such as the proposed transformation of Oxford Street, to give comprehensive feedback on the performance of this proposed scheme, or to areas such as town centres where improvement works are being contemplated. In these cases, scheme-specific scores can be compared to those from the general sample and on a before/after basis in relation to the scheme itself.

Progress with developing this new survey will be reported in subsequent Travel in London reports.

Healthy Streets Check for Designers

To support practitioners in delivering the Healthy Streets Approach, new guidance and tools are being produced by TfL. The Healthy Streets Check for Designers is a new tool we have developed to assess the detailed layout of streets against the 10 Healthy Streets Indicators. This tool enables us to see how we can improve a street and how our proposals will deliver the objectives of the Healthy Streets Approach. In this way it is a diagnostic and confirmatory tool for designers, as opposed to an evaluation of the experiential aspects of street design.

The tool is comprised of 26 metrics that can be applied to any street, and 5 additional metrics to apply to streets carrying public transport services. It can be applied to any scheme, but provides the greatest value when applied to schemes that expect to make a significant change to people's experience of the street environment. Once a street has been rated for the metrics in the Check these are converted into a score against each of the 10 Healthy Streets Indicators, typically displayed as a radar plot. This makes it easy to see at a glance the Healthy Street

Indicator improvements that the new design will deliver against the current situation on-street.

The Healthy Streets Check score does not show whether a street is healthy or not but indicates the strengths and weaknesses of a scheme/street. It is not possible to achieve an overall score of 100 per cent using the tool. To score well against some metrics, compromise will be needed with other metrics. This reflects the compromises inherent in any street design.

The Healthy Streets Check is not a scientific assessment of how healthy a street is. It is not the case that a street with a 10 per cent increase in Healthy Streets Check score confers 10 per cent greater health benefit to people who use it. It is also not the case that a 10 per cent increase in Healthy Streets Check score will deliver a 10 per cent uplift in active travel.

The metrics included in the Healthy Streets Check are the best available quantifiable and evidence based standards that are within the gift of the traffic engineer or urban designer to influence through the design of the street. The numbers must therefore not be given any undue weight in the interpretation of the results. The objective is to optimise the score for a given project, for this to be as evenly distributed across the 10 Indicators as possible and for '0' scores to be eliminated, where possible.

In a complex street environment a balanced approach must be taken; freeing up space for cycling or extending crossing times for people walking may produce delays for buses. Likewise removing a pinch point for cycles or buses may mean removing an island refuge for people walking or from the reverse perspective installing an island refuge may introduce a pinch point for buses and cycles. To be transparent and promote the best possible outcome in the round, recognising the difficult decisions designers must weigh up, the Check aims to identify and highlight these decisions so that stakeholders are informed as to what compromises have been made.

There is no threshold score that would produce a ‘pass’ or ‘fail’ because the focus is on improvement relative to the existing conditions. Some designs will perform better than others against the Healthy Streets Indicators because of physical, financial or political constraints that are outside of the designer’s control.

An example of how we are applying the Healthy Streets Check

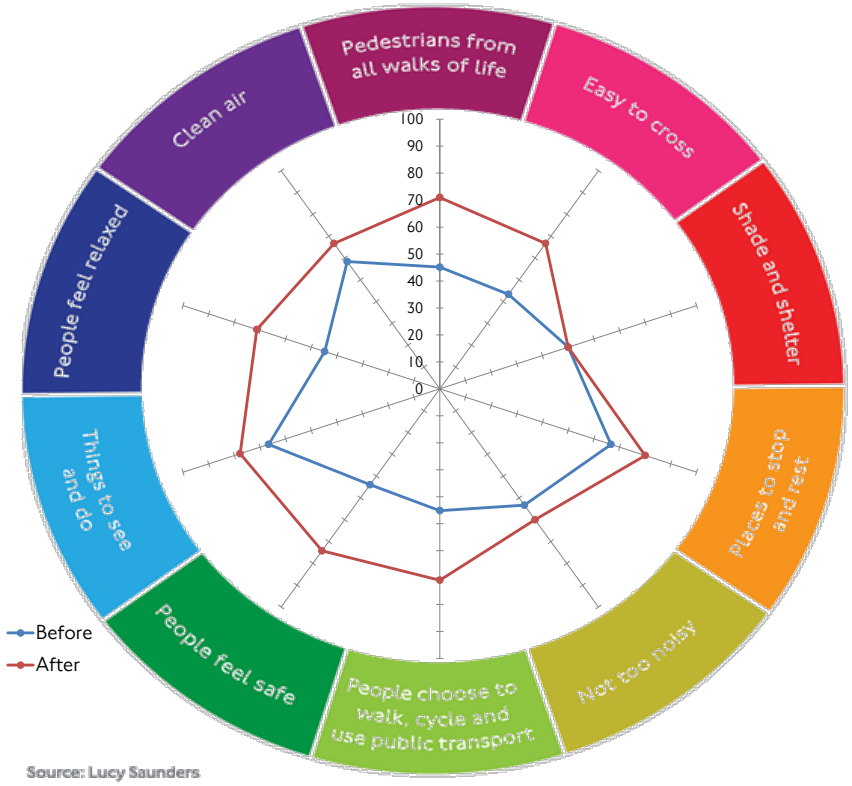
Archway, Islington

A busy gyratory at Archway was reconfigured to create a much safer environment for people to walk, cycle and access public transport. This transformational project also created new public space in the heart of the community. Figure 6.5 illustrates the scope of the improvements. Figure 6.6 shows the resulting change in Health Streets Check scores.

Figure 6.5 Archway Gyratory – before/after comparison.

Source: TfL Engineering, Traffic Design Engineering.

Figure 6.6 Archway Gyratory – Healthy Streets check metrics.



Healthy Streets Indicators' scores (%)☐	Existing layout	Proposed layout
Pedestrians from all walks of life	45	71
Easy to cross	43	67
Shade and shelter	50	50
Places to stop and rest	67	80
Not too noisy	53	60
People choose to walk, cycle and use public transport	45	71
People feel safe	44	74
Things to see and do	67	78
People feel relaxed	45	71
Clean Air	58	67
Overall Healthy Streets Check score	47	71
Number of '0' scores	7	0

Source: TfL Engineering, Traffic Design Engineering.

6.4 Attitudes to walking

Introduction

People's propensity to use a mode of travel for a particular journey depends on a range of factors. Crucially, the mode selected must be appropriate for the needs of the journey in terms of 'practical' factors such as availability, journey time, capacity to take luggage or other encumbrance etc. However, within those parameters and where there is a choice, people's attitudes towards the different modes are often the determining factor in choosing which mode to use.

These include a wide range of tangible and less-tangible factors, such as whether the mode is perceived as pleasant, safe and easy to use. TfL's Customer Insight surveys have tracked many aspects of people's attitudes to both walking and cycling over several years among a representative sample of London residents. The results from these surveys give valuable insight into how Londoners regard these modes of travel in general, and about specific aspects or features of each mode influence their overall view of that mode, and ultimately their choice of whether or not to use it for particular journeys. In turn, this gives TfL valuable pointers as to where to focus improvement initiatives.

The surveys that give rise to these indicators are currently under review, with the intention of developing a revised set of indicators that are more directly aligned to the priorities of the draft MTS. However, the available historic series for these indicators provides a rich source of insight. This section reviews key indicators from TfL's Attitudes to Walking survey. Section 6.5 below does the same for TfL's Attitudes to Cycling survey.

Overall indicator of attitudes to walking

The extent to which Londoners agree with the proposition that 'London is a City for walking' is an indicator that encapsulates the evaluation of individuals across a wide range of attributes. In terms of the historic surveys, it probably therefore gives the best benchmark and trend of how Londoners view walking as a mode of transport.

Table 6.1 Extent to which Londoners agree with the proposition that 'London is a city for walking'.

Year/Indicator	2010	2011	2012	2013	2014	2015	2016
Percentage of respondents agreeing that London is a city for walking	66	67	73	71	68	69	74

Source: TfL Customer & Employee Insight.

As is shown by table 6.1, the proportion of Londoners agreeing with the proposition is typically around 70 per cent. Although values vary considerably from survey to survey, the scores for 2016 were among the highest recorded.

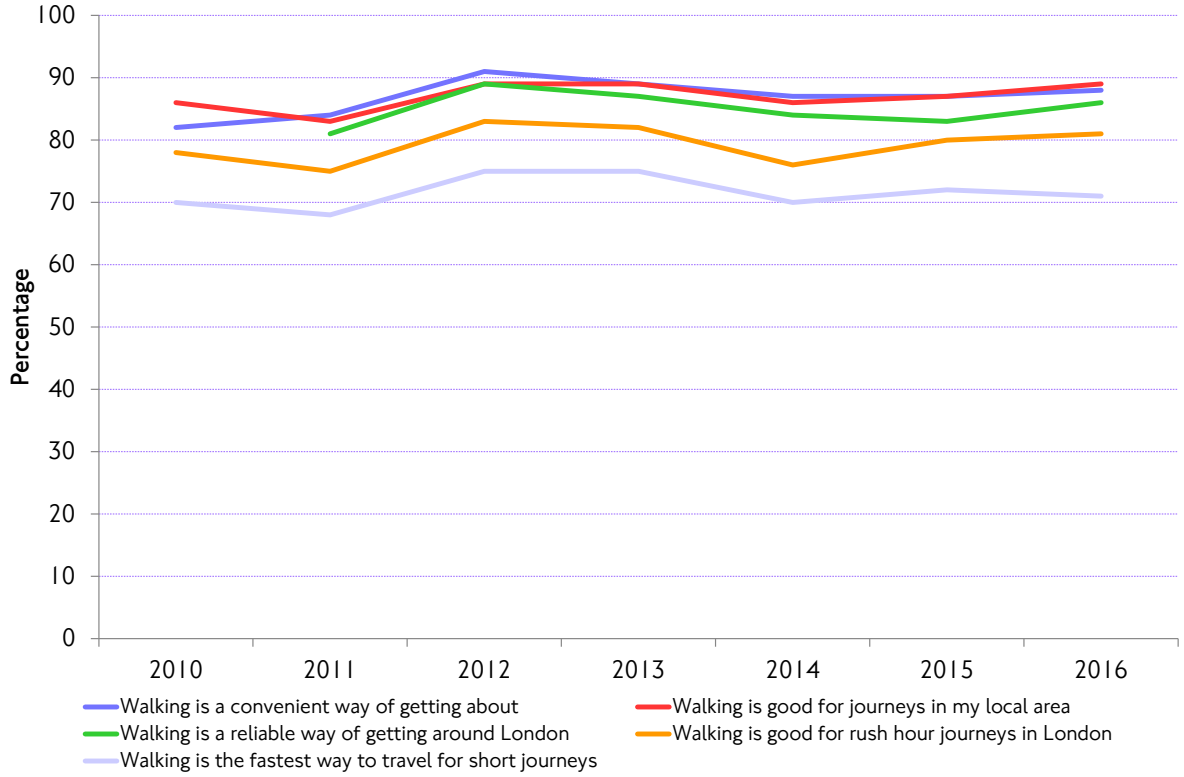
Nevertheless, overall scores show that there is considerable scope to improve aspects of the walking experience; typically between one quarter and one third of Londoners either do not agree with the proposition or are unsure. In turn, this should feed through to improved perception and, ultimately, more people choosing walking, where it is suitable, as a mode of transport.

The following sections explore various dimensions of people's attitudes to walking in more detail, and this feedback provides valuable insight into the infrastructural and attitudinal aspects where improvement is likely to be most beneficial.

Attitudes to walking: Convenience and reliability

Figure 6.7 shows the historic trend in a range of indicators relating to the convenience and reliability of walking. As with table 6.1 above, the scores relate to the percentage of Londoners agreeing with the proposition.

Figure 6.7 Attitudes to walking: Convenience and reliability.



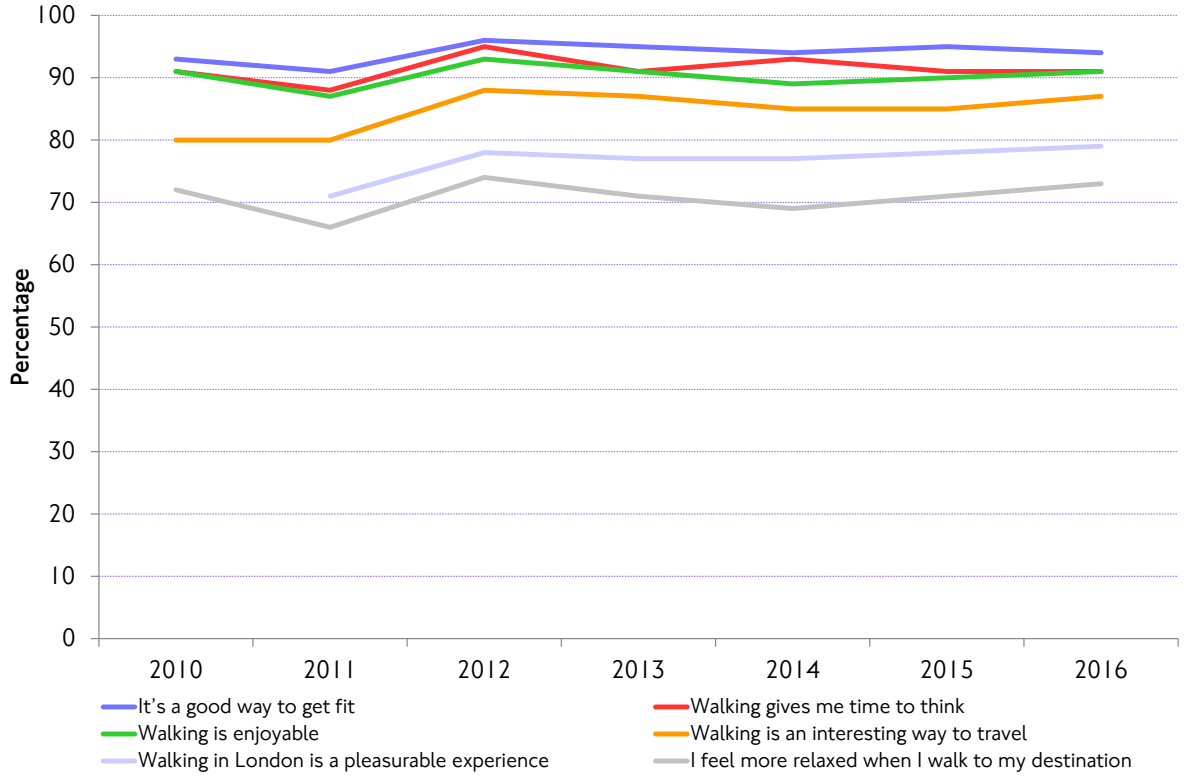
Source: TfL Customer & Employee Insight.

Walking is seen as a convenient and reliable form of transport, good for local journeys and rush hour trips in London. Over 70 per cent of Londoners feel that walking is the fastest way to travel for short journeys.

Attitudes to walking: Feeling good

Londoners generally feel positive about walking. Almost all believe that it's a good way to keep fit, and many Londoners find that walking is enjoyable, is an interesting way to travel and gives them time to think. For three quarters of Londoners, walking to a destination makes them more relaxed (figure 6.8).

Figure 6.8 Attitudes to walking: Feeling good.

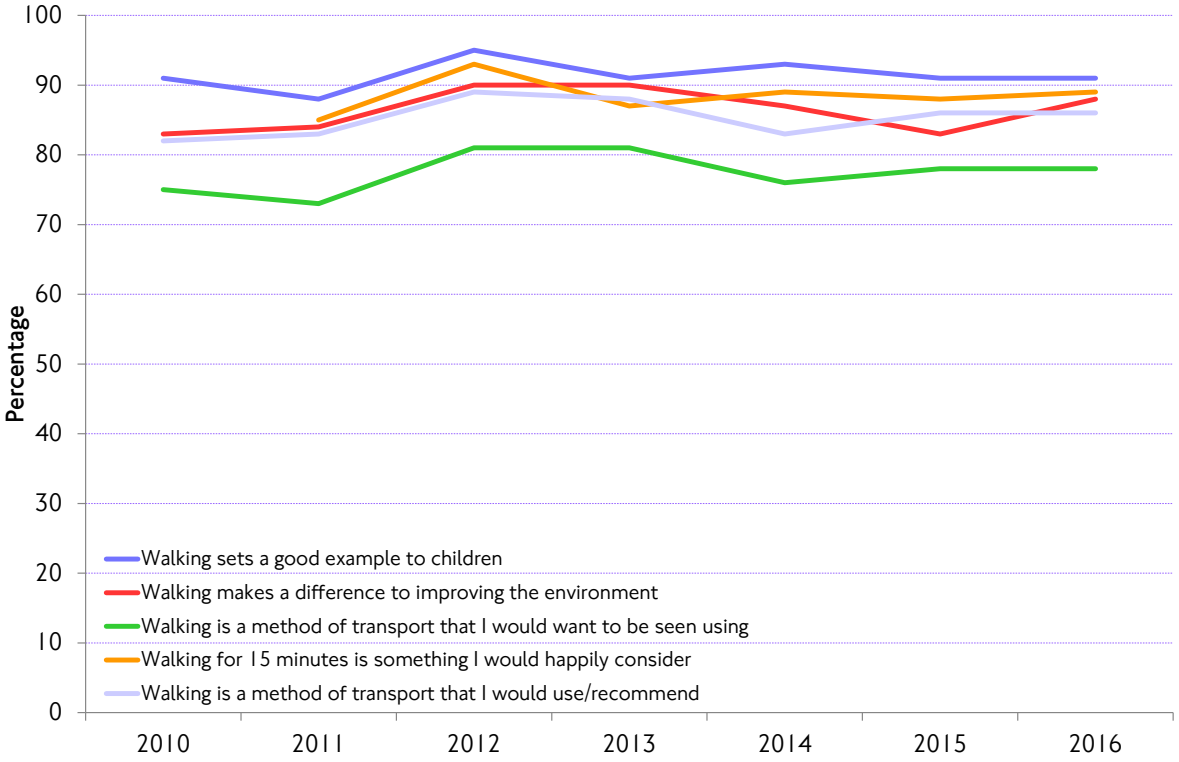


Source: TfL Customer & Employee Insight.

Attitudes to walking: Social, environmental and aspirational factors

Nine in ten Londoners agree that walking sets a good example to children, is something that they would happily consider doing, makes a difference to improving the environment and is something they would recommend. More than three quarters of Londoners agree that walking is a form of transport they would want to be seen using (figure 6.9).

Figure 6.9 Attitudes to walking: Social, environmental and aspirational factors.



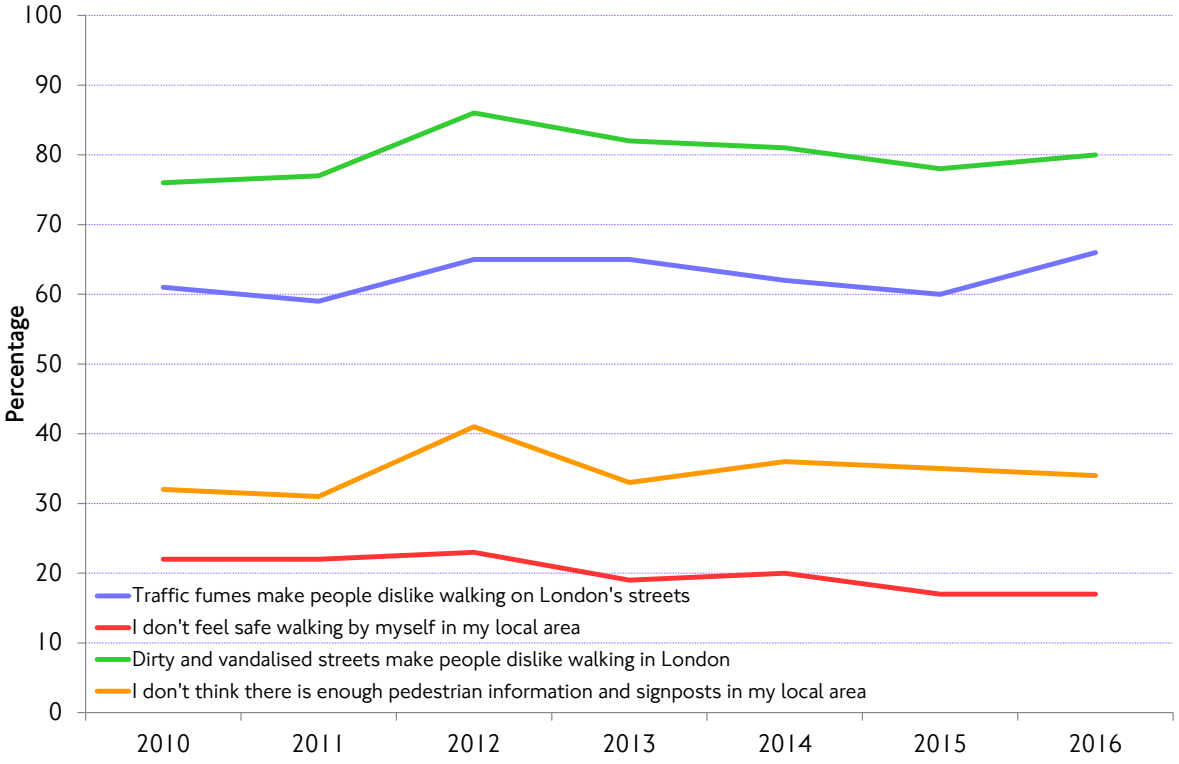
Source: TfL Customer & Employee Insight.

Attitudes to walking: State of the walking environment and attitudes to safety

While Londoners agree that good design and information encourage walking, they do not always believe that the right infrastructure is in place: three quarters of Londoners believe that information and signs make it easy to find one's way around London, but 34 per cent feel that there is not enough pedestrian information. The majority of Londoners (80 per cent) agree that dirty and vandalised streets make people dislike walking (figure 6.10).

Certain factors can make walking less pleasant; two thirds of Londoners believe that traffic fumes make people dislike walking in London, and two thirds feel the same about heavy traffic. Speed of vehicles is less of an issue, but nonetheless half of Londoners believe that vehicle speeds make walking unpleasant. Most Londoners feel safe walking by themselves in their local area, although 17 per cent do not.

Figure 6.10 Attitudes to walking: State of the walk environment and attitudes to safety.

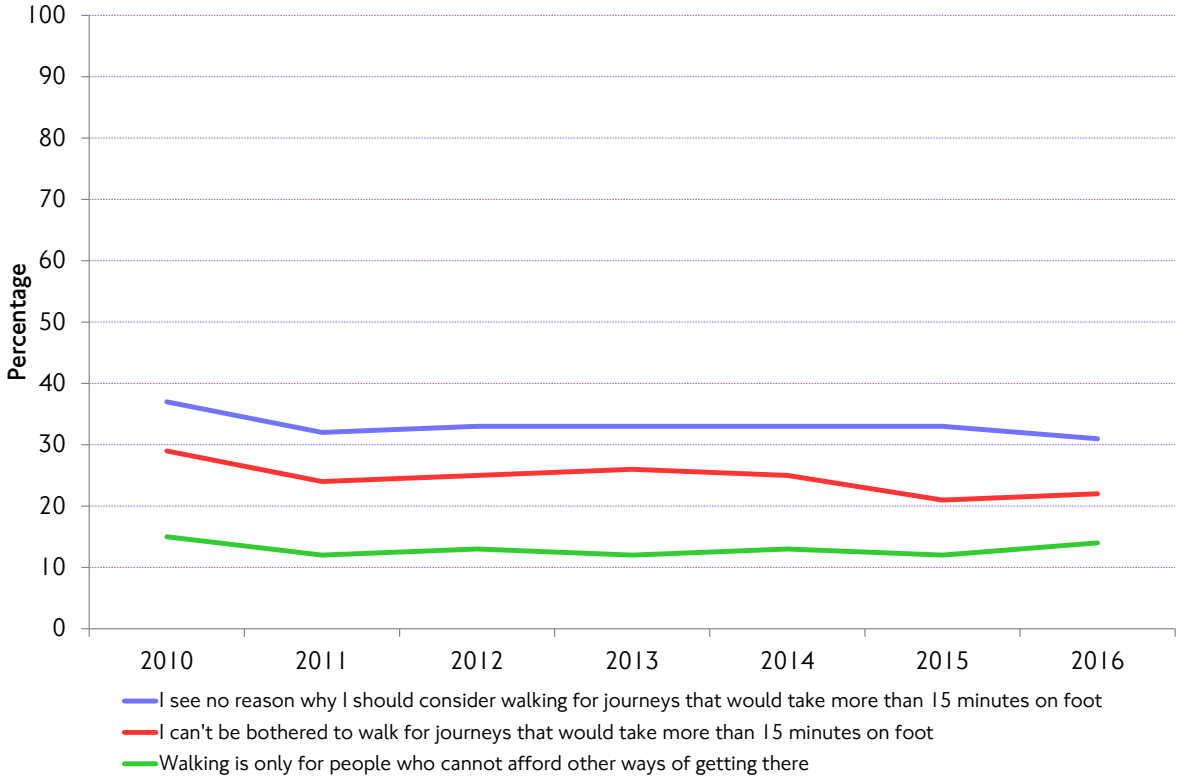


Source: TfL Customer & Employee Insight.

Attitudes to walking: Resistance to walking

Londoners were shown a list of 'negative' statements about walking and asked to select which they agreed with. Just less than a third said that they could see no reason to consider walking for a journey of more than 15 minutes, while slightly fewer 'couldn't be bothered' to make such journeys by foot. 14 per cent of Londoners agreed that walking is only for people that can't afford other methods of transport. Agreement with each of these 'negative' statements is made by only a minority of Londoners; however they give insight into the range of psychological factors that militate against people's decision to walk when it is a viable alternative for a trip otherwise made using another mode (figure 6.11).

Figure 6.11 Attitudes to walking: Resistance to walking.



Source: TfL Customer & Employee Insight.

6.5 Attitudes to cycling

Overall indicator of attitudes to cycling

The extent to which Londoners agree with the proposition that 'London is a city for cycling' is an indicator that encapsulates the evaluation of individuals across a wide range of attributes. In terms of the historic surveys, it probably therefore gives the best benchmark and trend of how Londoners view cycling as a mode of transport.

Table 6.2 Extent to which Londoners agree with the proposition that 'London is a city for cycling'.

Year/Indicator	2010	2011	2012	2013	2014	2015	2016
London is a city for cycling	34	41	47	42/40	38/38	39/38	41/43

Source: TfL Customer & Employee Insight.
Note: From 2013 onwards, there were two surveys undertaken each year.

As is shown by table 6.2, the extent to which Londoners agree with the proposition is typically around 40 per cent. Although values vary considerably from survey to survey, the scores for 2016 were among the highest recorded.

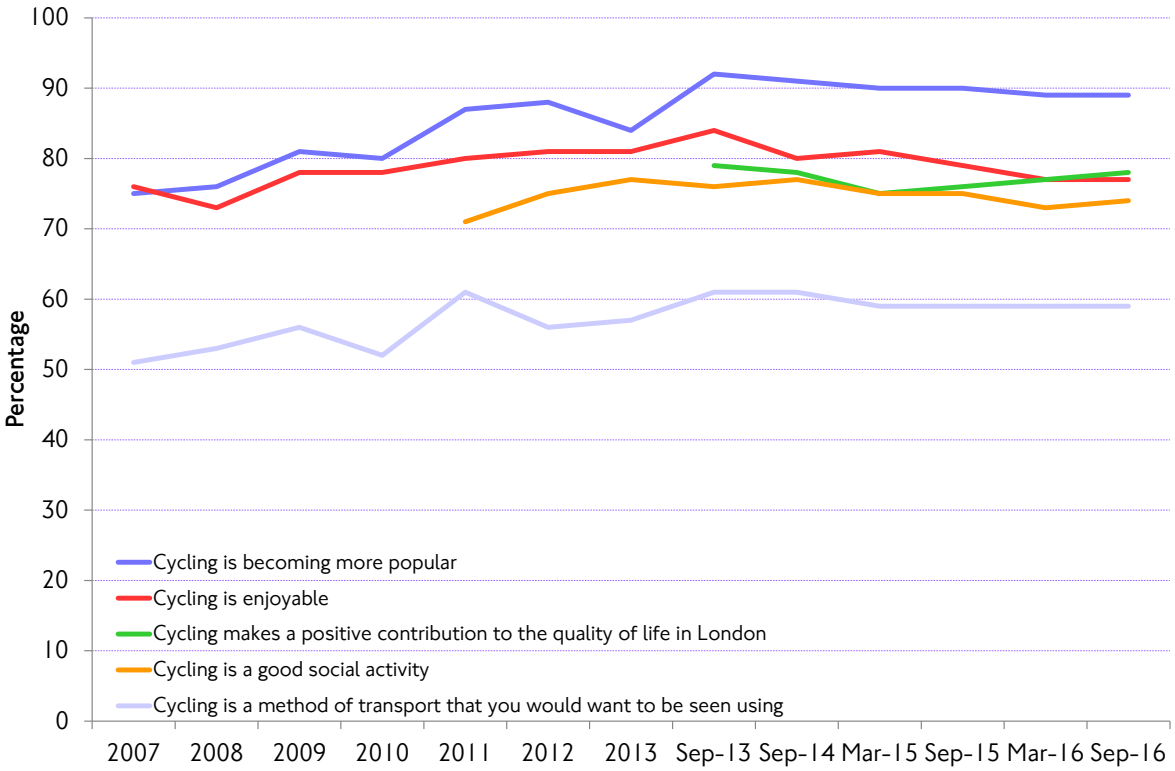
This evaluation for cycling is systematically substantially lower than that for walking (above), in part reflecting the relatively lower participation rates across the population; almost 80 per cent of respondents to the survey classify themselves as 'non cyclists'. They do however demonstrate ample scope to improve overall

perceptions of cycling through Healthy Streets improvements and, in doing so, contribute to increased levels of cycling and wider draft MTS objectives.

Attitudes to cycling: Emotional and social factors

Figure 6.12 shows responses to a range of social and environmental factors relating to cycling. It is interesting to note the overall relatively high levels of agreement with these statements, given the relatively large number of Londoners who define themselves as 'non cyclists' and that only just over one half (55 per cent) have access to a bike in their household. It is difficult to discern a clear trend in most of these indicators and, again, there is therefore considerable scope for improvement in the future.

Figure 6.12 Attitudes to cycling: Emotional and social factors.



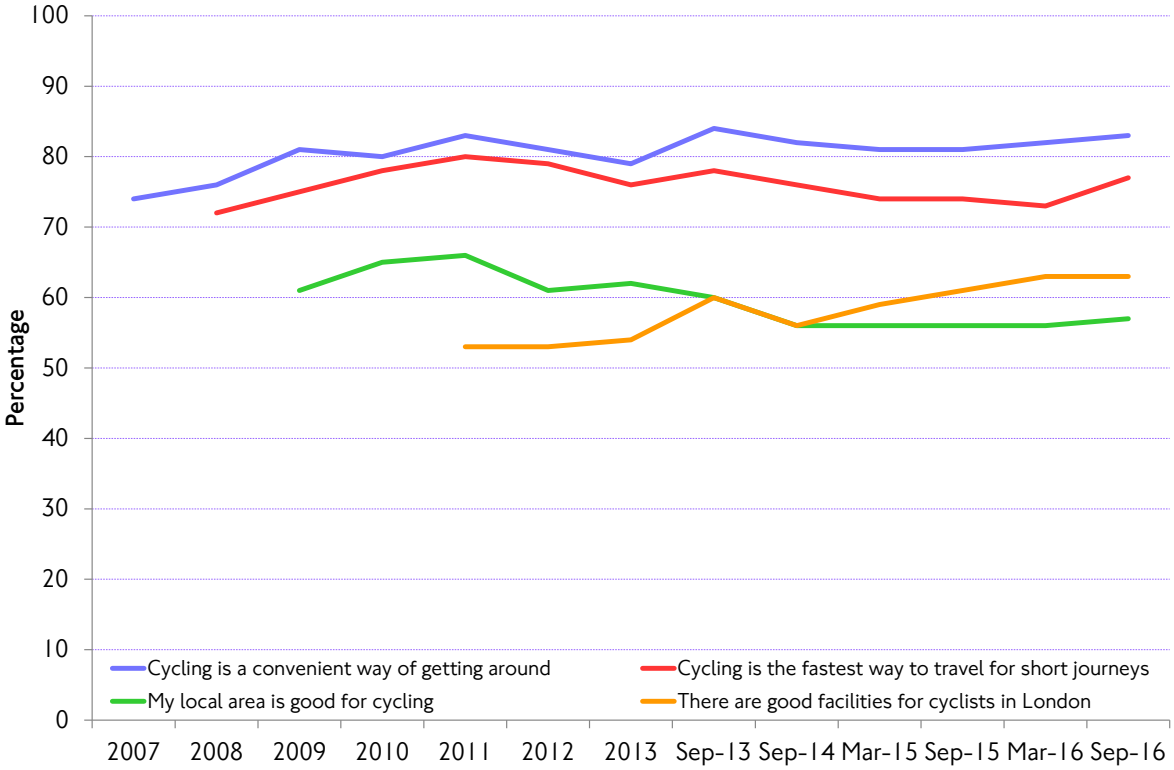
Source: TfL Customer & Employee Insight.

Attitudes to cycling: Convenience and facility factors

In terms of convenience (figure 6.13), and again in the context of roundly 80 per cent of Londoners who define themselves as 'non cyclists', typically more than 80 per cent of respondents regard cycling as a convenient way of getting around London. This alone illustrates the large potential for encouraging more people to cycle.

It is also widely recognised as being the fastest mode for short journeys. Somewhat less than 60 per cent of people regard their area as being 'good for cycling', an attribute that has shown a clear downward trend over the period covered by the surveys, which may be connected to an overall increased awareness of cycling. A similar proportion agree that 'there are good facilities for cyclists in London', an attribute which has shown signs of improving slightly over the survey period.

Figure 6.13 Attitudes to cycling: Convenience and facility factors.

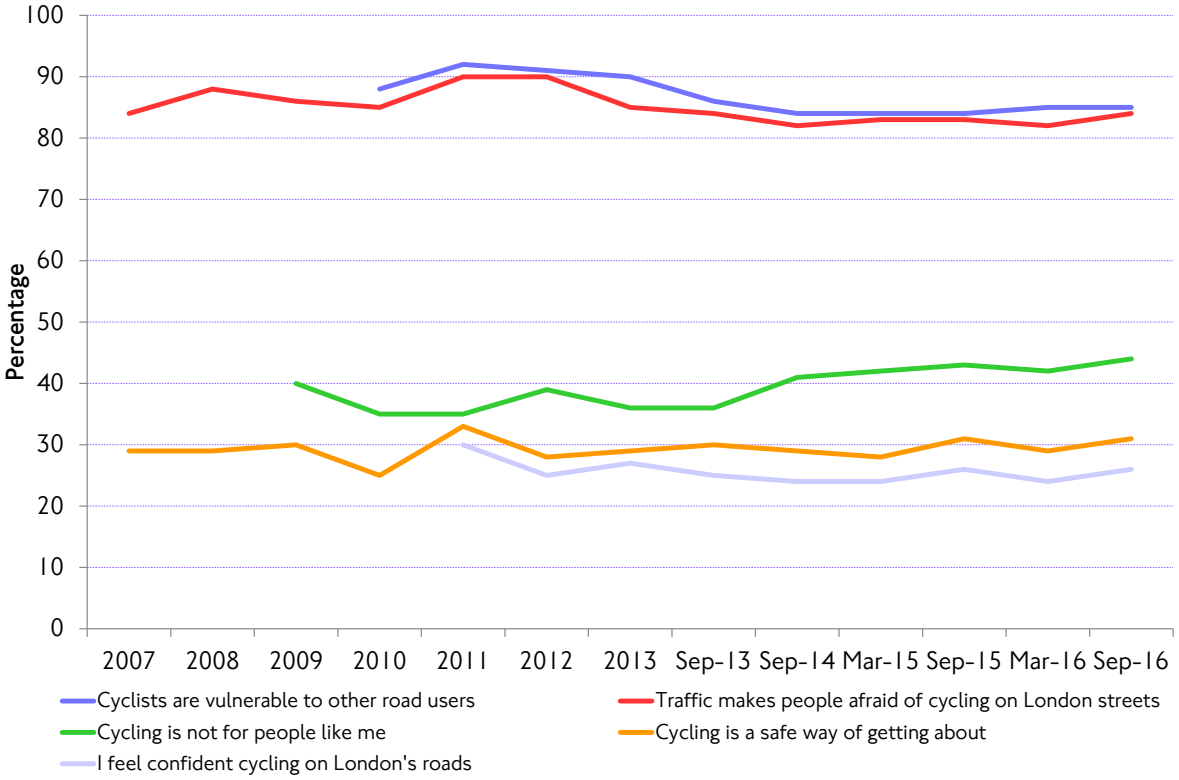


Source: TfL Customer & Employee Insight.

Attitudes to cycling: Confidence factors

Although often learned in childhood, cycling is nevertheless a skill, and Londoners feel different degrees of confidence in their ability to cycle, particularly in the context of the wider urban road network. Figure 6.14 shows levels of agreement with a range of propositions relating to people's confidence with being able to cycle.

Figure 6.14 Attitudes to cycling: Factors relating to confidence.



Source: TfL Customer & Employee Insight.

Notable from the figure is the relatively high level of concern about road danger, although these indicators appear to be on a slow downward trend. Consequently, only around 30 per cent of Londoners agree that cycling is a 'safe way of getting around'.

Just (typically) one quarter of people feel confident about cycling on London's roads, which is clearly a major factor in deterring people who otherwise hold positive attitudes towards cycling from using this mode on a regular basis. Interestingly, typically around 40 per cent of respondents do not regard cycling as 'for people like them'. This is a relatively high proportion, but there is roughly 60 per cent of Londoners to whom this does not apply. Again the prevailing responses to these propositions indicate considerable scope for improvement going forwards.

6.6 Access to the cycle network

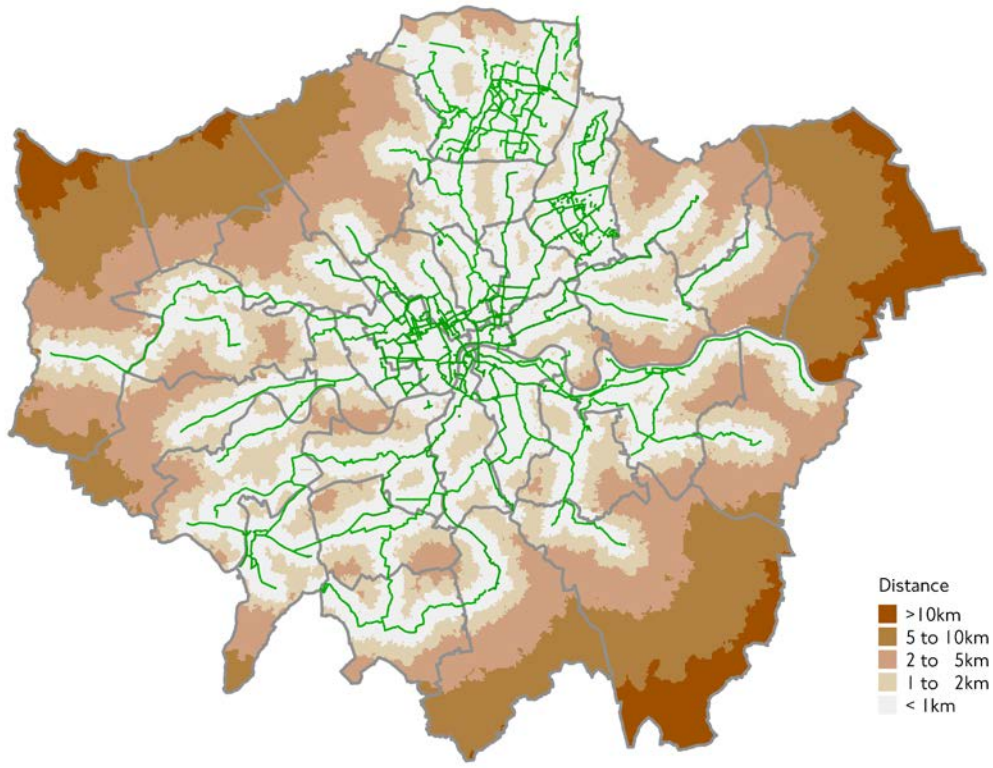
Since its formation in 2000, TfL has been working with London boroughs and other partners to improve London's cycle facilities, starting with the London Cycle Network (LCN) and London Cycle Network + (LCN+), then Cycle Hire and the first generation of Cycle Superhighways, and more recently the second generation of Cycle Superhighways and first phases of Quietways and Mini-Hollands. London's combined Superhighway and Quietway network is now more than 100km long.

