

We can all think of small cities that are lovely to live in – tranquil and green and blessed with efficient public transport.

And then we can think of big cities that are global economic powerhouses – teeming with the noise, energy and ambition of millions of people.

I want London to have the best of both worlds.

I want London to be the best big city on earth.

That means a place that brims with opportunity and talent and economic activity of all kinds, but also one where the pace of life can suddenly slow from one street to the next; where children can grow up in safety – where people can be seen walking or cycling with no purpose other than enjoyment.

That is why we have developed this transport strategy in tandem with the London Plan and the Economic Development Strategy, because taken together they help to outline my vision for the Capital.

What is our objective for transport? As I said when I launched ‘Way to Go!’, it is very simple: to help people get from a to b as quickly, safely and conveniently as possible. That’s not just because I want to make people happier in their daily commuting, it’s also because I want London to be the world’s number one location as a place to visit, do business and invest.

London is a growing city and I am determined we support the employment and population growth expected here over the next 20 years.



I want all Londoners to know that we at City Hall and Transport for London, together with the boroughs and our railway colleagues, are working flat out to keep our city moving, both now and in the future. This twenty-year strategy is supplemented by the TfL Business Plan – showing how I shall put the strategy into effect in its first eight years.

We are investing billions of pounds in the transport system, including Crossrail and a transformed Tube network (complemented by Thameslink and other rail investment). These are all vital to the city’s growth and its ability to remain internationally competitive.

I am determined that we make the most of London’s existing infrastructure. With the right mix of policies, set out in this strategy, I believe we can smooth traffic flow, cut emissions, and reduce the overall stress levels of the travelling public. The new London Overground services and development of Strategic Interchanges will transform orbital travel in London.

I want people to have the information they need, when they need it to make their journeys easier, whether they travel by bus, train, Tube, bike or on foot. I want to create a cycling revolution and to make walking count – not only to help reduce congestion and carbon dioxide emissions, but also to improve the health of Londoners. I want Londoners to be inspired by the Olympics and Paralympic games – a fantastic honour for London and a great opportunity for us all to think afresh on how we get about.

I also want London to lead the world in new green technology – from electric vehicles to a new low carbon bus and bike hire scheme. These initiatives will help to reduce carbon dioxide, sweeten the air, generate jobs and save consumers money at the same time.

Wherever we can I want to protect green space and enhance the urban realm – creating new spaces where we can and tidying up existing ones – so that London's great spaces can be enjoyed by all.

You will note that the strategy involves the proposed removal of the western extension to the congestion charge zone. There has been public opposition to the western extension, confirmed during the consultation to this strategy and informal consultation on the zone's removal in 2008. I now intend to consult the public and stakeholders on the making of a draft order for the revocation of the western extension with a view to removing it by the end of the year.

The TfL Business Plan does not include any extension to the remaining congestion charging arrangements or the introduction of any new area-

based congestion charging as a Mayoral initiative, although I plan to use the legislation to step up the Low Emission Zone and do not rule out using it to introduce some form of tolling on particular routes in order to pay for new river crossings if appropriate. I believe on the evidence contained in this strategy that this approach will allow London to achieve its transport, congestion, air quality and health objectives during the next decade.

Whatever the current economic difficulties, it is vital we continue our work to transform London's transport system and the way we travel in London.

With its growing population and astonishing base of skills and resources, London will not only lengthen its lead as the greatest city on earth, it will come to be seen as the best big city on earth, the best big city to live in.

Given this transport strategy (together with my other strategies) I have no doubt that London can achieve this ambition.

Finally, I would like to thank all the individual members of the public, stakeholder organisations and London boroughs who responded to the consultation on the draft of this document, and particularly to all the TfL staff involved in producing this strategy.



Boris Johnson
Mayor of London

Introduction

- E1 The Mayor's Transport Strategy (MTS) is a statutory document, developed alongside the London Plan¹ and Economic Development Strategy² (EDS) as part of a strategic policy framework to support and shape the economic and social development of London over the next 20 years. It sets out the Mayor's transport vision and describes how Transport for London (TfL) and its partners, including the London boroughs, will deliver that vision.
- E2 The MTS has been developed from 'Way to Go', published in autumn 2008, a consultation with the London Assembly in spring 2009, and a public consultation in autumn 2009. It takes into account the emerging policies in the London Plan and the EDS. It is supported by a detailed evidence base, including the Travel in London report³, strategic transport models and draft interim recommendations from the Outer London Commission. Analysis has focused on the outcomes of the committed investment programme⁴ and testing of further policies and proposals required to meet the goals of the strategy.
- E3 This executive summary is not a substitute for, nor does it derogate from, the policies, proposals and other text set out in the main body of the MTS to which the reader is referred.

The Mayor's transport vision

- E4 'London's transport system should excel among those of world cities, providing access to opportunities for all its people and enterprises, achieving the highest environmental standards and leading the world in its approach to tackling urban transport challenges of the 21st century.'
- E5 Achieving this vision will require a transport system with enhanced capacity and connectivity that: is efficient and integrated; encourages mode shift to cycling, walking and public transport; is accessible and fair to users; offers value for money; contributes to improving quality of life and the environment; and offers improved opportunities for all Londoners⁵.
- E6 Six goals set out how this overarching vision should be implemented. The transport strategy should:
- Support economic development and population growth
 - Enhance the quality of life for all Londoners
 - Improve the safety and security of all Londoners
 - Improve transport opportunities for all Londoners

¹ The London Plan: Spatial Development Strategy for Greater London, consultation draft replacement plan, October 2009

² Rising to the Challenge: The Mayor's Economic Development Strategy for Greater London, public consultation draft, October 2009

³ First published in 2009, the Travel in London report is an annual, in-depth analysis of travel patterns and trends in London. It is produced by TfL and is also the way in which the MTS outcomes will be monitored

⁴ The committed programme of rail investment to 2014, including Thameslink, plus TfL's programme of capital investments, outlined in its Business Plan to 2017/18, based upon the settlement with central Government. It will fund major upgrades to the Underground and the delivery of Crossrail

⁵ 'Londoners' refers to anyone in London, including permanent and temporary residents, visitors, workers, students and tourists

- Reduce transport's contribution to climate change and improve its resilience
- Support delivery of the London 2012 Olympic and Paralympic Games and its legacy

The context

- E7 Despite improvements in the last few years, there are major challenges facing London and its transport system. Public transport is crowded and many of the roads are already congested, with population and employment growth set to increase the pressure. Parts of London suffer from poor air quality and climate change is a serious issue that needs to be addressed. There is a need to strengthen the role of Outer London town centres in London's economy. It is also important to improve the accessibility of the transport system and the safety and security of people using it, and to ensure that journeys are as comfortable as possible.
- E8 It is forecast that, by 2031, there will be around 1.25 million more people and over 750,000 new jobs in the Capital¹. This is approximately equivalent to the current population of South Yorkshire. London makes a vital contribution to the UK economy and is essential to the wider southeast of England, which is the fastest growing part of the country. The provision of reliable and efficient transport, with the capacity and connectivity to accommodate this growth sustainably, is crucial to the continued success of the London and UK economies.
- E9 London's pattern of development has been largely dictated by the development of its transport network. Historically, the Capital has developed in a 'radial-centric' pattern, with employment concentrated in the centre and housing in Outer London, linked by high-capacity rail routes. A radial-centric transport network has been a large enabling factor in the development of the high density, highly productive service industries seen in central London today. While continuing to support central and Inner London, the Mayor is also determined to improve public transport and quality of life in, and to support the economic development of, Outer London.
- E10 The current MTS 2001 (revised 2006) does not address the range of transport challenges described above that are likely to become more pressing with forecast employment and population growth. This revised strategy addresses these challenges under each of its relevant goals. The desired outcomes associated with each of the goals and challenges are detailed in the table 'Proposed outcomes'.