The Healthy Streets Approach includes the continued expansion of London's network of quality cycle routes. TfL's most recent Business Plan set out a Healthy Streets investment portfolio that committed investment to increase provision for cycling in London, alongside improvements for walking, safety and bus reliability.

This planned infrastructure should triple the proportion of Londoners living within 400m of one or more of these cycle routes to around 35 per cent by 2022.

Looking further ahead, the Strategic Cycling Analysis and the draft Mayor's Transport Strategy set the framework for a strategic cycling network that will achieve the Mayor's aim of 70 per cent of Londoners living within 400m of a high-quality, safe cycle route by 2041.

Figure 6.15 Access to London's cycle network.



Source: TfL City Planning, Strategic Analysis.

Table 6.3 Londoners living within 400 metres of the cycle network.

Year/Indicator	2016
Percentage of Londoners living within 400 metres of the cycle network	26.7
Reference 2015 population (millions)	8.64

Source: TfL City Planning, Strategic Analysis.

6.7 Road danger

Summary

Recent years have seen substantial reductions in the number of killed or seriously injured (KSI) casualties from road traffic collisions in London. TfL has made significant progress by building new infrastructure that protects vulnerable road users and working with its partners to implement new ideas and technologies. This enabled TfL and delivery partners to reduce KSI casualties on London's roads by 40 per cent against a 2005-09 baseline by 2014.

Vision Zero

As outlined in the draft Transport Strategy, the Mayor, through TfL, the boroughs, police and enforcement authorities, will adopt Vision Zero for road danger in London. This will involve more demanding targets as the Mayor's aim is for no one to be killed in or by a London bus by 2030, and for all deaths and serious injuries from road collisions to be eliminated from London's streets by 2041.

Recent trends

During 2016 the number of fatalities on London's roads fell to the lowest level on record, with car occupant fatalities halving when compared to 2015. The number of slight casualties also fell significantly amongst motorcyclists. Despite these positive trends, pedestrian casualties increased, in particular those involving cars and motorcycles. Child car occupant casualties also increased. In parallel with these increases in casualties, travel by car and motorcycle increased during 2016, when compared to 2015, following reductions in previous years.

To further reduce the danger posed by motor vehicles, road danger reduction efforts, as outlined in the draft MTS, will be focused in four areas as part of the Mayor's commitment to Vision Zero for road danger:

- Safe speeds (lowering speeds to reduce road danger);
- Safe street design (ensuring all transport infrastructure contribute to reducing road danger);
- Safe vehicles (ensuring that those vehicles that need to use London's streets are as safe as possible) and
- Safe people (improving the behaviour of all road users, especially drivers of motorised vehicles).

Changes in the reporting of collision figures by the police

Figures for road traffic collisions from September 2016 onwards have been reported by the Metropolitan Police Service (MPS) using the new Case Overview and Preparation Application (COPA). The City of London Police Service adopted the Department for Transport (DfT) Collision Reporting and SHaring (CRASH) system in October 2015.

COPA and CRASH use a new method of assessing the severity of injury sustained in collisions, as recommended by the DfT. The use of these systems aims to improve accuracy in the recording of injury type, with the result that more injuries are being classified as serious rather than slight.

Figures for the number of serious injuries reported by the police since September 2016, using injury-defined systems, are therefore not directly comparable with data

collected using previous systems, and should not be used to interpret year on year trends. TfL is working with the DfT to back-estimate the number of seriously injured casualties that would have been reported by the police using an injury-defined rather than a severity-defined system. This will allow comparisons to be made between 2016 serious injury figures and previous years.

Casualty trends in London

Figure 6.16, indexed to the Government's 2005-2009 baseline for measuring progress, shows the long-term trend of casualty reduction in London since 2005.

Data presented is for personal injury road traffic collisions occurring on the public highway, and reported to the police, in accordance with the STATS 19 national reporting system. It should be noted that large percentage changes in small numbers may not necessarily be statistically significant.

In 2016 a total of 30,270 personal injury casualties were reported by the police in London. Of these, 116 were fatally injured, 2,385 were seriously injured and 27,769 were slightly injured.

Compared to 2015:

- Fatalities decreased by 15 per cent, from 136 to 116, to the lowest level on record and to 45 per cent down on the 2005-2009 baseline. The number of fatalities decreased, or remained unchanged, for all modes of travel. Pedestrian fatalities fell from 66 to 61, motorcyclist fatalities fell from 36 to 33 and cyclist fatalities fell from 9 to 8. Car occupant fatalities halved, from 20 to 10, falling to the lowest level on record.
- There was a 22 per cent increase in serious casualties, from 1,956 to 2,385. The majority of this increase occurred during the last four months of 2016 following the introduction of COPA by the MPS. Increases in the number of reported serious injuries during 2016 primarily reflect improvements in the reporting of serious injury severity by the police, and should not be compared with data previously collected by the police using severity based systems.
- Slight casualties decreased by 1 per cent to 27,769 compared to 28,090.
- Overall casualty numbers (all injury severities) increased slightly by 0.3 per cent.

Despite overall trends of reduced road danger for most road user groups, 2015 saw a concerning increase in the number of motorcyclist fatalities and serious injuries.

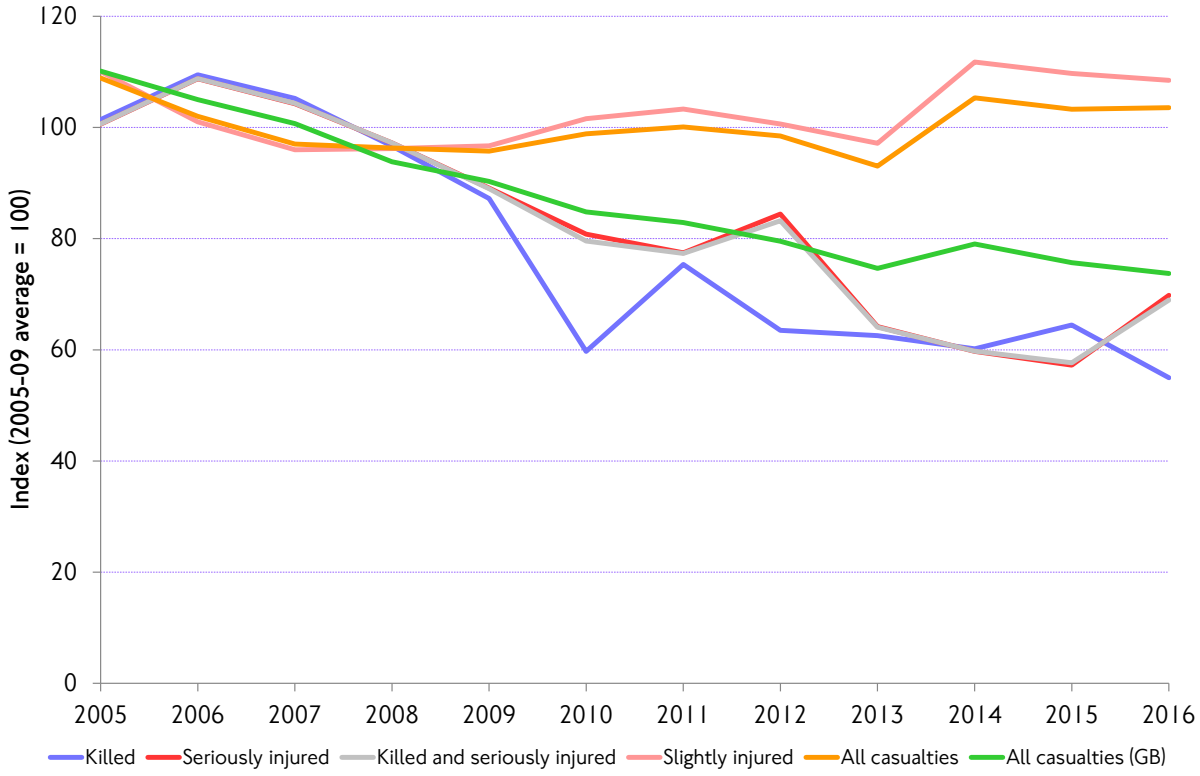
TfL launched the first Motorcycle Safety Action Plan in 2014, and is working with its partners, including the police and the Motorcycle Industry Association, to maximise the impact of the programme. This includes funding for accredited motorcycle training centres, one-to-one training for motorcycle commuters and improving street design for motorcyclists with the UK's first Urban Motorcycle Design Handbook. TfL's on-going motorcycle safety marketing campaign is also helping to tackle the main cause of fatal collisions, which is 'travelling too fast for the conditions'.

TfL's road danger reduction strategy is focused on tackling the five key sources of road dangers which include; travelling too fast, distractions, carrying out risky manoeuvres, driving under the influence of drink or drugs and failing to comply with

the laws of the road. Achieving this will help to halve the number of people killed or seriously injured on London's streets by 2020.

As part of TfL's drive to improve road danger awareness within the Capital, it has updated its London Collision Map with the latest road casualty data, which can be found at www.tfl.gov.uk/corporate/safety-and-security/road-safety/london-collision. By looking at the map, which has records dating back to 2005, road users can easily search for information about where and when most collisions occur.

Figure 6.16 Long-term trend for road traffic casualties in London, by severity of injury. Index: 2005-2009 average baseline = 100.



Source: STATS19.

Table 6.4 shows casualties on London's roads for 2015 and 2016 compared to the 2005-2009 baseline. The asterisks indicate where changes are significant at the 95 per cent confidence level, applying the Poisson probability distribution. In 2016 against the 2005-2009 baseline:

- Fatalities were 45 per cent below the 2005-2009 average.
- All KSI casualties were 31 per cent below the 2005-2009 average.
- Child KSIs were 50 per cent below the 2005-2009 average.
- Slight casualties were 8 per cent above the 2005-2009 average.
- Cyclist fatalities were 52 per cent below the 2005-2009 average.
- Pedestrian fatalities were 36 per cent below the 2005-2009 average.
- Motorcyclist fatalities were 24 per cent below the 2005-2009 average.

Table 6.4 Road collision casualties in Greater London in 2016 compared with 2005-2009 average and 2015.

Casualty severity	User group	Casualty numbers			Percentage change in 2016 over	
		2005-2009 average	2015	2016	2015	2005-2009 average
Fatal	Pedestrians	96.0	66	61	-8%	-36%*
	Pedal cyclists	16.6	9	8	-11%	-52%*
	Powered two-wheeler	43.4	36	33	-8%	-24%*
	Car occupants	49.4	20	10	-50%*	-80%
	Bus or coach occupants	2.4	1	1	0%	-58%
	Other vehicle occupants	3.2	4	3	-25%	-6%
	Total	211.0	136	116	-15%	-45%*
	Children (under 16 years)	11.6	5	6	20%	-48%
Fatal and serious	Pedestrians	1,216.4	730	875	20%*	-28%*
	Pedal cyclists	420.6	387	454	17%*	8%*
	Powered two-wheeler	791.2	540	681	26%*	-14%*
	Car occupants	949.0	314	368	17%*	-61%*
	Bus or coach occupants	139.6	71	70	-1%	-50%*
	Other vehicle occupants	109.8	50	53	6%	-52%*
	Total	3,626.6	2,092	2,501	20%*	-31%*
	Child pedestrians	231.8	111	124	12%	-47%*
	Child pedal cyclists	32.8	17	15	-12%	-54%*
	Child car passengers	42.2	12	17	42%	-60%*
	Child bus or coach passengers	11.6	4	4	0%	-66%
	Other child casualties	11.8	3	6	100%	-49%
	Children (under 16 years)	330.2	147	166	13%	-50%*
Slight	Pedestrians	4,214.0	4,653	4,674	0%	11%*
	Pedal cyclists	2,718.2	4,087	3,970	-3%	46%*
	Powered two-wheeler	3,806.4	4,903	4,574	-7%*	20%*
	Car occupants	12,426.8	11,491	11,523	0%	-7%*
	Bus or coach occupants	1,429.8	1,523	1,523	0%	7%*
	Other vehicle occupants	1,004.8	1,433	1,505	5%	50%*
	Total	25,600.0	28,090	27,769	-1%	8%*
	Children (under 16 years)	1,889.0	1,848	1,897	3%	0%*

All severities	Pedestrians	5,430.4	5,383	5,549	3%	2%*
	Pedal cyclists	3,138.8	4,474	4,424	-1%	41%*
	Powered two-wheeler	4,597.6	5,443	5,255	-3%*	14%*
	Car occupants	13,375.8	11,805	11,891	1%	-11%*
	Bus or coach occupants	1,569.4	1,594	1,593	0%	2%*
	Other vehicle occupants	1,114.6	1,483	1,558	5%	40%*
	Total	29,226.6	30,182	30,270	0%	4%*
	Children (less than 16 years)	2,219.2	1,995	2,063	3%	-7%*

The asterisks indicate where changes are significant at the 95% confidence level, applying the Poisson probability distribution. Significance testing helps to identify where change is associated with random change and where it is statistically significant. Given a set of two different numbers, the difference between these numbers is statistically significant where we are 95% confident that this is not due to randomness. Figures for the number of serious injuries during 2016 are not directly comparable with previous years as a result of improved reporting of injury severity by the police.

Source: STATS19.

Table 6.5 summarises the trend for recent years in all KSIs; table 6.6 summarises the recent trend in fatalities only, recognising that the definition of this outcome is not affected by the method change to the system for recording collisions.

Table 6.5 People killed or seriously injured in road traffic collisions in London.

Year/Indicator	2010	2011	2012	2013	2014	2015	2016
Total KSIs (all people)	2,886	2,805	3,018	2,324	2,167	2,092	2,501*
Total KSIs (vulnerable road users only)	1,995	2,150	2,423	1,837	1,737	1,657	2,010*
Total KSIs (people travelling on or in a collision involving a bus **or coach)**	236	232	233	195	185	166	165*

Source: STATS19.

Figures for the number of serious injuries from September of 2016 onwards are not directly comparable with previous years as a result of changes in the reporting of injury severity by the police.

Table 6.6 People killed in road traffic collisions in London.

Year/Indicator	2010	2011	2012	2013	2014	2015	2016
Total fatalities (all people)	126	159	134	132	127	136	116
Total fatalities (vulnerable road users only)	96	123	110	101	104	111	102
Total fatalities (people travelling on or in a collision involving a bus or coach)	9	14	18	12	11	15	10

Source: STATS19.

6.8 Congestion and journey time reliability for motorised traffic

Introduction and content

This section updates established indicators of road network performance in London, looking at average traffic speeds and delay (congestion) levels, based on Trafficmaster GPS data, as well as TfL's indicator of journey time reliability for traffic on major roads.

These indicators focus on motor vehicle traffic only. TfL is currently exploring how these indicators might be extended to also cover other modes using streets (bus passengers and people cycling and walking) and therefore better reflect the priorities of the MTS – putting people at the centre of how we plan and operate streets.

Established measures of motorised traffic congestion in London

There are three established measures of road network performance for motor vehicle traffic:

- **Average traffic speed** is the simplest measure, but does not indicate how actual network performance compares to what might be 'expected' for the network. This would vary, for example, between major and minor or residential roads.
- **Excess delay** is the conventional measure used to describe traffic congestion. It compares the actual travel rate (in minutes per kilometre) for a given journey against the travel rate for the same journey under uncongested conditions (typically and for practical purposes taken as the overnight period).
- **Journey time reliability** quantifies the variability of actual journeys around a nominal average, typically the most important aspect of road performance from a business and commuter customer perspective. The measure is independent of both absolute average speed and delay. This measure is described more fully in Travel in London report 3.

These are essentially 'pragmatic' measures that provide a good and consistent overview of the performance of the road network for general motorised vehicle traffic, eg for the purposes of optimising day-to-day road network operation, but are limited to that domain.

Summary of long-term trends for traffic speeds and delays in London

Previous Travel in London reports have described the trends over two decades towards slower average traffic speeds and increased congestion (delay) in London. They also described the relationship of these trends to levels of traffic demand, which had been falling for much of the last 15 years, and interventions, such as urban realm improvements, that have reduced the effective capacity of London's road network for general motorised traffic.

The consistency of this relationship, visible in the historic data from moving car observer surveys up to 2006/07, was more recently obscured as newer Trafficmaster GPS data (which replaced the traditional method of recording speeds and delays) had shown a notable lack of trend at the aggregate level since first becoming available in late 2006. This was, in part, due to the differing technical assumptions between the two indicators (see also Travel in London report 6, section 6.4).

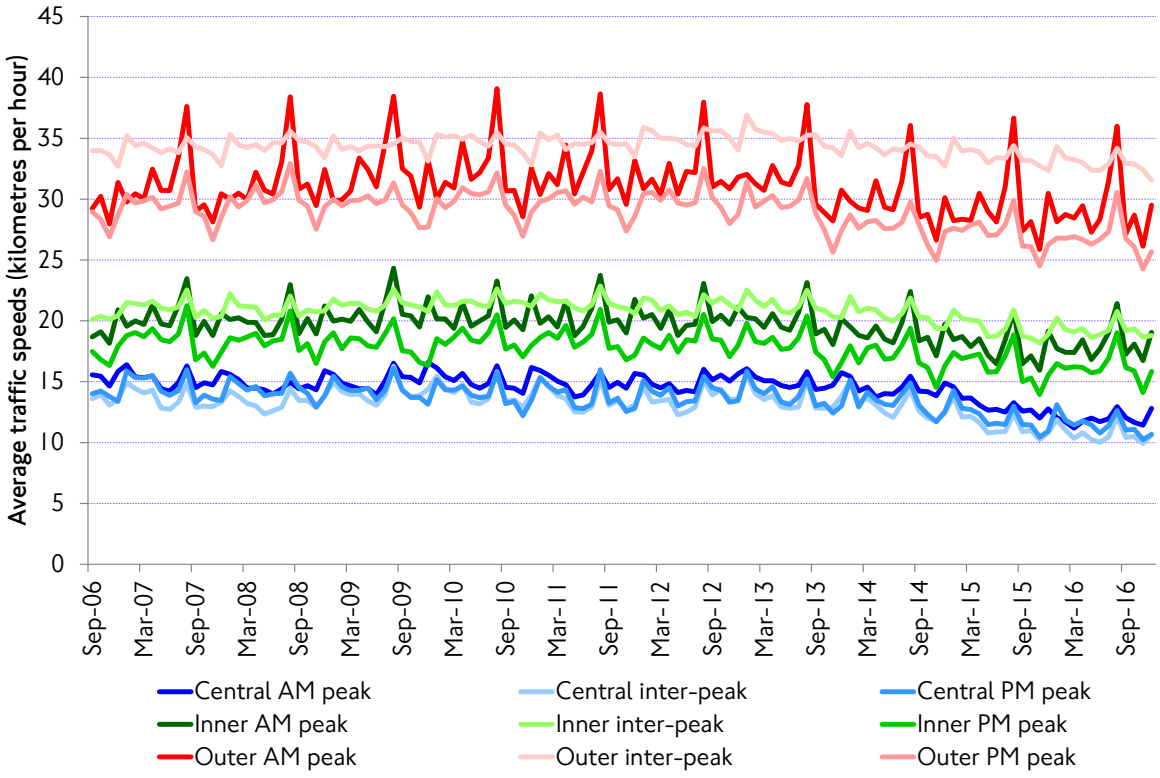
Over the most recent three years, however, there are clear indications in the GPS data that the long-standing trends are changing, with evidence of a sharp fall in average motorised traffic speeds and an increase in delays. This also coincides with indications that the historic trend of slowly-falling traffic levels may be reversing, and in the most recent year with a substantial increase in road and street works on the network, reflecting an increase in large-scale construction activity as London emerges from the recession, as well as TfL's continuing investment programme, which has seen temporary disruption associated with the construction of new cycling infrastructure in particular.

Average traffic speeds

Figure 6.17 shows the trend in average traffic speeds by functional sector of London since late 2006, when Trafficmaster data first became available.

There are clear and expected patterns associated with seasonality and the fluctuations in traffic demand on the network over the course of each year. There are also clear and expected differences in the prevailing average speeds for each of central, inner and outer London, reflecting the density and characteristics of the different networks. The overall trend was remarkably stable between 2007 and 2012; however, since this time the trend for average vehicle speed has been downwards in all parts of London, but particularly in central London. This is likely to be attributable to greater temporary disruption to the road network.

Figure 6.17 Average traffic speed (kilometres per hour) by functional sector of London. Working weekdays by time period. TfL's 'network of interest'.



Source: TfL Surface Transport, Outcomes, Insight & Analysis.

Table 6.7 shows a comparison of data over equivalent periods between 2015/16 and the first nine months of 2016/17. Average traffic speeds have declined in all sectors and time periods between 2015/16 and 2016/17, except in inner London in the AM and PM peaks where there were increases of 3.1 and 0.4 per cent respectively. The largest declines in average traffic speed were all in the central area, by 3.2 per cent in the AM peak, 4.5 per cent in the inter-peak and 4.2 per cent in the PM peak. The average decline in traffic speed in outer London was 1 per cent, whereas in inner London the overall trend was a 1.2 per cent increase in traffic speeds.

Table 6.7 Average traffic speed (kilometres per hour) and average vehicle delay (minutes per kilometre) by functional sector of London. Working weekdays, by time period. 2015/16 vs. 2016/17. TfL's 'network of interest'.

Area and time period	2015/16 average speed	2016/17 average speed*	% change	Area and time period	2015/16 average delay	2016/17 average delay*	% change
Central AM peak	12.4	12.0	-3.2	Central AM peak	2.1	2.2	3.7
Central inter-peak	11.1	10.6	-4.5	Central inter-peak	2.7	2.9	6.5
Central PM peak	11.7	11.2	-4.2	Central PM peak	2.4	2.6	5.9
Inner AM peak	17.7	18.3	3.1	Inner AM peak	1.5	1.4	-6.4
Inner inter-peak	19.2	19.2	-0.1	Inner inter-peak	1.3	1.3	0.3
Inner PM peak	16.1	16.2	0.4	Inner PM peak	1.9	1.9	-0.6
Outer AM peak	29.4	29.3	-0.1	Outer AM peak	0.8	0.8	0.1
Outer inter-peak	33.4	32.7	-1.9	Outer inter-peak	0.6	0.6	5.4
Outer PM peak	27	26.7	-1	Outer PM peak	1	1	2.0

Source: TfL Surface Transport, Outcomes, Insight and Analysis, based on data from Trafficmaster.
**Based on first nine months of 2016/17.*

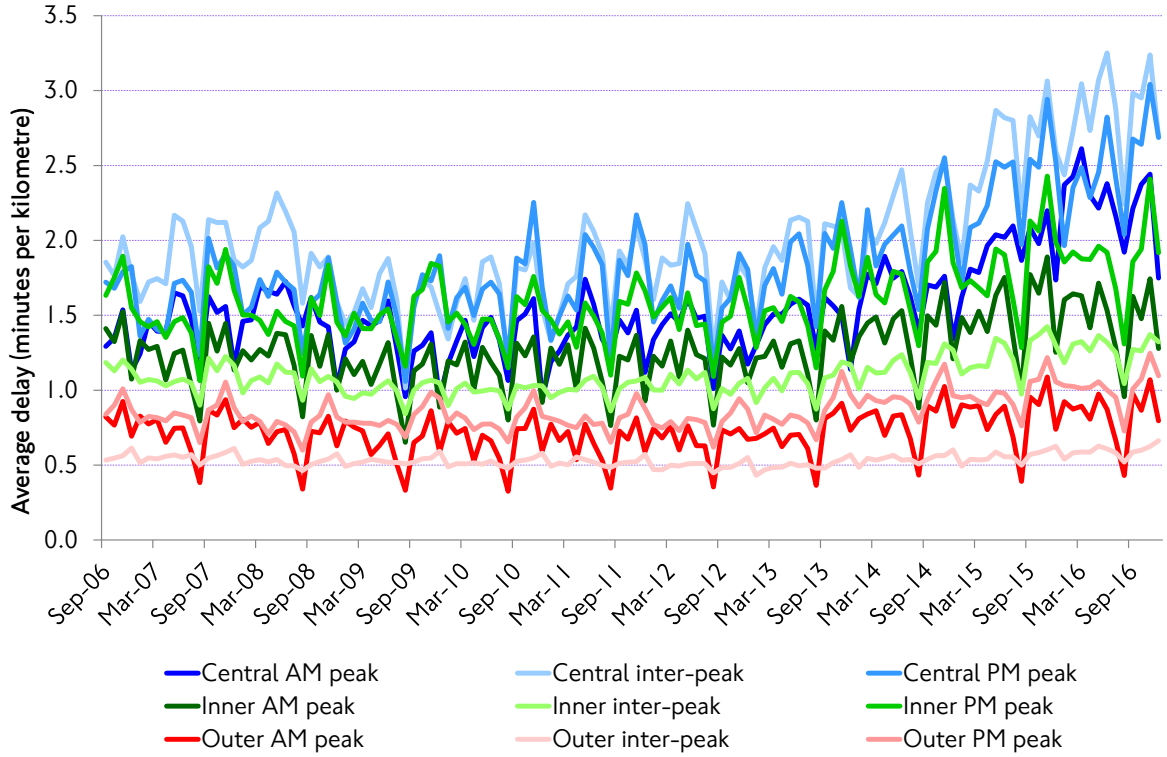
Vehicle delay (congestion)

Figure 6.18 shows the trend for congestion (delay), corresponding directly to the average speed data in figure 6.17. Trafficmaster delay values are calculated against a variable 'uncongested' night-time speed, which is that actually measured on a day-

by-day basis, rather than a fixed nominal 'night-time' speed. Furthermore, Trafficmaster 'uncongested' speeds relate to the period from 22:00 to 06:00 – a period that, in many parts of London, sees substantial volumes of traffic. Previous indicators based on moving car observer data used a faster night-time speed, reflecting the period from 02:00 to 05:00.

As well as the expected seasonal and geographical patterns shared with the speed data, figure 6.18 shows large differences in the degree of variability of traffic congestion by both area and time period. Congestion, as a measure of network instability, increases at a greater rate, and journey times are therefore more variable, the closer that traffic demand is to the carrying capacity of the network.

Figure 6.18 Average vehicle delay (minutes per kilometre) by functional sector of London. Working weekdays, by time period. TfL's 'network of interest'.



Source: TfL Surface Transport, Outcomes, Insight & Analysis.

Average delay has shown a similar pattern to average speeds, with the time series remaining relatively stable to late 2013, after which there has been a sharp increase in all parts of London. Table 6.7 shows a comparison of 2015/16 and the first nine months of 2016/17.

Figure 6.18 shows that, similar to trends in average speeds, the greatest increases in average vehicle delay between 2015/16 and 2016/17 are all in the central area. The greatest increase was in the inter-peak (6.5 per cent), followed by the PM peak (5.9 per cent) and the AM peak (3.7 per cent). Vehicle delay increased in outer London, by an average of 2.5 per cent, whereas in inner London there was an overall decline in delay of 2.2 per cent.

Journey time reliability for general road traffic

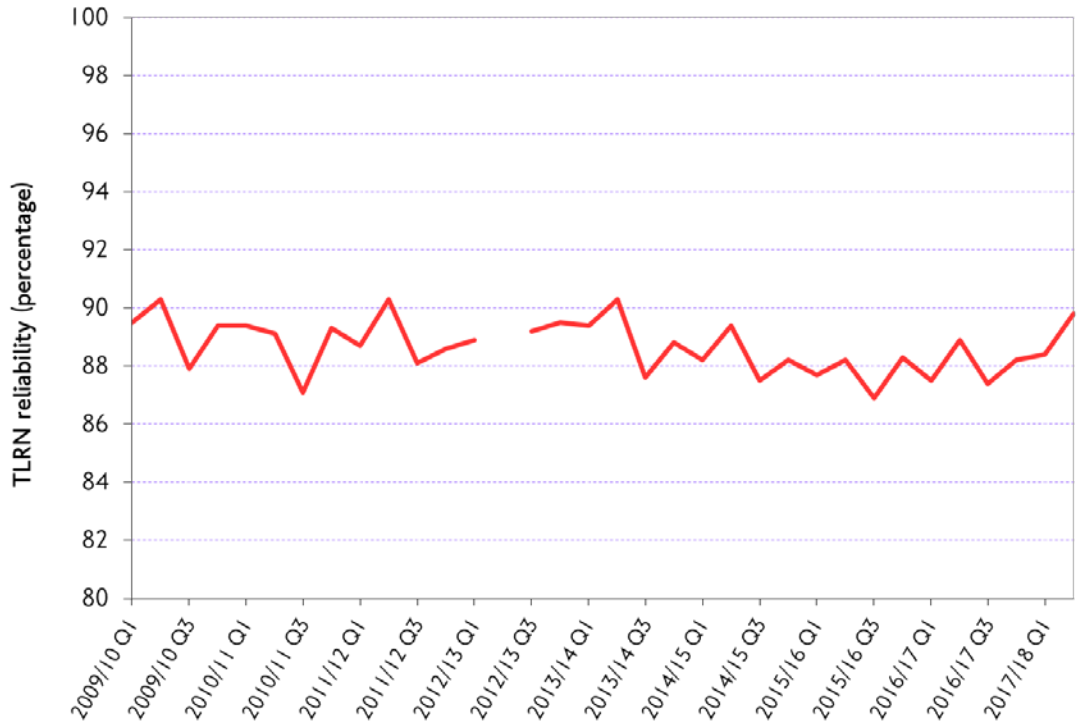
TfL's strategic level assessment of road network performance has recently been based on the concept of journey time reliability for general road traffic. TfL's journey time reliability metric considers the relationship of actual measured journeys (using Automatic Number Plate Recognition, ANPR, cameras) to a nominal average journey time that is representative of motor vehicle journeys by road in London. This is measured quarterly on a road corridor basis, covering most of the TLRN in London, and is aggregated to a London-wide index. This measure was explained in Travel in London report 2, section 4.4.

Consistency of road journey times is important to motorised road users. To that end there has been a significant focus within TfL to improve reliability through a range of initiatives aimed at actively managing traffic flow, as originally described in Travel in London report 4, section 4.14. More latterly these have been intensified to help mitigate the impact of TfL's roads modernisation programme.

Figure 6.19 shows the available trend for AM peak journey time reliability from the start of 2009/10. Against a working target of 87 per cent of road journeys in London to be achieved within five minutes of the nominal 30-minute average journey time, recorded performance since the start of this measure has mostly been between 87 and 90 per cent, with the value for 2016/17 being 88 per cent.

The relative insensitivity of this measure to factors affecting average motorised road journey speeds and excess delays has been previously explained (see, for example, Travel in London report 9, section 6.5). Whilst values for the most recent year represent an improving trend, the long-term picture is relatively stable within a narrow percentage range of reliability values.

Figure 6.19 AM peak journey time reliability on the TLRN. Percentage of journeys completed within an allowable 'excess' of a normalised average journey time.



Source: TfL Surface Transport, Outcomes, Insight & Analysis.
Note: Due to the widespread alterations made to the operation of the major road network in London during the 2012 Games, a comparable value for this period is not available.

6.9 Air quality – emissions from road traffic

Introduction

Improving London's air quality is a key Mayoral commitment and is one that requires action on many fronts. Travel in London report 9 described outputs from the latest update to the London Atmospheric Emissions Inventory (LAEI), which had been updated to reflect a 2013 baseline and also included long-range future projections to 2020, 2025 and 2030. These projections considered emissions from all sources and emissions from road transport specifically.

The report also illustrated various forms of output and insight that can be gained from the LAEI - a comprehensive and authoritative source of information on spatially-disaggregated emissions covering the area within and including the M25 motorway. The LAEI is updated on an approximate two-year cycle, with each iteration typically including a range of methodological improvements, as for example our understanding of the actual 'on road' performance of vehicles develops. The next update is scheduled to be published towards the end of 2018. The LAEI is available for use via the London Datastore (see: https://data.london.gov.uk/dataset/london-atmospheric-emissions-inventory-2013).

This section looks at short range trends, based on the LAEI 2013 and covering the period 2013-2016, for emissions from road transport, bearing in mind that progress

in reducing emissions from this source is a key Mayoral objective. Change over this period reflects a combination of changed traffic volumes and changed vehicle technology, as older vehicles are progressively removed from the fleet and newer, generally cleaner vehicles replace them. The short-term trends have been calculated based on information that is available in the LAEI and give a short-term view of progress, pending the next comprehensive update to the LAEI.

The Mayor, through his draft Transport and Environment strategies, is taking forward an ambitious programme to help bring London's air quality into compliance with applicable EU standards as soon as possible, as well as go beyond these to deliver further improvements to health by achieving World Health Organisation (WHO) recommended guidelines for $PM_{2.5}$, and to help ensure that London's carbon footprint and contribution to global climate change is minimised.

Emissions from road transport

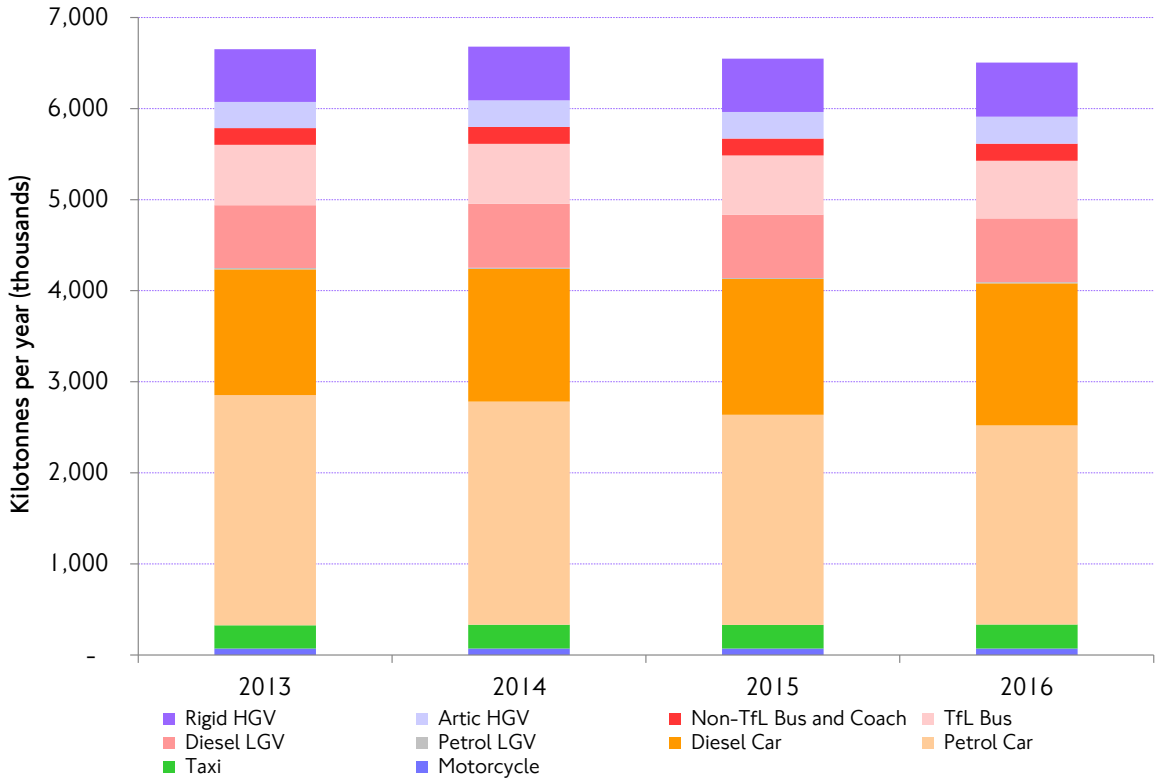
Road transport is a substantial contributor to all three of the main atmospheric pollutants in London. For Carbon Dioxide (CO_2), London's principal greenhouse gas, road transport is estimated (2013) to account for 28 per cent of total local London CO_2 emissions. For Oxides of Nitrogen (NO_x), the contribution is 50 per cent, for fine particles (PM_{10}), the proportion is 50 per cent and for ultra-fine particles ($PM_{2.5}$) the proportion is 54 per cent.

Updated short-term LAEI emissions projections for Greater London are shown below for CO_2 and the key local air quality pollutants, NO_x and PM_{10}, for the LAEI 'base' year of 2013, and subsequent years to 2016. Longer term projections from this source were described in Travel in London report 9.

Carbon Dioxide (CO_2)

Figure 6.20 shows the short-term trend for CO_2 emissions from road transport between 2013 and 2016. Table 6.8 sets out the underlying figures.

Figure 6.20 Emissions of CO_2 from road transport in Greater London – short term trend 2013-2016.



Source: London Atmospheric Emissions Inventory (LAEI).

Table 6.8 Emissions of CO_2 from road transport in Greater London – short-term trend 2013-2016. Kilotonnes per year.

	LAEI		Projections		% change		
	2013	2014	2015	2016	2014	2015	2016
Motorcycle	70,021	71,045	70,492	71,178	1%	-1%	1%
Taxi	255,566	260,124	259,220	263,299	2%	0%	2%
Petrol Car	2,527,751	2,452,075	2,308,615	2,185,732	-3%	-6%	-5%
Diesel Car	1,380,883	1,455,754	1,488,843	1,560,614	5%	2%	5%
Electric Car	-	-	-	-			
Petrol LGV	14,927	13,115	12,500	12,212	-12%	-5%	-2%
Diesel LGV	688,625	702,231	694,411	700,828	2%	-1%	1%
Electric LGV	-	-	-	-			
TfL Bus	663,474	657,217	651,158	631,978	-1%	-1%	-3%
Non-TfL Bus and Coach	183,136	186,452	185,660	188,621	2%	0%	2%
Artic HGV	288,124	292,903	291,631	296,101	2%	0%	2%
Rigid HGV	579,003	588,910	586,219	595,218	2%	0%	2%
Total Road Transport	6,651,511	6,679,828	6,548,749	6,505,782	0.4%	-2.0%	-0.7%

Source: London Atmospheric Emissions Inventory (LAEI).

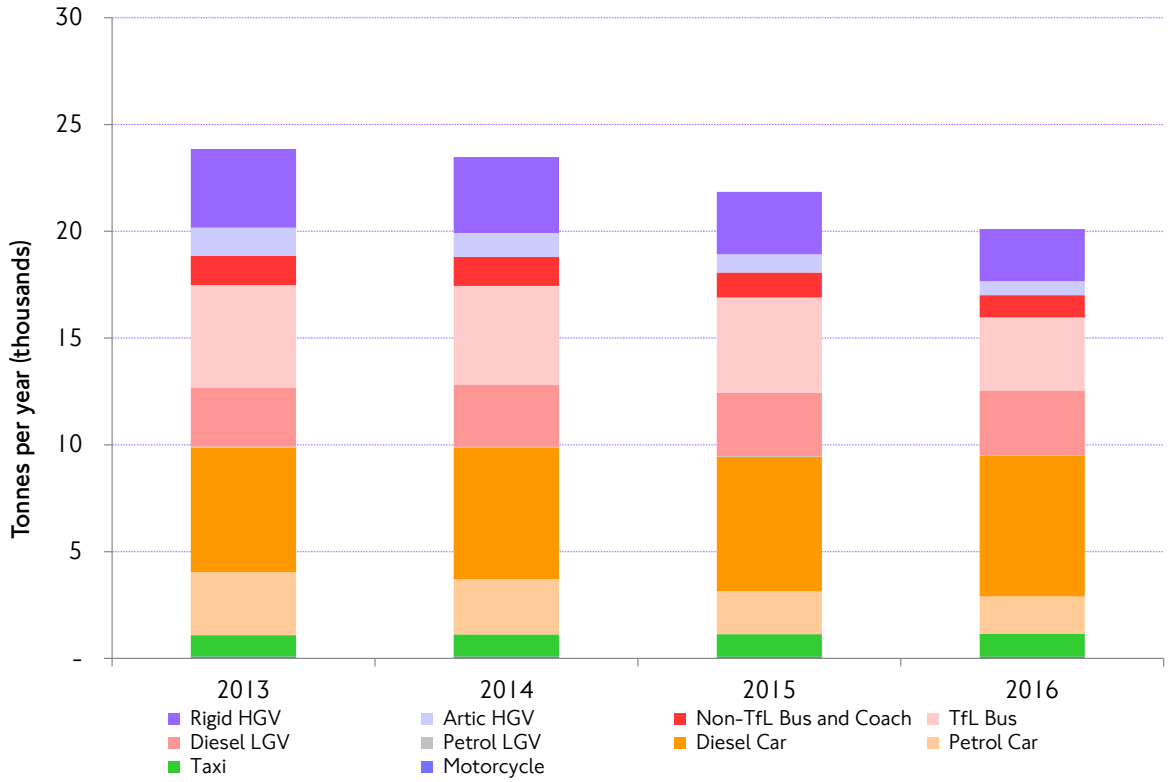
CO_2 emissions reflect vehicle kilometres driven and the efficiency of those vehicles; therefore the recent trend in emissions shows the net effect of an increase in the former, combined with steady progress (reductions) in the latter.