¹ Compared to 2007 (pre-recession) levels, using GLA projections

Proposed outcomes

Goals	Challenges	Outcomes
Support economic development and population growth	Supporting sustainable population and employment growth	<ul style="list-style-type: none"> • Balancing capacity and demand for travel through increasing public transport capacity and/or reducing the need to travel
	Improving transport connectivity	<ul style="list-style-type: none"> • Improving people's access to jobs • Improving access to commercial markets for freight movements and business travel, supporting the needs of business to grow
	Delivering an efficient and effective transport system for people and goods	<ul style="list-style-type: none"> • Smoothing traffic flow (managing delay, improving journey time reliability and resilience) • Improving public transport reliability • Reducing operating costs • Bringing and maintaining all assets to a state of good repair • Enhancing use of the Thames for people and goods
Enhance the quality of life for all Londoners	Improving journey experience	<ul style="list-style-type: none"> • Improving public transport customer satisfaction • Improving road user satisfaction (drivers, pedestrians, cyclists) • Reducing public transport crowding
	Enhancing the built and natural environment	<ul style="list-style-type: none"> • Enhancing streetscapes, improving the perception of the urban realm and developing 'better streets' initiatives • Protecting and enhancing the natural environment
	Improving air quality	<ul style="list-style-type: none"> • Reducing air pollutant emissions from ground-based transport, contributing to EU air quality targets
	Improving noise impacts	<ul style="list-style-type: none"> • Improving perceptions and reducing impacts of noise
	Improving health impacts	<ul style="list-style-type: none"> • Facilitating an increase in walking and cycling
Improve the safety and security of all Londoners	Reducing crime, fear of crime and antisocial behaviour	<ul style="list-style-type: none"> • Reducing crime rates (and improving perceptions of personal safety and security)
	Improving road safety	<ul style="list-style-type: none"> • Reducing the numbers of road traffic casualties
	Improving public transport safety	<ul style="list-style-type: none"> • Reducing casualties on public transport networks
Improve transport opportunities for all Londoners	Improving accessibility	<ul style="list-style-type: none"> • Improving the physical accessibility of the transport system • Improving access to services
	Supporting regeneration and tackling deprivation	<ul style="list-style-type: none"> • Supporting wider regeneration
Reduce transport's contribution to climate change and improve its resilience	Reducing CO ₂ emissions	<ul style="list-style-type: none"> • Reducing CO₂ emissions from ground-based transport, contributing to a London-wide 60 per cent reduction by 2025
	Adapting to climate change	<ul style="list-style-type: none"> • Maintaining the reliability of transport networks
Support delivery of the London 2012 Olympic and Paralympic Games and its legacy	Developing and implementing a viable and sustainable legacy for the 2012 Games	<ul style="list-style-type: none"> • Supporting regeneration and convergence of social and economic outcomes between the five Olympic boroughs and the rest of London • Physical transport legacy • Behavioural transport legacy



Supporting economic development and population growth

E11 Supporting sustainable population and employment growth – In the short to medium term, a package of investment in London's transport infrastructure has been secured that is unprecedented in recent generations. It includes Crossrail, a comprehensive upgrade of the Tube network, Thameslink and a massive expansion in the capacity of suburban rail services. This will increase public transport capacity in the three-hour morning peak by over 30 per cent in the period 2006 to

2031. It will also ease crowding on some parts of the rail and Tube network, but other areas will continue to be crowded as a result of the projected growth in population and employment. Committed investment in London's public transport system is illustrated in the following two diagrams:

E12 The growth of London will lead to more trips, up from 24 million per day within London to more than 27 million in 2031. Thinking differently about travel to encourage a shift away from the private car, smoothing traffic flow, continuing

Committed investment¹ in Tube upgrades and Docklands Light Railway

Bakerloo line

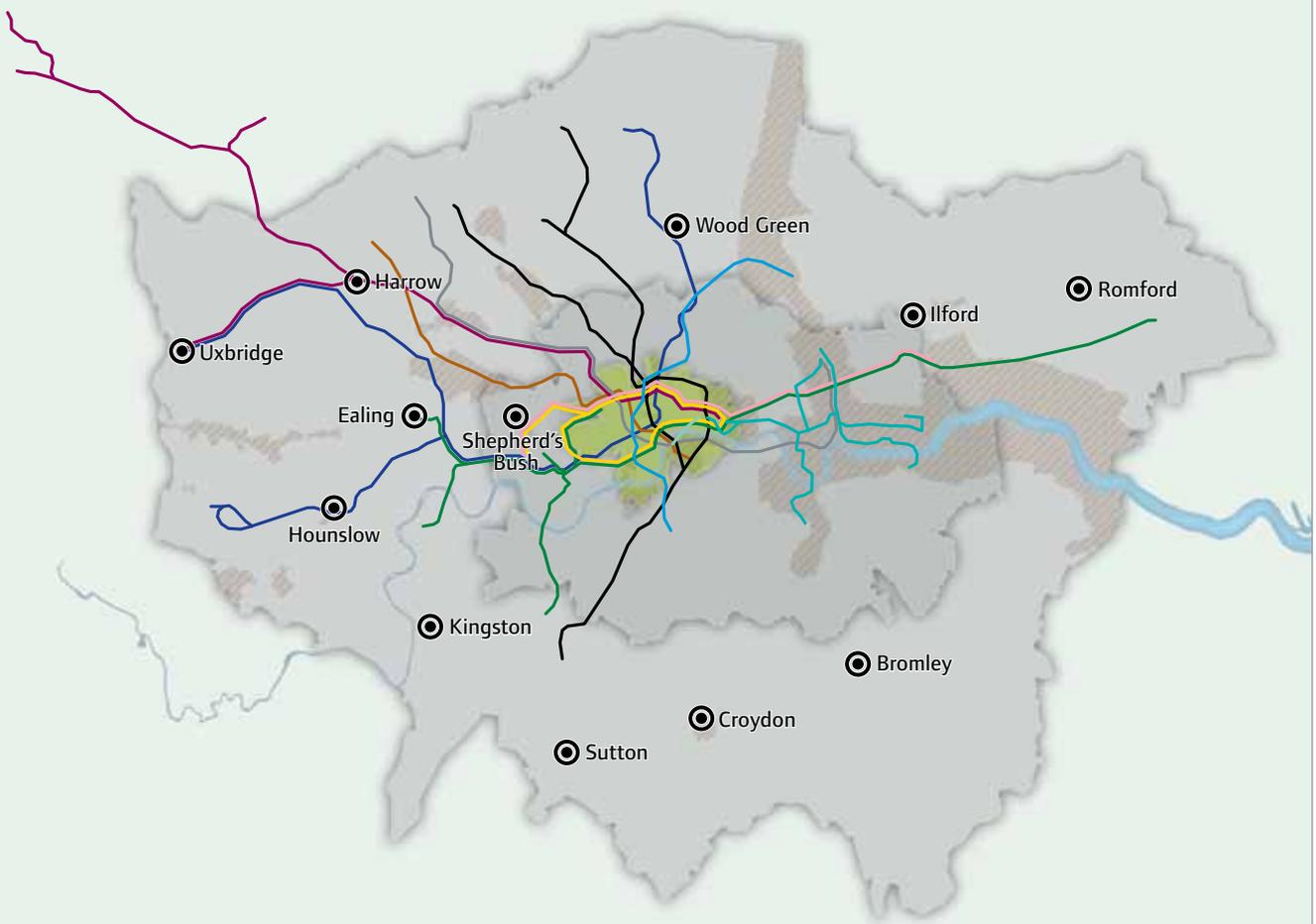
Line upgrade to provide new trains, more capacity and quicker journeys