Within the overall trend, the relative increase in emissions from diesel cars, with a corresponding decrease in emissions from petrol cars, is notable – reflecting a shift in the vehicle fleet composition. TfL bus emissions also decrease gradually over the period, driven by the significant increase in hybrid buses, compensating the overall increase in vehicle kilometres.

Oxides of Nitrogen (NO_x)

Figure 6.21 shows the short-term trend for NO_x emissions from road transport between 2013 and 2016. Table 6.9 sets out the underlying figures.

Figure 6.21 Emissions of NO_x from road transport in Greater London – short term trend 2013-2016.



Source: London Atmospheric Emissions Inventory (LAEI).

Table 6.9 Emissions of NO_x from road transport in Greater London – short-term trend 2013-2016. Tonnes per year.

	LAEI		Projections		% Change		
	2013	2014	2015	2016	2014	2015	2016
Motorcycle	85	84	82	79	-1%	-3%	-3%
Taxi	1,010	1,045	1,055	1,069	4%	1%	1%
Petrol Car	2,956	2,590	2,005	1,754	-12%	-23%	-13%
Diesel Car	5,831	6,158	6,297	6,578	6%	2%	4%
Electric Car	-	-	-	-			
Petrol LGV	33	28	25	23	-16%	-10%	-7%
Diesel LGV	2,769	2,917	2,977	3,042	5%	2%	2%
Electric LGV	-	-	-	-			
TfL Bus	4,792	4,617	4,461	3,423	-4%	-3%	-23%
Non-TfL Bus and Coach	1,367	1,362	1,171	1,040	0%	-14%	-11%
Artic HGV	1,321	1,114	848	657	-16%	-24%	-23%
Rigid HGV	3,688	3,560	2,929	2,435	-3%	-18%	-17%
Total Road Transport	23,853	23,477	21,850	20,101	-1.6%	-6.9%	-8.0%

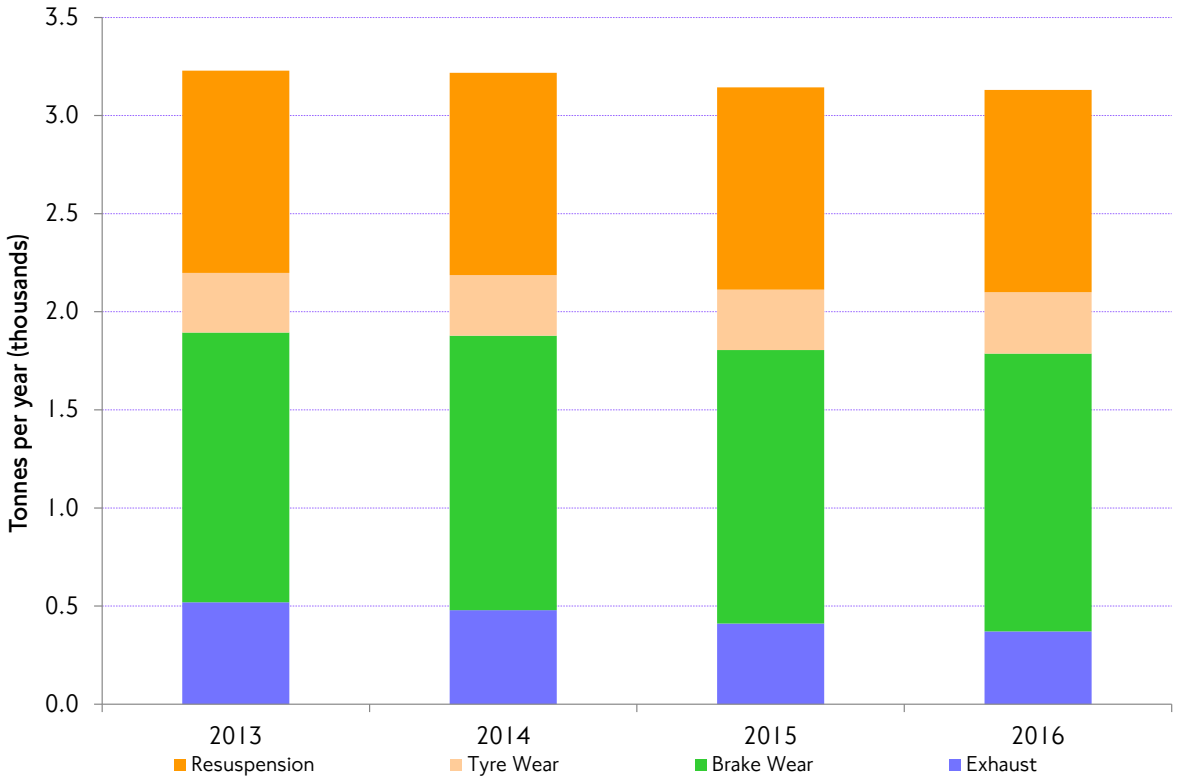
Source: London Atmospheric Emissions Inventory (LAEI).

Overall, NO_x emissions decrease over the period despite the increase in vehicle kilometres, reflecting a progressively cleaner vehicle fleet. For cars, and as with CO_2 (above), emissions from diesel vehicles slightly increase, whilst emissions from petrol cars decrease, following the higher proportion of diesel vehicles in the fleet over the period. Emissions from vans also slightly increase over the period, in line with the increase in vehicle kilometres by these vehicles. However, emissions from lorries, buses and coaches reduce significantly (-30 per cent) over the period, notably due to the steep increase of Euro VI vehicles entering the vehicle fleet.

Fine particles (PM_{10})

Figure 6.22 shows the short-term trend for PM_{10} emissions from road transport between 2013 and 2016. Table 6.10 sets out the underlying figures.

Figure 6.22 Emissions of PM_{10} from road transport in Greater London – short term trend 2013-2016.



Source: London Atmospheric Emissions Inventory (LAEI).

Table 6.10 Emissions of PM_{10} from road transport in Greater London – short term trend 2013-2016. Tonnes per year.

	LAEI	Projections			% change		
Source	2013	2014	2015	2016	2014	2015	2016
Exhaust	520	479	411	371	-7.9	-14.2	-9.7
Brake Wear	1,374	1,399	1,394	1,416	+1.8	-0.4	+1.6
Tyre Wear	304	309	308	313	+1.6	-0.3	+1.6
Resuspension	1,031	1,031	1,031	1,031	0	0	0
Total	3,229	3,218	3,144	3,131	-0.3	-2.3	-0.4

Source: London Atmospheric Emissions Inventory (LAEI).

Despite a progressive decline in exhaust emissions (-30 per cent between 2013 and 2016), reflecting continued improvements to the emissions performance of the vehicle fleet, overall PM_{10} emissions see only relatively small reductions over the period. This is due to the fact that non-exhaust emissions such as tyre and brake wear, representing more than 85 per cent of total road traffic PM_{10} emissions, actually increase over the period, in line with vehicle kilometres.

6.10 Air quality – trends in ambient air quality

Introduction

This section updates recent trends in ambient concentrations of key local air quality pollutants – the actual 'air quality' as experienced by Londoners, as measured by the London Air Quality network (LAQN), and as it relates to European Union Limit Values for air quality.

It is important to note that, whilst emissions in Greater London are the main underlying source of poor air quality, ambient air quality varies considerably over time and is additionally dependent on a wide range of other variables, most notably the prevailing weather and the transport of pollutants from elsewhere. Nevertheless, as emissions reduce locally and all other things being equal, commensurate reductions in ambient concentrations can be expected from reduced primary emissions.

Monitoring ambient air quality

London has a comprehensive air quality monitoring network, funded by London boroughs, the GLA, TfL, Defra, Heathrow Airport and several of London's Business Improvement Districts. Many of these sites are part of the London Air Quality Network (LAQN), managed by King's College London, and some are also part of the Defra Automatic Urban and Rural Network (AURN) UK Network used for compliance reporting (see: https://www.londonair.org.uk/LondonAir/Default.aspx).

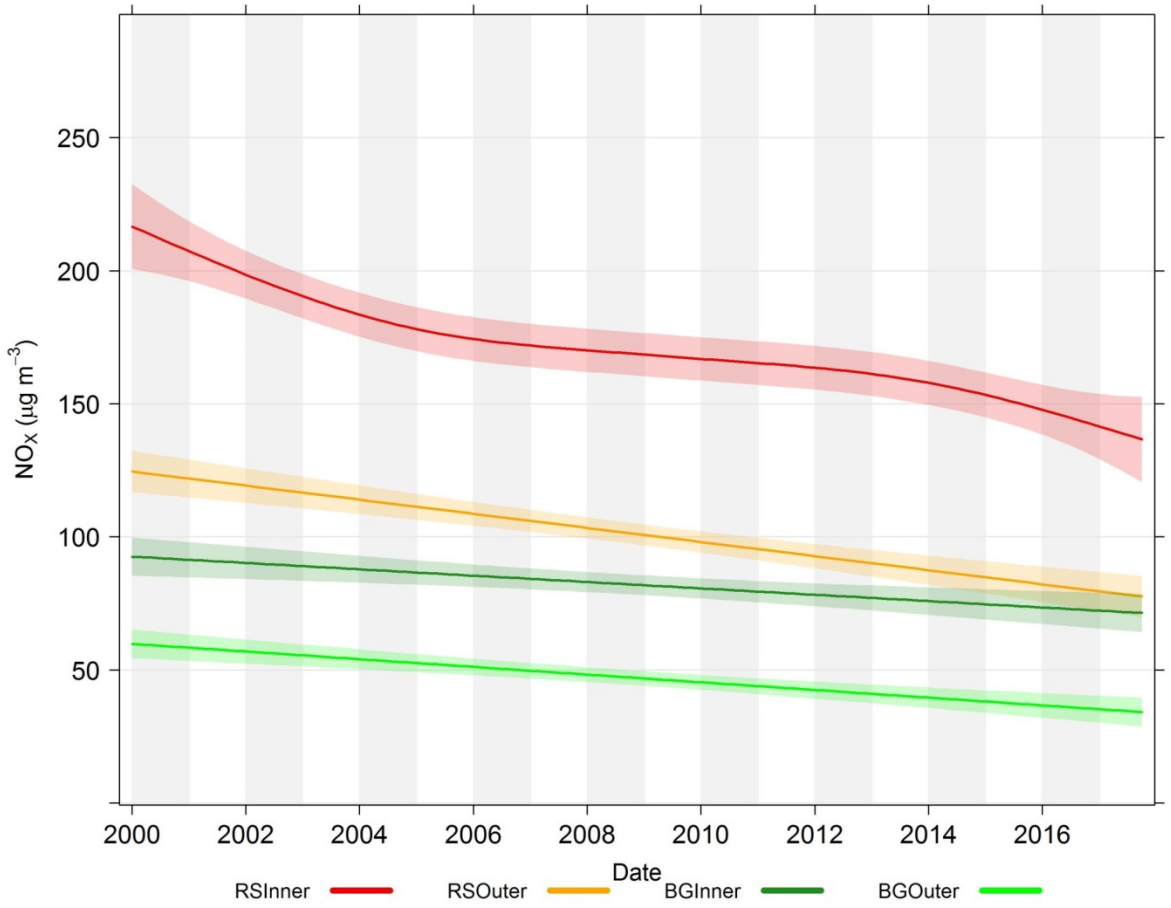
As well as information on air quality at specific sites this network provides unique opportunities to understand trends in London's air quality at the strategic level. One way to view air quality monitoring data is to group monitors based on their location and distance from the roadside and look at the average concentrations.

Concentrations of nitrogen oxides

Figures 6.23 and 6.24 show the general (average) trend over the last decade or so for nitrogen oxides (NO_x) and, specifically, nitrogen dioxide (NO_2) concentrations at sites that are part of the LAQN, grouped by site type. Roadside monitors (RS) are within 5 metres of roads, while 'background sites' (BG) are located away from major sources of pollution.

Trends at individual sites will vary, and some sites will go up and some will go down, however, overall, grouping sites together to represent inner and outer London allow more general trends for London to be represented.

Figure 6.23 Trends in ambient NO_x in London – 2000 to 2017.



Source: London Air Quality Network and analysis by King's College London.
RS refers to roadside monitoring sites; BG refers to urban background monitoring sites.

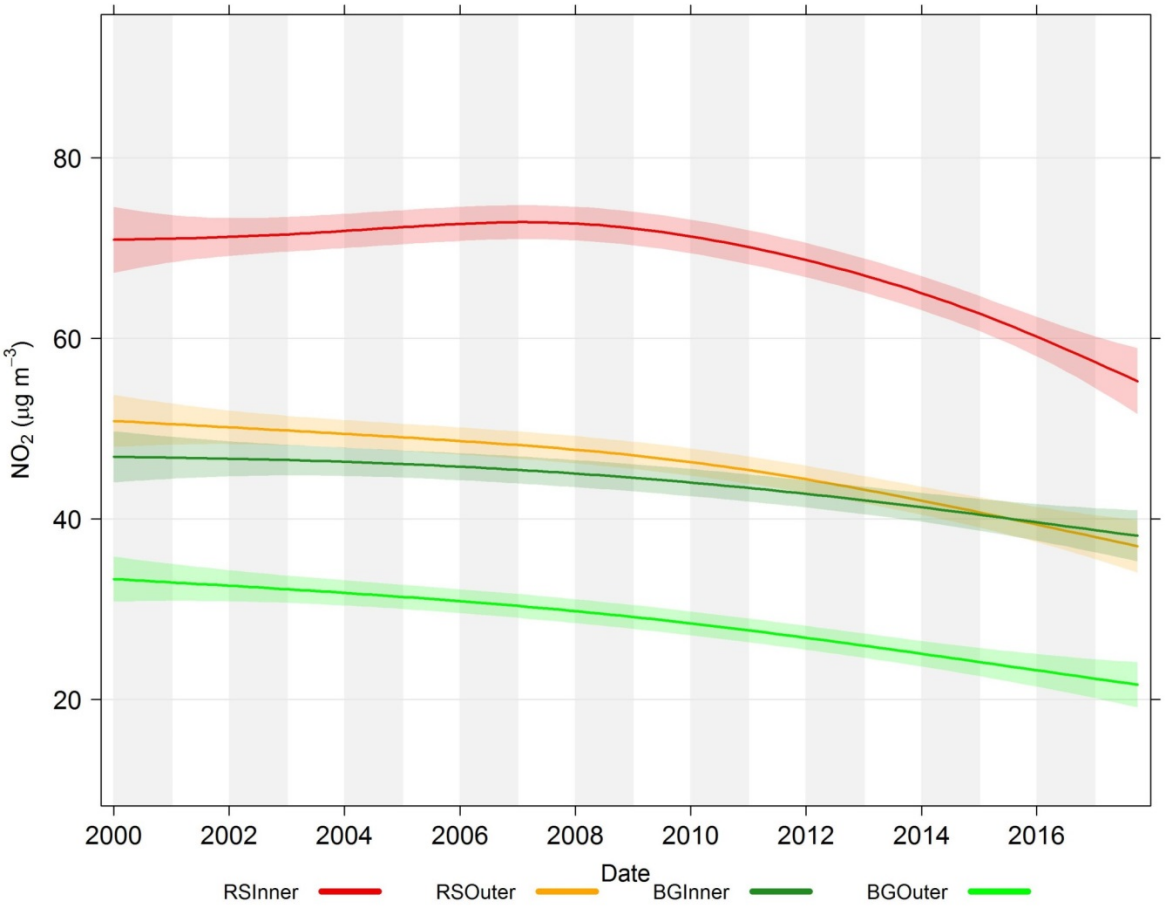
Nitrogen Dioxide (NO_2) is a key pollutant that damages health and ambient concentrations continue to exceed European Union limit values in many parts of London. Oxides of Nitrogen (NO_x) is a collective term for a group of pollutants and includes nitrogen oxide (NO), which is converted to NO_2 in the atmosphere. NO_2 concentrations continue to fall in London, with the greatest reductions being observed at roadside sites in inner London, where pollution concentrations are significantly higher, on average, than outer London. Current trends analysis indicates that concentrations are reducing by about 4 per cent each year. Historically, NO_2 concentrations in London remained flat or broadly increasing until about 2008/09 but are now consistently improving year on year.

Reductions of NO_2 concentrations at background sites and outer London roadside sites also continue to be observed. Recent trends suggest that, on average, concentrations at roadside sites in outer London are now slightly lower than inner London background concentrations.

Although a decrease in NO_2 concentrations is positive, it is important to note that concentrations at roadside sites in inner London are still well above the legal limits for NO_2. London was supposed to have achieved EU Limit Values for NO_2 by 2010 and is not forecast by the Government to do so until at least 2025. This delay has ongoing health impacts on London's population. Analysis suggests that these

effects disproportionately fall on more deprived communities. As a result, urgent action is needed to achieve legal compliance (and further health improvements beyond this) as quickly as possible. The Mayor has set out a comprehensive programme of measures to improve air quality, but requires Government support (eg on vehicle scrappage) and additional powers (eg over construction, buildings and the river) to achieve compliance as quickly as possible.

Figure 6.24 Trends in ambient NO_2 in London – 2000 to 2017.



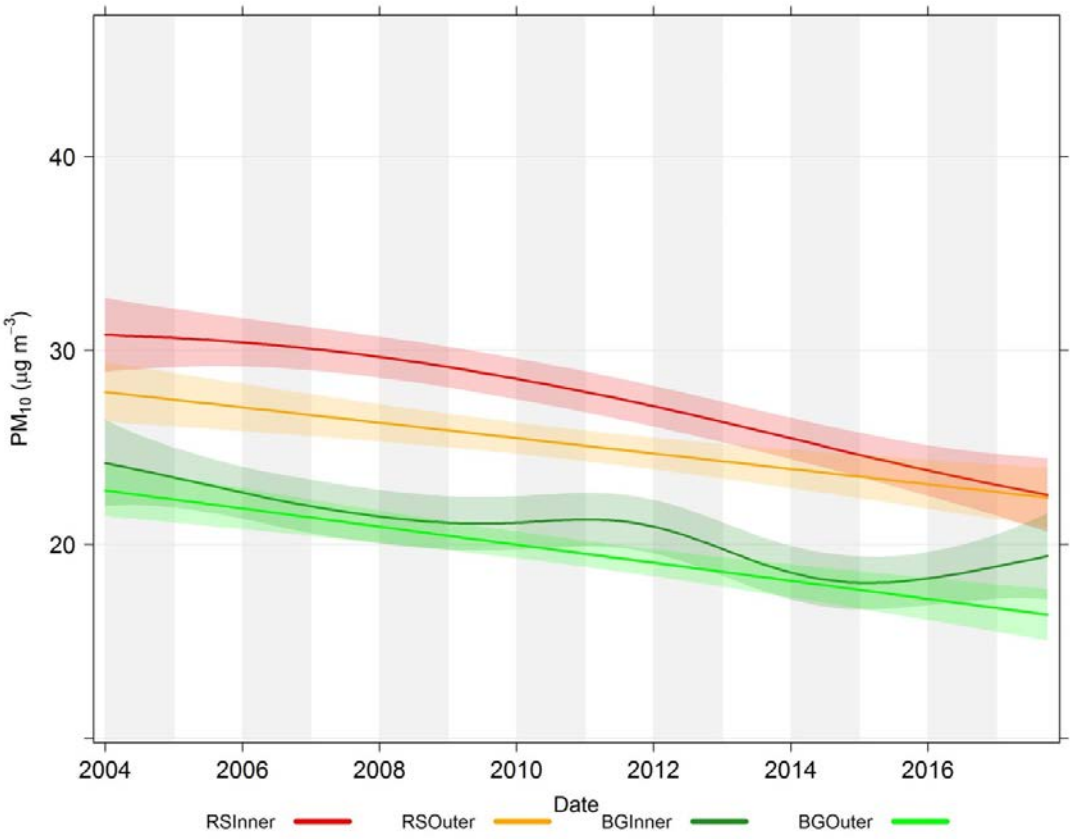
Source: London Air Quality Network and analysis by King's College London.
RS refers to roadside monitoring sites; BG refers to urban background monitoring sites.

Concentrations of particulate matter

PM_{10} concentrations in London have reduced significantly over the years (figure 6.25). These reductions have continued across London, however from 2015 onwards the average trends suggest that PM_{10} concentrations in inner London are increasing somewhat. The reasons for this may be related to weather conditions but also may be due to increases in the use of solid fuel burning in some areas, as well as other factors.

Similarly to PM_{10}, concentrations for $PM_{2.5}$ have been reducing for a number of years, but recent trends analysis suggests that the reductions are now starting to level off in inner London (figure 6.26). Further research is required to understand the underlying reasons for increasing PM_{10} and $PM_{2.5}$ in inner London.

Figure 6.25 Trends in ambient PM_{10} in London.

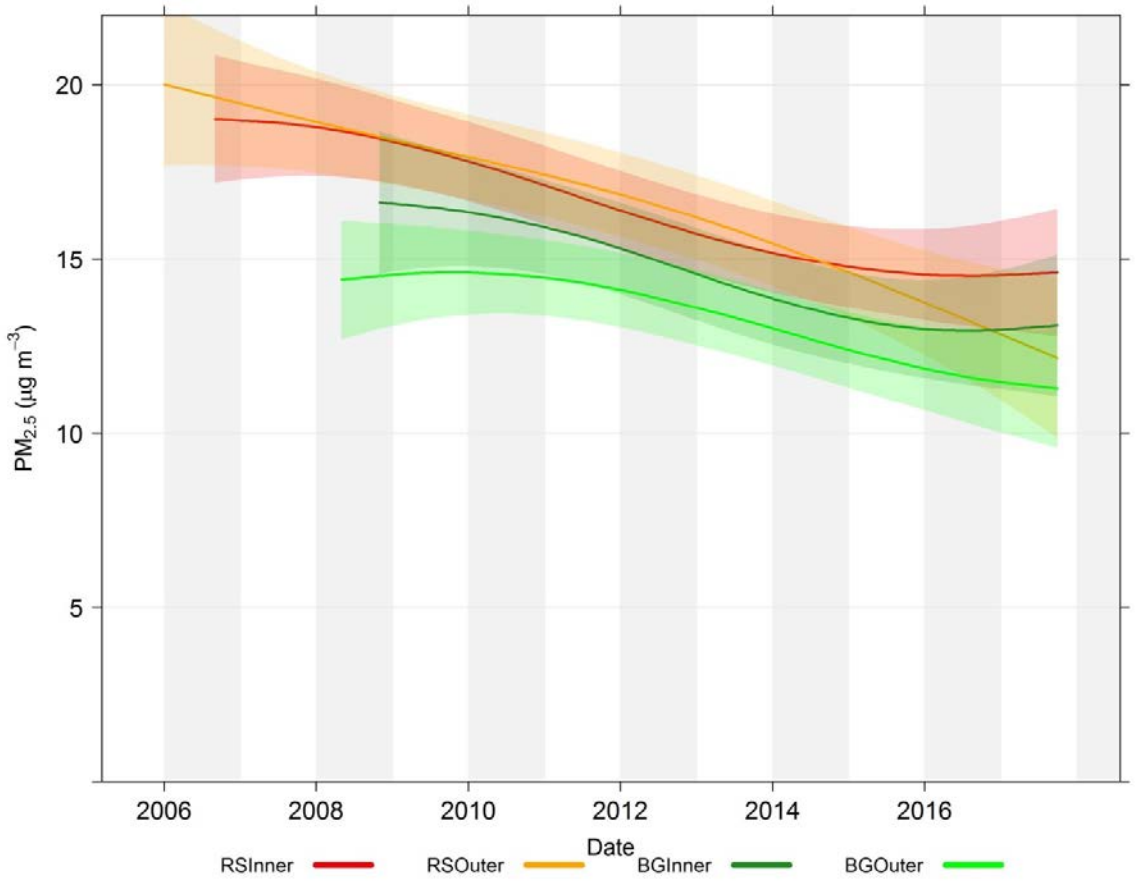


Source: the London Air Quality Network and analysis by King's College London.
RS refers to roadside monitoring sites; BG refers to urban background monitoring sites.

This is even more important because, as part of the Mayoral commitment to improving air quality, the draft London Environment Strategy introduced an ambition to meet WHO guidelines for $PM_{2.5}$, which are significantly tighter than national or European limits, by 2030.

Previous reporting has shown that national and EU limits for $PM_{2.5}$ are met throughout London, but has not assessed these against World Health Organisation guidelines. TfL and the GLA have undertaken research to establish the extent to which the World Health Organisation targets are breached in London (see: https://data.london.gov.uk/dataset/pm2-5-map-and-exposure-data).

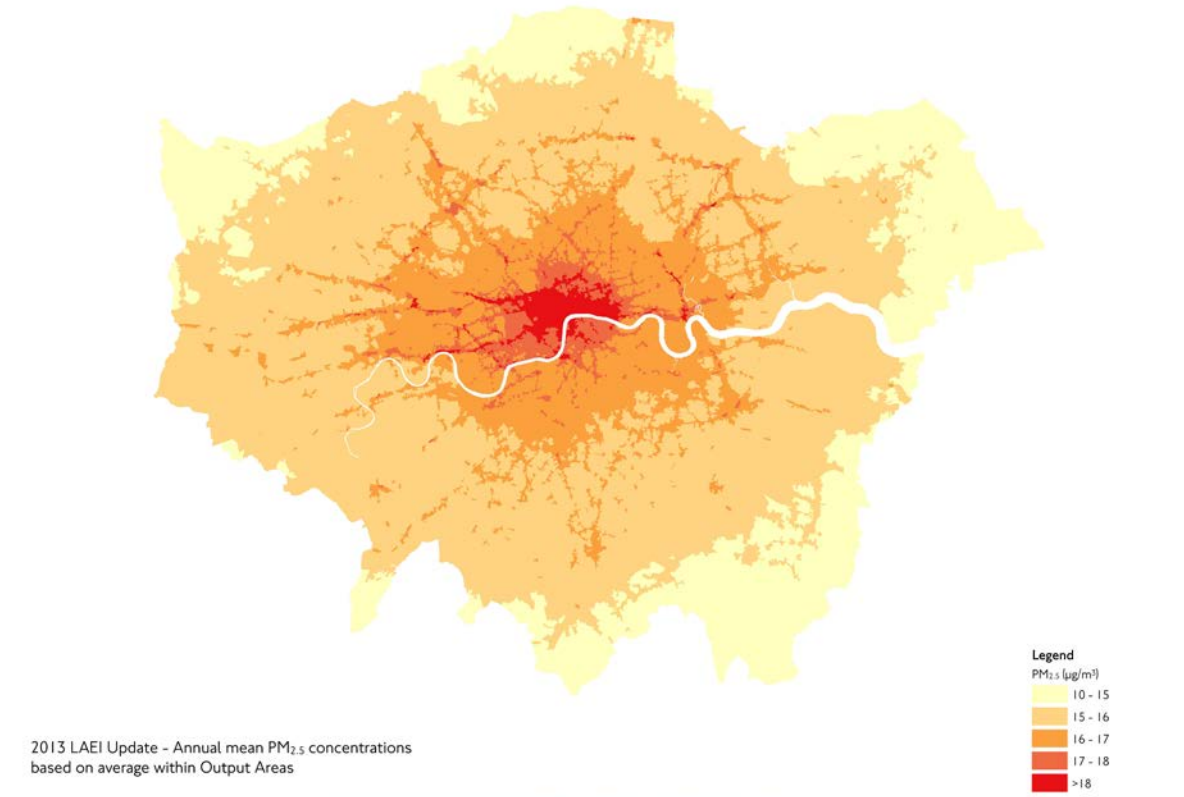
Figure 6.26 Trends in ambient $PM_{2.5}$ in London.



Source: London Air Quality Network and analysis by King's College London.
RS refers to roadside monitoring sites; BG refers to urban background monitoring sites.

Figure 6.27 shows the concentrations of $PM_{2.5}$ across London. The World Health Organisation guideline is 10 µg/m^3. The map shows that in 2013 there were no areas in London within the WHO guideline limit.

Figure 6.27 Concentrations of $PM_{2.5}$ in Greater London – 2013.



Source: London Atmospheric Emissions Inventory (LAEI).

While there is a long way to go before compliance with WHO guidelines for $PM_{2.5}$ is achieved, our analysis has determined that if $PM_{2.5}$ reduction measures within the draft Mayor's Transport Strategy and London Environment Strategy are accompanied by co-operation on a national and international level, the guideline limit is achievable by 2030.

Section 3: A good public transport experience

7. Public transport: Provision and operational performance

7.1 Introduction

An attractive, safe, reliable and comprehensive public transport network is fundamental to achievement of the Mayor's ambitions through the draft MTS.

Despite many improvements and enhancements over the period since 2000, as described in previous Travel in London reports, the public transport experience can still fall short in many ways. Unreliability remains a problem, and has recently particularly affected the bus network, whilst London's growing population and prosperity continues to place ever-greater demands on the capacity of the rail networks, leading to overcrowding and a poor journey experience.

Poor transport connectivity and physical accessibility continue to compromise social and economic fairness. Alongside this, good public transport networks are increasingly fundamental to achieving other strategic goals – to improve air quality and sustainability more generally, to enhance the health of Londoners through more active travel, and for the role of transport capacity and connectivity in 'unlocking' much-needed new homes.

This chapter firstly examines aspects of service provision, capacity and reliability – key 'operational' aspects that underpin the performance of the networks on a daily basis. Chapter 8 then broadens the perspective to look at other aspects of the public transport experience that are important to people – such as safety, physical accessibility, connectivity and customer satisfaction.

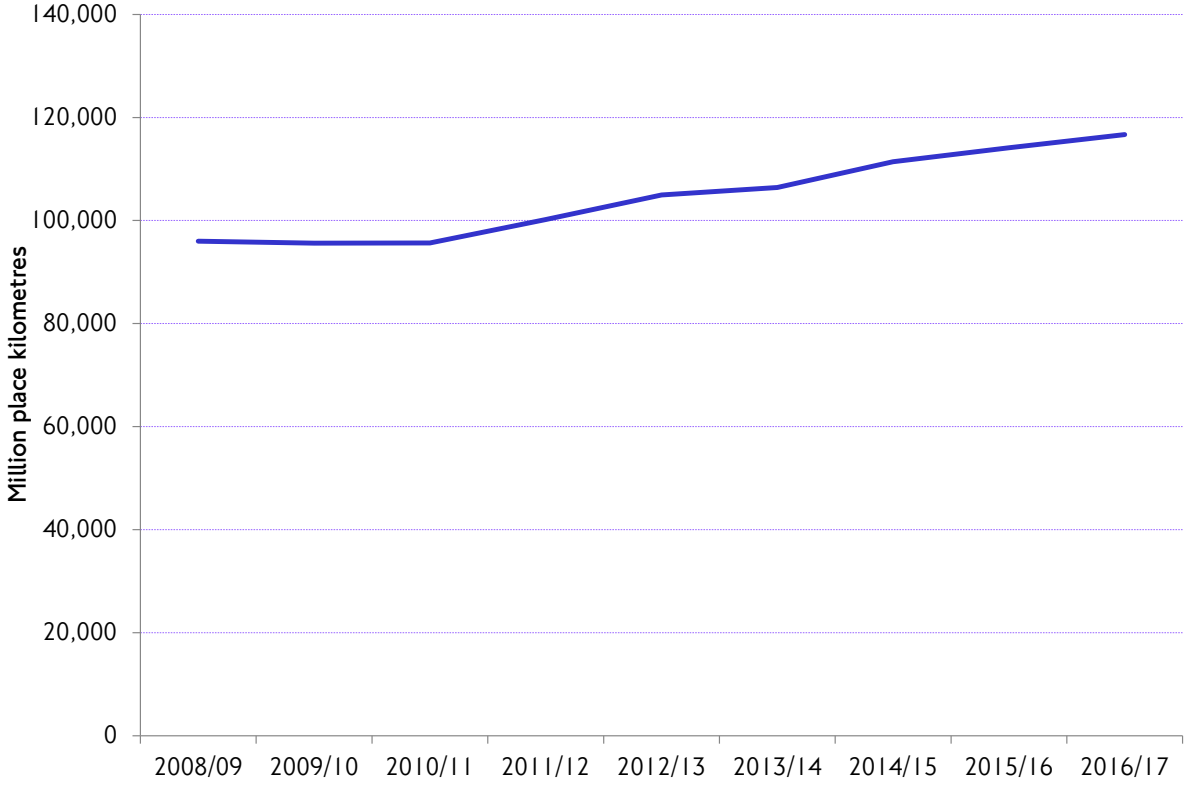
7.2 Overall capacity provided by the public transport networks and recent demand trends

Capacity of the public transport networks

The growth in demand on public transport has been accompanied, and in part facilitated, by a large-scale investment programme. In the early part of the period since 2000, this featured a large-scale expansion of the bus network. In later years the Tube upgrade programme featured large-scale capacity improvements on many lines. The development of the London Overground and TfL Rail networks from the middle part of the last decade, and continued expansion to the Docklands Light Railway, have also been key developments.

Figure 7.1 shows total capacity on the TfL public transport networks (excluding London Overground and TfL Rail) over the period since 2008/09 for which consistent figures are available (see also table 7.1). After a slight decline between 2008/09 and 2010/11, in part reflecting temporary closures for the Tube upgrade programme, Underground, DLR, bus and London Trams capacity has steadily increased since 2010/11. This resulted in an overall combined increase of capacity on these modes of 22.0 per cent in the six-year period between 2010/11 and 2016/17. In the latest year, overall capacity increased by 2.3 per cent, with the largest increase in capacity of 5.5 per cent on the DLR.

Figure 7.1 Growth in capacity on the principal public transport modes (excluding TfL Rail/Overground/National Rail), 2008/09 to 2016/17. Million-place kilometres.



Source: TfL City Planning, Strategic Analysis.

Table 7.1 Total yearly capacity provided by the principal public transport modes. Million place-kilometres.

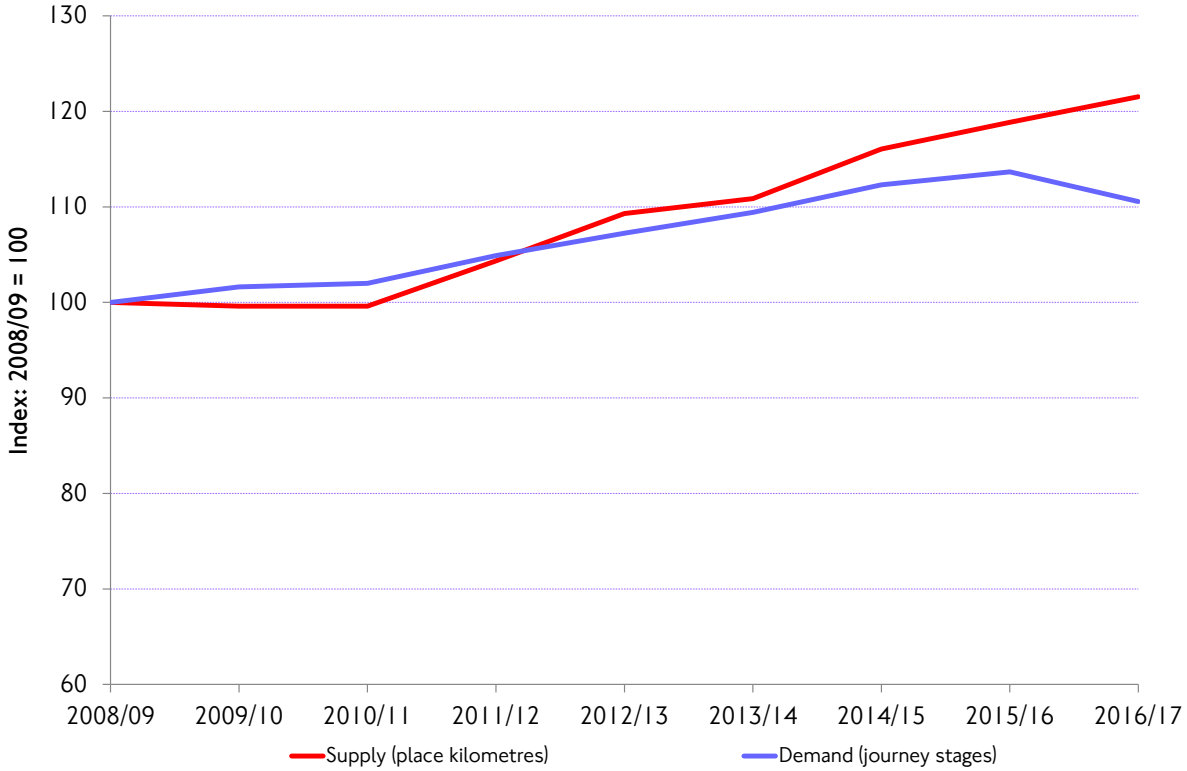
Mode	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
LU	64,919	63,743	63,555	67,173	71,404	72,793	77,313	79,728	81,704
Bus	28,817	29,311	29,175	29,804	29,626	29,605	30,057	30,386	30,903
DLR	1,715	2,027	2,338	2,635	3,311	3,401	3,426	3,366	3,409
Trams	556	544	564	566	606	632	629	634	669
Total	96,007	95,625	95,632	100,178	104,947	106,431	111,425	114,114	116,685

Source: TfL City Planning, Strategic Analysis.
Note: Values for Underground have been revised to reflect published London Underground assumptions for standing capacity. The absolute values given in the table reflect these revised assumptions, and are internally consistent. They do differ, however, from equivalent values published in previous Travel in London reports, although the percentage changes between years are the same.

Relationship between public transport demand and supply – short term

Figure 7.2 shows that, between 2008/09 and 2011/12, the demand for public transport (in terms of journey stages) grew at a faster rate than the supply of public transport (measured as place kilometres). During that period, public transport supply increased by 4.3 per cent while demand grew by 4.9 per cent. Since 2011/12 however, public transport supply has grown at a faster rate than demand, particularly in the latest year where demand fell by 2.7 per cent and supply increased by 2.3 per cent.

Figure 7.2 Comparison of demand and supply trends on the core TfL public transport networks (excluding TfL Rail/London Overground), 2008/09 to 2016/17.



Source: TfL City Planning, Strategic Analysis.

7.3 Service provision and operational performance: Bus

Buses in London operated 495 million bus kilometres in 2016/17, up from 365 million kilometres in 2000 and from 486 in 2010, and which represented 97.4 per cent of the scheduled service.

In 2016 there was little change in the average wait time on high frequency services, and a very small decline in the percentage of low frequency services that operated on time.

Bus speeds have been added to table 7.2 to reflect the greater importance now attached to this aspect of performance. The available data shows that bus speeds have declined by 4.2 per cent over the last four years.

Table 7.2 Indicators of bus service capacity and reliability.

Year	Kilometres scheduled (millions)	Percentage of scheduled kilometres			High frequency services[1]		Low frequency services[2]	Bus Speed (mph)
		Operated	Lost due to traffic congestion[4]	Lost due to other causes[5]	Average wait time (minutes)[6]		Percentage of timetabled services on time[3,7]	
					Actual	Excess		
2000/01	383	95.3	2.1	2.6	6.8	2.2	67.7	
2001/02	395	96.4	2	1.6	6.6	2	69.4	
2002/03	425	96.1	2.6	1.3	6.4	1.8	70.5	
2003/04	457	97.2	1.7	1.1	5.8	1.4	74.6	
2004/05	467	97.7	1.6	0.8	5.6	1.1	77.1	
2005/06	473	97.7	1.7	0.6	5.6	1.1	77.2	
2006/07	479	97.5	1.9	0.6	5.5	1.1	78.1	
2007/08	480	97.5	2	0.5	5.5	1.1	79.1	
2008/09	492	97	2.3	0.7	5.5	1.1	80.8	
2009/10	497	97.1	2.3	0.6	5.5	1.1	80.5	
2010/11	499	97.4	2.1	0.5	5.4	1	81.4	
2011/12	502	97.6	1.9	0.5	5.4	1	83.2	
2012/13	503	97.6	1.7	0.7	5.9	1	83.6	
2013/14	502	97.7	1.9	0.4	5.9	1.0	82.5	9.6
2014/15	504	97.1	2	0.9	6.0	1.1	81.8	9.5
2015/16	507	97.2	2.3	0.5	6.1	1.2	80.6	9.3
2016/17	508	97.4	2.0	0.6	6.1	1.1	80.1	9.2

Source: London Buses.
1. High frequency services are those operating with a scheduled frequency of five or more buses an hour.
2. Low frequency services are those operating with a scheduled frequency of fewer than five buses an 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 lost kilometres outside the control of the operator.
5. Includes all lost kilometres within the control of the operator.
6. The rise in AWT in 2012/13 reflects the move to a greatly expanded QSI monitoring system for high frequency routes from P1 12/13. This figure is now based on continuous monitoring between 0500-2400 hours at an expanded number of locations. Scheduled levels of service are lower at additional times of day not previously monitored such as late evenings and Sunday mornings.
7. Results for low frequency routes from 2013/14 reflect the move to a greatly expanded QSI system for monitoring this group of routes.