Northern line

Phase 1: Line upgrade to provide more capacity and quicker journeys
Phase 2: Northern line Upgrade 2 to deliver a further increase in capacity through the simplification and recasting of service patterns

Victoria line

Line upgrade to provide new trains, more capacity and quicker journeys



Key

- Opportunity or Intensification Area
- Outer London
- Inner London
- Central Activities Zone

Piccadilly line

Line upgrade to provide new trains, more capacity and quicker journeys

Jubilee line

Line upgrade to provide more capacity and quicker journeys

Sub-surface lines

Line upgrade to provide new trains, more capacity and quicker journeys on Circle, District, Hammersmith & City and Metropolitan lines

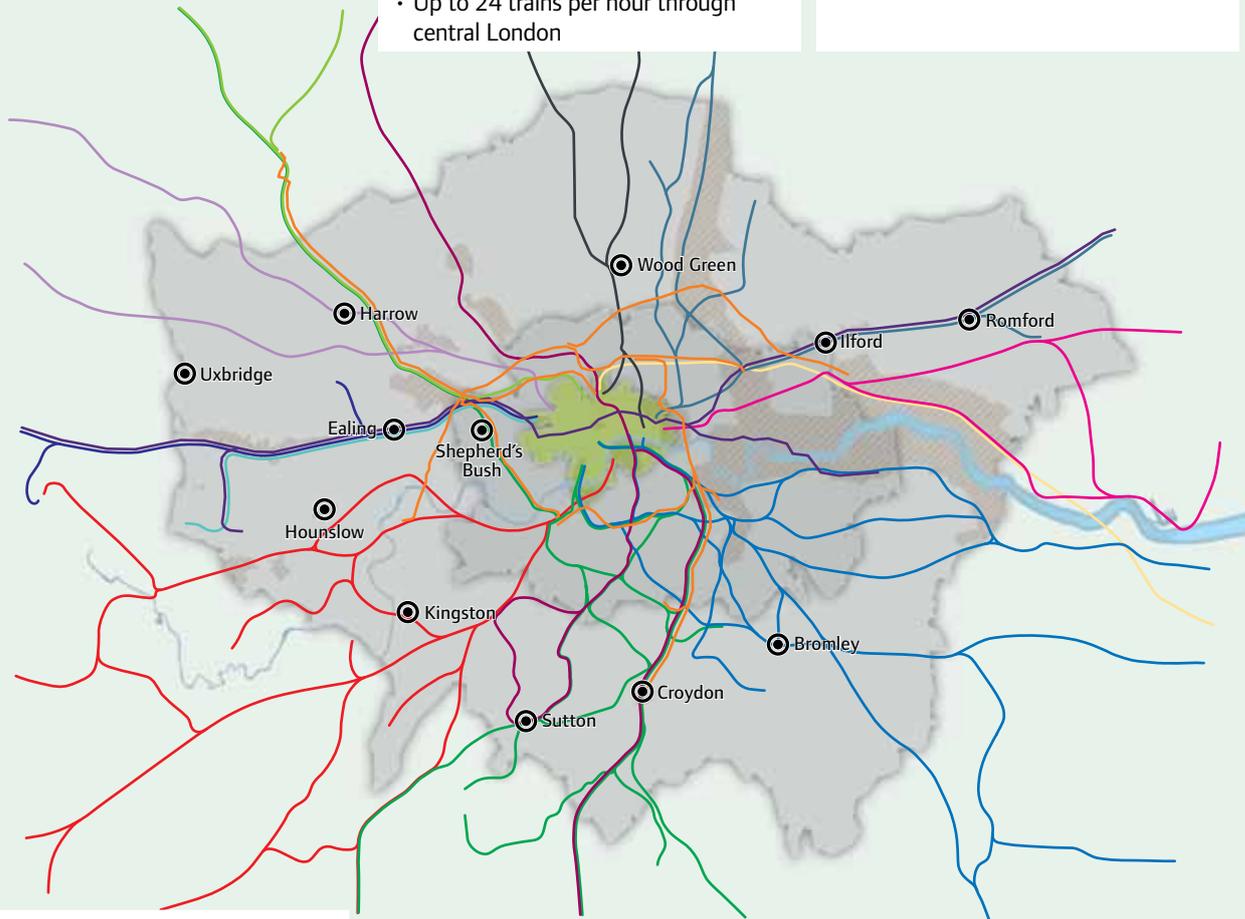
Docklands Light Railway

Three-car trains Bank – Lewisham, with infrastructure capability to operate three cars across entire network
Canning Town – Stratford International extension

¹ Based upon commitments in the TfL Business Plan

Committed¹ enhancements to London’s rail network

London Overground <ul style="list-style-type: none"> • New routes from: Dalston to New Cross, West Croydon and Crystal Palace • Connection between East London line and North London line at Dalston • Surrey Quays to Clapham Junction extension, completion of new orbital route 	Chiltern <ul style="list-style-type: none"> • Frequency improvements 	Great Northern <ul style="list-style-type: none"> • Frequency improvements
Crossrail core scheme <ul style="list-style-type: none"> • New route from Maidenhead and Heathrow to Shenfield and Abbey Wood with 24 trains per hour through central London 	West Coast <ul style="list-style-type: none"> • Trains lengthened and frequency increased 	West Anglia <ul style="list-style-type: none"> • 12-car capability Stansted and Cambridge
	Great Western <ul style="list-style-type: none"> • Electrification • New Crossrail services 	Great Eastern <ul style="list-style-type: none"> • Additional services • New Crossrail service
	Thameslink <ul style="list-style-type: none"> • 12-car capability • Up to 24 trains per hour through central London 	Essex Thameside <ul style="list-style-type: none"> • 12-car capability on all routes



Key	
	Opportunity or Intensification Area
	Outer London
	Inner London
	Central Activities Zone

South Western <ul style="list-style-type: none"> • 10-car Windsor lines and inner suburban capability

South Central <ul style="list-style-type: none"> • 10-car inner capability
South Eastern <ul style="list-style-type: none"> • 12-car inner suburban trains

¹ Committed in High Level Output Specification (HLOS) control period four (CP4) and TfL Business Plan

the cycling revolution and making walking count will help the environment and reduce congestion. Better integrated systems with enhanced interchanges will also help to get the most from the transport system. Locating homes, services and employment opportunities together and encouraging the use of new technology to allow more people to work and shop from home, will help reduce the need to travel. Making more use of London's Blue Ribbon Network¹ for passengers and freight will also provide an alternative to congested roads and public transport. Measures will be progressed principally through the River Concordat.

E13 Improving transport connectivity – Committed investment in London Overground will create a new Inner London orbital rail service, linking Strategic Interchanges and improving public transport connectivity significantly, as well as providing more capacity. However, in the longer term, in order to reduce crowding and maintain the efficiency and effectiveness of the transport system, further investment in transport infrastructure will be required. To support a thriving economy in London, the Mayor recognises that efficient and effective connectivity is required at all levels: international, national, inter-regional, London-wide, sub-regional and local. Adequate airport capacity is needed but the Mayor is opposed to further expansion of Heathrow airport. The strategy supports the development of high-speed rail in the UK and better rail services to Europe as an alternative to short and medium-

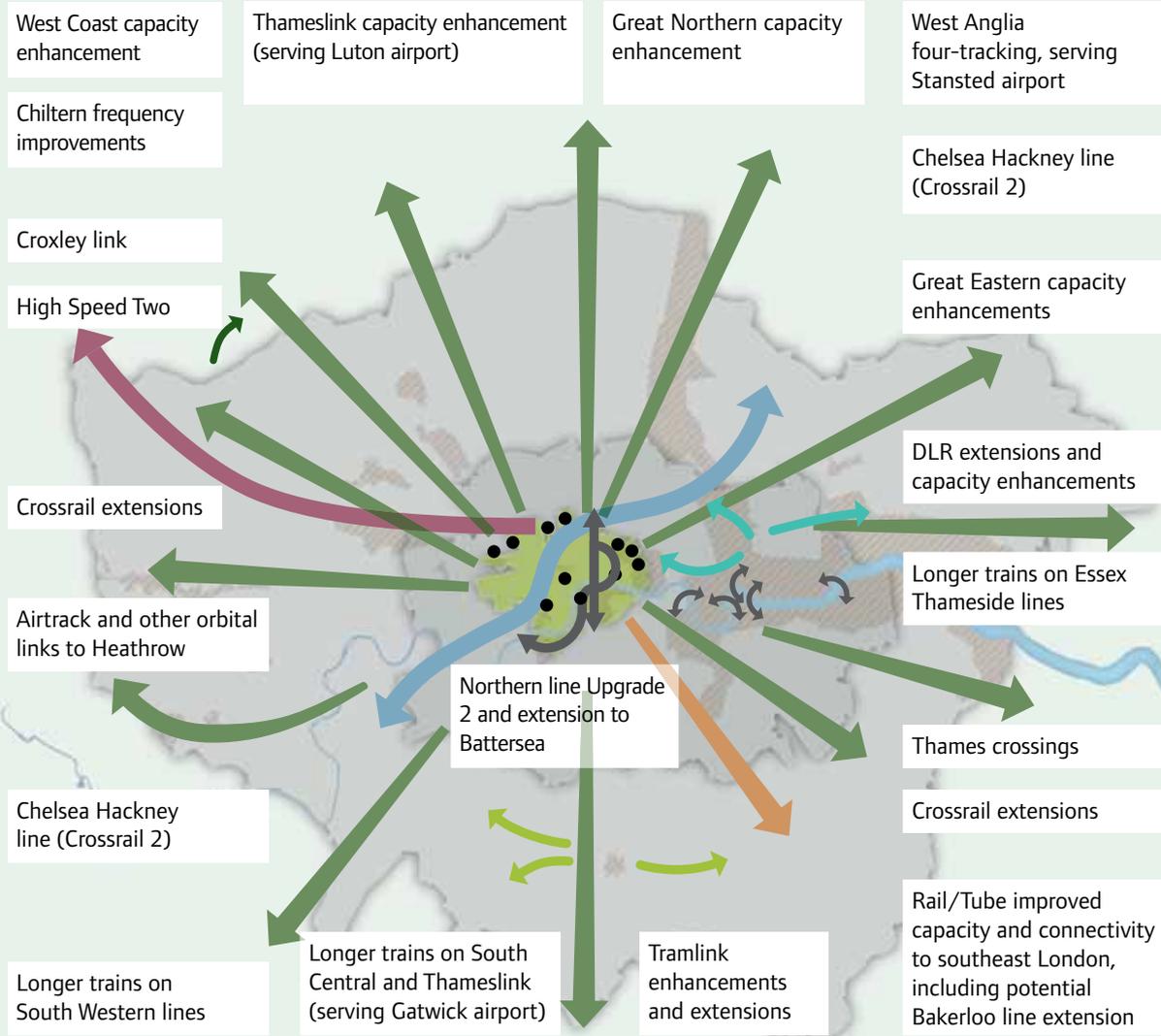
haul air travel. Schemes such as the Chelsea Hackney line (Crossrail 2), an extension of the Northern line to Battersea, new river crossings in east London, as well as a possible extension of the Bakerloo line in southeast London, would also improve the connectivity of areas currently less well-served by public transport.

E14 The 'Significant additions to transport capacity and connectivity in London' diagram, opposite, identifies priority schemes for implementation in the period following the current investment programmes (from 2014 for schemes funded by Network Rail and from 2020 for schemes funded by TfL and others). These will relieve particularly crowded corridors, improve accessibility in areas of most need, for example, deprived areas of Inner London, and support London's wider regeneration. Better National Rail services will be vital in delivering the strategy. The Mayor is therefore seeking to have greater influence over the development of rail services in London to improve capacity, service levels and integration with the wider transport system.

E15 The Mayor recognises the capacity and resilience challenges presented by the lack of river crossing options in east London. He is keen to maximise the possibilities afforded by new public transport infrastructure in east London, and freight efficiency measures. Nevertheless, improved links for freight and those with no alternative to private transport will improve the economic performance of the sub-region.