7.4 Service provision and operational performance: Underground

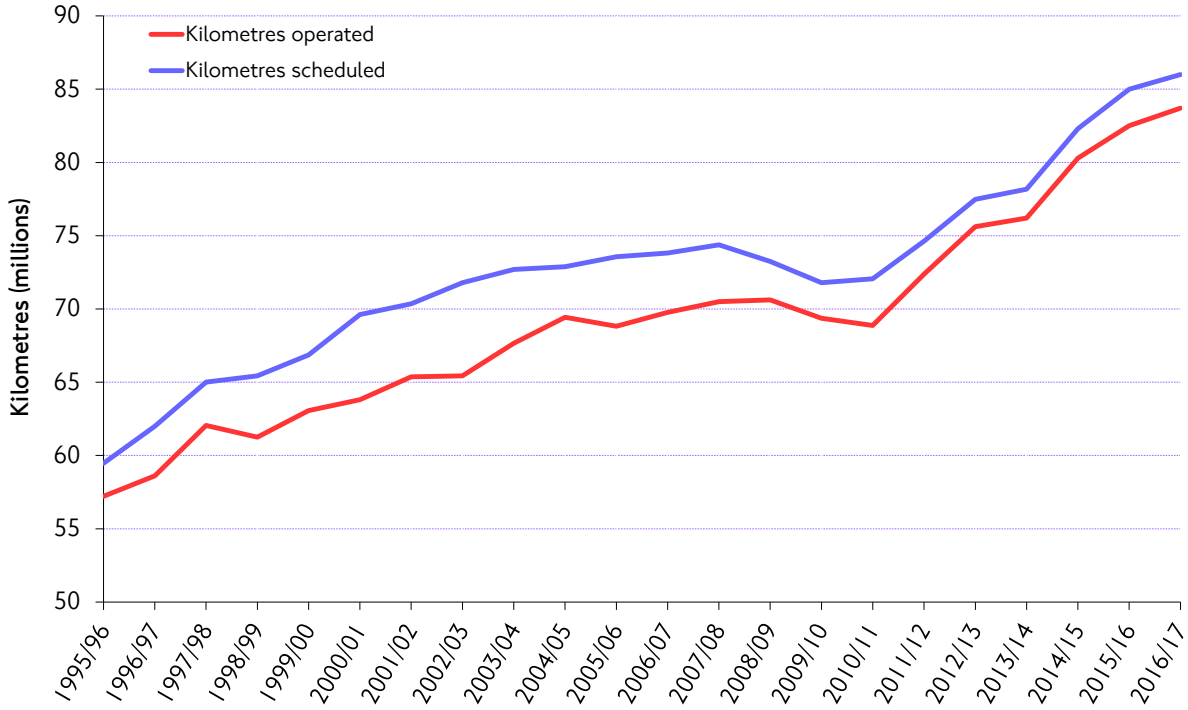
Underground service supply (capacity)

London Underground has substantially increased its service offering over the period since 2009/10, in the context of a largely static physical network in terms of its extent and largely reflecting intensification of service on several lines. This reflects the success of the Tube upgrade programme, providing the ability to increase both capacity and service reliability.

Underground train kilometres scheduled in 2016/17 were 1.2 per cent higher than in 2015/16 and the number of train kilometres operated was 1.5 per cent higher. This continued the upwards trend visible since 2010/11 (figure 7.3), with kilometres

scheduled in 2016/17 23.5 per cent higher than in 2000/01, and kilometres operated 31.2 per cent higher.

Figure 7.3 London Underground: Train kilometres scheduled and train kilometres operated.



Source: London Underground.

Underground service performance

In 2016/17, 96.9 per cent of scheduled train kilometres were operated, which is very slightly lower than in 2015/16.

Underground reliability can also be expressed in terms of customer-focused measures such as average journey time and excess journey time. The latter is the additional time that customers have to wait over and above that implied by the schedule as a result of unreliability in the service. Excess journey time increased slightly to 4.7 minutes in 2016/17, although it remains lower than almost all previous years. The average generalised weighted journey time and excess as a percentage of generalised journey time have remained unchanged compared to the previous year (table 7.3).

Table 7.3 London Underground – service reliability and journey times.

Year	Train kilometres scheduled (millions)	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
2000/01	69.6	91.6	28.6	45.7	8.6	18.9
2001/02	70.4	92.9	28.3	45.2	8.1	18.0
2002/03	71.8	91.1	29.1	46.7	9.7	20.7
2003/04	72.7	93.1	27.9	44.3	7.4	16.8
2004/05	72.9	95.3	27.7	44.0	7.2	16.4
2005/06	73.6	93.6	27.8	44.3	7.5	16.9
2006/07	73.8	94.5	28.0	44.7	8.1	18.0
2007/08	74.4	94.8	27.8	44.5	7.8	17.4
2008/09	73.2	96.4	27.5	43.9	6.6	15.1
2009/10	71.8	96.6	27.7	44.1	6.4	14.5
2010/11	72.1	95.6	28.0	44.6	6.5	14.6
2011/12	74.6	97.0	27.5	45.1	5.8	12.9
2012/13	77.5	97.6	26.8	43.6	5.3	12.1
2013/14	78.2	97.5	26.8	43.4	5.2	12.0
2014/15	82.3	97.6	26.5	42.3	4.6	11.0
2015/16	85.0	97.1	26.3	41.7	4.6	11.0
2016/17	86.3	96.9	26.2	41.7	4.7	11.0

Source: London Underground.
1. 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.

7.5 Service provision and Operational performance: Docklands Light Railway

Since 2000/01 the number of train kilometres operated on the DLR has increased from 2.9 million to 6.0 million, as shown in table 7.4 – reflecting both network expansion and enhanced service levels. The percentage of scheduled services operated was 99.0 per cent, a slight increase on 2015/16 as the lower value last year was due to a two-day strike in November 2015. To bring the DLR in line with other TfL modes, in 2014/15 the 'percentage of trains on time' measure was replaced by a measure of excess waiting time (EWT), which has been back-cast to 2011/12 for comparison. The year 2016/17 saw an EWT figure of 0.1 minutes, a slight increase on 2015/16.

Table 7.4 DLR service provision and reliability.

Year	Kilometres operated (millions)	Percentage of scheduled services operated	Percentage of trains on time	Excess waiting time (EWT)
2000/01	2.9	98.2	96.3	
2001/02	2.9	98.3	96.6	
2002/03	3.2	98.1	96.3	
2003/04	3.4	98.2	96.6	
2004/05	3.3	98.5	97.1	
2005/06	3.6	98.7	97.3	
2006/07	4.3	99.2	97.8	
2007/08	4.4	99.1	97.3	
2008/09	3.9	98.4	94.6	
2009/10	4.6	97.2	94.8	
2010/11	4.7	97.5	97.4	
2011/12	4.9	97.7	97.5	0.23
2012/13	5.7	98.5	98.8	0.14
2013/14	5.8	99.2	99.3	0.08
2014/15	5.8	99.3	n/a	0.07
2015/16	5.9	98.5	n/a	0.09
2016/17	6.0	99.0	n/a	0.10

Source: Docklands Light Railway.

7.6 Service provision and Operational performance: London Trams

In 2016/17, 97.1 per cent of scheduled tram services were operated, down from 99.0 per cent in 2015/16. However, both scheduled and operated kilometres increased on the previous year, by 7.5 and 5.3 per cent respectively (table 7.5).

Table 7.5 London Trams service reliability.

Year	Scheduled kilometres (millions)	Operated kilometres (millions) [1]	Percentage of scheduled services 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
2008/09	2.70	2.66	98.5
2009/10	2.62	2.60	99.2
2010/11	2.72	2.70	99.2
2011/12	2.74	2.71	98.9
2012/13	2.98	2.90	97.3
2013/14	3.06	3.03	98.9
2014/15	3.03	3.01	97.9
2015/16	3.07	3.04	99.0
2016/17	3.30	3.20	97.1

Source: London Trams.
Note: Operated kilometres exclude replacement bus services operated during period of track repair works.

7.7 Service provision and Operational performance: National Rail in London

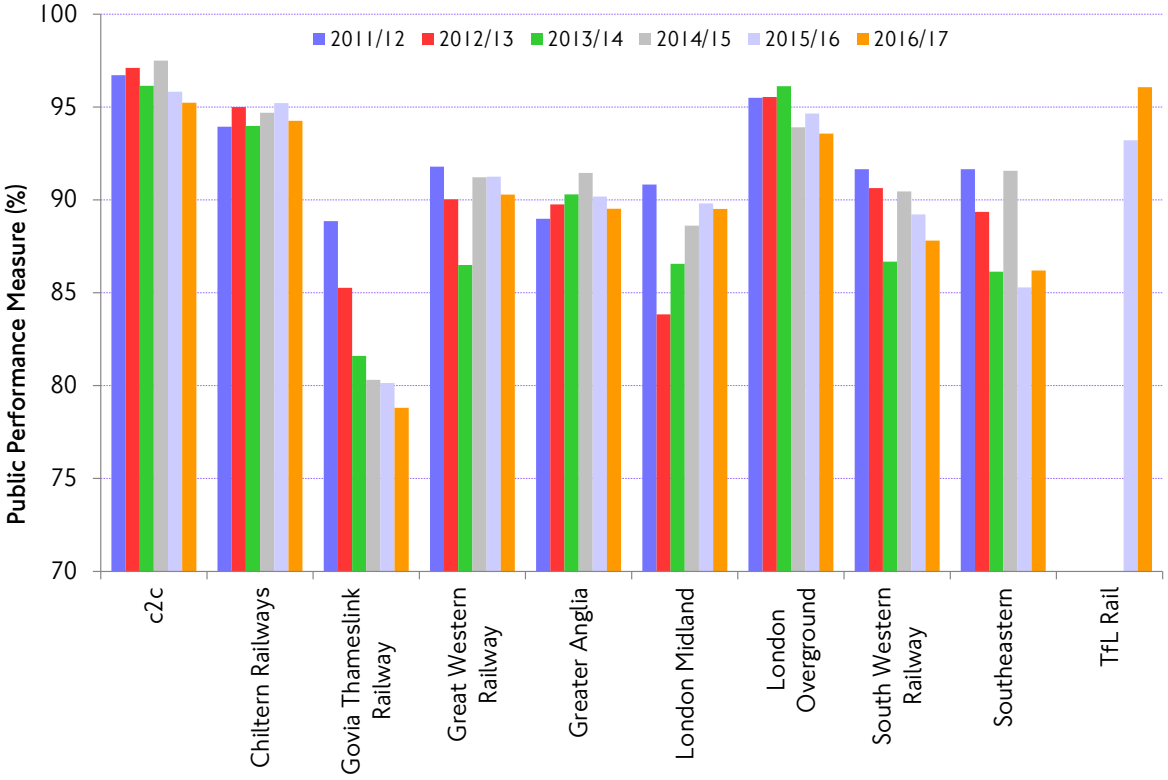
There are several ways of measuring the operational performance of National Rail services in London. For this purpose London Overground is considered as part of the National Rail network.

Reliability

The reliability of National Rail services is measured through the public performance measure (PPM), which combines figures for punctuality and reliability into a single measure. The PPM is therefore the percentage of trains 'on time' compared to the number planned. A train is defined as 'on time' if it arrives no later than five minutes after the planned destination arrival time for services defined by the ORR as L&SE and regional operators, or not later than 10 minutes for long-distance operators.

Figure 7.4 shows PPM measures for all services operated by L&SE operators over the last six years. The general trend over the most recent year was mixed – services of some operators showing an improvement balanced by others whose PPM measure had fallen. The most notable changes in the last year were for TfL Rail, which increased from 93.2 per cent in 2015/16 to 96.1 per cent in 2016/17 and Govia Thameslink, which decreased from 80.1 per cent in 2015/16 to 78.8 per cent in 2016/17. TfL Rail was the best performing L&SE operator on this measure, followed by c2c (95.2 per cent) which was the previous best performing operator for a number of years.

Figure 7.4 National Rail – public performance measure for London and South East operators (moving annual average as at quarter four each year).



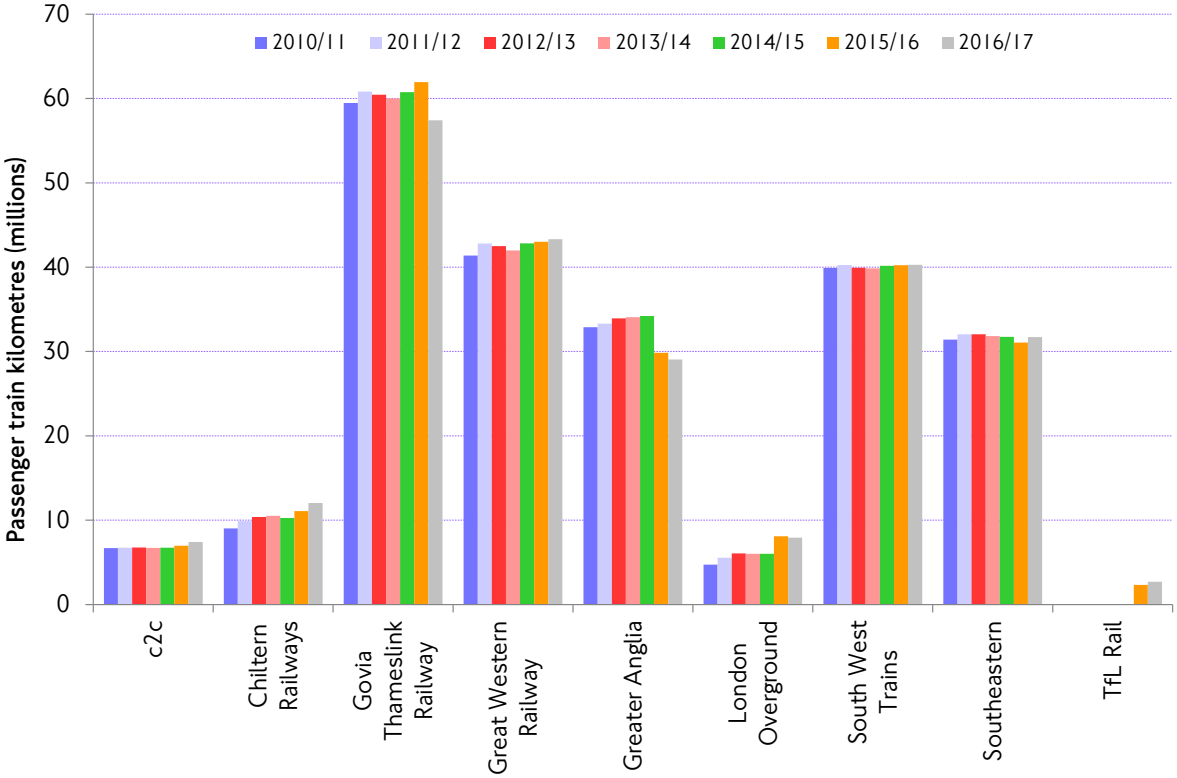
Source: Office of Rail and Road.

National Rail capacity

Capacity of National Rail services relevant to London can be measured in terms of train kilometres operated. This is available from the ORR website (http://orr.gov.uk/).

Figure 7.5 shows that the trend in passenger train kilometres has differed by operator. The largest increase in capacity over the period has been on London Overground (68 per cent) due to the incremental expansion of the network over this time as well as increases in frequency. The fall in the latest year on London Overground is due to closures on the Gospel Oak to Barking route while electrification takes place as part of the Railway Upgrade Plan. Other operators have seen little change in the number of passenger train kilometres operated, with an increase of 1 per cent respectively on South West and Southeastern since 2010/11. Train kilometres operated on Greater Anglia have declined by 15 per cent in the last two years, due to the takeover of Liverpool Street to Shenfield local services by TfL ahead of the opening of the Elizabeth Line (currently operating under the TfL Rail identity).

Figure 7.5 Passenger train kilometres by operator.



Source: Office of Rail and Road.

7.8 Crowding on public transport

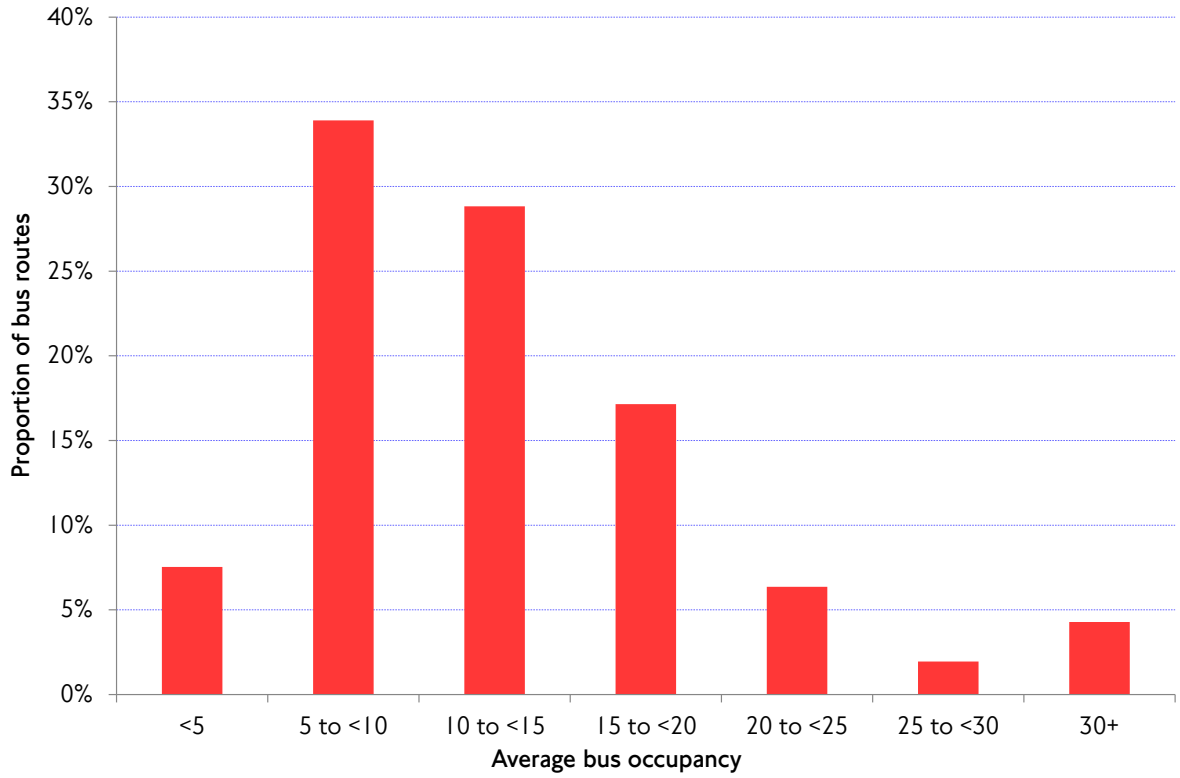
Introduction

Crowding on London's public transport network can be a major issue at certain locations and during peak hours. Customers find travelling in crowded conditions stressful and unsatisfying, and it is likely that crowding increases journey times, as customers are forced to wait for a less crowded train. Crowding arises where the demand for travel on a particular service exceeds certain capacity thresholds – often a combination of number of seats with some allowance for standing. A standing density above two passengers per square metre in peak hours is uncomfortable for passengers and is used as an acceptable threshold for planning purposes. This section looks at some of the crowding measures that are currently available for selected public transport modes. These indicators are under review in connection with future monitoring of the draft MTS.

Crowding: Bus

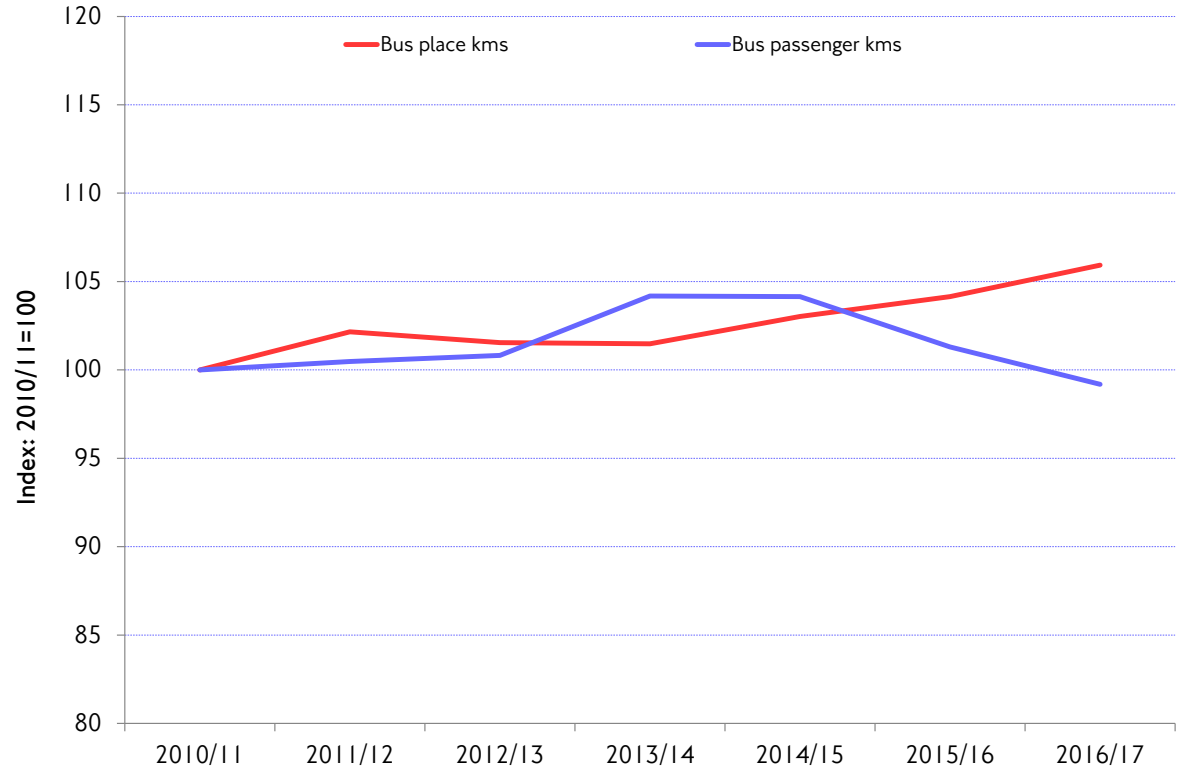
Figure 7.6 shows the number of bus routes by the average occupancy of buses on that route. More than 40 per cent of routes have an average occupancy of less than 10 passengers. However, around 6 per cent of routes have average occupancies of 25 or more. Figure 7.7 shows that, at a London-wide level, crowding on the bus network is becoming less of an issue, with place kilometres increasing by 2.8 per cent between 2014/15 and 2016/17, while passenger kilometres have decreased by 4.8 per cent over the same period.

Figure 7.6 Distribution of bus routes by average occupancy.



Source: London Buses.

Figure 7.7 Trend in bus place and passenger kilometres.



Source: London Buses.

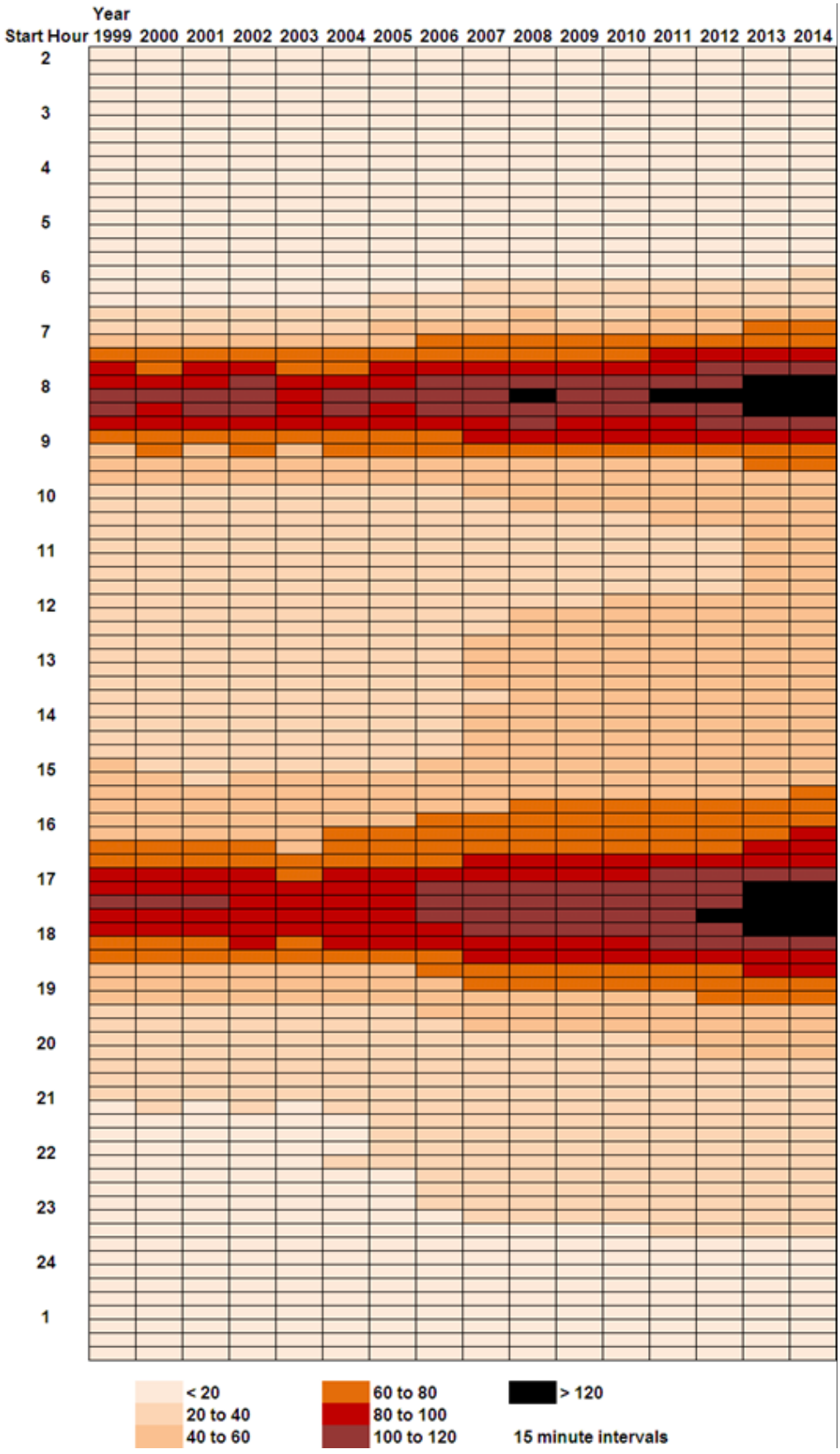
Crowding: Underground

Since 2000, rail capacity into London has increased substantially. Nevertheless, demand for rail services has risen faster than the increase in space offered, and as a result more people than ever are travelling in crowded conditions. Crowding particularly affects London Underground services due to its role as both a local metro and onward distributor through the Central Activities Zone. Figure 7.8 illustrates the rising demand for London Underground services since 1999, showing how the peak period is spreading out and intensifying. Trains are considered crowded when there are more than two passengers standing per square metre, and severely crowded when there are more than four passengers standing per square metre.

The longest sections suffering the most severe crowding in the peak directions are:

- Victoria Line between Victoria and Highbury and Islington;
- Northern Line Bank branch between Clapham South and Camden Town, and continuing to Archway;
- Central Line between Oxford Circus and Leyton;
- Jubilee Line between Baker Street and Canary Wharf;
- Waterloo & City Line.

Figure 7.8 Trend in London Underground station entry profile, 1999 to 2014.

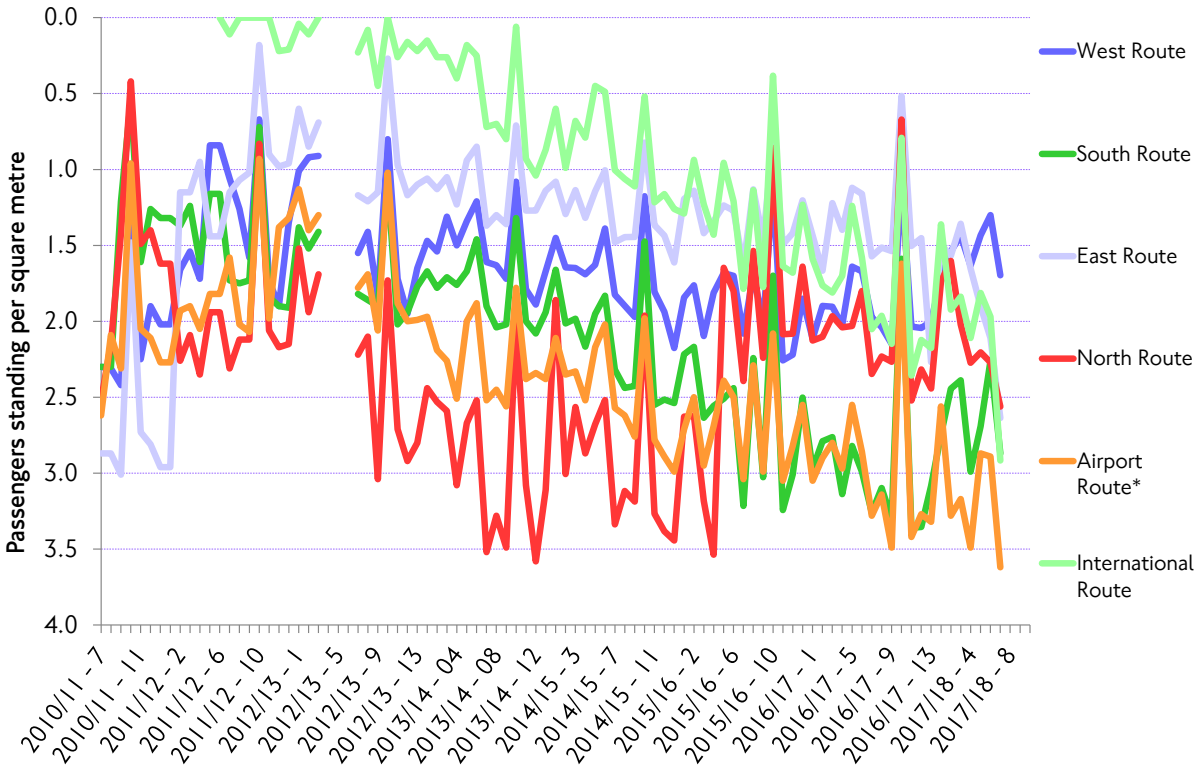


Source: TfL City Planning, Strategic Analysis.

Crowding: Docklands Light Railway and London Trams

Figure 7.9 shows crowding on the DLR network during peak hours. Over time, there has been an increase in crowding on a number of DLR routes. Initially, the worst crowding on the network occurred on the north route, which experienced several periods of severe crowding between 2013/14 and 2015/16, although this has subsequently improved. In 2016/17, the south and airport routes started to experience severe levels of crowding. This is particularly significant on the airport route, as customers travelling to and from London City Airport are typically bringing luggage with them.

Figure 7.9 Crowding density on the DLR, peak hour average on busiest link.



Source: Docklands Light Railway.
1. Airport Route crowding is calculated assuming a 15% reduction in available space due to luggage.

Crowding levels on London's Trams have remained relatively stable over time, with typically 5 to 10 per cent of peak services having more than 2 people standing per square metre. This measure did increase to around 17 per cent towards the end of 2016, but has subsequently dropped back to 5 per cent (figure 7.10).

Figure 7.10 Crowding density on London Trams, proportion of peak services with more than 2 people standing per square metre.

Source: London Trams.

Crowding: National Rail in London

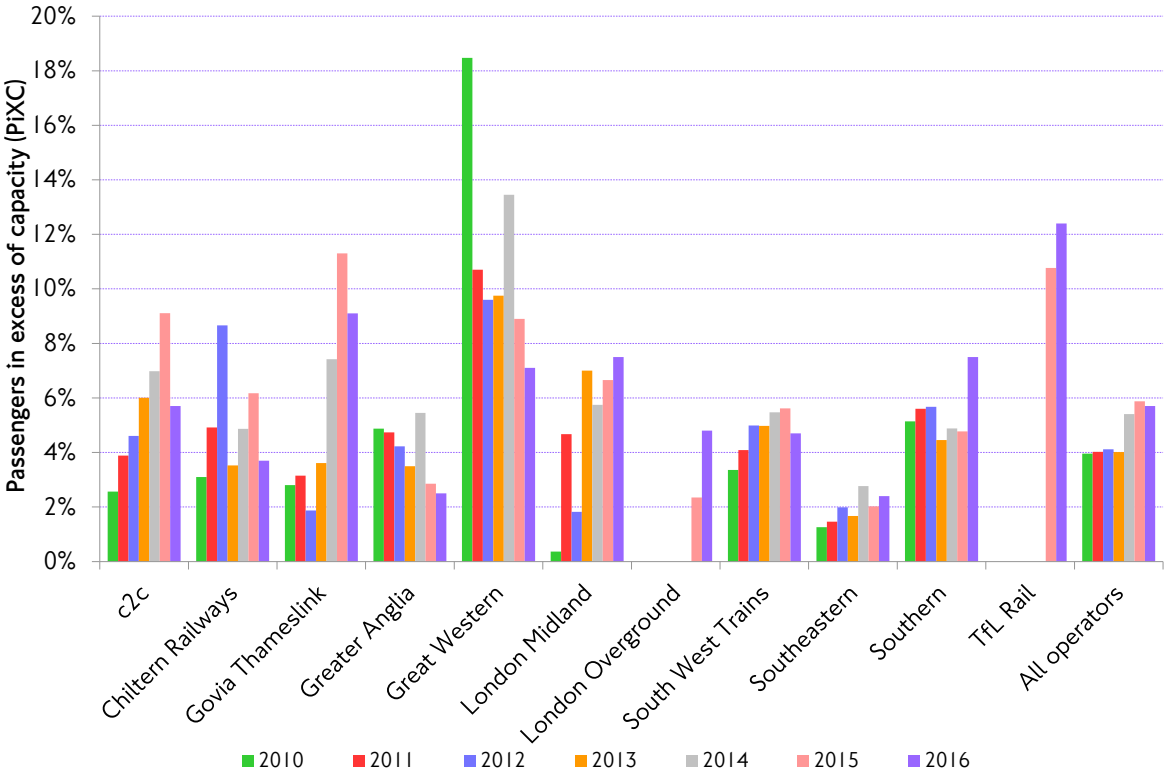
Crowding on National Rail is monitored using the Department for Transport's (DfT's) passengers in excess of capacity (PiXC) measure. This compares planned capacity on services arriving in or departing from central London against actual demand, with PiXC being the difference between the two. The observations relate to trains departing their last stop before arrival at the relevant London terminal.

Figure 7.11 shows PiXC results (for the morning peak period only) from 2010 by train operator. In 2016 the PiXC value across all operators (combined) decreased to 5.7 per cent, down slightly from 2015. Six operators saw a reduction in crowding in the most recent year, with the largest decrease on Chiltern Railways.

The first non-zero value for London Overground in 2015 reflects TfL's assumption of responsibility for certain short-distance services from London's Liverpool Street station, effective from May that year. This also partly explains the reduction in PiXC values for the Greater Anglia group of services between 2014 and 2015, under which the London Overground services formerly operated.

TfL Rail services had the highest morning peak PiXC values in the latest year, with the PiXC value increasing to 12.4 per cent in 2016 from 10.8 per cent in 2015.

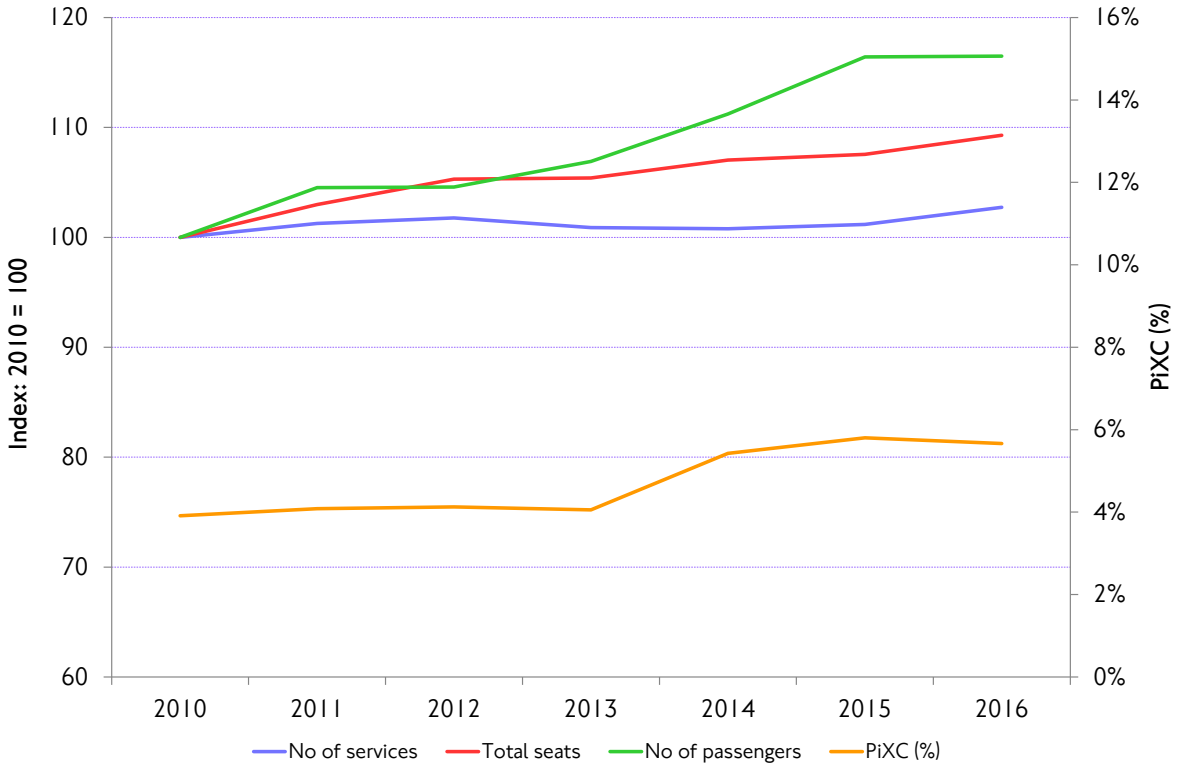
Figure 7.11 Passengers in excess of capacity (PiXC) for National Rail operators in London during the weekday morning peak.



Source: Department for Transport.

Figure 7.12 shows the trend in the overall London PiXC value for the period 2010-2016, and sets this against the equivalent trend for demand and the basic elements of supply – loaded trains and seats provided. It is seen that passenger demand has grown consistently over this period, but that the growth in the number of train services has been less. This reflects recognised capacity issues at many main London terminal stations, which limit the ability of train operators to introduce more frequent services in the weekday AM peak. In many cases, the operator response has been to lengthen trains through the addition of extra coaches, to maximise passenger throughput in the context of limited train 'paths' – particularly on Great Western services into Paddington and South West Trains services into Waterloo. This means that the number of 'seats' (a proxy for total passenger capacity) have increased at a more rapid rate, although the overall PiXC trend is edging upwards, and there are also limits to the extent to which train lengths can be extended.

Figure 7.12 National Rail – measures of capacity, demand and passengers in excess of capacity for services approaching London terminals during the weekday AM peak.



Source: Department for Transport.

8. Public transport: Customer experience

8.1 Introduction

Chapter 7 considered a range of 'operational' measures of the performance of the public transport networks in London. This chapter broadens the perspective to look at aspects of the customer experience, both direct and indirect, but which nevertheless contribute to the perceived attractiveness of public transport as a mode of travel and hence indirectly determine major outcomes such as the active, efficient and sustainable mode share.