¹ The Blue Ribbon Network is the name for the network of London's major watercourses. It incorporates the Thames, canals, other tributaries, rivers and streams within London and London's open water spaces such as docks, reservoirs and lakes. Additionally, it includes culverted (or covered over) parts of rivers, canals or streams

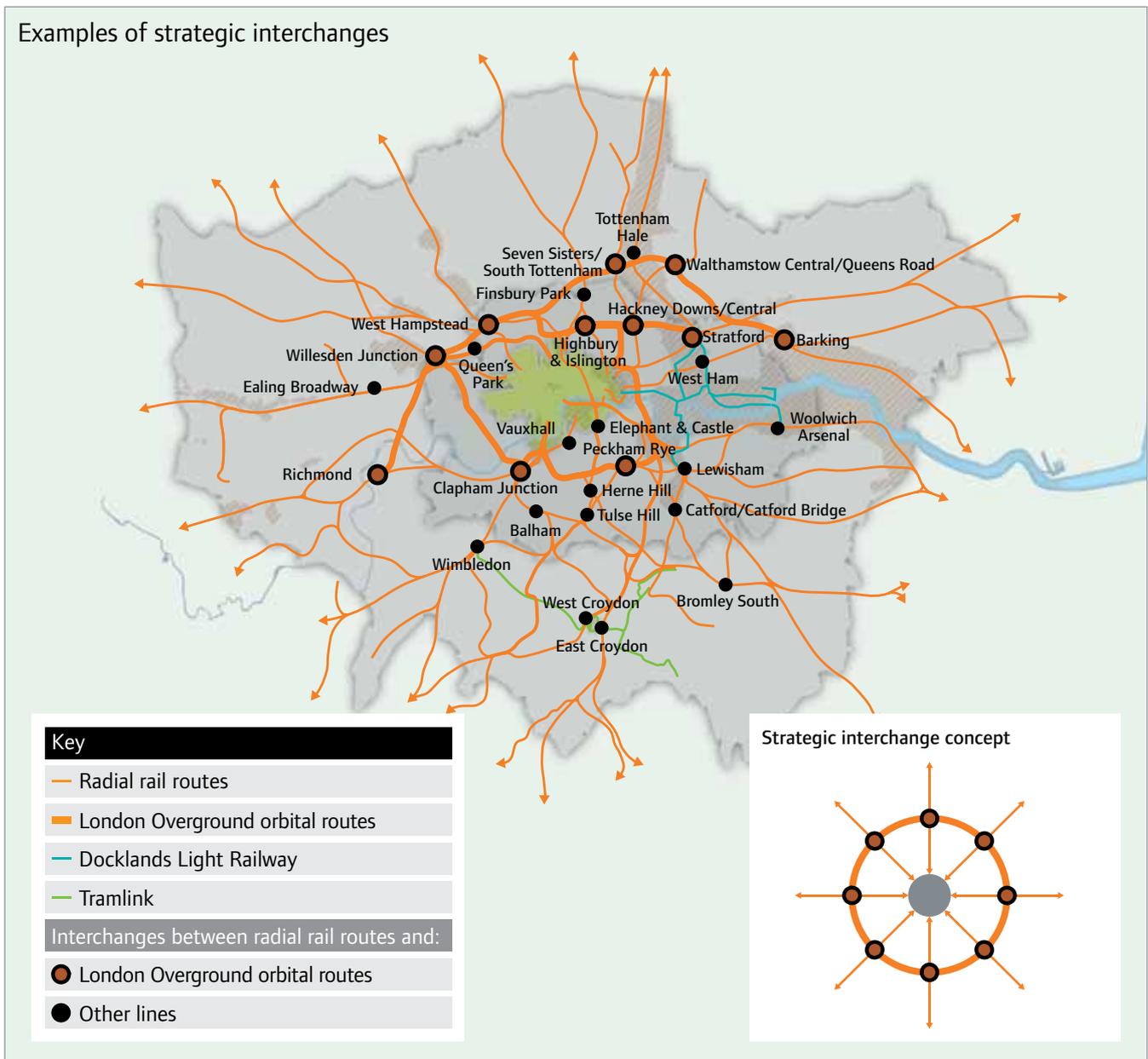
Significant additions to transport capacity and connectivity in London



Key Opportunity or Intensification Area Rail termini Route improvements London-wide improvements	Bus services will continue to support economic growth and regeneration	Greater use of the River Thames	Cycle and walking improvements
	London terminals capacity upgrades and strategic interchanges	Upgrade of all National Rail stations and services to London Overground standards and integration with Oyster	

E16 The strategy also seeks to improve interchange between radial and orbital rail lines, and between modes, in order to facilitate orbital travel. The priority strategic interchanges include those shown in the diagram, 'Examples of strategic interchanges' below.

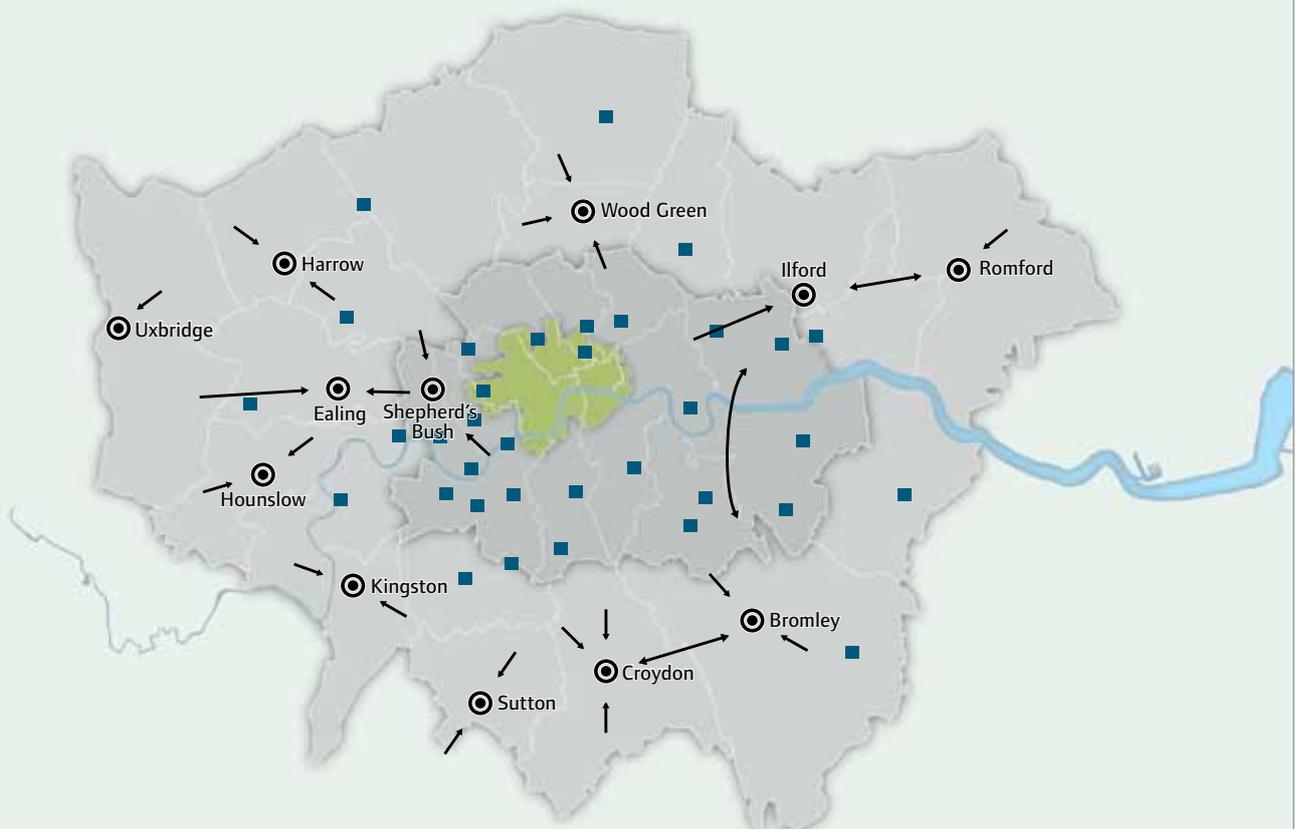
E17 Working with the London boroughs, this strategy aims to develop locally agreed improvements that enhance the vitality of Outer London, including improved accessibility to, and between, metropolitan town centres and a greatly improved urban environment



within town centres. Working closely with the boroughs, locally agreed approaches to improving orbital connectivity will be encouraged through better integration between public transport services and better information

provision. Potential measures to enhance accessibility to, and within, Outer London town centres are illustrated on the diagram 'Enhanced links to, and between, metropolitan town centres' below.