Topics covered include:

- Customer satisfaction with TfL's services
- Safety and security on the public transport networks
- Fares and affordability of fares
- Physical accessibility to public transport

8.2 Overall customer satisfaction with public transport in London

Introduction

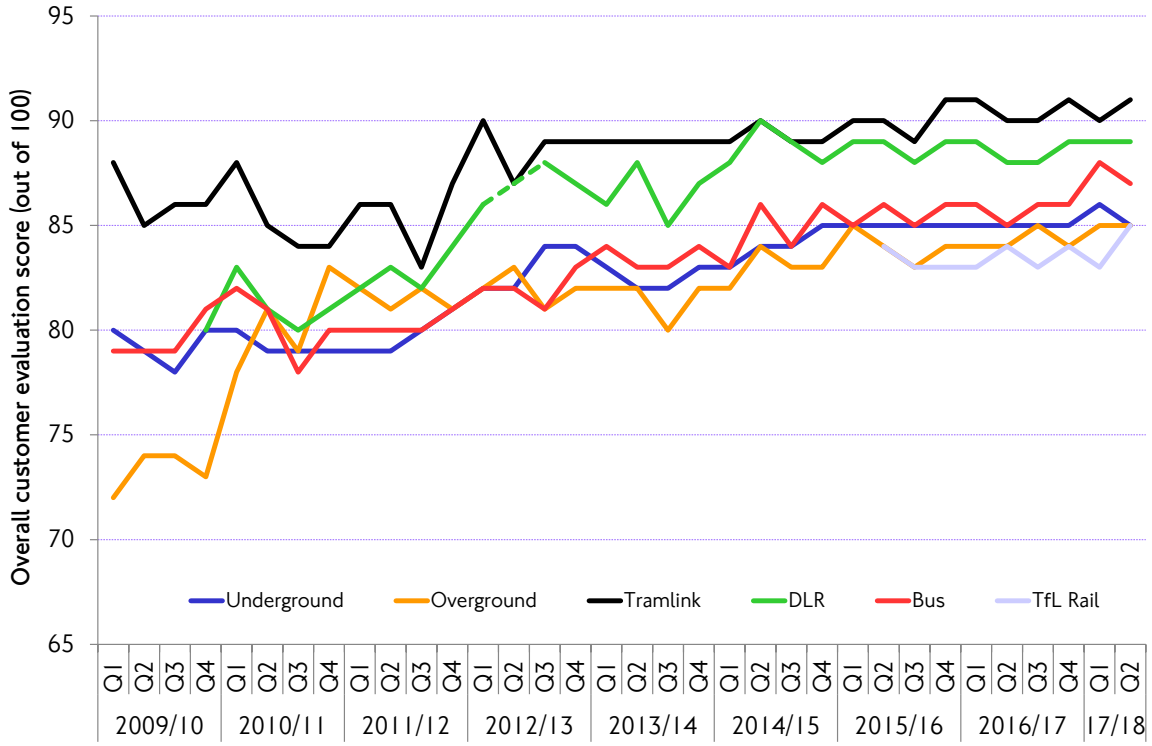
Previous Travel in London reports have described TfL's approach to understanding what makes for a good customer experience, including our Customer Model, which is used to shape our strategy and underpin our delivery – see Travel in London report 8, section 7.4. This report also described the factors that were understood – from customer research – to be the main determinants of customer satisfaction for each of the major modes, and illustrated some recent trends in relation to these.

Trend in overall customer evaluation of public transport

TfL has a proven record of improving customer satisfaction. Figure 8.1 shows overall customer evaluation scores for each of the principal public transport modes. These are scores out of 100, but are not percentages.

The overall trend since 2009/10 has been one of steady improvement across all modes. The scores for London Trams and the DLR reflect the comparatively high satisfaction with these self-contained networks, which are relatively new. Trends for the longer-established and more complex bus and Underground networks have also been decisively upwards over the period covered, reaching the highest level since surveys began. Scores for recent years, however, have been notably stable – albeit at relatively high levels – for all of the modes covered by the figure.

Figure 8.1 Overall customer evaluation scores for each of the main public transport modes.



Source: TfL Customer and Employee Insight.

There is scope for further improvement but one feature of measures such as these is that once a certain standard is reached, it tends to be considered 'the norm' by customers – who, in this context, would be looking for the next step-change in quality. Therefore, it becomes progressively harder to improve these scores towards the top end of the possible range. On the other hand, the notable jump in scores associated with the early stages of the creation of the London Overground network, with associated radical improvements in train frequency and service quality, is clearly visible and demonstrates what is possible.

Table 8.1 Summary of customer satisfaction scores for principal public transport modes.

Year/Indicator	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Underground	79	80	83	83	84	85	85
DLR	81	82	87	87	89	89	89
Bus	80	80	82	83	85	86	86
Tram	85	86	89	89	89	90	90
Overground	81	82	82	82	83	84	84
TfL Rail	n/a	n/a	n/a	n/a	n/a	83	83

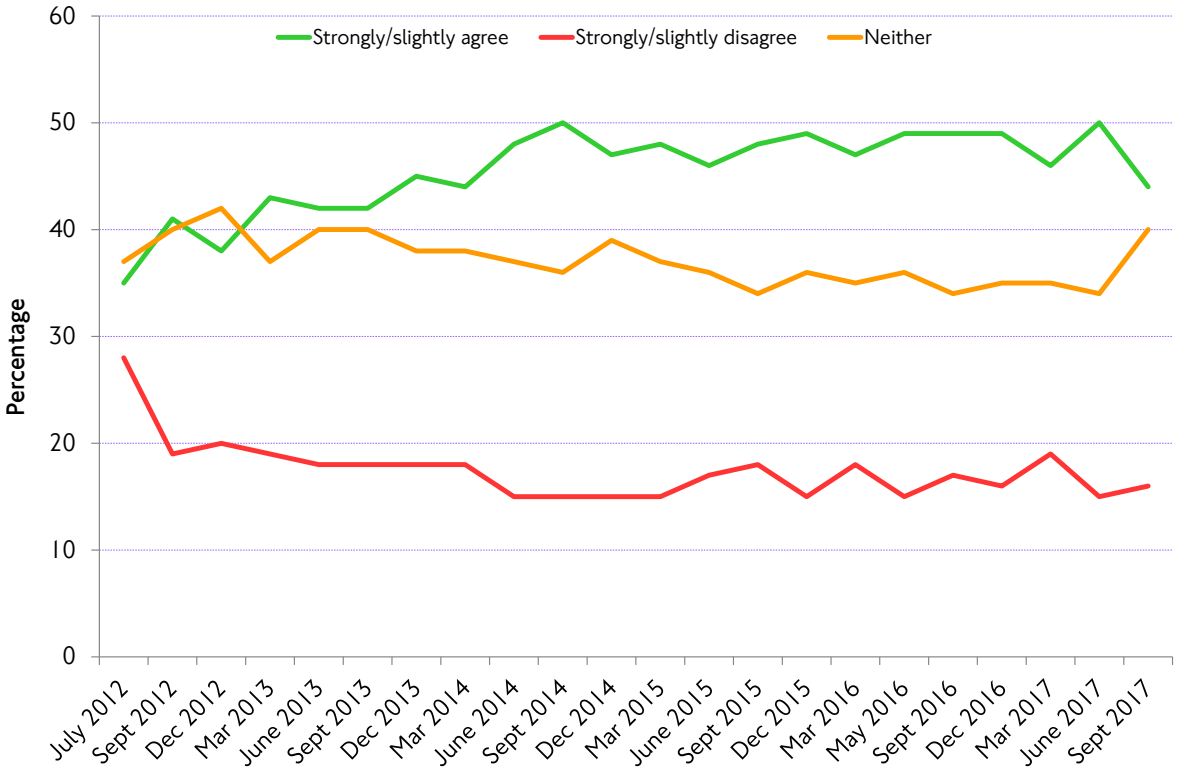
Source: TfL Customer and Employee Insight.

Extent to which TfL is perceived to care about its customers

Care is our overall measure of customer focus and is driven primarily by customers' experience of using public transport, most notably Underground and Bus. Unlike the customer satisfaction scores described above, it is about overall perception, so the occasional disrupted journey does tend to stick in the mind and cause customers to rate us lower than the typical scores described above. It will also be affected by safety issues that get reported in the media, major disruption (both caused by us or by National Rail), how well we support customers through that disruption, whether they perceive we are making improvements (eg care was boosted by the success of travel demand management during the London 2012 Games, introduction of contactless payments, improving reliability and introducing WiFi on the Tube, the Night Tube announcement etc), and whether they feel we are being open and honest with them.

Figure 8.2 shows the overall trend for this measure, which, in terms of the proportion who agree, was of good growth between 2012 and 2014, but much flatter since then. In broad terms, this is thought to reflect a particular focus on customer service improvements during the early period, and a relative lack of visible innovations over more recent years. Issues with the reliability of Underground and, particularly, bus services over this period are also thought to have been an underlying factor affecting these scores.

Figure 8.2 Percentage of people agreeing with the proposition that 'TfL cares about its customers'. Quarterly series.



Source: TfL Customer and Employee Insight.

8.3 Public transport safety and security

Introduction

Customers need to be confident that the public transport networks are safe – both in terms of risk of injury from operational incidents and freedom from crime and fear of crime. On the whole, London's public transport networks offer a safe, low-crime environment. However, after many years of safe operation, there was a major tram derailment at Sandilands Junction in November 2016, in which seven people lost their lives and more than 50 people were injured. This tragedy serves as a reminder that safety is paramount. This section reviews trends relating to customer injury and crime on the principal public transport networks.

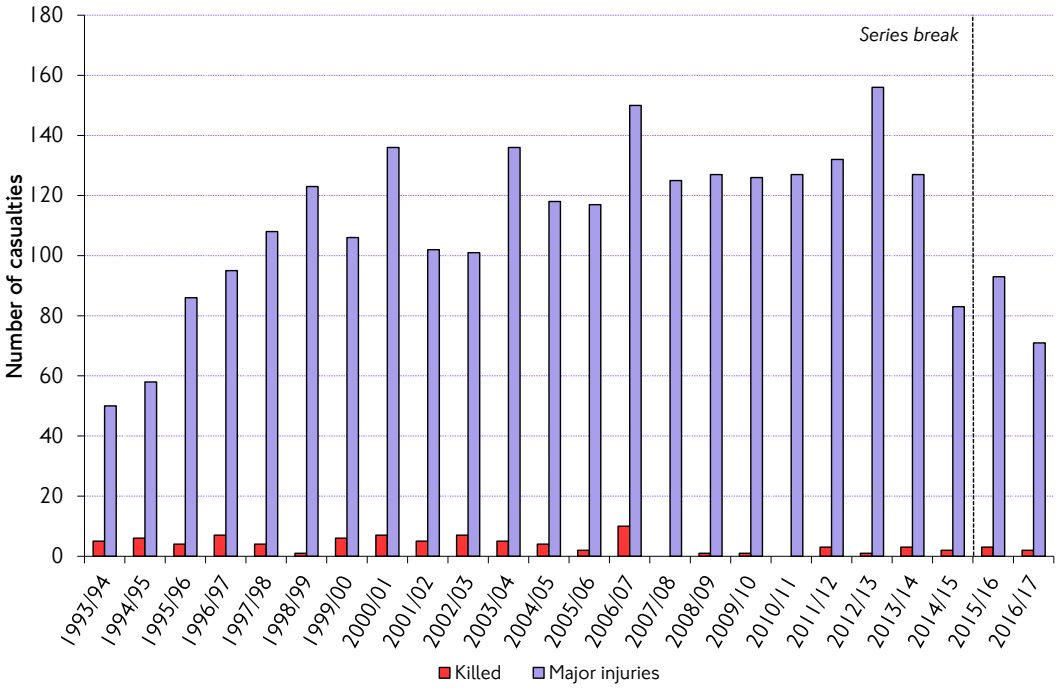
Customer injuries

Figures 8.3 and 8.4 show the trend in passenger injuries and fatalities on the principal public transport networks up to the 2016/17 financial year. Figure 8.3 shows the trend for London Underground (excluding other rail modes) and figure 8.4 shows the trend for bus and coach occupants.

- On the Underground during 2016/17 there were 71 serious passenger injuries and two fatalities, a decline on the previous year.
- In 2015, 70 bus or coach occupants were seriously injured in London, with one fatality. These casualty numbers exclude pedestrian and other vehicle users who might have been injured in collisions involving buses or coaches. Figure 8.4 shows a consistent trend of improvement in bus or coach passenger injuries over the last decade.

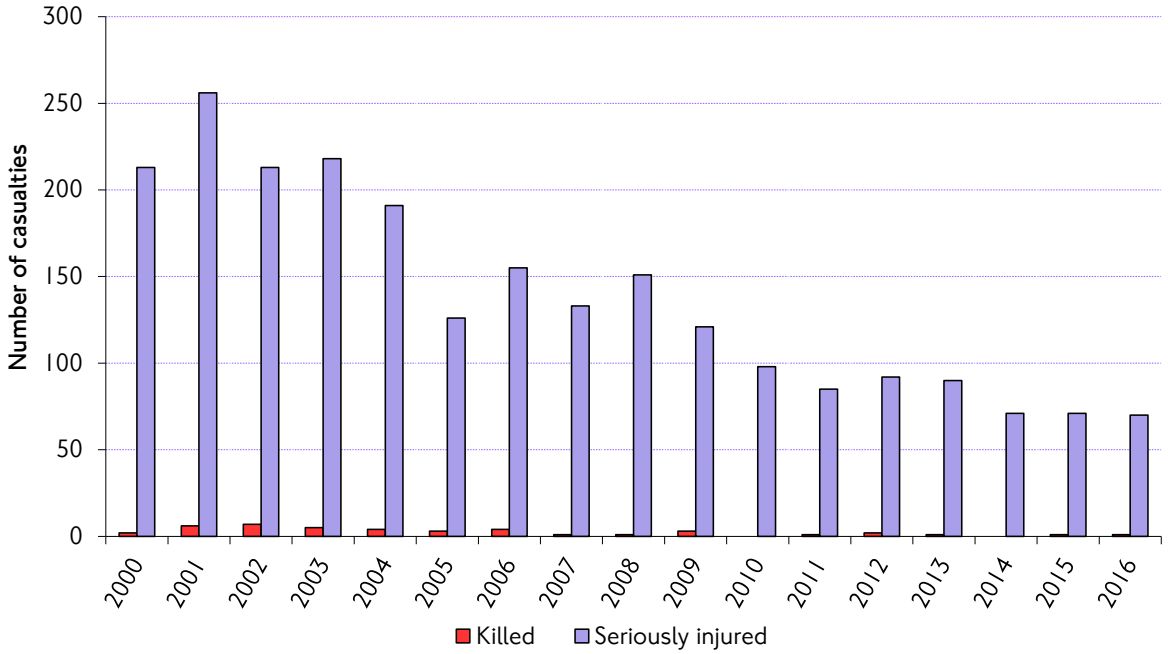
These trends should also be evaluated in the context of rising public transport patronage in London.

Figure 8.3 Number of people killed or injured while travelling on London Underground.



Source: London Underground. Excludes suicides and victims of assault and terrorist activity.

Figure 8.4 Number of bus/coach occupants killed or seriously injured in London.



Source: TfL City Planning, Strategic Analysis.
Excludes suicides and victims of assault and terrorist activity.

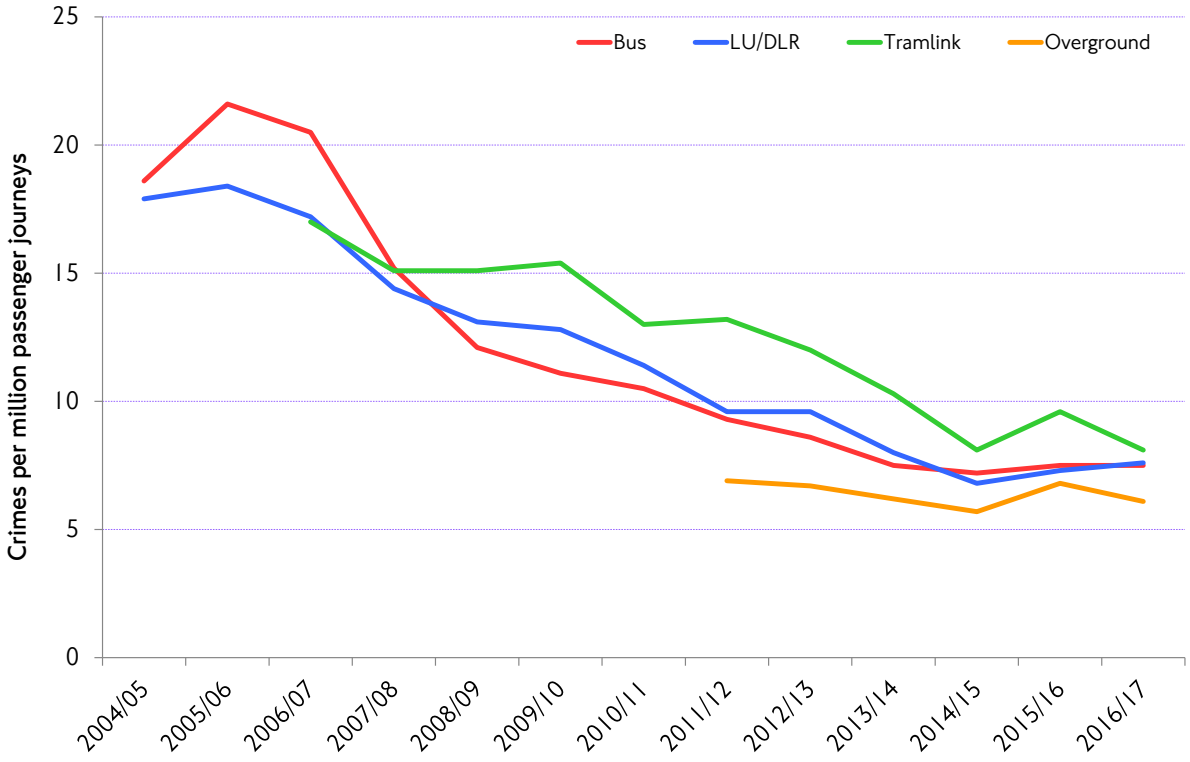
Crime and antisocial behaviour

Public transport in London continues to be a safe and low crime environment. Currently, over ten million passengers travel on TfL's public transport services each day with very few of them ever experiencing or witnessing crime. In 2016/17, the levels of pan-modal transport crime were 0.5 per cent higher (161 additional offences) compared with the previous year. The rate of crime has also increased slightly to 7.5 crimes per million passenger journeys (from 7.4 in 2015/16).

Figure 8.5 shows that in 2016/17:

- Levels of bus-related crime were 2.0 per cent lower (365 fewer offences) compared with the previous year, although there was no change in the rate of crime, which remained at 7.5 crimes per million customer journeys.
- Crime on the Underground and DLR networks increased by 6.0 per cent (643 additional offences) compared with the previous year. The rate of crime also increased to 7.6 crimes per million passenger journeys from 7.3 in 2015/16.
- Crime on the London Overground network decreased by 8.0 per cent (100 fewer offences) compared with the previous year. The rate of crime also decreased to 6.1 (from 6.8 in 2015/16).
- Crime on London Trams decreased by 9.8 per cent (26 fewer offences) compared with the previous year. The rate of crime also decreased to 8.1 crimes per million passenger journeys from 9.6 in 2015/16.

Figure 8.5 Reported crime on TfL's public transport networks. Rate per million passenger journeys.



Source: TfL Enforcement and On-street Operations.

Tackling transport crime and disorder is one of TfL's main priorities. The transport system in London is a low-crime environment, but crime, antisocial behaviour and the fear or crime can have a major effect on people's willingness to travel. Improving safety and security will help improve the quality of life and make London a fairer and more prosperous city. TfL is continuing efforts to reduce crime and antisocial behaviour and identify opportunities and areas for improvement so that Londoners feel safe travelling at any time of day or night.

8.4 Public transport fares and affordability

Introduction

Affordable public transport fares are essential for encouraging a shift from car to public transport, and to allow all Londoners to take advantage of the opportunities that the city offers. Travel in London report 9, section 4.3, reviewed several aspects of public transport fares in London, including trends in real fares levels, Travelcard holding and use, the availability of concessions and the role of technology. This section updates selected indicators and looks in more detail at various ways of measuring 'affordability' of fares in London.

Real fares trends

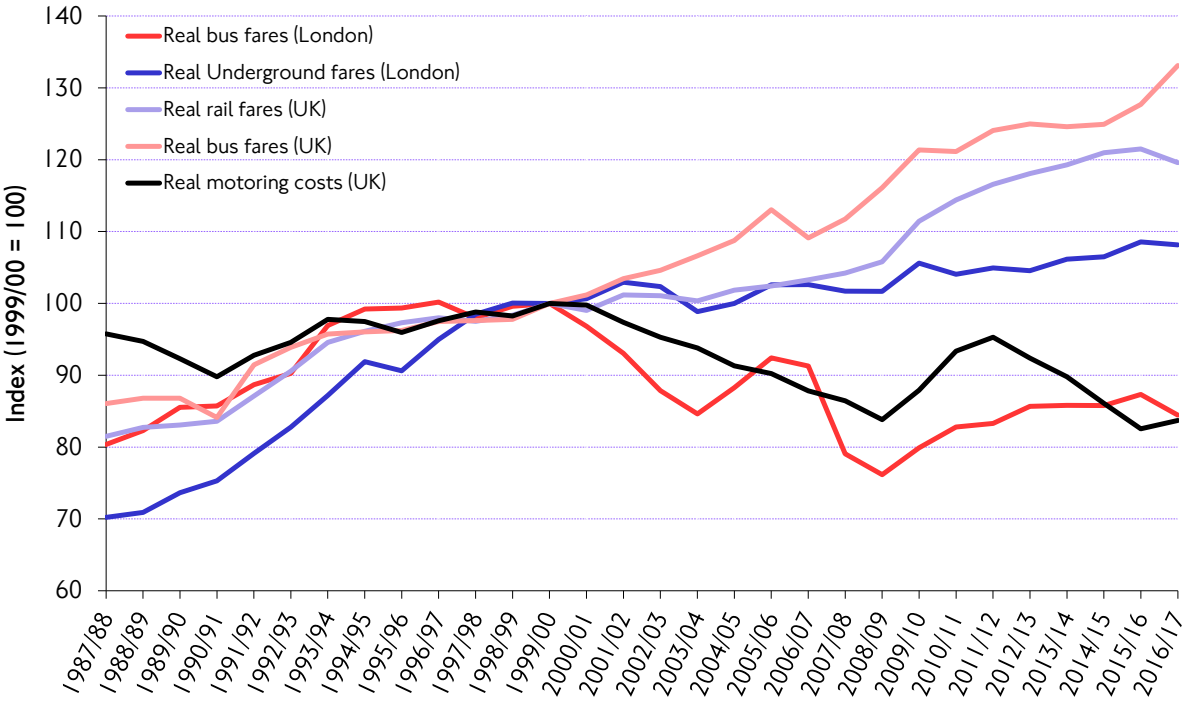
Figure 8.6 shows indexed real public transport fares in London (deflated by the Retail Prices Index) alongside national public transport fares and motoring costs for comparison. It is seen that, generally over the past two decades, public transport fares in London have compared favourably with those at the national level.

While bus fares in London have been increasing since 2008/09, they still (in 2016/17) remain 15.5 per cent lower than in 1999/2000 in real terms following a sharp fall between 1999/2000 and 2003/04. In contrast, real bus fares in the UK as a whole increased steadily over the last decade and have only recently levelled off at about 33 per cent higher than 1999/2000. Similarly, while Underground fares have remained relatively constant in real terms (currently standing 8.1 per cent above the value for 1999/2000), real rail fares in the UK as a whole have increased by 19.6 per cent.

The trend for motoring costs has been much more variable. Real costs declined steadily between 1999/2000 and 2008/09, eventually bottoming out at 16 per cent below the 1999/2000 value. They have since fluctuated, rising to within five percentage points of the 1999/2000 value in 2011/12 before falling again. This fall has been driven by a large fall in petrol costs and a smaller decline in the costs of vehicle purchase since 2010/11.

These indices are adjusted for inflation. When looking at the unadjusted data, motoring costs have risen at a slower rate than overall inflation, whereas national bus and rail fares have increased at a faster rate than inflation since 2000.

Figure 8.6 Public transport fare trends – London and UK compared. Index: 1999/00 = 100.



Source: TfL City Planning, Strategic Analysis.

Real fares levels

A real fares level indicator is available that measures the average actual fare paid in London per kilometre travelled. It is a composite measure, covering bus and Underground only, calculated as the total actual fares revenue for passengers paying full adult fares, adjusted for inflation and divided by corresponding actual bus and Underground passenger kilometres.

The trend from 2009/10 is shown in table 8.2. In 2016/17, the average adult composite bus and Underground fare was 20.9 pence per kilometre, slightly lower than in the previous year where it was 21.3 pence per kilometre. This indicator has been relatively stable for the past six years, with a 1.1 per cent increase in real terms between 2009/10 and 2016/17, although with a reduction in the most recent year, this in part reflecting the Mayor's fares freeze – effective from January 2017.

Table 8.2 Real fares levels public transport (pence, 2016/17 prices).

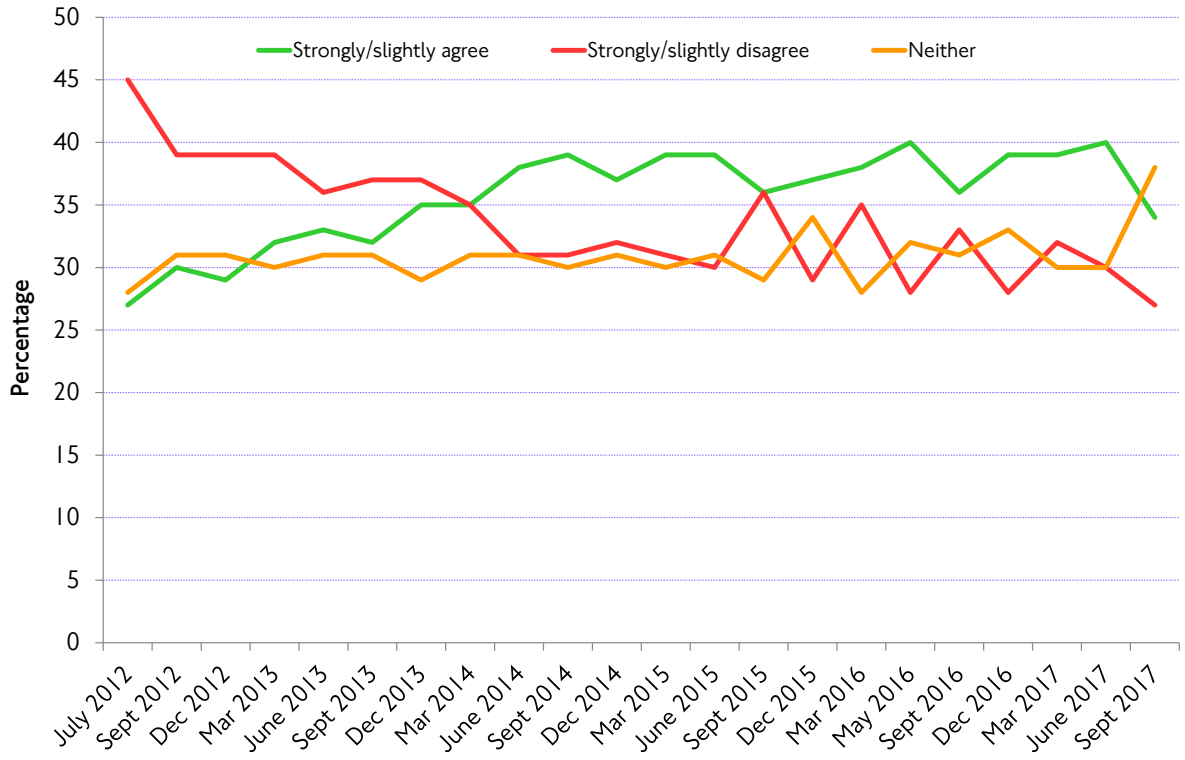
	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Fare	20.7	20.8	21.0	21.0	21.2	21.1	21.3	20.9

Source: TfL Customer Experience.

Extent to which people consider that TfL provides value for money

The cost of fares is only one aspect that drives the extent to which people consider that TfL provides value for money. This is also affected by quality of service, and wider aspects related to what the organisation stands for. However the level of fares is the most significant driver. TfL seeks quarterly feedback on this proposition through its customer surveys, and the recent trend is shown by figure 8.7, with the green line showing the percentage of people agreeing with the proposition.

Figure 8.7 Extent to which people agree that TfL provides value for money.



Source: TfL Customer Research and Insight.

The overall trend is one of strong growth in the early period, with a relatively more stable trend in the later years. The absolute level of agreement, however, is relatively low – typically around 40 per cent over recent years.

Value for money is a challenging metric for all businesses and therefore it tends to be a relatively low scoring indicator for a lot of organisations. For TfL, this primarily reflects a perception that public transport fares are relatively high. It is also interesting to note the similarity of this trend with that for TfL cares (see section 8.2 of this report, above), perhaps reflecting the impact of more general factors on the value for money score. It is thought that recent initiatives such as the fares freeze and bus Hopper fare should feed through to be reflected in this indicator over the medium term.

8.5 Equality and inclusion on the public transport networks

Context – Action on Equality

In March 2016, TfL produced Action on Equality – TfL's commitments to 2020 (see: http://content.tfl.gov.uk/action-on-equality-tfls-commitments-to-2020.pdf). This describes TfL's vision and policy on equality and inclusion from 2016 to 2020. Action on Equality extends the work of TfL's Single Equality Scheme between 2012 and 2015. Whilst much has been achieved in recent years in developing a more accessible and inclusive transport network in London, much also remains to be done. The focus of Action on Equality is therefore to embed the values of equality and inclusivity into everything TfL does, and ultimately the way that we deliver for our customers and users.

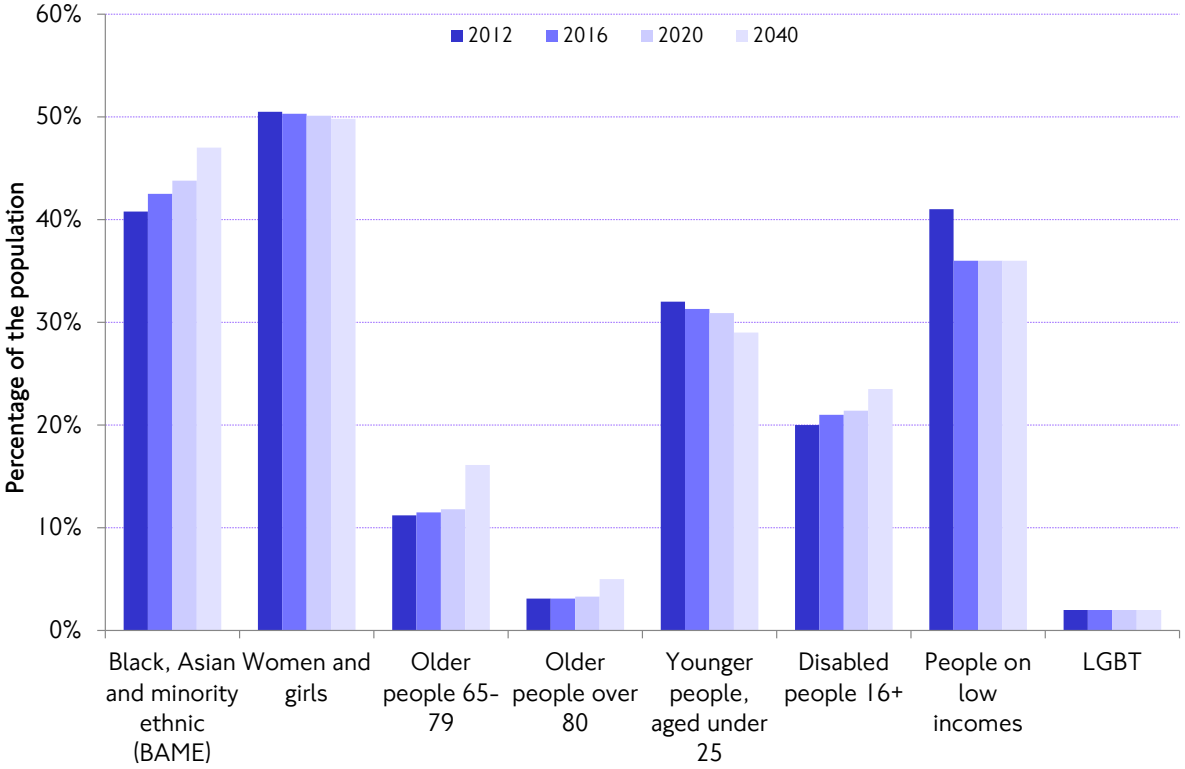
Key to advancing these values is to better understand the issues, the outcomes that they contribute to, and their underlying causes. Summaries of available material and insight are published periodically through 'Travel in London: Understanding the travel needs of London's diverse communities' (see: http://content.tfl.gov.uk/travel-in-london-understanding-our-diverse-communities.pdf). Action on Equality also sets out clear objectives for the period 2016 to 2020 across a wide range of improvements, and specifies measures by which progress can be assessed. This section focuses on updating several aspects of the information base that is available to assist this work.

London's changing socio-demographic structure and its implications for equality

London's population is becoming increasingly diverse. The proportion of BAME (Black, Asian and minority ethnic) Londoners is expected to rise to just around 47 per cent by 2040. As the city's population becomes more diverse, the transport system will need to serve a widening diversity of needs.

London also has a relatively youthful population, but as the city continues to grow we expect to see people living longer and, therefore, a rise in the number of older people. By 2020 almost 12 per cent of Londoners will be aged 65 or over. As the likelihood of becoming disabled increases with age, there are also likely to be more disabled and mobility impaired Londoners in future. A growing population is also likely to lead to more families with small children, who will require accessible travel. Figure 8.8 gives an appreciation of these expected changes.

Figure 8.8 Projected changes to Londoners' diversity to 2040.



Source: Annual Population Survey 2014, ONS and GLA 2013 round of trend-based population projections (central variant).
1. The figure shows no change for LGBT and low income for future years because the data are not sufficient to forecast changes.

Public transport accessibility

This section looks at the infrastructural aspects of physical accessibility to London's transport networks. Previous Travel in London reports set out statistics describing the accessibility status of key elements of the transport infrastructure. These have been combined into a 'physical accessibility' strategic outcome indicator, expressed in terms of a weighted percentage score across the modes, based on the overall mode shares for all people.

The trend for this indicator is one of relatively slow but continuous improvement (table 8.3), reflecting the legacy nature of much of London's rail infrastructure; however in the latest year there has been no change in the physical accessibility score, which has remained at 59 per cent in 2016/17.

Although the overall score has not increased, there have been some improvements to mode-specific accessibility, for example an increase in the percentage of bus stops with accessible footways as well as an increase in the number of step-free Underground and Overground stations. Despite these improvements, slightly less than half of the network is still not fully accessible according to this definition. Furthermore, looking at physical accessibility in this way does not take account of actual journey opportunities, only considering ease of access to the public transport network per se.

Table 8.3 Modal composite physical accessibility score.

Year	Composite physical accessibility score (%)
2007/08	(36)
2008/09	(36)
2009/10	37
2010/11	38
2011/12	44
2012/13	46
2013/14	50
2014/15	54
2015/16	59
2016/17	59

Source: TfL City Planning, Strategic Analysis.
Note: Values prior to 2009/10 are based on a dataset that differs in minor respects to that used from 2009/10.

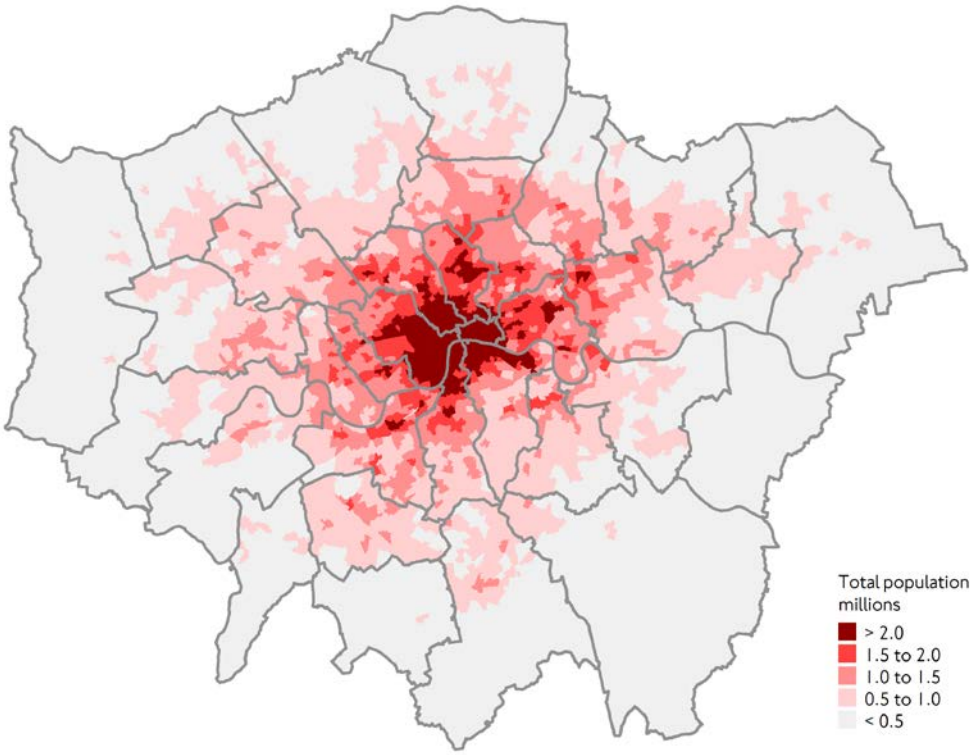
Impact of physical accessibility on journey opportunities

Improving the accessibility of public transport is critical to delivering a better whole-journey experience for all Londoners, but in particular for those with specific physical accessibility needs. Currently, 45 per cent of disabled Londoners find travelling by public transport stressful. A more accessible public transport system will enable new trips to be made by disabled people as well as making easier those that are currently being made, as well as improving overall quality for all travellers.

To this end, TfL is working to make 40 per cent of the tube network step-free by 2022 (against a current level of 26 per cent). The Mayor's long-term aim is for the majority of the Underground network to be step-free, recognising that the nature of some locations makes this extremely difficult to achieve. It is also important that other parts of the network, such as National Rail in London, and interchanges with the bus network, are also brought up to these standards, recognising the whole-journey nature of the requirements. New infrastructure will be designed from the outset to be accessible, including the Elizabeth line and the proposed Crossrail 2 project.

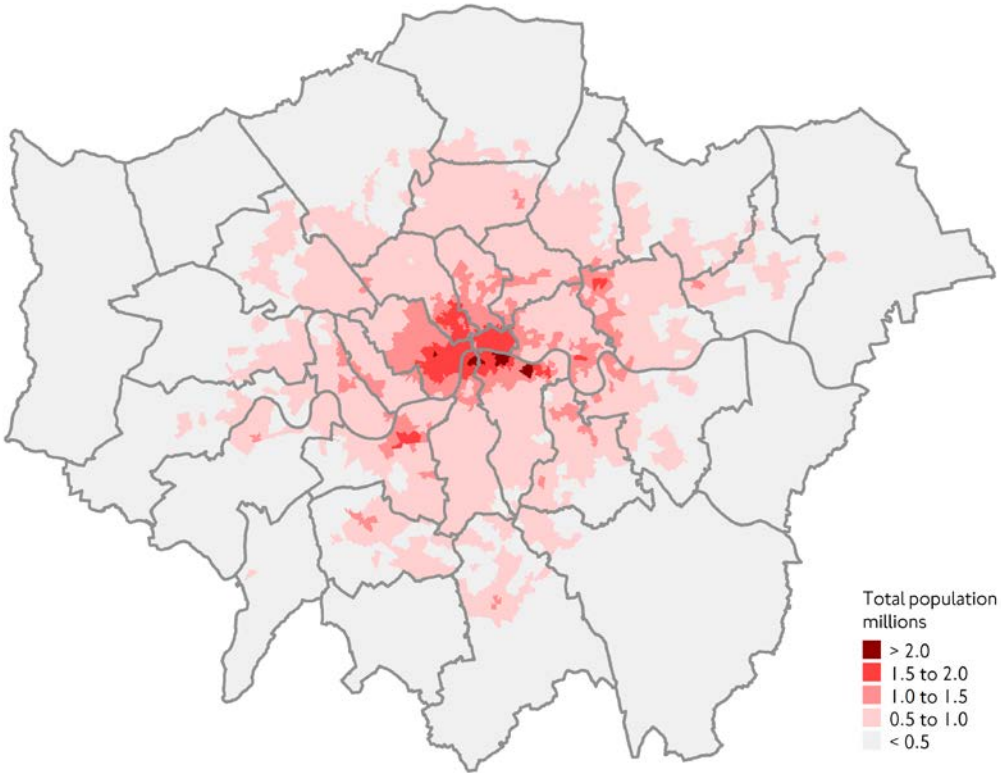
Figures 8.9 and 8.10 illustrate how the current accessibility status of the rail networks in London limit connectivity for those who require step-free access, in terms of the number of people (residents) that can be reached within 45 minutes of any location. On the basis of small zones, the number of people is given by the intensity of the shading. It is immediately clear from the comparison that the degree of connectivity provided by just the step-free rail network is considerably less than the full network, and that this difference applies widely across Greater London.