Enhanced links to, and between, metropolitan town centres



Key

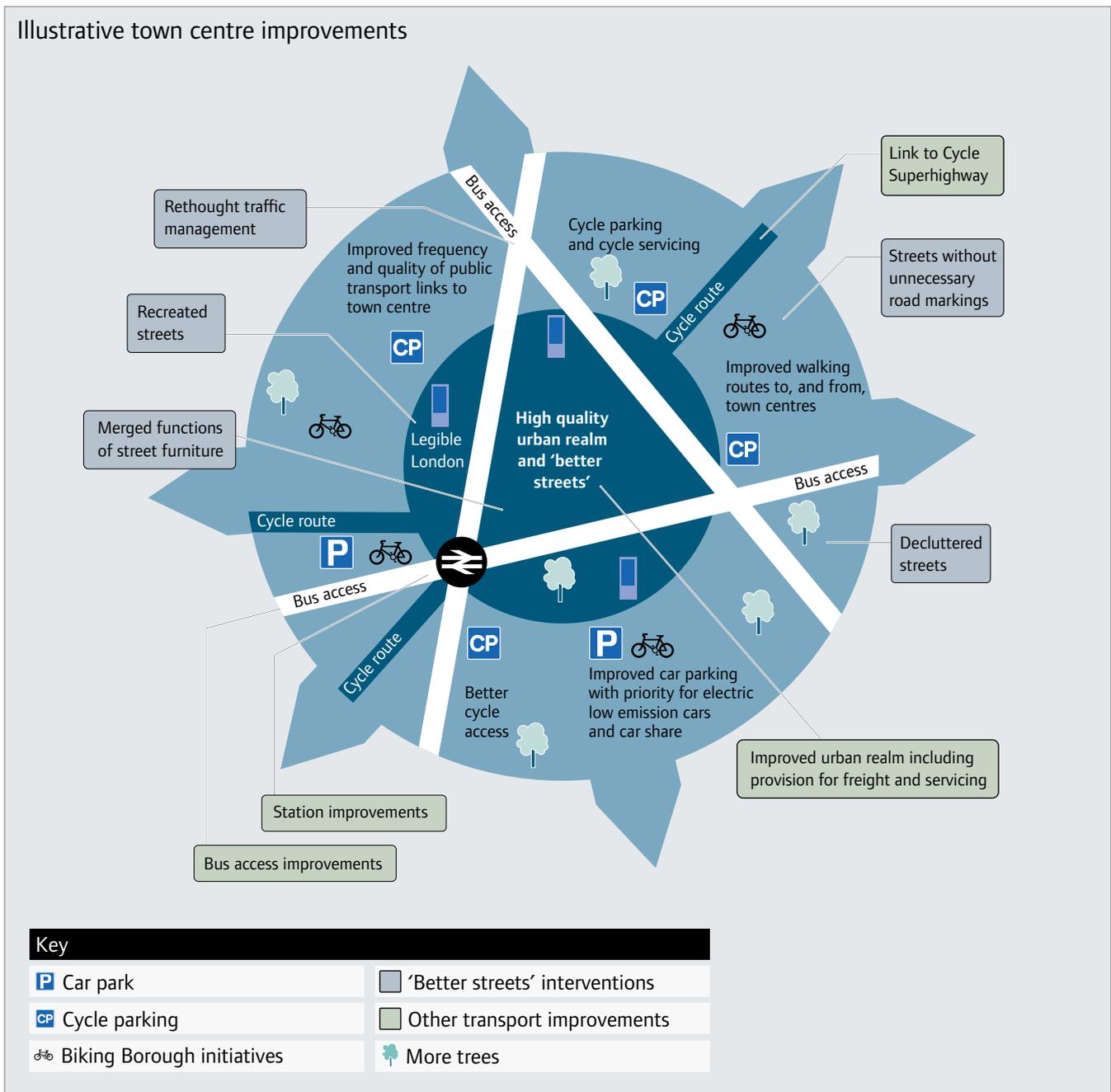
- ⊙ Metropolitan town centre
- Major centre
- ↔ Illustrative enhanced link

Enhancements will reflect local need and travel characteristics, and include:

- Better information and marketing for bus and rail links
- Improved bus, walking and cycle routes to/from town centres
- Maximising the benefits of existing public transport services

E18 Working with the London boroughs, this strategy aims to develop locally agreed improvements to town centres and better integrate transport with local conditions.

The 'Illustrative town centre improvements' diagram, below, highlights the improvements that could be made in a typical town centre.



E19 Delivering an efficient and effective transport system for people and goods – Congestion on London’s roads is a huge hindrance to businesses, costing about £2bn each year. The Mayor will implement a package of measures to smooth traffic flow and, in particular, achieve more reliable journey times. These include improved traffic control, minimising the impact of planned and unplanned events (such as roadworks and collisions), maintaining road network assets in a state of good repair, and – where there is a net benefit – developing the road network. Tackling congestion is especially important for the freight industry and the efficiency of freight distribution will be further improved through a number of measures, such as the Freight Operator Recognition Scheme (FORS), to promote best practice.

E20 In central London, with diverse and competing demands on the road network, effective management of scarce road capacity is a key priority. To assist with this, the central London Congestion Charging scheme was introduced in February 2003, delivering significant congestion reduction benefits. The scheme was extended in February 2007 to cover the area to the west of the original central London zone (the Western Extension zone). However, the Mayor recognises that to be beneficial to businesses, road user charging must be accurately targeted to achieve set objectives. Therefore, having listened to public opinion he proposes to remove the Western Extension to the central London Congestion Charge scheme.

E21 In the life of the strategy, the Mayor may consider road user charging schemes if other measures at

his disposal are deemed insufficient to meet the strategy’s goals and where there is a reasonable balance between the objectives of any scheme and its costs and other impacts.

Enhancing the quality of life for all Londoners

E22 Transport affects the quality of life of Londoners in many ways. Five challenges have been identified:

E23 Improving the journey experience – Journeys can be comfortable and smooth or slow and unreliable with an impact on people’s day-to-day lives. The Mayor will improve the quality of public transport services through raising standards of cleanliness, reducing crowding, cooling the Tube where feasible, and providing more journey planning information. The strategy also promotes a fair approach to traffic enforcement on the roads.