Figure 8.9 Number of people who can be reached from any location in London within 45 minutes. Full rail network assumption.



Source: TfL City Planning, Strategic Analysis.

Figure 8.10 Number of people who can be reached from any location in London within 45 minutes. Step-free rail network assumption only.



Source: TfL City Planning, Strategic Analysis.

Additional travel time required for those using the step-free network

People with specific physical mobility needs can be disadvantaged in terms of trip making since not all of the public transport networks are fully accessible. Therefore, in order to make certain trips, it is necessary to use the 'accessible network', which can often imply longer, more time-consuming and arduous journeys or, in some cases, may mean that the trip simply cannot be made by public transport. This can further contribute to social and economic disadvantage for these people. TfL is working to improve this situation, with a Mayoral ambition to halve the additional journey time required by those using the step-free network only so that journey times on the step-free network become comparable to those on the wider public transport network.

Table 8.4 Comparison of average journey time by fastest available route and step-free network only. 2015 baseline.

Year	2015
Average journey time by quickest route (minutes)	77
Average journey time using bus and step-free stations only.	86
Relative additional journey time (minutes)	11
Relative additional journey time (%)	14

Source: TfL City Planning, Strategic Analysis.

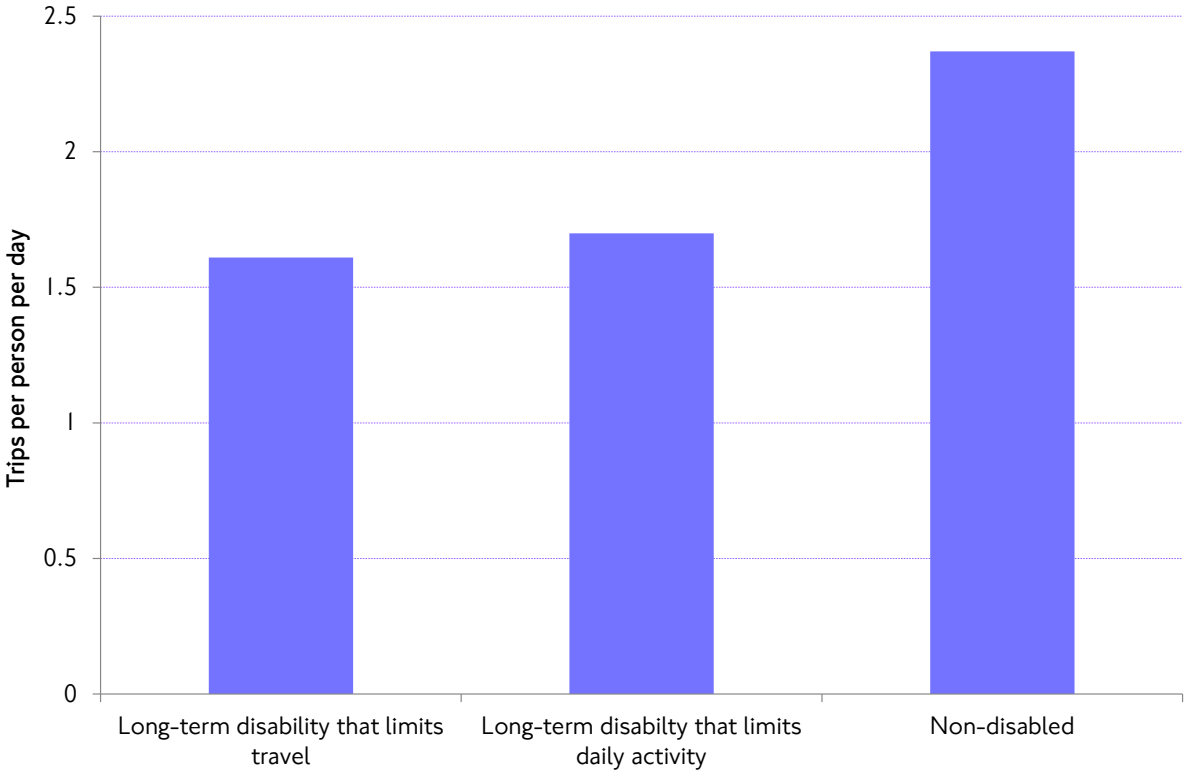
It is important to note that step-free features such as lifts and level platforms are also beneficial to those carrying heavy loads, those with children in buggies and, potentially, other non-disabled travellers such as older people and those feeling unwell. In this way, the overall appeal of the public transport network is also enhanced.

Travel behaviour – trip rates

One way of exploring the impact of limitations to the availability of transport that meets all people's needs is to look at the actual travel behaviour of the different equalities groups, as revealed by the LTDS survey. Transport is only one factor underlying these differences – there are aspects related to wider societal disadvantage that also determine the need to travel and the type of trips made; however provision of a fully accessible network will, in time, help eliminate this particular aspect.

Figure 8.11 shows the trip rate (the average number of trips made per person per day), for three groups of residents in London – those with a long-term disability that limits travel, those with a long-term disability that limits daily activity and those without a disability. The values relate to an average over the three-year period between 2014/15 and 2016/17. The relative number of trips made by each group is informative, with people who have a disability that limits travel making, on average, 32 per cent fewer trips per person per day than the population as a whole and those with a disability that limits daily activity making, on average, 28 per cent fewer trips than the population as a whole.

Figure 8.11 Trip rate by disability group, LTDS 3 year average 2014/15-2016/17.



Source: TfL City Planning, Strategic Analysis.

Travel behaviour – mode shares

In terms of trip-based mode share, there is not much variation among London residents who have a disability that limits travel or those who have a disability that limits daily activity. Disabled London residents tend to make a greater proportion of trips by bus and as a car passenger, but fewer trips on average by rail, cycle or as a car driver compared to non-disabled London residents. The walk mode share is very similar across the three groups.

Table 8.5 Disability and mode shares. LTDS 3 year average, 2014/15-2016/17.

	London residents with a disability that limits travel	London residents with a disability that limits daily activity	London residents without a disability
National Rail/ Overground	2%	3%	6%
Underground/DLR	4%	4%	10%
Bus/tram	22%	23%	14%
Taxi/ Other	3%	3%	1%
Car driver	19%	19%	23%
Car passenger	18%	16%	12%
Van/ Lorry	0%	1%	1%
Motorcycle	0%	0%	0%
Cycle	1%	1%	3%
Walk	31%	32%	31%
Total	100%	100%	100%

Source: TfL City Planning, Strategic Analysis.

Amount of travel by those with mobility needs

Evidence from TfL's LTDS survey shows that people with specific mobility needs travel less – ie have a lower average trip rate – than the general population. Although this reflects both transport and non-transport factors, improving the physical accessibility of the transport networks will help reduce social and economic exclusion.

The most suitable indicator is therefore the average annual trip rate for those who declare that they have specific mobility needs, set against the average trip rate for the general population. Success on this measure would be reflected in a narrowing of the difference between the two trip rates. Table 8.6 below shows the available time series from the LTDS survey.

Table 8.6 Average daily trip rate for different social groups. LTDS 2010/11-2016/17.

Year	2010/ 11	2011/ 12	2012/ 13	2013/ 14	2014/ 15	2015/ 16	2016/ 17
All Londoners	2.48	2.53	2.51	2.52	2.39	2.32	2.22
Women	2.52	2.54	2.54	2.60	2.43	2.37	2.27
Black, Asian and minority ethnic (BAME)	2.31	2.33	2.32	2.31	2.17	2.09	1.95
Household income less than £20,000	2.27	2.33	2.23	2.29	2.18	2.14	1.99
Under 25s	2.19	2.23	2.21	2.24	2.09	2.02	1.94
Over 64s	2.06	2.14	2.05	2.10	2.05	1.99	1.93
Disabled	1.86	1.93	1.86	1.72	1.73	1.69	1.67

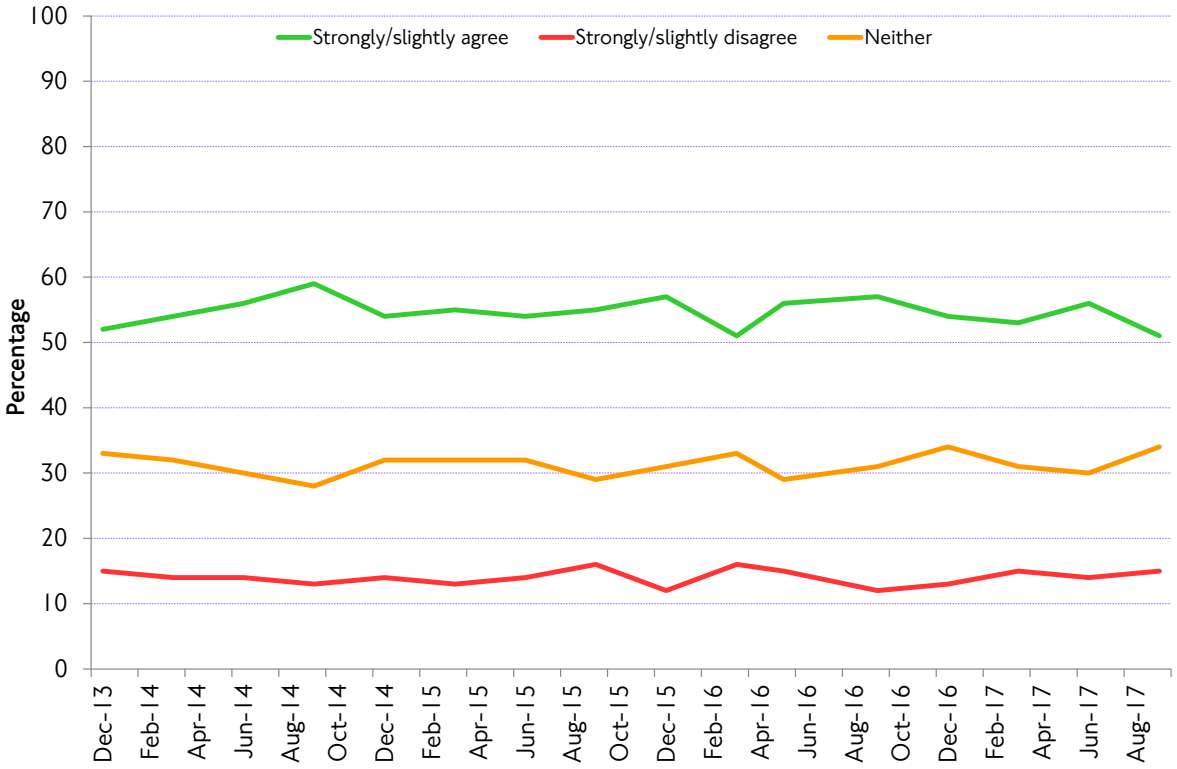
Source: TfL City Planning, Strategic Analysis.

Women make the highest number of trips per day, at 2.27 per person, which is higher than the London average. Disabled Londoners make the fewest trips per person on average, at just 1.67 per day. Interestingly all groups have seen a decline in their trip rate in the last three years, mirroring the trend of declining trip rates by London residents (explained in more detail in section 4.2).

Accessible travel experience

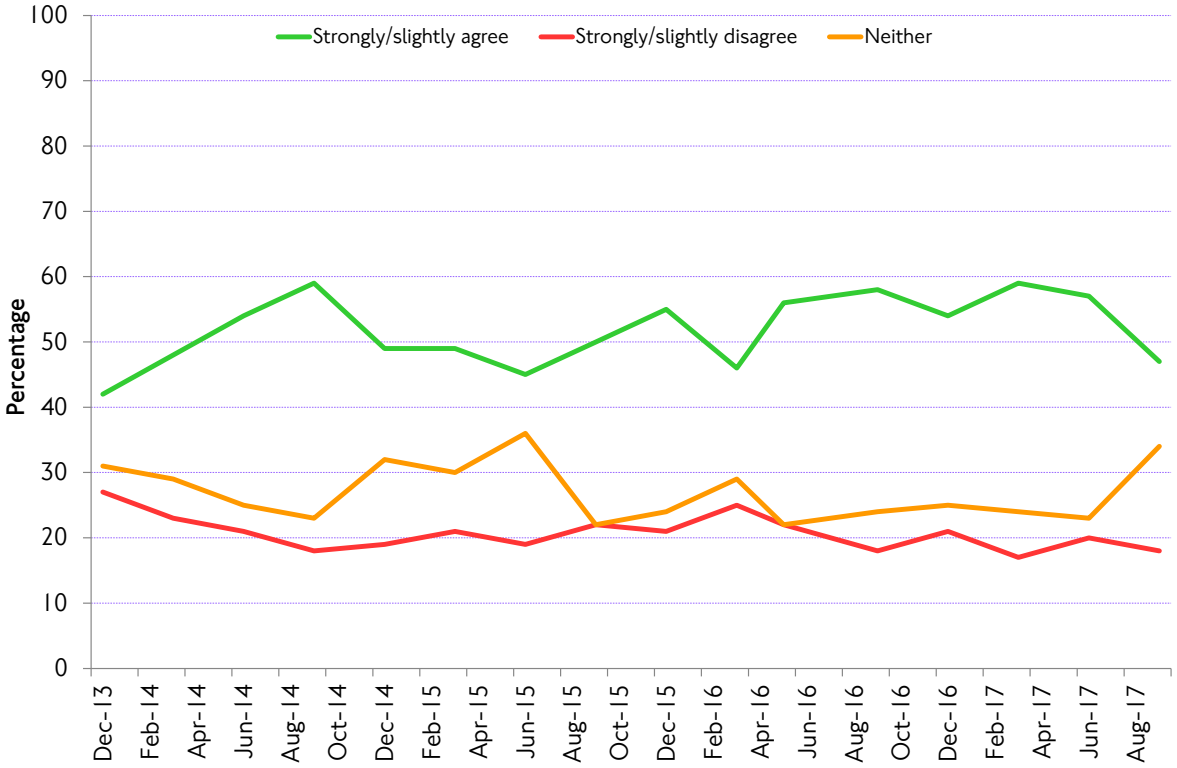
TfL's customer insight surveys seek customer feedback on a number of aspects of the travel experience. One of these is the extent to which Londoners agree with the proposition that TfL is making it easier for disabled people to get around. This is asked of both the general population but also of a sub-sample of people with mobility needs. Figures 8.12 and 8.13 below illustrate this feedback – in terms of three levels of agreement with the proposition – for both the whole population and specifically for disabled people.

Figure 8.12 Level of agreement with the proposition that 'TfL is making it easier for disabled people to get around'. All respondents.



Source: TfL Customer Research and Insight.

Figure 8.13 Level of agreement with the proposition that 'TfL is making it easier for disabled people to get around'. Disabled respondents only.



Source: TfL Customer Research and Insight.

Although superficially similar and accepting that, owing to a smaller sample, there will be a greater degree of variability in the responses from disabled people, consistently more disabled people, typically just more than 20 per cent in the period under review, disagree with the proposition, compared to (typically) 15 per cent of all people.

This is a legacy indicator that is under review, as part of TfL's current comprehensive review of its customer insight surveys. A number of indicators better suited to understanding aspects of the disabled travel experience are currently under trial.

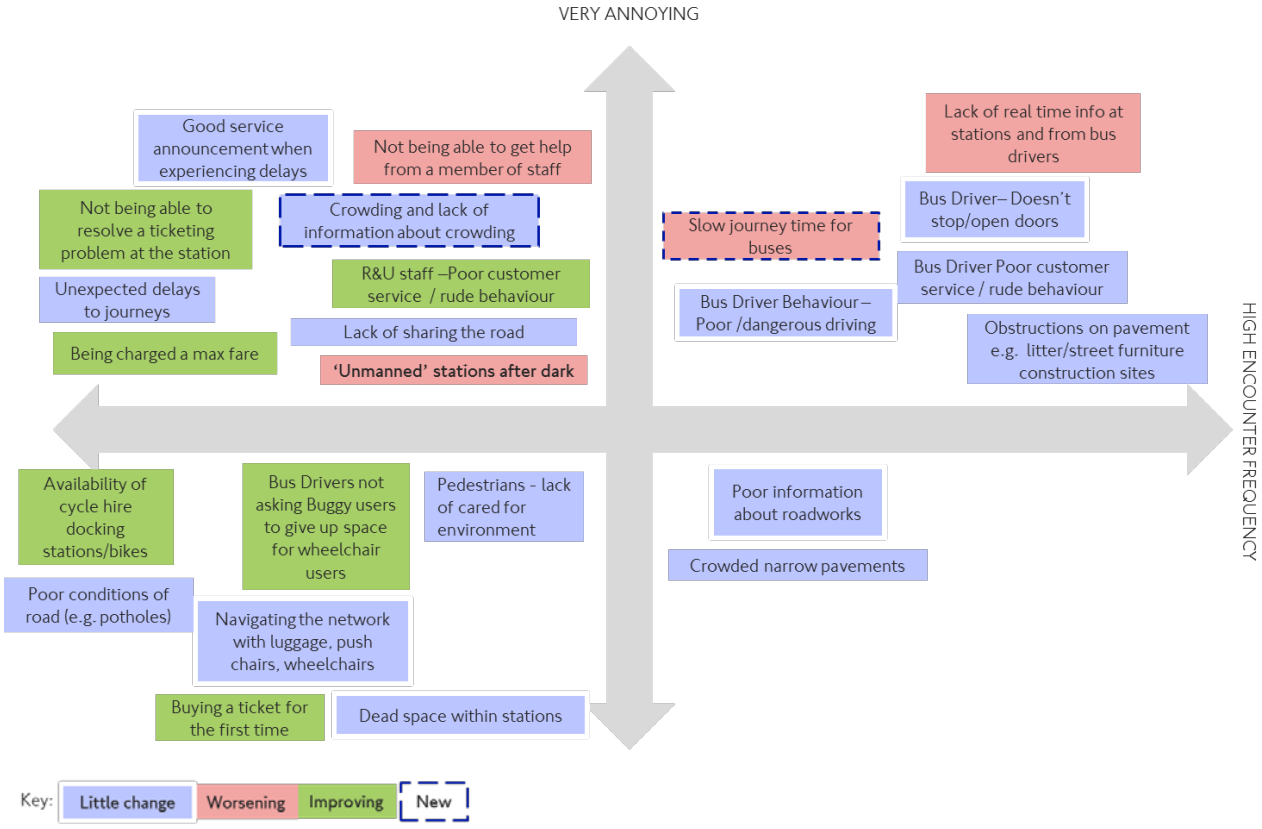
Impact of operational factors on journey opportunities for customers with accessibility needs

Gain points – all customers

Travel in London report 8 introduced the concept of 'gain points', the identification of which, through surveys, analysis of data sources such as customer complaints and other customer research, allow us to more accurately target customer service improvements. These are presented on a grid with two axes, reflecting, respectively, the frequency with which they are encountered, and the severity of annoyance caused when they do occur. Gain points that are most acutely felt relate to not having an easy journey and feeling stressed, although the specific issues that are identified do change, as older factors are addressed or cease to become as significant, and new annoyances or impediments arise. Contemporary examples include delays on public transport, specific examples of poor customer service and obstructions on the street that impede progress and degrade the local environment.

Figure 8.14 is a schematic showing updated customer gain points. It also shows the extent to which individual gain points are considered to be improving or worsening (colour coding). Aspects such as bus journey times and lack of real time information are highlighted as being of particular contemporary concern. Addressing gain points takes time and effort and therefore not everything can be fixed immediately, however there have been recent improvements in issues relating to ticketing and wider aspects of public transport customer service.

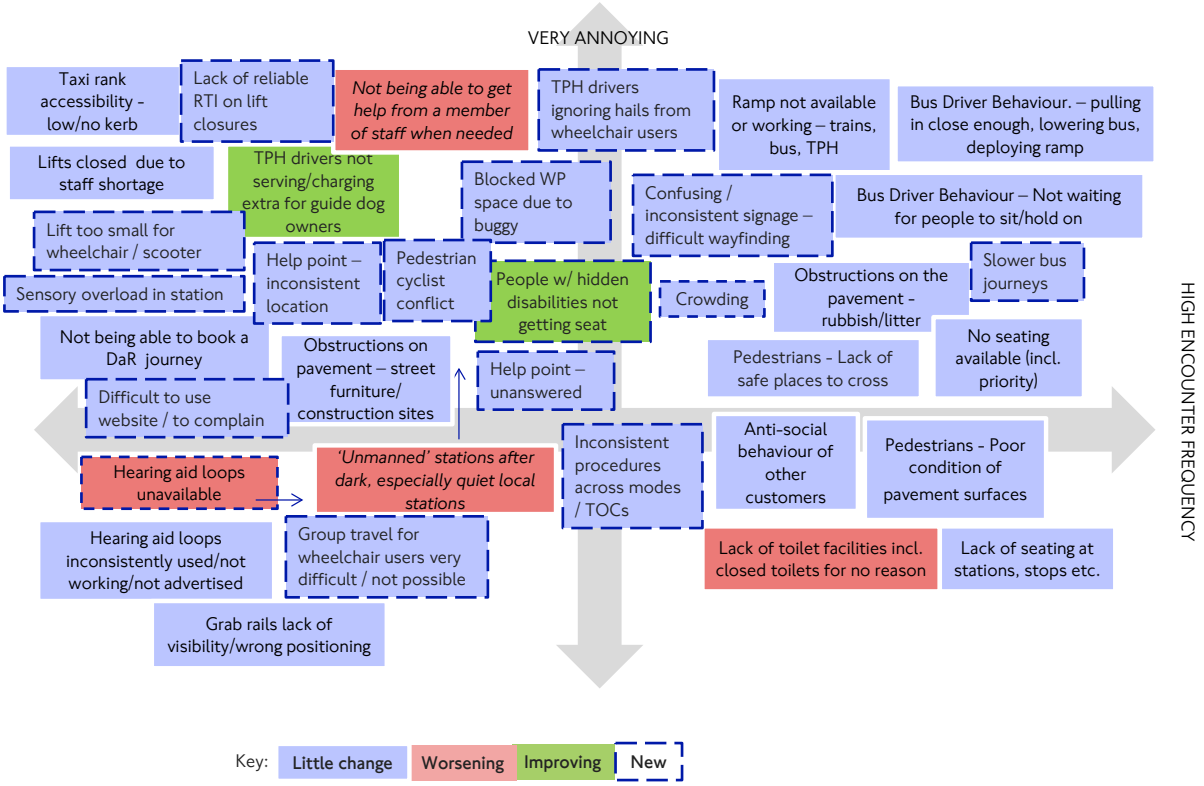
Figure 8.14 Customer gain points.



Source: TfL Customer Research and Insight.

Gain points apply to all customers; however it is known that the general gain points highlighted above are felt more acutely by customers with accessibility needs and that they tend to occur more often. Furthermore, customers with accessibility needs have a range of additional gain points, over and above those shown by figure 8.14. Figure 8.15 is a schematic showing identified gain points for customers with accessibility needs. The figure also shows the extent to which they are considered to be improving or worsening, although the large majority of the gain points show little change in this regard. The figure highlights issues relating to the availability of toilets and inductive hearing loops as particular issues of contemporary concern, although issues such as recognition of 'hidden disabilities' and aspects of taxi customer service are areas of recent improvement.

Figure 8.15 Additional gain points for customers with accessibility needs.



Source: TfL Customer Research and Insight.

Section 4: New homes and jobs

9. Supporting London's development

9.1 Introduction

This chapter addresses the particular challenge of providing adequate housing for Londoners, specifically illustrating the role that transport can play in 'unlocking' housing development – by providing connectivity to new areas and developments.

9.2 Supporting new homes

London's housing challenge

More people than ever want to live and work in London. By 2041 there are forecast to be about 2 million more people living and 1.2 million more people working in London than there are today.

To meet the demands of this growing population, and to improve conditions for current residents, it is estimated that the city will need to deliver at least 65,000 new homes every year between now and 2041 to meet the needs of its rapidly growing population. But, with the city building less than half this amount in recent years, we will need to use every tool available to increase the rate of delivery. The current housing crisis in London is generally accepted to be one of the biggest risks to the future prosperity of the city – some 73 per cent of 'business decision makers' think London's housing supply and costs are a significant risk to the Capital's economic growth and competitiveness.

In September 2017 the Mayor published his draft London Housing Strategy for consultation
(see: https://www.london.gov.uk/sites/default/files/2017_london_draft_housing_strategy.pdf). This set out a range of proposals for tackling London's current housing need, and for providing for the future.

Strategic Housing Land Availability Assessment (SHLAA)

The purpose of the SHLAA is to identify the housing capacity that can be brought forward during the timescale of the new London Plan to address the Capital's overall housing need. The 2017 London SHLAA has been published as part of the evidence base of the new London Plan. The study coves a 24-year period from 2017 to 2041 and has informed the ten year housing targets in the London Plan, which run from 2019/20 to 2028/29 (table 9.1).

The SHLAA shows that London has capacity for 649,350 homes during the ten-year period covered by the London Plan housing targets. This equates to an average annualised capacity of 64,935 homes per year.

- 55 per cent of capacity is in outer London (357,890 homes).
- 45 per cent of capacity is in inner London (291,460 homes).

Table 9.1 Overall housing capacity, 2019/20 – 2028/29.

Borough	Ten year capacity	Annual capacity
Barking and Dagenham	22,640	2,264
Barnet	31,340	3,134
Bexley	12,450	1,245
Brent	29,150	2,915
Bromley	14,240	1,424
Camden	10,860	1,086
City of London	1,460	146
Croydon	29,490	2,949
Ealing	28,070	2,807
Enfield	18,760	1,876
Greenwich	32,040	3,204
Hackney	13,300	1,330
Hammersmith and Fulham	16,480	1,648
Haringey	19,580	1,958
Harrow	13,920	1,392
Havering	18,750	1,875
Hillingdon	15,530	1,553
Hounslow	21,820	2,182
Islington	7,750	775
Kensington and Chelsea	4,880	488
Kingston upon Thames	13,640	1,364
Lambeth	15,890	1,589
Lewisham	21,170	2,117
London Legacy Development Corporation (LLDC)	21,610	2,161
Merton	13,280	1,328
Newham	38,500	3,850
Old Oak and Park Royal Development Corporation (OPDC)	13,670	1,367
Redbridge	19,790	1,979
Richmond upon Thames	8,110	811
Southwark	25,540	2,554
Sutton	9,390	939
Tower Hamlets	35,110	3,511
Waltham Forest	17,940	1,794
Wandsworth	23,100	2,310
Westminster	10,100	1,010
Total	**649,350**	**64,935**

Source: The London Strategic Housing Land Availability Assessment 2017, Greater London Authority.

The role of transport

The transport network has a crucial role to play in improving housing availability in London. By ensuring that there is sufficient capacity on the rail, bus and tram networks, and improving the environment for walking and cycling, it is possible to enable higher density housing and mixed use development at transport hubs. In addition, new public transport connections can make parts of London viable places to build homes for the first time.

TfL's planned extension of the Overground to Barking Riverside will unlock the delivery of 11,000 new homes, which would otherwise not have been possible, whilst the Elizabeth line has already seen planning applications for more than 55,000 new homes around its stations. Future major transport schemes and

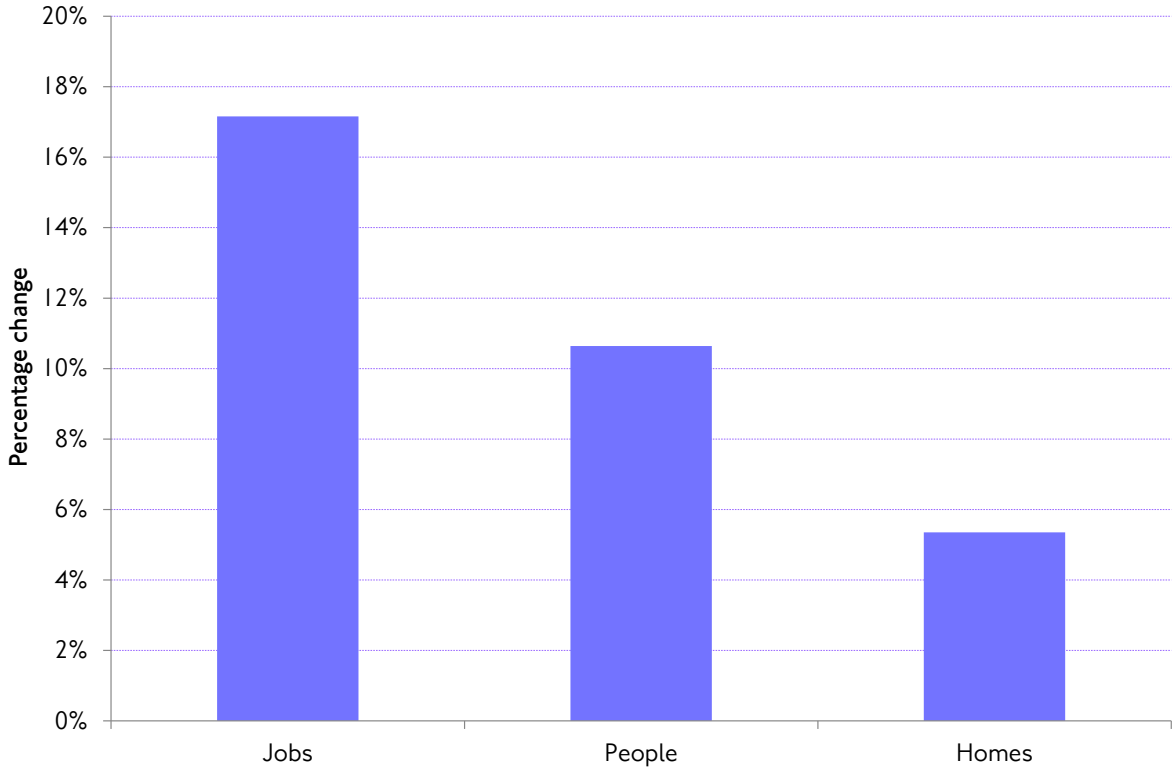
proposals, such as Crossrail 2 and the Bakerloo Line extension, are also being planned to maximise the number of new homes that they could support.

By applying these principles we will ensure that, as London grows, a greater proportion of people will live in locations that are well connected to employment and other opportunities by walking, cycling or using public transport.

Growing population, employment and prosperity alongside a housing affordability crisis

Building enough new homes and catering to the needs of all Londoners is extremely challenging – currently, only half of the homes London needs are being built. During the past 10 years the number of new housing completions has not exceeded 25,000 in any single year. Since the Second World War, the largest number of completions in a single year was 37,400 in 1970. Over the past 10 years, the annualised rate of new housing completions in London was 0.9 per cent while the annualised growth in population was 1.4 per cent.

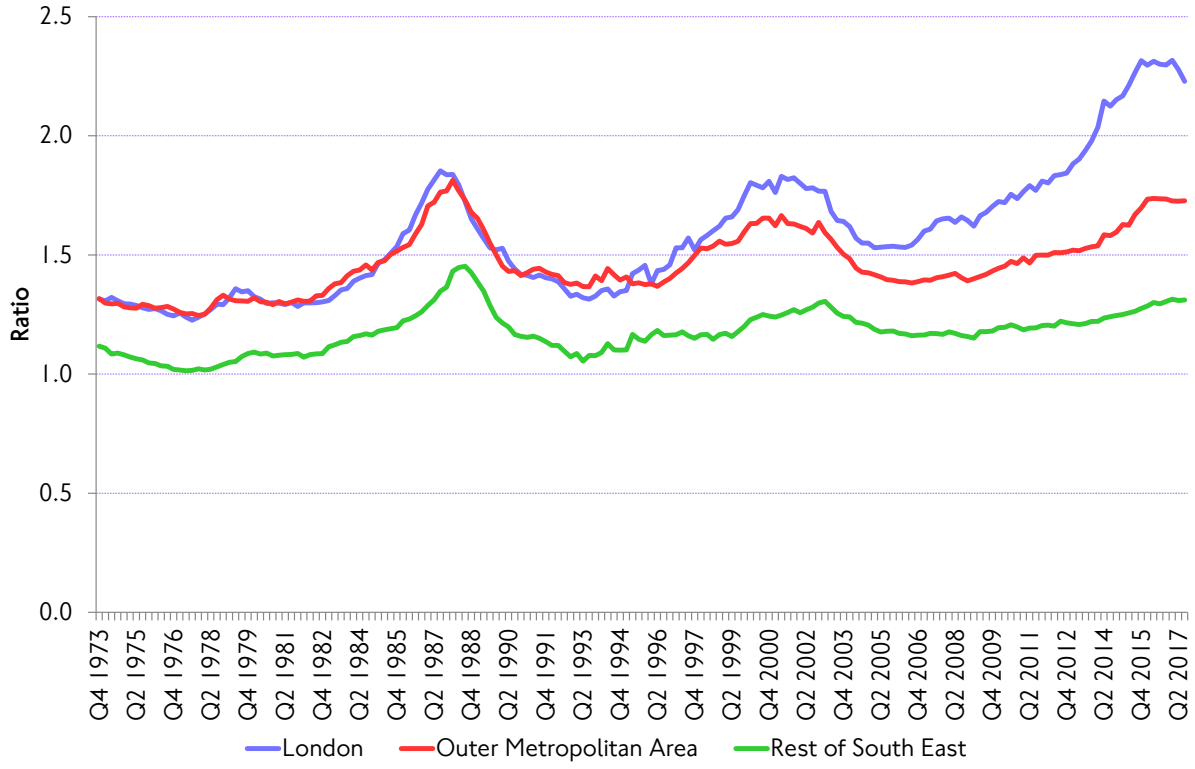
Figure 9.1 Change in number of jobs, people and homes on Greater London 2009-2016.



Source: Office for National Statistics.

This chronic lack of supply has resulted in an affordability crisis. Average house prices in London are now 11 times the median earnings. This issue particularly affects lower wage sectors and occupations and makes recruitment difficult – restricting the size of the labour market.

Figure 9.2 Ratio of London and wider South East average house prices to UK average.



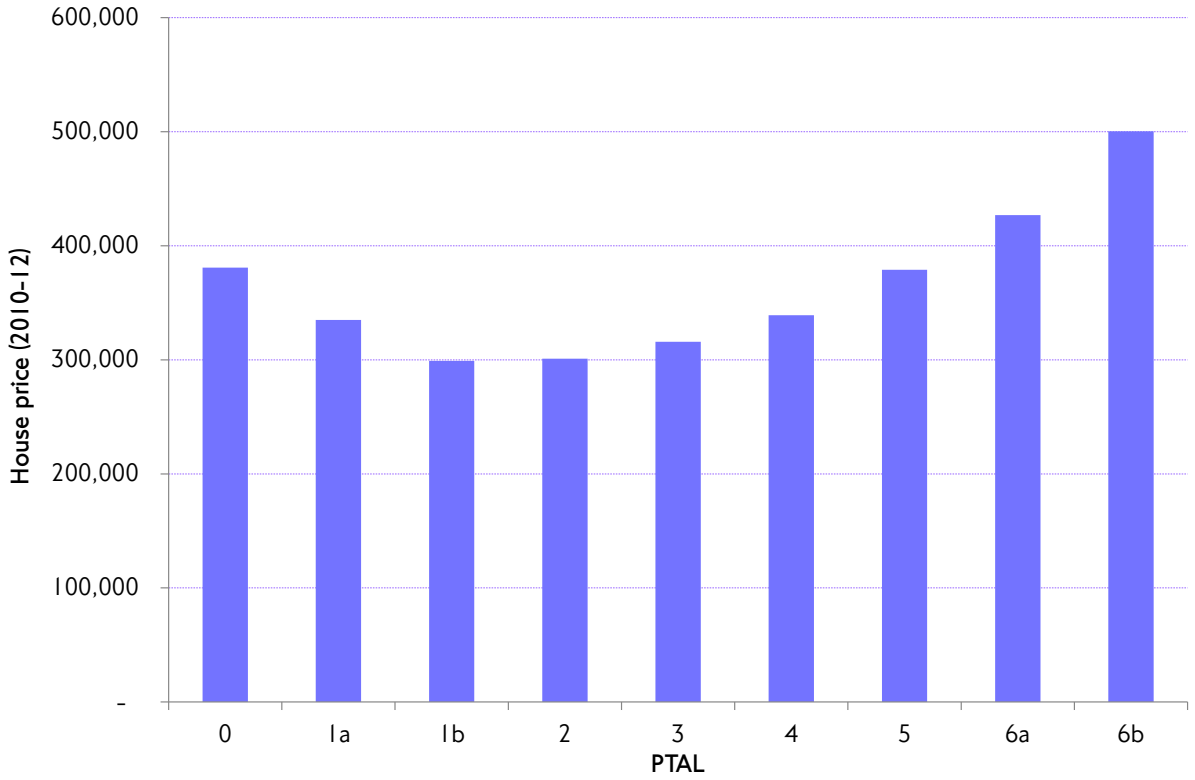
Source: Office for National Statistics.

Connectivity and capacity support housing development

Whilst not the only factor, good quality transport provision is a prerequisite for supporting major hew housing growth, particularly that aligned with the principles of Good Growth. Since 2000, 73 per cent of new residential development homes have been within 800 metres of a rail or Tube station, and 85 per cent within 1 kilometre. Transport provides access to jobs and services, and creates places where people want to live, hence well-connected areas have high population and/or workplace density.

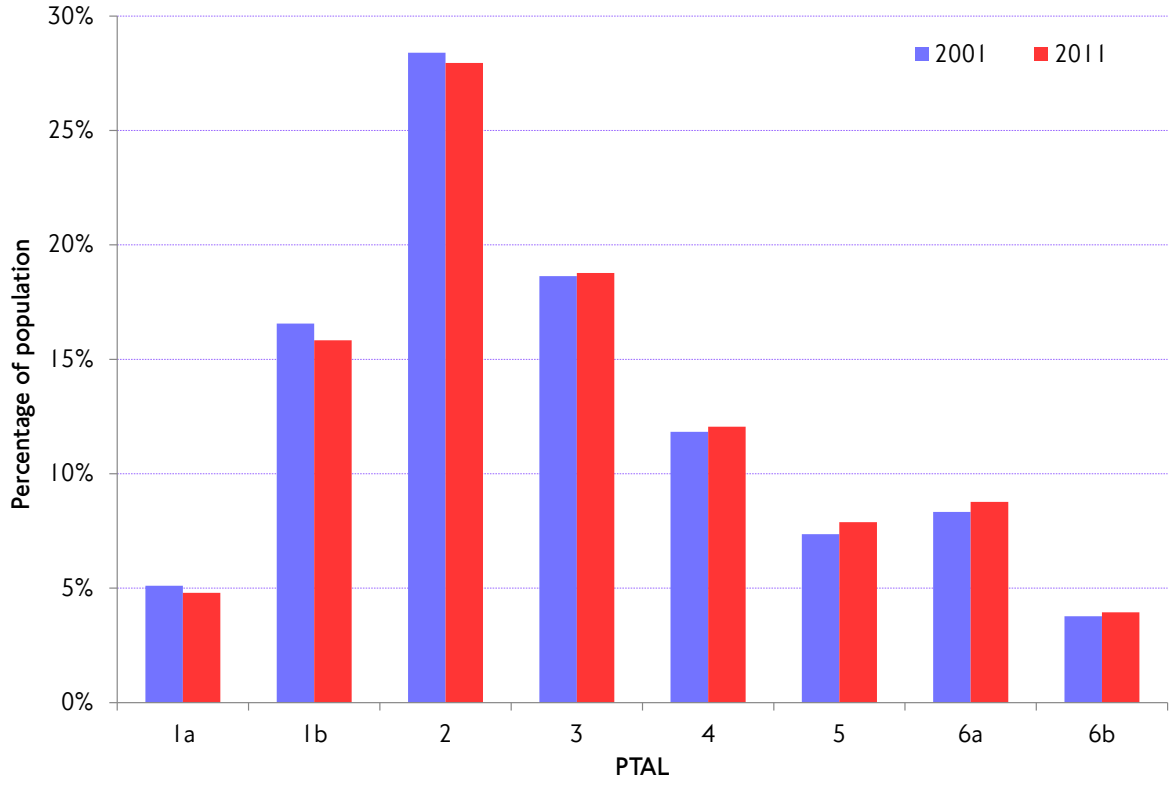
Looking, for example, at the relationship between average house prices and PTAL level (figure 9.3), it is seen that average values tend to increase with increasing connectivity (the higher PTAL values to the right of the figure). Areas with the lowest PTAL values include areas with larger properties commanding higher average values, thus distorting this relationship on the left hand side of the figure. In a similar way, areas with higher PTAL values have tended to gain population, relative to those with lower PTAL values (figure 9.4).

Figure 9.3 Relationship of average house prices to PTAL value.



Source: TfL City Planning, Strategic Analysis.