E24 Enhancing the built and natural environment – The city has unique historic character and diversity which enriches people’s quality of life as well as benefitting the economy, culture and environment. Well-designed public spaces can provide attractive places to spend time and can also support walking and cycling. The strategy promotes the innovative remaking of London’s streets through flagship schemes and good practice using ‘better streets’ principles. These include well-designed streets with less clutter, high quality materials and redesigned layouts providing a better balance between all road users to create attractive streets that are a pleasure to use. The strategy will support biodiversity and improve the quality of the natural environment.

- E25 Improving air quality** – Air quality in London is the worst in the country. It exacerbates heart and lung conditions such as asthma, particularly in children, older people and those with poor health. The Mayor has a legal obligation to meet national and European targets for reducing concentrations of particulates (PM) and oxides of nitrogen (NOx). The strategy therefore promotes incentives to use low emission vehicles, develops the current Low Emission Zone (LEZ) and takes a lead by promoting a cleaner public service fleet, including buses, taxis and Greater London Authority (GLA) Group vehicles.
- E26 Improving noise impacts** – Unwanted noise can cause annoyance, anxiety, sleep disruption and health problems. The Mayor will reduce noise impacts from transport through providing speed control alternatives to road humps, promoting smoother driving and the use of quieter vehicles.
- E27 Improving health impacts** – Transport is a key determinant of health and wellbeing, with direct effects through road collisions and air pollutants, and indirectly through stress and physical activity. The uptake of physically active modes of transport will be promoted through information campaigns, travel planning, training and improved infrastructure such as cycle hire schemes, Cycle Superhighways, cycle parking provision, key walking routes and consistent wayfinding (such as Legible London). In addition, new developments will be planned in a way to increase the attractiveness of walking and cycling.

Improving the safety and security of all Londoners

- E28** Crime, the fear of crime and antisocial behaviour are all barriers which dissuade people from using London's transport system. The Mayor recognises that feeling safe while cycling, walking, or using public transport is a very important part of the journey experience.
- E29 Reducing crime, fear of crime and antisocial behaviour** – Despite low crime levels on public transport, fear of crime and antisocial behaviour remain barriers to travel for some people. The strategy will seek to reduce the rate and fear of crime on London's transport network through better policing and enforcement by TfL, the boroughs and police. This will enable integrated reporting of antisocial behaviour and crime on the transport system and focus staff resources at times and places when people feel particularly vulnerable, for example, at night. Designing out crime through careful design and good use of lighting and CCTV will improve surveillance and make people feel safer.
- E30 Improving road safety** – Great progress has been made in the last decade, with the number of people being killed or seriously injured (KSI) on London's roads falling by more than 40 per cent since 1998. The Mayor is committed to working with the boroughs and police to further improve road safety for all communities in London and, in July 2009, endorsed the European Road Safety Charter. The strategy will therefore promote better balanced streets and an improved urban realm to make the roads physically safer, particularly for vulnerable

users such as pedestrians and cyclists. It will also provide more advice on staying safe, such as road safety campaigns aimed at young people, and the Mayor's Cycle Safety Action Plan, published in March 2010. In addition, the strategy will seek to create a culture of mutual respect, where all road users show consideration for each other.

- E31 Improving public transport safety** – Public transport in London is already safe and injury rates are low. The strategy will promote partnership working to maintain and improve operational safety and security on public transport in order to reduce injury rates.

Improving transport opportunities for all Londoners

- E32** The Mayor is committed to ensuring 'equal life chances for all'¹. Meeting the needs of, and expanding opportunities for, all Londoners – and where appropriate, the needs of particular groups and communities – is key to tackling the huge issue of inequality across London. The provision of a more accessible transport system and improved transport connectivity and capacity is an important part of meeting this commitment. Fares have an important role to play in ensuring they make an adequate contribution towards the provision of services.

- E33 Improving accessibility** – Physical accessibility of the public transport system has been improved in recent years. All buses are low-floor and committed investment will provide step-free access from street to platform at some Tube and National Rail/London

Overground stations. However, the Mayor recognises that more is needed. Using the 'whole journey approach', the strategy will seek to increase accessibility for all Londoners by promoting measures to further improve the physical accessibility of the transport system (streets, bus stops, stations and vehicles). Enhancing information provision, more visible and better-trained staff and providing better interchange will also increase accessibility. Fares will be kept under review, ensuring they are affordable (both to passengers and to TfL), and offer concessions to those most in need.

- E34** The London Plan identifies areas that have a greater need for investment to accommodate London's growth, expand opportunities for all and address deprivation. Prioritising transport investment in these areas will maximise the benefits of regeneration. Better integration of land use and transport planning will also ensure that new housing and employment is supported by good public transport accessibility and adequate capacity.

- E35 Supporting regeneration and tackling deprivation** – Some of London's most deprived areas have relatively poor integrated transport and insufficient access to essential services, while others are well-served by public transport. Other factors, such as fear of crime and antisocial behaviour in deprived areas can dissuade people from walking, cycling or using public transport. The strategy therefore promotes measures to enhance connectivity, improve the urban realm and provide better accessibility to jobs and services in deprived areas.

¹ 'Equal Life Chances for All' is the Mayor's framework to address deprivation and inequality. Published by the GLA, 2009

Reducing transport's contribution to climate change and improving its resilience

- E36** The Mayor aims to establish London as a role model city in addressing the climate change challenge.
- E37** **Reducing CO₂ emissions** – The Mayor has a target to reduce London's CO₂ emissions by 60 per cent by 2025, compared to 1990 levels. Given the growth in population and employment that is expected, meeting this target will be a huge challenge that will set London on course to be a global leader in reducing CO₂ emissions. Road vehicles currently account for around 72 per cent of transport-related CO₂ emissions in London. Meeting the Mayor's target will require strong commitment from TfL, the boroughs, Government, the EU and others to catalyse the introduction and use of low carbon road vehicles. This also includes the provision of charging points for electric vehicles (EVs) and a package of incentives to ensure price competitiveness of low carbon vehicles and, if required, to introduce further demand management measures.
- E38** The Mayor will take a lead in reducing emissions from vehicle fleets under his control through initiatives such as low emission buses and an electric vehicle fleet by 2015. Encouraging walking, cycling and public transport use together with smarter travel initiatives for people and goods will further reduce the environmental impact of transport in London.

- E39** **Adapting to climate change** – London's transport system is vulnerable to the long-term changes in climate and the more frequent, extreme weather conditions. The Mayor will take steps to risk assess the transport system and take appropriate risk mitigation actions. This will include designing and constructing infrastructure to withstand future climatic conditions and urban greening measures such as planting additional street trees.

Supporting delivery of the London 2012 Olympic and Paralympic Games and its legacy

- E40** Hosting the 2012 Games is a great honour for London. It also presents a huge challenge. The Mayor is committed to making it the most accessible, inclusive and environmentally friendly games ever. The strategy will ensure the delivery and successful operation of the committed transport infrastructure required for the event. Also, the strategy will ensure the legacy of the 2012 Games supports the principle of convergence. Namely, that within 20 years the communities who host the Games will have the same social and economic chances as their neighbours across London. Maximising the benefits of the 2012 Games by encouraging walking and cycling will help promote more sustainable and healthy lifestyles. It will also help people to access opportunities within their communities and support the delivery of convergence in the Olympic boroughs.