Figure 9.4 Percentage of the London population residing in each PTAL, 2001 and 2011.



Source: TfL City Planning, Strategic Analysis.

Many of the areas with greatest capacity for development have poor connectivity, which has directly limited private sector investment in housing. London's Growth Areas have the potential to provide 570,000 new jobs and at least 300,000 new homes, given appropriate transport improvements that will effectively 'unlock' this capacity.

How TfL can contribute to the Mayor's aims for housing in London

There is a long history of transport helping to unlock housing development in London. Perhaps the most enduring example is that of 'Metro Land', where the Metropolitan Railway used surplus land from the construction of its railway to build homes, later encouraging development in hitherto rural areas around stations, which in turn provided the railway with a growing source of traffic and revenue. More recently, the transformation of London's Docklands as a major employment and residential hub went hand in hand with the development of several new transport links – the Docklands Light Railway, Jubilee Line and, more recently, the London Overground, with similar improvements to the local bus network. Similar initiatives, focused on London's Opportunity Areas, are seen as major contributors to improving London's housing supply in the future.

Housing in areas of good transport connectivity commands higher values than equivalent property elsewhere, and recent experience is that they also have a higher rate of value growth. The availability of good transport links is a major factor improving the marketability of new homes, all of which create conditions more favourable to private sector investment in housing. It also makes it more attractive to the market, with research by Nationwide Building Society finding that London homebuyers were willing to pay a £42,000 premium for a property 500 metres from the nearest station, compared to a similar one 1.5 km away.

Housing on TfL land

As one of the Capital's largest landowners, TfL can play a pivotal role in providing places to live and work and improving the connectivity that Londoners need. Our landholdings play a vital role in meeting the Mayor's priorities to build affordable homes, while generating revenue to invest in improving our transport network.

We have already brought forward sites that will provide 1,000 homes, half of which are genuinely affordable. Over the next year we will bring to market further sites that will deliver 3,000 homes. We have partners appointed for our sites at Earls Court, Kidbrooke, Landmark Court and Blackhorse Road, with Northwood, Harrow-on-the-Hill, South Kensington and Limmo soon to follow.

Every year 50 per cent of the homes brought to market will be affordable. In 2016/17 we achieved this, and brought around 500 affordable homes to market from a total of 1,000. This year we will increase the number of homes brought to market, and still maintain the principle that half of these will be affordable.

Figure 9.5 Illustrative proposals for the next phase of development of the Greenwich Peninsula.

Source: TfL Commercial Development.

Work to improve transport services directly supports London's growth, creating Healthy Streets, and providing new homes and jobs for Londoners. Our work to upgrade the existing Tube network will support the creation of 80,000 new homes across the Capital. In parallel, we are working to provide new, affordable housing through the development of our own property estate. Our initial programme is to develop over 300 acres across London. By 2021, we will have started work on sites that will deliver 10,000 homes – 50 per cent of which will be affordable – as well as new workspaces and offices.

Our stations sit at the heart of London's town centres, and we are planning our developments so that they help connect our stations with the areas that they serve. We will work closely with London Boroughs, local communities, and other public bodies such as Network Rail to increase the amount of land available for development, and to design places where people want to live and work for years to come.

It is estimated that TfL land, with appropriate financial and planning support, could support up to 40,000 new homes.

'Unlocking' new housing through transport investment and improvement

However, the greatest number of new homes can be unlocked by new transport investment. It is estimated that currently planned investments and upgrades to the transport system have the potential to support up to 350,000 new homes. This aspect has two components:

- Major new infrastructure that has the potential to unlock whole new areas for strategic growth.
- Optimisation of the current transport network and the potential for densification around existing station areas.

In terms of new infrastructure, over the past 15 years, the Jubilee Line Extension, corridors served by the Docklands Light Railway, London Trams and the East London Line Extension have seen 100,000 new homes built within 1 kilometre of stations – creating the largest concentrations of new development anywhere in the city. TfL has plans for significant investment in new infrastructure that will help support and deliver new housing where major opportunities exist, such as in the Upper Lee Valley and Old Kent Road corridor. In many areas, residential development is not currently financially viable due to relatively low land values; however with improved transport links, providing frequent and reliable services into central London, this situation could be transformed.

An example is the proposed Crossrail 2 scheme – a standard-gauge railway tunnel under central London connecting National Rail lines to the south west and north east. In addition to the benefits from this scheme of providing substantial additional capacity, connectivity and relieving overcrowding, Crossrail 2 also has the potential, with the right planning framework and delivery mechanisms in place, to facilitate the development of up to 200,000 homes, over and above the estimated 60,000 homes that might be developed in the same areas without the scheme. This includes the Upper Lee Valley in north east London, one of the biggest Opportunity Areas in the Capital, spanning some 3,900 acres across four boroughs and with the potential to add 40,000 new homes in an area that suffers from some of the poorest connectivity in London.

Case study: Barking Riverside

Barking Riverside is an example of a short extension to an existing rail line that is supporting a major development opportunity. This location in east London has planning permission for 10,800 new homes, but it can only proceed if the London Overground can be extended into the heart of the development. This new link will, in turn, provide access to the rest of the rail and Underground networks at Barking, with direct connections to central London. Other local transport links are key to the development too – the East London Transit, a new high-quality bus service opened in 2010 – has supported a first phase of development of 1,500 new homes, due for completion in 2017.

Homes unlocked by upgrading the network

Between London Underground and Network Rail, most Londoners have access to the rail network, with 75 per cent of the population living within 1km of a station. However, the capacity, frequency and quality of service offered is often uneven, which affects the attractiveness of the surrounding area and the ability to support housing growth. Stations served by the Underground already benefit from frequent services, although many parts of the network operate at capacity in peak times. The additional capacity that TfL will provide through the New Tube for London (NTfL) programme the additional capacity provided will unlock potential for thousands of new homes, alongside the additional demand for travel that they will generate.

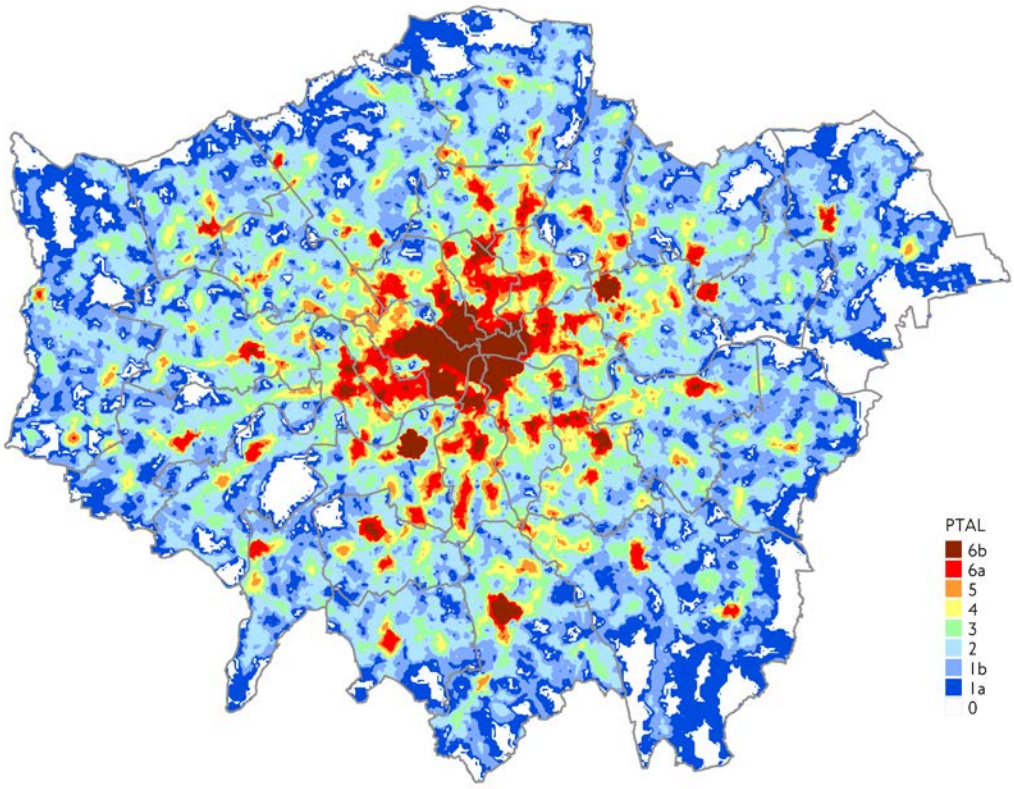
9.3 Transport Connectivity – PTALs

Public transport access levels across Greater London (PTAL scores)

PTALs (public transport access levels) quantify relative connectivity to the public transport network for any location in London. The term 'connectivity to the network' indicates that the PTAL measure focuses on the proximity to public transport services, and not on where these services actually take people to or indeed how accessible they are to all members of the population.

Figure 9.6 shows Greater London PTALs for 2016. As would be expected, central London features high PTAL values, as do other metropolitan town centres, such as Croydon, Kingston and Harrow, where many locations have close proximity to public transport access points. The predominantly radial orientation of the main public transport corridors is also visible in the figure. Note that PTAL values are on a scale from 1 to 6, with 6 representing the highest connectivity level.

Figure 9.6 Public transport access level, 2016.



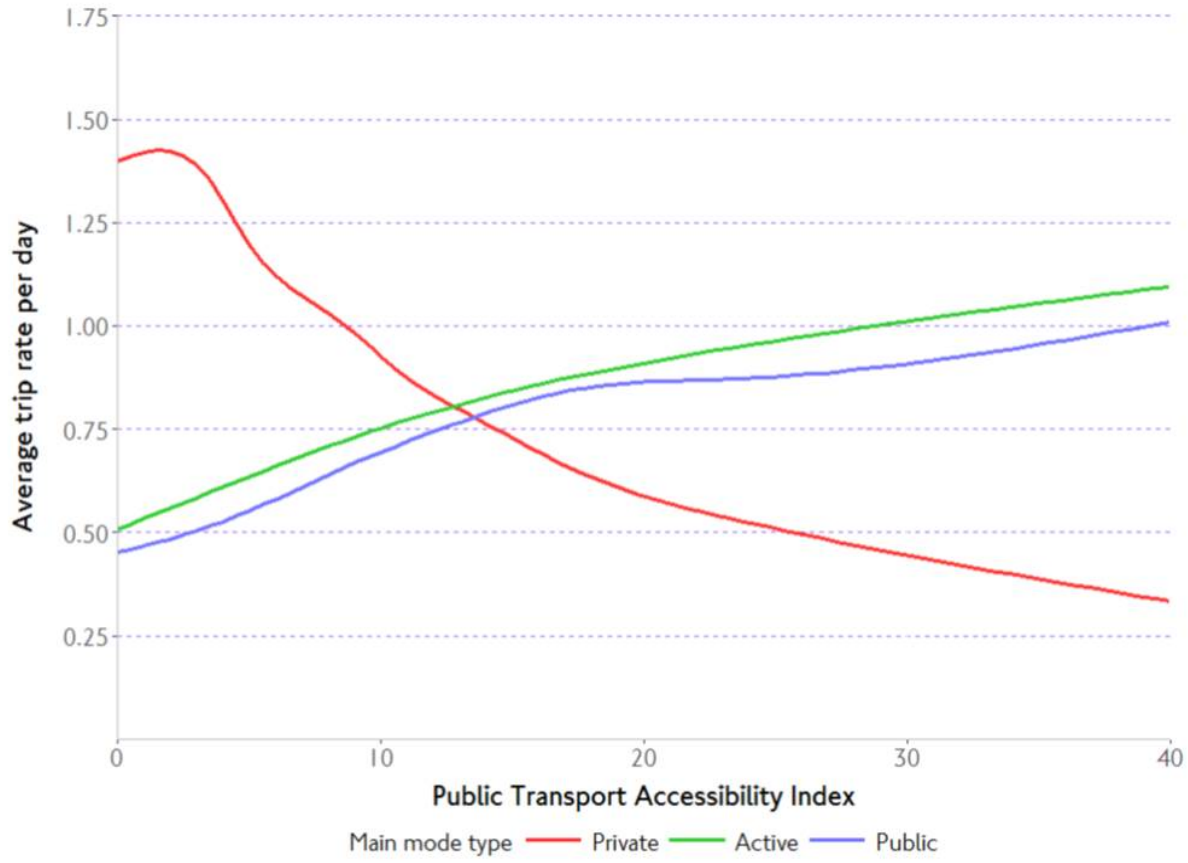
Source: TfL City Planning, Strategic Analysis.

Despite frequent incremental improvements to the public transport networks, the overall pattern of PTAL scores changes only slowly at the Greater London level. However, specific additions to the networks, such as the opening of the East London line, and 2012 Games-related improvements around Stratford, can make a substantial difference locally, as has been illustrated in previous Travel in London reports.

PTALs are relatively simple calculations because they only measure access to the public transport network, and ignore what happens once a passenger has 'entered' this network. They do not consider aspects of the journey such as the final destination, vehicle capacity or service quality. For this reason PTALs should not be used to estimate how many people will actually use public transport. Two sites with the same PTAL scores will most likely offer different levels of public transport service.

Figure 9.7 shows the relationship of PTAL level to mode of travel used. In areas with low PTAL values, showing a poor level of public transport connectivity, average daily trip rates by car are more than twice those of either active modes or public transport. As PTAL values increase, however, the relationship changes such that, in locations with high PTAL values, active travel and public transport trip rates are typically more than double the car trip rate. The similarity of the active travel and public transport trip rates is also significant in that it demonstrates the close relationship between good public transport provision and active travel.

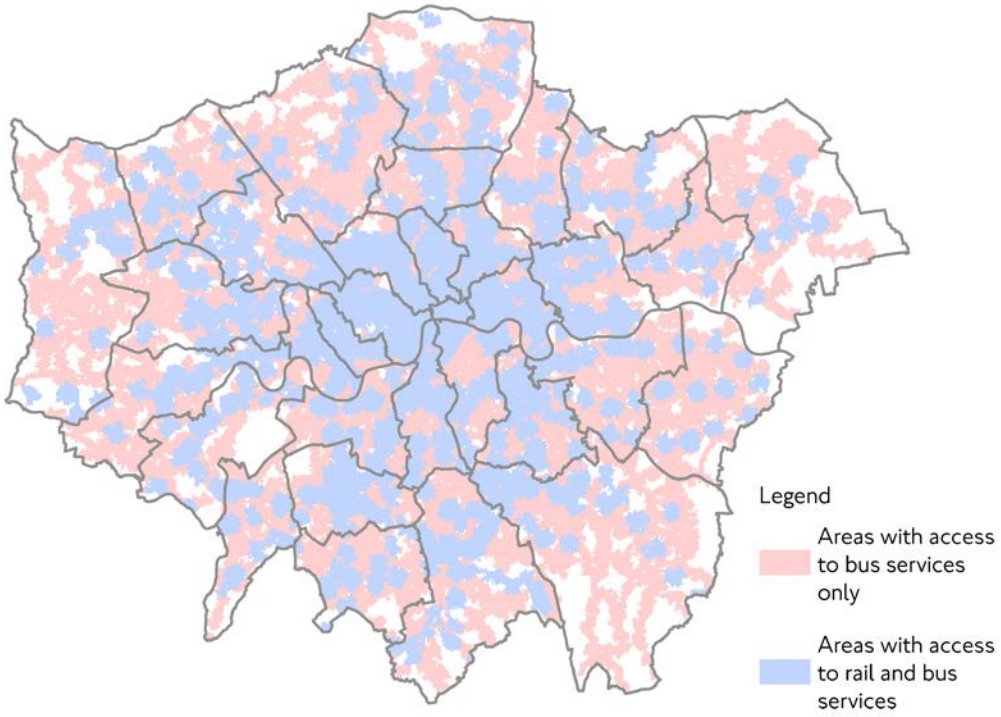
Figure 9.7 Relationship of PTAL levels to average daily trip rates.



Source: TfL City Planning, Strategic Analysis.

Figure 9.8 shows areas of London that, according to the PTAL methodology, have access to the rail network and bus network (blue colours), or just have access to the bus network (pink colours). Although London is often considered to have uniformly good access to public transport, the figure demonstrates that large areas of London rely on the bus network only, and that some areas have no effective (based on PTAL methodologies) coverage by either.

Figure 9.8 Effective PTAL coverage.



Source: TfL City Planning, Strategic Analysis.

Travel in London report 8, section 8.5, summarised the trends in PTAL scores over recent years, and reviewed how they were expected to change in the future. It also gave details of TfL's WebCAT tool, which can be used to access these data (for planning purposes etc). See: https://tfl.gov.uk/info-for/urban-planning-and-construction/planning-with-webcat/webcat.

9.4 Transport connectivity – access to jobs

One measure that can be used to quantify the development of the transport networks in terms of the support that they give to London's economy is the number of jobs (whether filled or currently vacant) that are potentially available within a given travel time from a particular residential location. The basis for assessing this is a travel time contour of 45 minutes by the principal public transport modes, expressed as an aggregate measure across Greater London.

This indicator is produced using TfL's transport models and the methodology has recently been revised from that published in previous Travel in London reports.

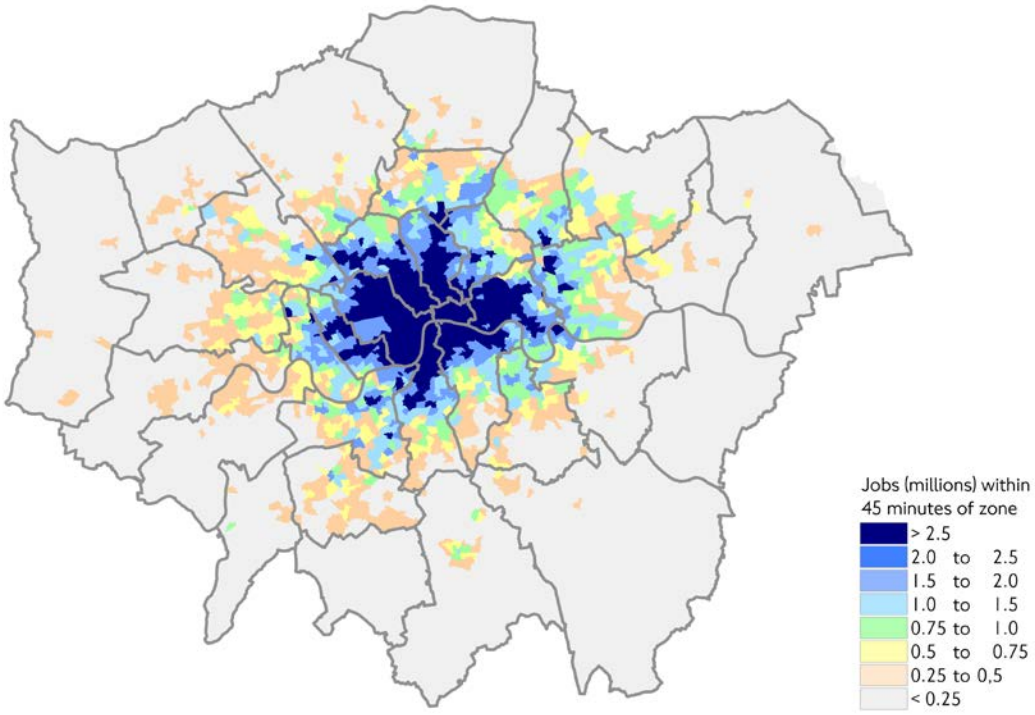
Figure 9.9 shows the pattern for 2016. The map should be interpreted in terms of, from any one point (effectively a small zone), the number of jobs that are potentially reachable in 45 minutes by public transport. The darker areas are therefore the most connected in this respect.

As might be expected, the map reflects the concentric pattern of employment density and also the primarily radial orientation of the public transport networks. Typically, for people living in outer London, less than 0.5 million jobs are potentially available from their home location within 45 minutes travel time. However, this

rises to typically around 2.5 million jobs potentially available to a resident of central London or the more dense parts of inner London.

In 2016, based on an average of these small area scores and using the revised methodology, the average London resident could potentially access 855,562 jobs within 45 minutes by public transport.

Figure 9.9 Total number of workplaces within 45 minutes travel time – 2016.



Source: TfL City Planning, Strategic Analysis.

10. London's Opportunity Areas and central London

10.1 Introduction

This chapter considers future approaches to achieving and monitoring Draft MTS outcomes in London's Opportunity Areas – around the principle of Good Growth set out in the draft Transport Strategy. It then looks at long-term travel trends for travel to central London – the 'Central Activities Zone' (CAZ) and the London Docklands, illustrating some of the important transport challenges in these areas.

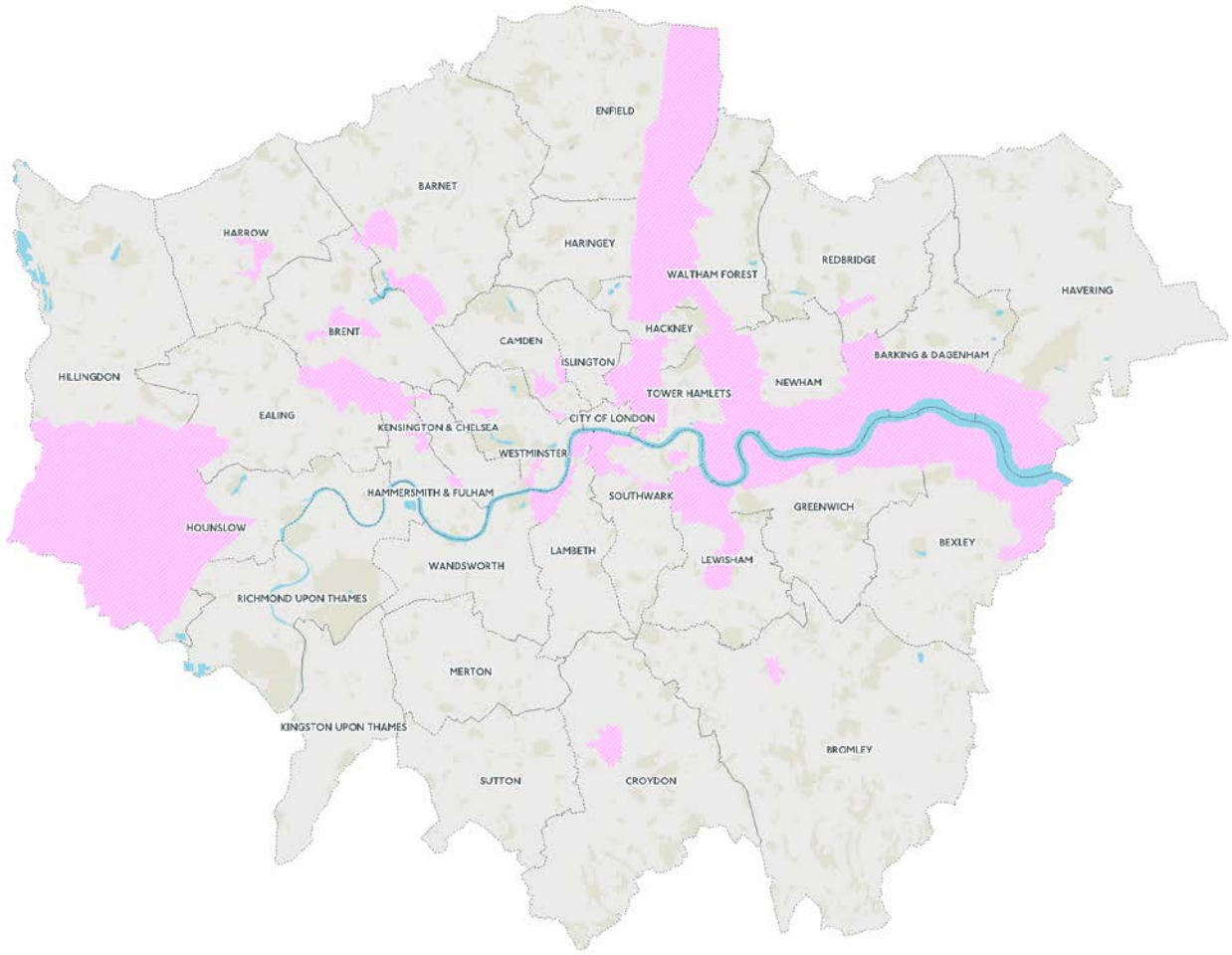
10.2 London's Opportunity Areas

Extent and location of Opportunity Areas

Opportunity Areas are the Capital's major reservoir of brownfield land with significant capacity to accommodate new housing, commercial and other development linked to existing or potential improvements to public transport. Typically they can accommodate at least 5,000 jobs or 2,500 new homes or a combination of the two, along with other supporting facilities and infrastructure.

The broad locations of London's Opportunity Areas and intensification areas are set out in Figure 10.1. Together, the Opportunity Areas have capacity for 575,000 additional jobs and 303,000 additional homes.

Figure 10.1 London's Opportunity Areas.



Source: TfL City Planning, Strategic Analysis.

The Opportunity Areas are diverse, ranging in size from 3,900 hectares (Upper Lee Valley) to 19 hectares (Tottenham Court Road). The 12 areas in east London together cover 9,000 hectares of land, and have capacity for 217,000 jobs (including 110,000 in the Isle of Dogs and 50,000 in the Lower Lea Valley including Stratford) and 126,500 homes (including 32,000 in the Lower Lea Valley and 26,500 at London Riverside). The Mayor expects both types of area to make particularly significant contributions towards meeting London's housing needs.

London's Opportunity Areas in the context of the Draft MTS

Planning for London's Opportunity Areas should embed best practice in Good Growth. Dedicated public transport and walking and cycling provision should be at their heart, as well as good interchanges with rail and Tube for longer journeys. Opportunity Areas should be well connected to nearby town centres, schools, employment hubs and stations, including the provision of public transport options at weekends to enable car-free lifestyles. Strategic planning for Opportunity Areas should ensure that unnecessary journeys by car are discouraged.

The Mayor expects planning frameworks in these areas to set mode share targets that are significantly more ambitious than elsewhere in London and will require boroughs and other stakeholders to demonstrate how development plans will contribute to mode shift away from car use towards public transport, walking and cycling.

MTS outcomes in Opportunity Areas

London's Opportunity Areas are seen as exemplars of the principles of 'Good Growth'. Dedicated public transport, walking and cycling provision, alongside good connectivity to nearby town centres, schools and employment centres should help support car-free lifestyles. The draft MTS elaborates these principles in two ways:

- Strategic planning for Opportunity Areas should ensure that unnecessary journeys by car are discouraged, partly through restricted parking (including mandatory car-free/car-lite developments), limited access for vehicles by time of day/vehicle type, and very low speeds, with traffic calming measures. Providing shared access to a car club instead of private parking bays in a new development (or in an existing residential street) is just one example of how car dominance can be reduced and space freed up for other infrastructure to support active travel.
- Developments within Opportunity Areas should be well-designed, compact, safe, walkable neighbourhoods with good access to facilities and services from the outset. Live-work areas can reduce the need to travel, and efficient deliveries and servicing infrastructure should be integrated within the site to reduce vehicle movements.

It will be particularly important to monitor developments in Opportunity Areas to track the extent to which these principles are being achieved. TfL is currently developing this monitoring, which will vary according to the characteristics of each area. The following sections look briefly at two established survey programmes that track the evolving travel behaviour in Opportunity Areas, and which might form a basic template for future surveys of this type.

10.3 Example of long-term travel behaviour tracking – Isle of Dogs cordon survey

Over the past 25 years, London's Docklands has developed as an area of high-density high-value employment, primarily in financial and business services, to complement the historic centre of these activities in central London. Development has been concentrated in the Isle of Dogs, located 3km east of the City of London, generating a significant number of trips and adding to overall travel demand, both locally and more widely across London. Transport networks have also been extended in parallel with this development, most notably the Jubilee line extension which opened in 1999, as well as development of the DLR network.

The Isle of Dogs Cordon Survey

With the regeneration of London Docklands during the late 1980s, TfL instituted a cordon-based count survey to cover the Isle of Dogs. As well as the AM peak period this survey covers an extended weekday (05:00 to 23:00). The survey counts trips into and out of the Isle of Dogs on a designated working day each autumn (except in 2009 and in the most recent year (2016) when no survey was carried out).

All trips that have an origin or destination within the Isle of Dogs or cross the boundary cordon are included. Through trips on the Jubilee line or DLR and interchange trips between the two rail modes that do not start or end in the Isle of Dogs are excluded on the basis of interchange surveys carried out on the same day. Internal trips within the Isle of Dogs are also excluded.

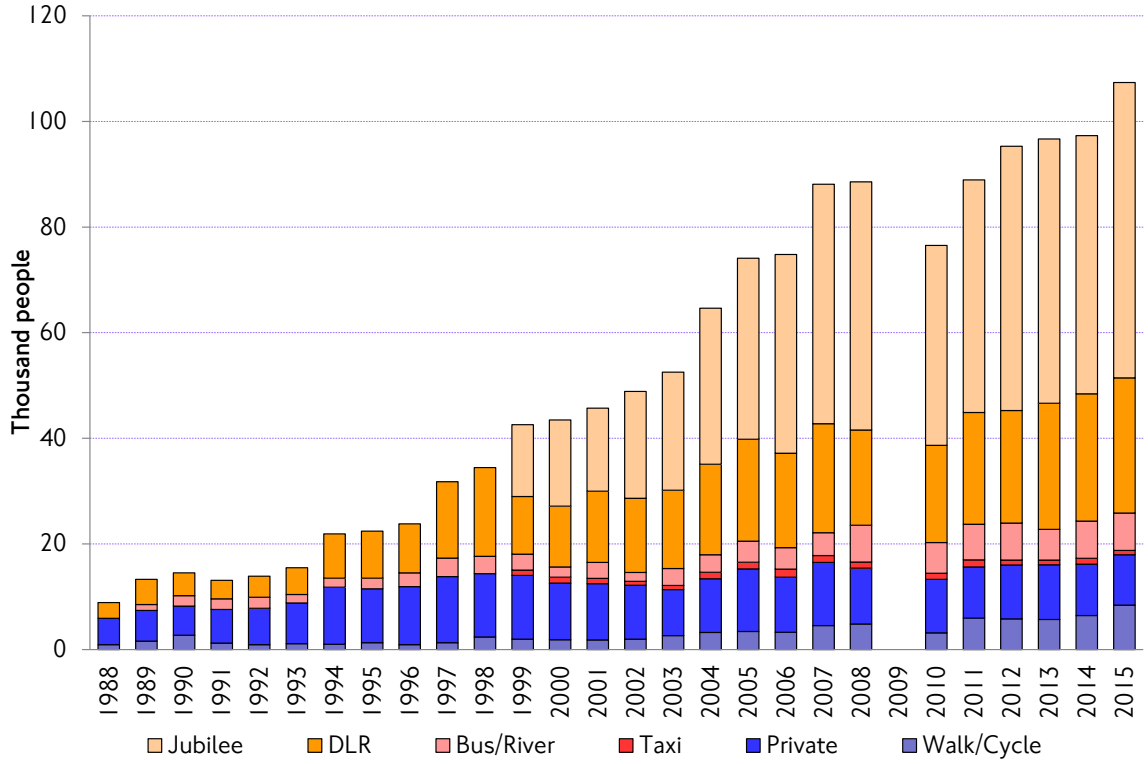
An additional cordon, inside the Isle of Dogs cordon, closely bounding Canary Wharf, is also identified and used to measure the number of trips to and from Canary Wharf, including those to and from points within the Isle of Dogs. Canary Wharf is a major centre of employment within the Isle of Dogs, located at the northern end of the Opportunity Area.

Long term trend in inbound mode shares in the morning peak period

Figure 10.2 shows travel to the Isle of Dogs between1988, the year in which construction started at Canary Wharf, and the latest available survey in 2015. It shows the number of people entering the Isle of Dogs during the weekday morning peak (between 07:00 and 10:00) by mode.

The overall picture during this period has been one of rapid growth in travel demand, reflecting the development of the Isle of Dogs itself. Inbound travel demand grew from 8,900 trips in 1988 to 43,488 trips in 2000, to 107,394 trips in 2015 – an average annual percentage increase of 10.1 per cent.

Figure 10.2 Morning peak travel to the Isle of Dogs (including Canary Wharf) by mode of transport, 1988 to 2015.

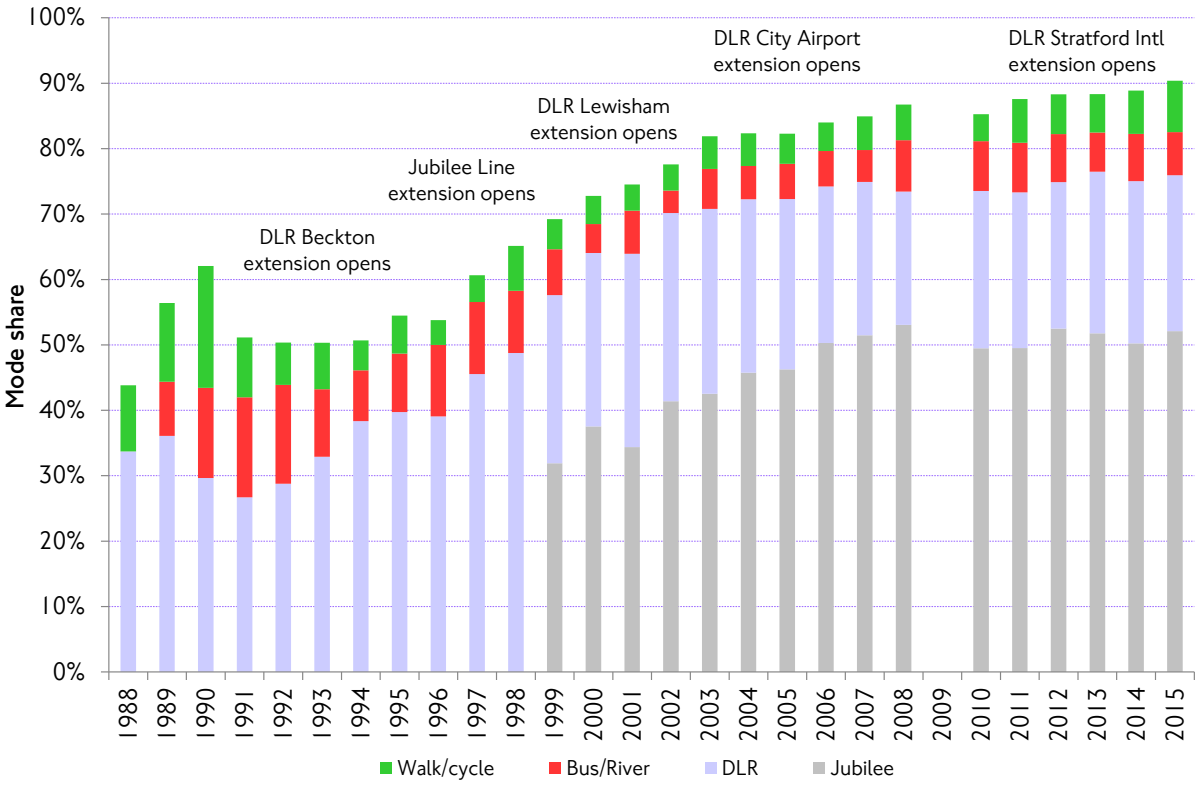


Source: TfL City Planning, Strategic Analysis.

Equally striking has been the evolution of the mode share. In 1988, before the opening of the Jubilee line extension, 56 per cent of trips to the Isle of Dogs were by private transport. In 2000 this proportion had fallen to 25 per cent and, in 2015 it was 9 per cent. In terms of the draft MTS definition of active, efficient and sustainable modes, the proportions were 44 per cent in 1988, 73 per cent in 2000, and 90 per cent in 2015 – a transition all the more impressive given the overall scale of growth in travel demand – and illustrating what can be achieved.

The role of increased public transport provision in facilitating this growth can be appreciated by figure 10.3, which shows the annual progression of the percentage of travel by active, efficient and sustainable modes, annotated with points at which additional public transport capacity became available.

Figure 10.3 Evolution of active, efficient and sustainable mode share for travel to London Docklands in the weekday morning peak, showing key additions to the local public transport network.



Source: TfL City Planning, Strategic Analysis.

Also relevant is the growth in trips on foot or by cycle. Although the number of trips accomplished by these modes has grown by an overall average of 8.1 per cent per year over the period 1988 to 2015 (an average of 7.5 per cent per year between 2000 and 2015), the rate of growth in mode share for these modes has been slower than the rate of increase in travel demand.

10.4 Tracking the transport legacy of the London 2012 Games

TfL has also put in place a similar survey in relation to the development area associated with the London 2012 Olympic and Paralympic Games. In this case, TfL is seeking to understand progress towards the transport aspects of the Games Legacy, both in their own right and in view of their role to facilitate wider social and economic development in what, in the run up to the Games, were some of London's most deprived areas. TfL's overall approach to this study was set out in Travel in London report 6, with an update given in Travel in London report 8.

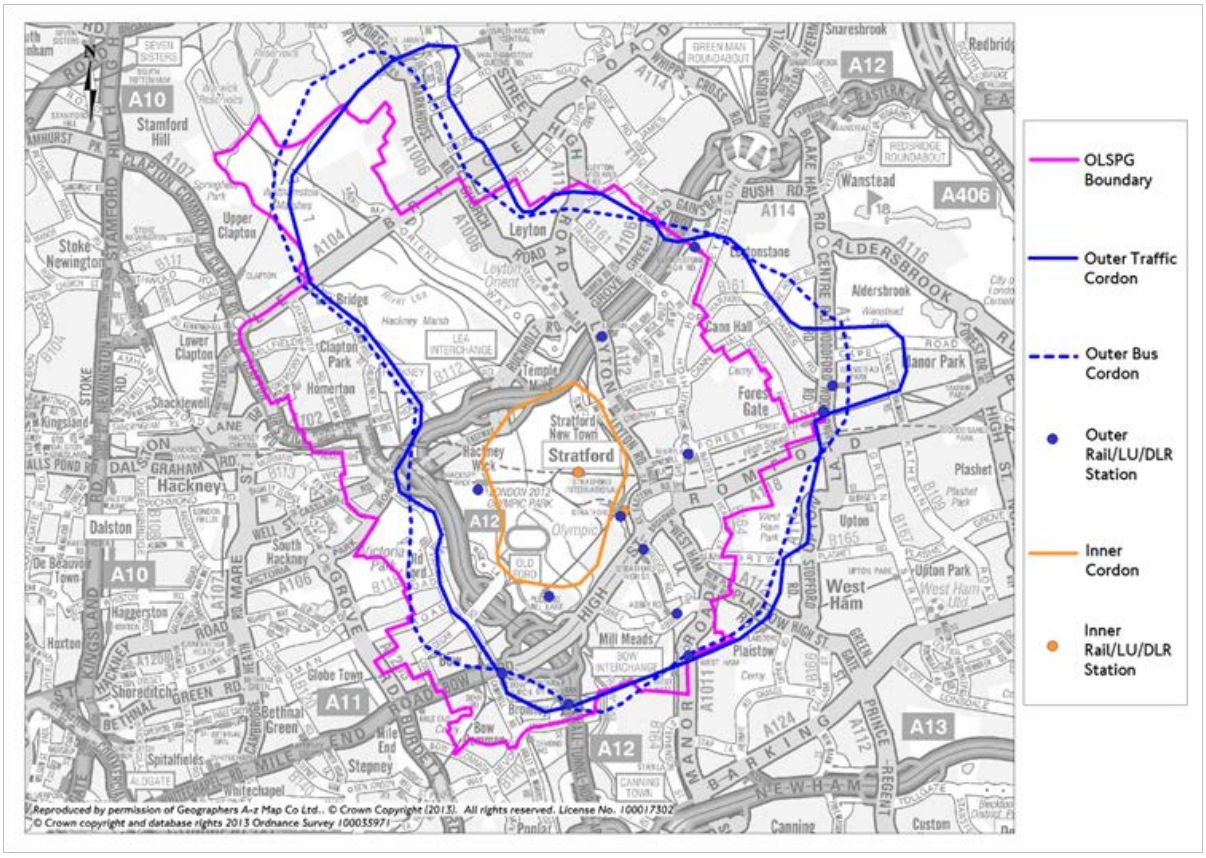
Games Legacy plans have timescales stretching 30 or more years into the future, and it is not yet possible to comment definitively on their achievement. However, the Olympic Park itself, in the immediate vicinity of Stratford, benefitted enormously, in the run up to the Games, from improved public transport connectivity, along with a range of improvements aimed at encouraging and facilitating walking and cycling. It will therefore be instructive to understand how mode share trends evolve as commercial, residential and other development in the area comes to fruition and as travel demand increases over the coming years.

Olympic Legacy cordon survey

The survey is similar in concept to TfL's long-standing CAPC (Central Area Peak Count) and Isle of Dogs Cordon Surveys, consisting of two cordons (lines enclosing areas across which movements are counted). The 'outer' cordon broadly corresponds to the Olympic Legacy Supplementary Planning Guidance (OLSPG) boundary that was set out in the OLSPG in July 2012. The OLSPG explains that this area has the potential to provide 32,000 new homes and 1.35 million square metres of new and improved commercial floor space over the legacy period, thus generating a substantial number of additional trips. The 'inner' cordon tightly encloses the Queen Elizabeth Olympic Park itself, which is currently undergoing conversion to a high quality sporting and leisure destination, and also encloses the Stratford City complex, including the Westfield Stratford City shopping centre.

Figure 10.4 shows the extent and location of these two cordons. The outer cordon roughly traces the OLSPG boundary and enables enumeration of all people movements in and out by road vehicle. It is counted between 06.00 and 20.00 hours. As passengers can typically only board and alight buses at designated bus stops, a modified cordon was defined for counting bus passengers. In addition, the 13 National Rail, London Underground, London Overground and DLR stations inside the cordon were surveyed to estimate people movements crossing the cordon by rail modes. Rail data was collected from several sources, including Oyster data and manual station counts. This data covers the period 07:00 – 19:00. Baseline surveys were conducted in spring 2013, the first year after the Games, and representing 'neutral' traffic/demand conditions.

Figure 10.4 Olympic Legacy area counting cordons.



Source: TfL City Planning, Strategic Analysis.

This cordon therefore gives estimates for all people entering or leaving the area, excluding those making wholly through trips (and not interacting with the area), for example international passengers on High Speed One (HS1) or travellers making 'through trips' on the Central line (for example, Holborn to Epping). Persons in road vehicles making 'through' trips would be counted on entering the cordon, and counted again a short time later upon exiting it.

The inner cordon surrounding the Olympic Park adopts a similar methodology, although Stratford station partly straddles the inner cordon. This means that people exiting the station to Stratford City enter the inner cordon, whilst those exiting via the main ticket hall and bus station do not enter the inner cordon but enter the area circumscribed by the outer cordon.

Totals and mode share

Table 10.1 below provides a 12-hour baseline figure for total inbound and outbound volumes for both cordons. Table 10.2 provides a baseline mode share breakdown.

Table 10.1 Numbers of people entering and exiting the OLSPG cordon (07:00 – 19:00).

	Thousands of people					
	Inner cordon inbound (2013)	Inner cordon inbound (2015)	Difference (%)	Outer cordon inbound (2013)	Outer cordon inbound (2015)	Difference (%)
All modes	66.2	111.4	68	449.6	460.4	2
National Rail	11.8	16.8	42	20.6	23.5	14
LUL and DLR	15.1	25.7	70	40.5	45.4	12
Bus	3	7.1	137	78.5	79.2	1
Coach/ minibus	0.4	1.7	325	8.5	8.6	1
Car	11.1	21.8	96	220.2	218.3	-1
Taxi	0.2	0.3	50	1.2	1.1	-8
Goods vehicles	1.6	4.1	156	65.4	66.6	2
Two-wheeled motor vehicles	0.1	0.3	200	5.9	6.6	12
Cycle	0.2	2.8	1300	8.9	10.9	22
Walk	22.7	30.8	36	n/a	n/a	n/a

Source: TfL City Planning, Strategic Analysis.

Mode shares for public transport for all London residents making trips that originate in the growth boroughs

It is possible to extend this analysis by looking specifically at the active, efficient and sustainable mode share, by either growth borough residents or, as in this case, by all residents of Greater London making trips in the growth boroughs (table 10.2). This is a potentially interesting perspective, as it should ultimately be possible to understand the extent to which travel behaviour change is specifically a feature of people who live in the growth boroughs, who may be 'new' to the area, or is reflective more generally of London residents, as a response to changed transport provision in the growth boroughs.

Table 10.2 Active, efficient and sustainable mode share – Olympic growth boroughs compared. All trips by London residents with an origin in listed boroughs.

Borough/area	2006/07-2010/11 5 year average	2013/14-2014/15 2 year average	2015/16-2016/17 2 year average
Barking & Dagenham	56%	49%	55%
Greenwich	56%	58%	60%
Hackney	79%	78%	82%
Newham	72%	72%	71%
Tower Hamlets	80%	80%	82%
Waltham Forest	59%	60%	60%
Growth total/average	68%	68%	70%
'Geographic comparison'	64%	65%	66%
'Most similar comparison'	67%	67%	67%
Non-legacy boroughs	62%	62%	62%
Inner London	78%	78%	78%
Outer London	51%	51%	51%
Greater London	63%	63%	64%

Source: TfL City Planning, Strategic Analysis.

The general trend in the active, efficient and sustainable mode share of trips originating in the growth boroughs has been either stable or upward over the three time periods. In the latest two-year average (2015/16-2016/17), the active, efficient and sustainable mode share of trips originating in Hackney, Newham and Tower Hamlets was higher than the Greater London average, whereas trips originating in Barking & Dagenham, Greenwich and Waltham Forest were lower than the Greater London average. The active, efficient and sustainable mode share of the growth boroughs overall has increased from 68 per cent in the first two time periods to 70 per cent in the latest two-year average, 6 percentage points higher than the Greater London average. This compares to 62 per cent for the non-Olympic legacy boroughs, which is 2 percentage points lower than the Greater London average. This indicates that there has been a longer lasting positive effect of the London Olympics on the active, efficient and sustainable mode share of trips originating in growth boroughs.

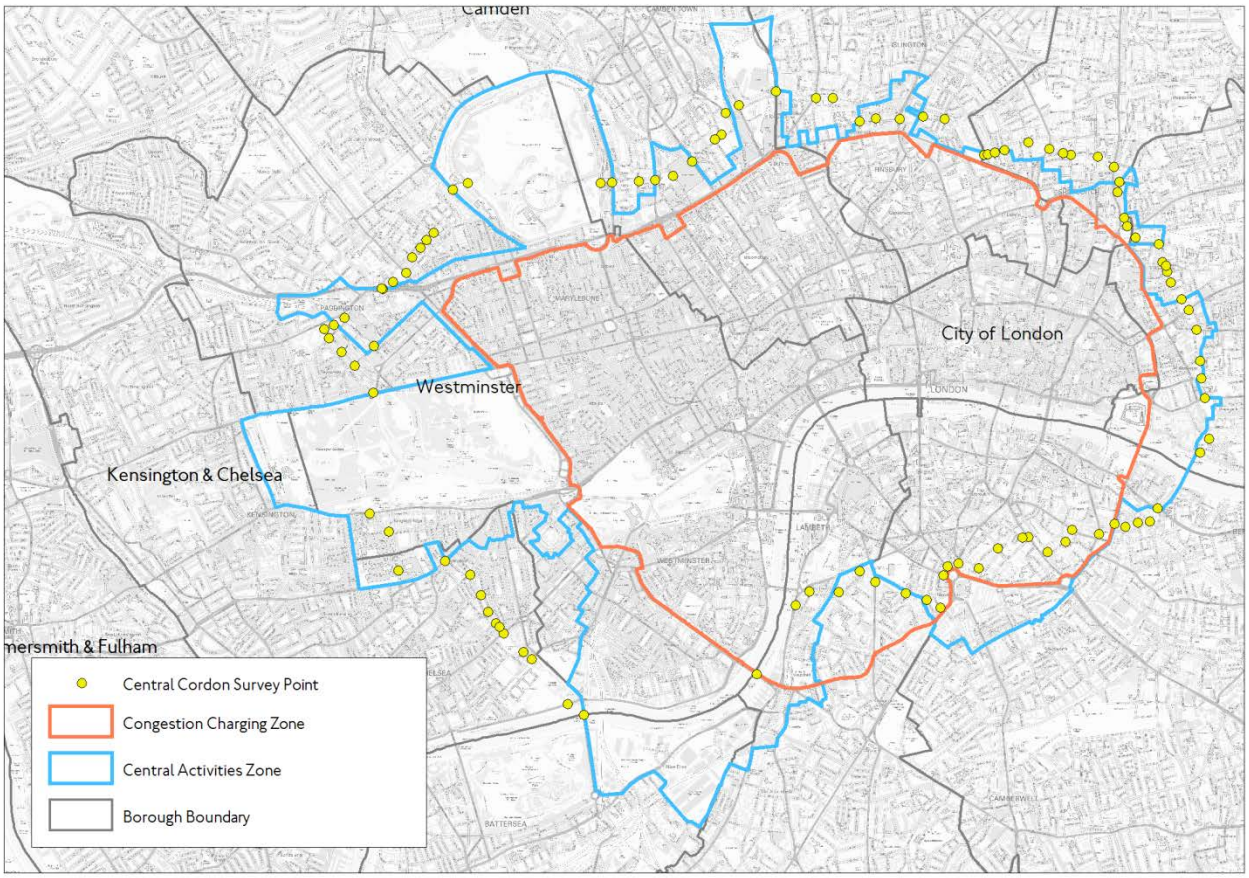
10.5 Central London: Trends in morning peak travel to central London

The Central Activities Zone (CAZ)

The Central Activities Zone is the global iconic core of London and hosts a multiplicity of high value activities. It is distributed across 10 boroughs and includes the northern part of the Isle of Dogs. It is one of the world's most attractive and competitive business, retail and cultural locations. Over the last decade, the CAZ has changed very significantly in a number of ways, for example population has grown by around 22 per cent and there are half a million new jobs. Public transport capacity has increased substantially and the walk and cycle offer has also been improved.

The CAZ boundary reflects the functional centre of London, but it is not ideally aligned with established indicators of travel demand. Traditionally, these have been surveyed on the basis of a 'central statistical area' or on the basis of the Congestion Charging zone. More recently, a separate survey has enumerated travel to the Isle of Dogs. This means that there are no precise measurements of travel demand to the CAZ. However, indices or time-series based on the available historic indicators are both useful and relevant.

Figure 10.5 Alternative definitions of central London for the purpose of estimating travel demand.



Source: TfL City Planning, Strategic Analysis.

The northern part of the Isle of Dogs has very close relationships with the CAZ in terms of world city financial and business service functions. These two areas are of strategic importance to London. Boroughs within the CAZ are expected to account for 35 per cent of the annual projected growth in jobs in London, equivalent to 16,900 jobs per year between 2017 and 2041. This will create more demand for travel to these areas, as well as demand for freight and servicing trips to support this growing workplace population.

Travel demand to the central area in the weekday morning peak period

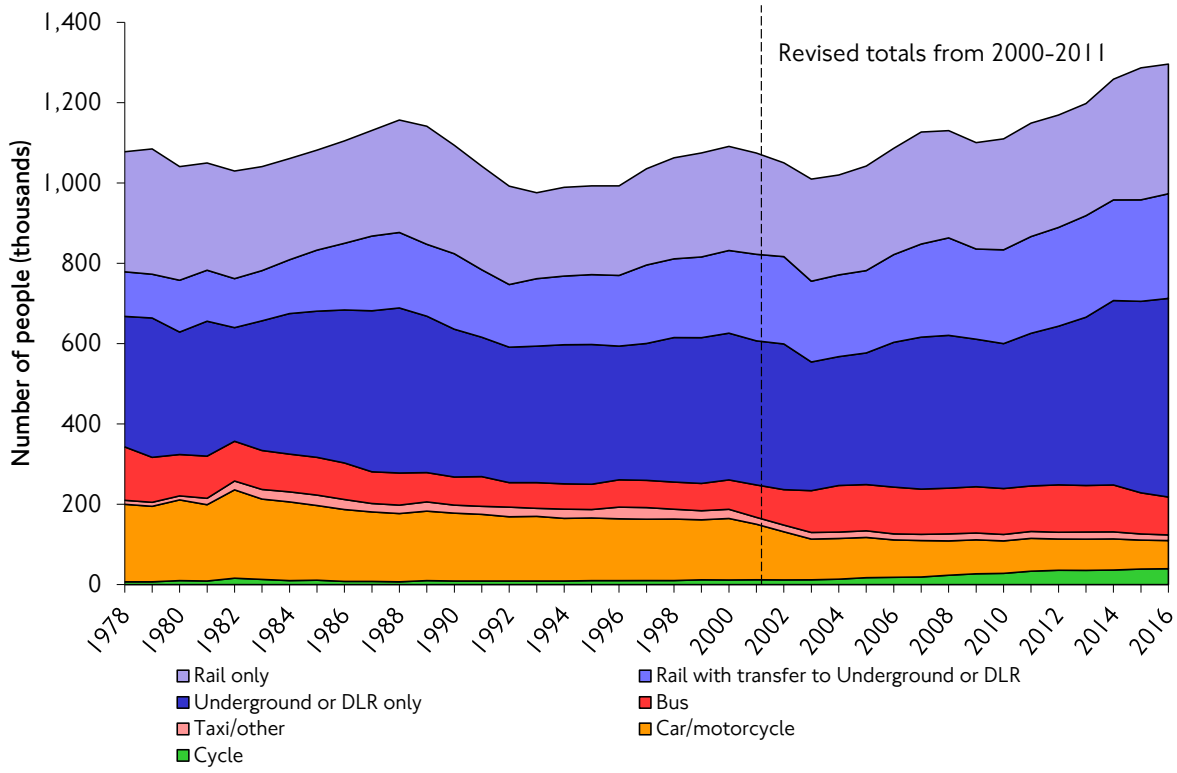
Based on the central London statistical area definition, the numbers of people entering central London during the weekday morning peak period (07:00 to 10:00) has been monitored since the 1970s through a long-established yearly count, taken in the autumn. The Central Area Peak Count (CAPC) survey covers all modes except walking and those travelling in commercial vehicles or travelling as part of their job

(for example, licensed taxi drivers). Most of these people are commuting to work in central London, and this indicator provides a good picture of this one specific, but important, aspect of travel in London.

Long-term trends

Figure 10.6 shows the trend for the total number of people entering central London over the past 37 years. The year 2016 saw the highest number of people entering during the morning peak since the current survey started in 1978 – 1.30 million. The total number of people entering has varied relatively little over most of the period covered by the survey. These variations tend to follow the economic cycle in central London and interestingly have shown no clear trend over much of the period – although the trend over recent years has been sharply upwards.

Figure 10.6 People entering central London in the weekday morning peak, 1978 to 2016.



Source: TfL City Planning, Strategic Analysis.

Change between 2015 and 2016

Between 2015 and 2016 the number of people entering the central cordon in the morning peak by all modes increased by 0.7 per cent, a smaller than average increase compared to previous years. Although the number of people entering central London by rail decreased in the latest year, by 1.8 per cent, the number of people who used rail with a transfer to Underground or DLR was up by 3.1 per cent and the number using Underground or DLR only increased by 3.7 per cent. The number of people cycling to central London was up by 2.1 per cent in 2016.

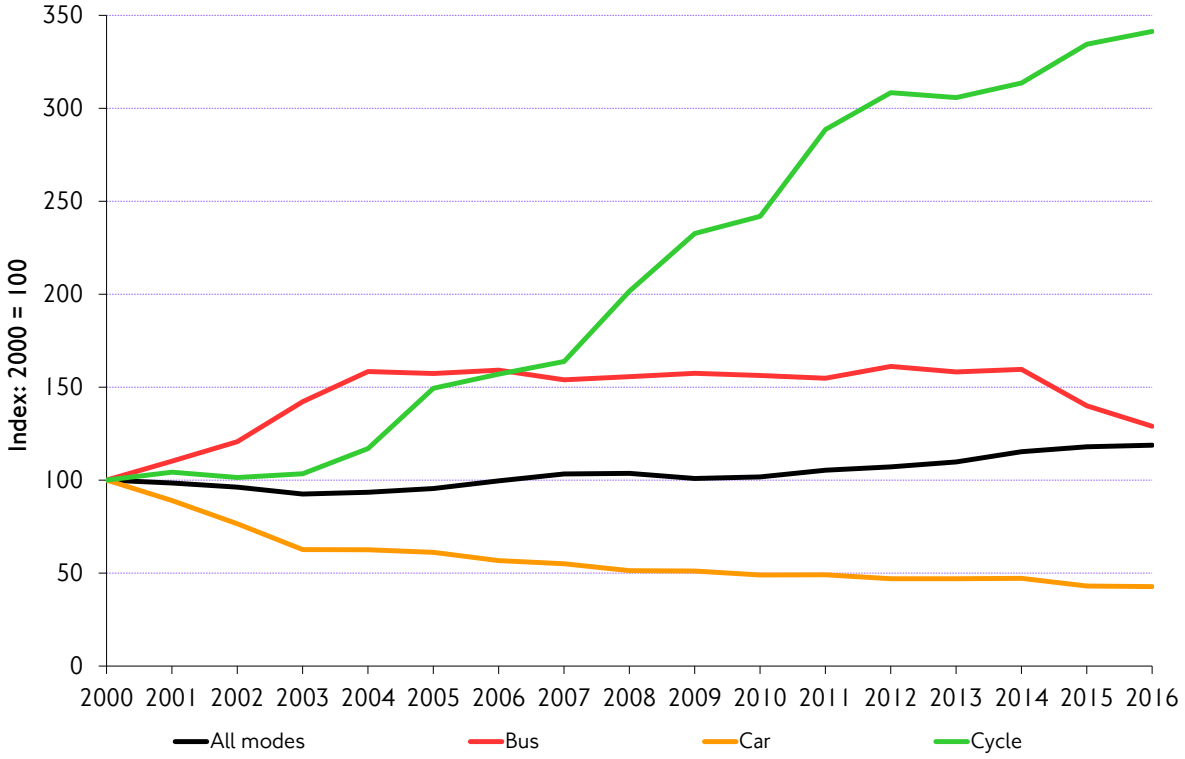
However, in the latest year, the number of people entering central London by bus decreased by 7.8 per cent. This follows a decrease of 12.3 per cent decline between 2014 and 2015 and mirrors the London-wide decline in bus patronage,

described further in chapter 3 of this report. There were also reductions in car and coach passengers, down by 1.3 per cent and 3.2 per cent respectively.

Changes in mode share

Within a relatively stable overall total and in the context of a relatively consistent rail-based mode share of more than 80 percent, there have nevertheless been some substantial shifts in the relative shares of the various modes of transport used to travel to central London, particularly affecting road-based modes. These are best appreciated with reference to figure 10.7, which looks at the most recent 16 years and plots changes in the use of the principal road-based modes as an index against the position in year 2000 (see also table 10.3).

Figure 10.7 Trends by road based mode of transport for people entering central London during the weekday morning peak. Index year 2000=100.



Source: TfL City Planning, Strategic Analysis.

Key developments over this 15-year period have been:

- Broadly flat total morning peak travel to central London until 2003, followed by a generally rising trend for the rest of the decade, with the level in 2016 being 18.8 per cent above that of 2000. The increase between 2015 and 2016 was 0.7 per cent.
- A reduction of more than half – 57 per cent – in the number of people using the car. The impact of the introduction of Congestion Charging in 2003 is visible in the figure, but is not the only factor involved in this dramatic shift away from private transport for these journeys.
- An increase in the use of bus occurring in the early half of the last decade, followed by stable bus mode share between 2003 and 2014 and a 19.2 per cent

decrease in the number of people entering central London by bus in the last two years alone.
- A 230 per cent increase in cycling to central London during the weekday morning peak period, again mirroring wider trends for this mode.

There has been growth on all rail modes since 2000; however interpretation of the use of rail services is not straightforward. This is because the CAPC counting cordon coincides with the main central London rail termini, where interchange between National Rail and Underground services takes place.

Looking at the numbers in table 10.3:

- Some 25.4 per cent more people used National Rail in 2016 compared with 2000.
- Of the 583,400 people using National Rail, 260,600 (26.5 per cent more than in 2000) transferred to Underground or DLR services on arrival at the central London rail terminus.
- There was a 35.4 per cent increase in the number of people using the Underground or DLR without transferring from National Rail.
- The total number using Underground/DLR services rose by 32.2 per cent over this period.

The net outcome of all these changes over the period since 2000 has been that the mode share for public transport (all modes) for weekday morning peak travel to central London increased from 85 per cent to 92 per cent. The mode share for travel by car has more than halved, falling from 13 per cent to 5 per cent (table 10.4). The cycling mode share has trebled, up from 1 per cent in 2000 to 3 per cent in 2016.

Table 10.3 People entering central London in the weekday morning peak, by mode of transport, 2000 to 2016.

Thousands of people

Year	All modes	National rail	Rail only	Rail of which transfer to LUL/DLR	LUL or DLR only	LUL and DLR	Bus	Coach/ minibus	Car	Taxi	Two-wheeled motor vehicles	Cycle
2000	1,091	465	259	206	365	571	73.0	15	137	8	17	12
2001	1,075	468	252	216	359	574	80.7	10	122	7	16	12
2002	1,050	451	234	217	363	580	88.3	10	105	7	15	12
2003	1,010	455	254	201	320	522	104.1	10	86	7	16	12
2004	1,020	452	249	204	321	524	116.0	9	86	7	16	14
2005	1,042	465	260	205	328	533	115.1	9	84	8	16	17
2006	1,087	483	265	218	361	579	116.5	8	78	7	15	18
2007	1,127	511	279	232	378	610	112.7	9	75	6	15	19
2008	1,131	510	267	243	381	623	113.9	11	70	7	15	23
2009	1,101	490	265	225	367	592	115.3	11	70	6	15	27
2010	1,110	510	276	234	361	594	114.4	10	67	6	14	28
2011	1,149	523	282	241	380	621	113.3	11	67	6	14	33
2012	1,169	526	280	246	395	641	118.0	11	64	6	14	36
2013	1,198	532	279	253	419	672	115.8	11	64	6	13	35
2014	1,259	551	301	251	459	710	116.8	11	65	6	13	36
2015	1,287	581	329	253	477	730	102.4	9	59	6	13	39
2016	1,296	583	323	261	495	755	94.4	9	58	5	12	40

Source: TfL City Planning, Strategic Analysis.

Table 10.4 Mode shares of people entering central London in the weekday morning peak, 2000 to 2016.

Percentage

Year	All modes	National rail	Rail only	Rail of which transfer to LUL/DLR	LUL or DLR only	LUL and DLR	Bus	Coach/ minibus	Car	Taxi	Two-wheeled motor vehicles	Cycle
2000	100	43	24	19	33	52	7	1	13	1	2	1
2001	100	44	23	20	33	53	8	1	11	1	2	1
2002	100	43	22	21	35	55	8	1	10	1	1	1
2003	100	45	25	20	32	52	10	1	8	1	2	1
2004	100	44	24	20	31	51	11	1	8	1	2	1
2005	100	45	25	20	31	51	11	1	8	1	2	2
2006	100	44	24	20	33	53	11	1	7	1	1	2
2007	100	45	25	21	34	54	10	1	7	1	1	2
2008	100	45	24	21	34	55	10	1	6	1	1	2
2009	100	44	24	20	33	54	10	1	6	1	1	2
2010	100	46	25	21	33	54	10	1	6	1	1	3
2011	100	46	25	21	33	54	10	1	6	1	1	3
2012	100	45	24	21	34	55	10	1	5	1	1	3
2013	100	44	23	21	35	56	10	1	5	1	1	3
2014	100	44	24	20	36	56	9	1	5	0	1	3
2015	100	45	26	20	37	57	8	1	5	0	1	3
2016	100	45	25	20	38	58	7	1	5	0	1	3

Source: TfL City Planning, Strategic Analysis.

Section 5: Monitoring progress towards MTS outcomes

11. Monitoring and evaluating progress towards Mayor's Transport Strategy goals

11.1 Introduction

The draft Mayor's Transport Strategy (MTS) sets a clear and challenging policy agenda for TfL and our partners to deliver. The strategy is based on an up-to-date evidence base that characterises historic trends, identifies current issues, and quantifies the expected future direction of key features of the travel environment in London.

Travel in London reports, having been produced over the past 10 years, formed a key part of this evidence base, and they will continue to be the principal means by which progress towards MTS outcomes is assessed in future years. The reports will track the progress of policies and schemes as they are implemented. They will also accumulate and interpret new evidence – as wider societal factors affecting transport and travel change – in order to ensure that MTS policies continue to be based on the best possible understanding, and to facilitate any adjustments or pre-emptive or corrective action as may prove necessary.

This chapter describes the broad overall framework for the monitoring and evaluation of progress towards MTS goals. It should be recognised that this relates to the draft strategy as published in June 2017, and that aspects may change, pending consideration of consultation responses received and the publication of the final strategy, expected in early 2018.

11.2 Evidence, appraisal, monitoring and evaluation

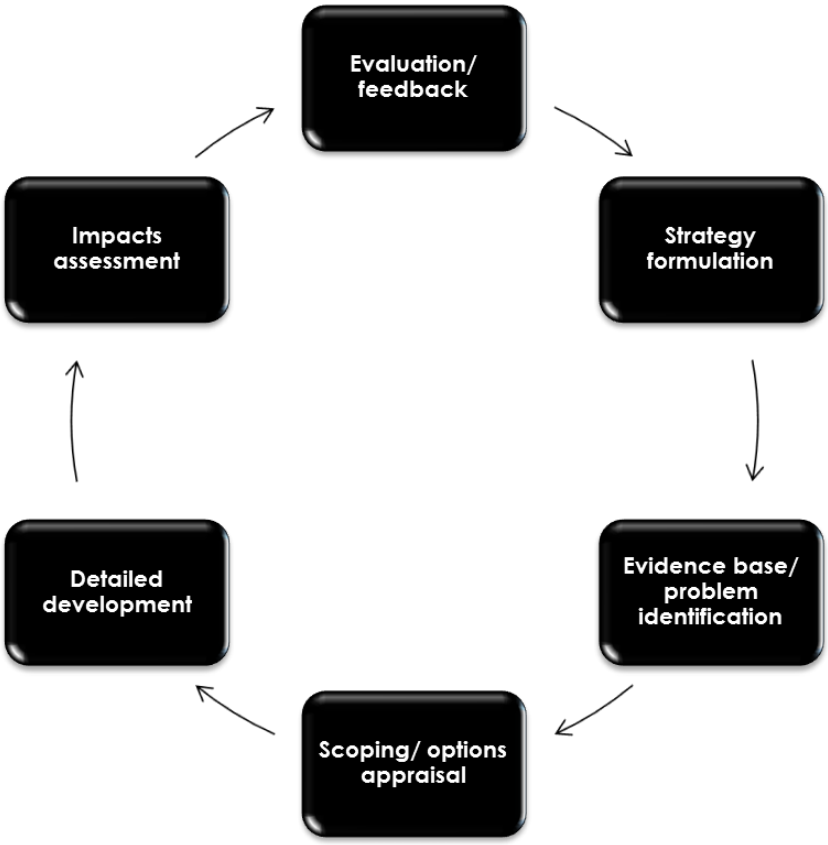
Figure 11.1 is a simplified representation of the 'strategy (or policy) development life cycle'. This reflects a cyclical process that broadly follows the following steps:

- Current issues and problems are identified through a review of the available evidence and an understanding of stakeholder priorities.
- Strategies and policies are formulated to address the problems and issues, and optimal approaches identified, based on the available evidence (appraisal).
- Schemes and policies are implemented and their impacts (performance) are measured and understood.
- An assessment is made of the 'success' of these approaches (evaluation), and also changing stakeholder and societal needs, in order to identify further issues to be addressed through the next iteration of the cycle.

Common, indeed absolutely essential, to all of these stages is the need for good evidence, and it is this aspect of TfL's work that is reflected through Travel in London reports.

The way that this works at the strategic level for the draft MTS is illustrated by figure 11.2, where there is clear traceability from the evidence base underlying the draft strategy through the content of the strategy itself to the subsequent monitoring and evaluation through annual Travel in London reports.

Figure 11.1 The strategy or policy development life cycle.



Source: TfL City Planning, Strategic Analysis.

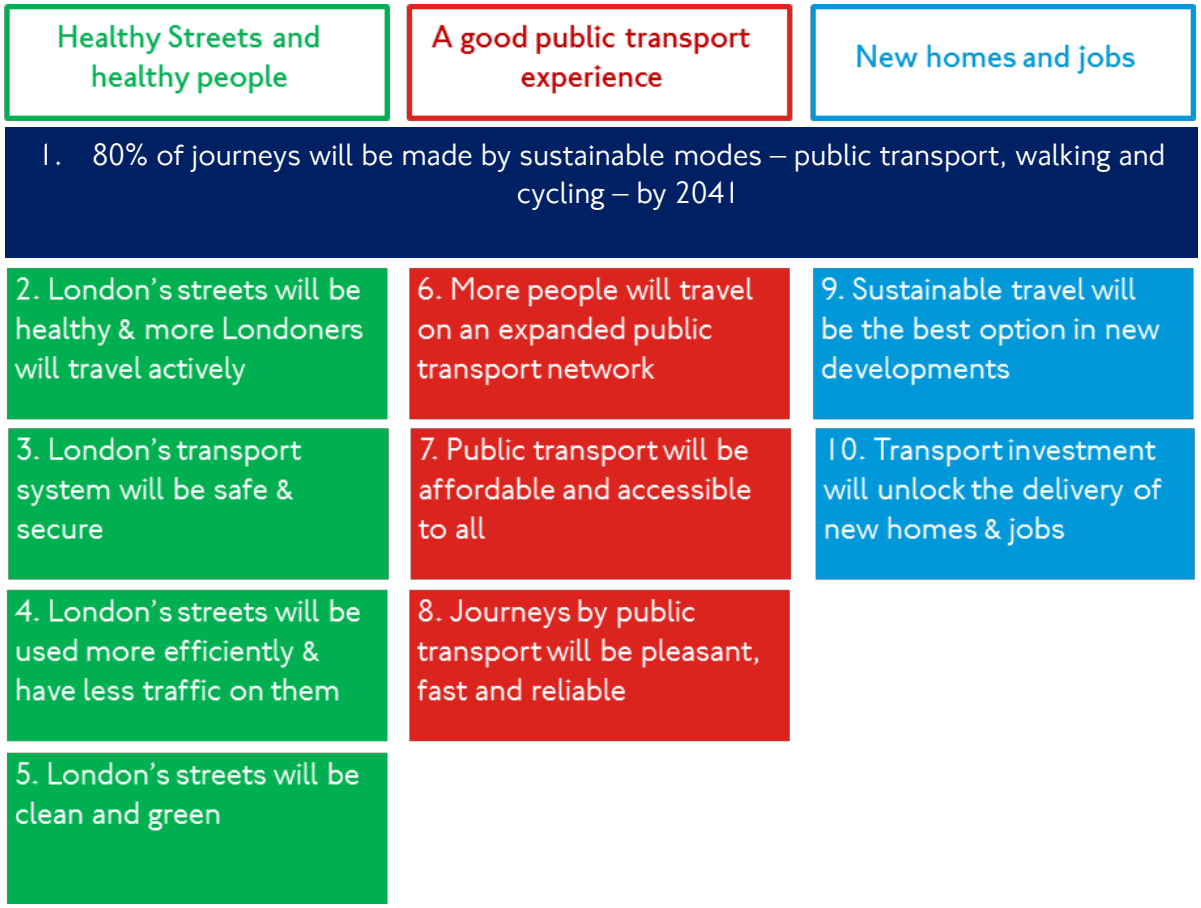
Figure 11.2 Evidence base for London's draft Transport Strategy.

Source: TfL City Planning, Strategic Analysis.

11.3 Outcomes and indicators

Ten **outcomes** describe how the draft MTS will deliver the Mayor's aims, transforming London's streets and its transport network. The outcomes describe how the strategy will mean that 80 per cent of trips are made by an active, efficient and sustainable mode, and how the strategy will deliver Healthy Streets and healthy people, a good public transport experience, and new homes and jobs for London. The ten outcomes are summarised in figure 11.3 below.

Figure 11.3 The ten outcomes of the draft Mayor's Transport Strategy.



Each of these outcomes is associated with one or more quantifiable **measures** or **indicators,** through which progress toward the outcome can be tracked, and which, in interpreted form, can be used as the basis for decisions by TfL and our delivery partners. These key indicators are shown in figure 11.4, and will form the basis of reporting through future Travel in London reports.

In considering these outcomes and indicators it is important to recognise the following:

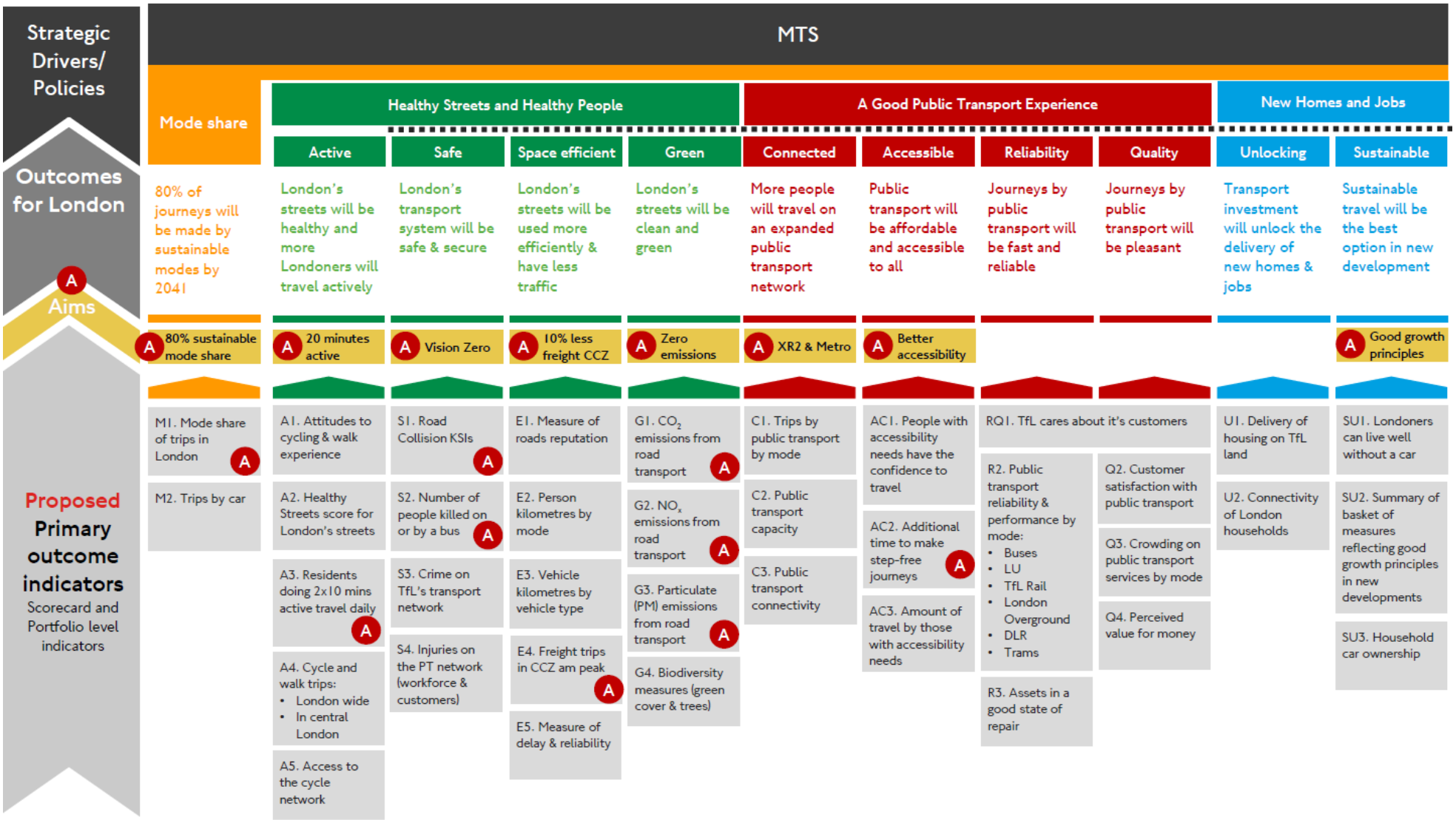
- The identified indicators are those likely to give the best and most direct appreciation of progress. Often however they are not the sole or only available indicator relating to a topic, and it is usually preferable to have one or more 'subsidiary' indicators, which can, for example, perform a confirmatory role or illuminate a particular issue from a different perspective. Trends in motorised road traffic congestion, expressed variously through changes in average vehicle speeds, excess delay, journey time reliability or per-capita based measures of delay is an obvious example, even if these three potential measures do not

encapsulate the use of the street by pedestrians, cyclists or bus passengers. Travel in London reports will therefore continue to draw on the widest universe of available evidence, as relevant, available to TfL and its partners in assessing progress towards MTS outcomes, in order to reach a rounded and considered interpretation and assessment of progress.

- Progress towards MTS outcomes reflects various interventions, both specific to TfL or from other authorities, and also the effect of wider factors in either facilitating or frustrating their achievement. European Union legislation relating to vehicle emissions factors (the 'Euro' emissions standards) is a good example of the former, whilst annual variations in weather giving rise to 'good' or 'bad' air quality years is an example of the latter. The point is that, in order to properly understand change in an indicator, and the specific contribution of MTS interventions, it is vital to understand and properly account for all of the factors at work driving outcomes, and that these in turn must also be comprehensively understood.
- Additional to and largely separate from specific policy interventions, wider developments in society, the economy or technology will also bring new or intensified challenges that will need to be addressed. Topical examples are the apparent recent trend towards lower per capita levels of travel, which could have important implications for future travel demand forecasts, and the opportunities (as well as potential challenges) likely to be brought about by the development of autonomous vehicle technologies in the future. This means that TfL's monitoring will need to be alert to these developments, and gather new evidence outside the immediate scope of the MTS through which future policies and responses can be developed.
- Finally, although the evidence base available for the draft MTS covers most of the outcomes and associated indicators, it is inevitable that at this stage in the life of the strategy there are some gaps in our knowledge and in our quantified indicators. In turn, some of the MTS policies are not yet fully elaborated, and it is not yet therefore possible to specify all of the evidence and indicators that might ultimately be needed. Known key measurement and knowledge gaps, and initiatives underway to address them for future Travel in London reports, are described where appropriate throughout this report.

Underlying all of the above is the key proposition that changes to the indicators of themselves are only part of the evidence needed to fully understand progress and to properly respond to developments. They must be properly contextualised and fully interpreted. Assembling these indicators in one place is therefore only one of the roles of Travel in London reports. Of equal or even greater importance is the wider interpretative narrative contained in this report, which enables the reader to better understand the true meaning of observed change, and to see this in the context of the wider set of actors and influences affecting transport and travel in London.

Figure 11.4 Key metrics to be used for reporting the outcomes of the draft MTS.



Trajectories towards meeting MTS outcomes

In considering and measuring strategy outcomes, it is important to recognise that they may trace a range of trajectories towards the MTS goal. In monitoring trends in future years there will be periods when they may move in the opposite direction to that which is intended, which can either represent natural variability in the indicators, specific disruptive events, such as major disruptive engineering work, or a genuine adverse trend. This latter can act as a valuable indicator that additional action is necessary to regain the desired trajectory as soon as possible.

Travel in London 10 as a 'baseline' for the draft MTS

Much of the material reviewed in this report necessarily predates the publication of the draft MTS, and does not therefore reflect the implementation of strategy policies per se. Because of this, Travel in London report 10 should be viewed as reflecting the 'baseline' situation at the point when the draft MTS was published. In many cases historic trends are given to provide context to the contemporary situation.

11.4 Aligning impacts monitoring and evaluation within TfL and across our delivery partners

A key innovation to be taken forward over the coming years is the better alignment of appraisal, monitoring and evaluation activities across TfL, and between TfL and our delivery partners. Previously there has sometimes been a degree of misalignment, resulting in knowledge gaps, inconsistent methodologies and other incompatibilities when trying to establish the particular contribution of individual initiatives to wider overall trends. In turn, the evidential requirements for strategic, scheme or project appraisal could sometimes have been better served, if there had been a better established 'common view' of these requirements and a shared appreciation of how best to address them through available methods and data. The clarity with which the monitoring framework for the draft MTS can be articulated presents a clear opportunity to improve this, by:

- Promoting the overall framework and ensuring, where possible through the alignment of internal processes, that it forms the basis of all sub-strategic monitoring and evaluation work.
- Promoting and sharing, across TfL and with our delivery partners, common indicators, methods and technical standards, where possible, always bearing in mind that local requirements may legitimately require different approaches and levels/types of measurement, and the limited availability of resources.
- Mandating 'upwards' reporting of data, interpretations and findings, at least for the more major interventions, so that they can contribute in the most informative way to the emerging strategic level picture.
- Being proactive in sharing insights and data arising from the strategic level monitoring work, allowing improved project design and appraisal.

This approach can be characterised as improving 'lines of sight' between work at the strategy level, through major projects and portfolios, down to more specific or local schemes and interventions. This includes TfL's delivery partners, most notably the London boroughs through the revised LIPS (Local Implementation Plans) process. It is a two-way process that will require specific action, and some adaptation to previous practice, at all levels.