Summary of policies and proposals

- E41** The table opposite summarises the strategy's proposals.

Summary of the MTS proposals

Goals	Proposals summary
Support economic development and population growth	<ul style="list-style-type: none"> • Implementing Crossrail • Improving suburban and National Rail links • Carrying out major upgrades to the Underground and potential extensions • Keeping the bus network under review • Improving interchange between bus, Underground, rail and other forms of transport • Promoting strategic interchange between Inner and Outer London rail to facilitate more orbital movement • Smoothing traffic flow with new traffic control systems, better coordinated roadworks, management of unplanned events and asset management • Providing new links to support development – both rail and road including new east Thames river crossings • Making more use of the river for transporting people and goods • Improving the accessibility of the transport network • Bringing about a revolution in cycling in London • Making walking count • Creating better, more attractive streets • Promoting and encouraging new, cleaner technologies such as electric vehicles • Improving the management of freight and servicing • Providing Londoners with better information to help them plan their journeys • Removal of Western Extension zone and continuation of central London Congestion Charging scheme
Enhance the quality of life for all Londoners	
Improve the safety and security of all Londoners	
Improve transport opportunities for all Londoners	
Reduce transport's contribution to climate change and improve its resilience	
Support delivery of the London 2012 Olympic and Paralympic Games and its legacy	

Delivery, funding, monitoring and reporting

E42 Funding and delivery of the MTS will be dependent on partnership working with a number of stakeholders, including the boroughs, Government, Network Rail, the London Development Agency (LDA), developers and other stakeholders. TfL's Business Plan provides detail in terms of planning and budgeting for schemes to be delivered by TfL. National Rail improvements will be made through the High Level Output Specification (HLOS) and franchising processes. Sub-regional transport plans will be developed that will outline in greater depth how the strategy will be implemented at a sub-regional level. Borough

Local Implementation Plans (LIPs) and Local Area Agreements will be important mechanisms through which the strategy will be delivered. The Mayor has reviewed, improved and simplified the previously cumbersome process.

E43 The works required to improve London's transport system will inevitably lead to some disruption. TfL and other delivery agencies will consult local communities and the public to minimise the impact of disruptions required to deliver a transport system London can be proud of.

E44 Monitoring and reporting the effectiveness of the strategy will take place on an annual basis, through the Travel in London report.

Mayor's Transport Strategy – Part one

Vision and context



1.1 About this document

- 1 This document sets out the Mayor's Transport Strategy for London for the period up to 2031. It supersedes the first version published in July 2001 (including its revisions).
- 2 The six goals the MTS seeks to achieve are:
 - To support economic development and population growth
 - Enhance the quality of life for all Londoners
 - Improve the safety and security of all Londoners
 - Improve transport opportunities for all Londoners
 - Reduce transport's contribution to climate change, and improve its resilience
 - Support delivery of the London 2012 Olympic and Paralympic Games and its legacy
- 3 The document is set out in three parts:
 - **Part one:** Outlines the vision, goals and outcomes that the strategy shall seek to achieve, and the context for the strategy
 - **Part two:** Examines the main transport challenges facing London and sets out the policies and proposals required to achieve the goals
 - **Part three:** Sets out how the Mayor proposes his policies and proposals will be delivered by the GLA, TfL, the London boroughs, the Department for Transport

(DfT), Network Rail, the train operating companies and other delivery agencies; and sets out how the achievement of his main transport outcomes will be monitored and reviewed

- 4 The transport strategy is for both people and goods. Freight and servicing is considered throughout the MTS and most policies and proposals apply to the transportation of people and goods. For ease of reference, those areas of the strategy which make direct mention of freight and servicing are listed at the end of the document.

1.2 The role of the Mayor's Transport Strategy

- 5 The MTS is the principal policy tool through which the Mayor exercises his responsibilities for the planning, management and development of transport in London, for both the movement of people and goods. It takes into account the emerging policies in the London Plan¹ and the Mayor's EDS². It provides the policy context for the more detailed plans of the various transport-related implementation bodies, particularly TfL and the London boroughs.
- 6 The legislative framework for the MTS is laid down by the GLA Act 1999 as amended by the GLA Act 2007. The GLA Act 1999 sets out the general transport duties of the Mayor and the GLA. It specifies that the transport strategy must contain policies for 'the promotion and encouragement of safe, integrated, efficient

¹ The London Plan: Spatial Development Strategy for Greater London, consultation draft replacement plan, October 2009

² Rising to the Challenge: The Mayor's Economic Development Strategy for Greater London, public consultation draft, October 2009

and economic transport facilities and services to, from and within Greater London', and proposals for securing the transport facilities and services needed to implement the Mayor's policies over the lifetime of the MTS, with regard to the movement of people and goods. His transport body, TfL, is under a duty to use its powers to facilitate and implement the MTS. The 33 London boroughs (including the Cities of London and Westminster) must formulate plans to implement the strategy in their areas. Every person or body exercising statutory functions with respect to the Greater London area, including the boroughs and the City, must have regard to the MTS wherever relevant to do so.

- 7 The MTS must also contain the Mayor's proposals for providing transport that is accessible to mobility impaired people and may contain any other proposals which he considers appropriate. Mobility issues are addressed in the policies, proposals and the Accessibility Implementation Plan.

1.3 Considerations for the revision of the strategy

- 8 The Mayor set up the Outer London Commission to review the opportunities to improve the economy, quality of life and transport in Outer London. This strategy reflects the interim findings of the Commission: that the development of Outer London should be based upon a 'hub and spoke' approach making particular use of the existing town centre network, and recognising other strategic business locations; that transport should meet the needs of people to access places with a competitive choice of goods and services; that the solutions for Outer London vary across London and need to be applied flexibly at a local level.
- 9 In preparing the MTS and in formulating his policies and proposals, the Mayor has had regard to: promoting equality; to preventing crime and disorder; to the promotion of economic development and wealth creation; social development and the improvement of the environment; to the effect that the strategy would have on health and health inequalities between people living in Greater London; and on climate change and the consequences of climate change; and the achievement of sustainable development.
- 10 He has also considered the likely contribution of the MTS to the promotion of equality of opportunity for all Londoners, the promotion of good relations between them, and the elimination of unlawful discrimination.

He has also had regard to the need to ensure that the strategy is consistent with national policies, certain international obligations and his other strategies; to the resources available for its implementation; and to the desirability of promoting and encouraging the use of the Thames for safe passenger and freight transport.

- 11 In accordance with the statutory requirements, the Mayor has included in the MTS those transport-related policies and proposals he considers are best calculated to promote improvements in the health of, and the reduction in health inequalities between, Londoners; and to contribute to the mitigation of, or adaptation to, climate change in the UK; and to improve sustainable development.
- 12 The Mayor, in accordance with the 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1998 Aarhus Convention on access to information, public participation in decision-making and access to justice in environmental matters, and the Copenhagen Accord on Climate Change, has included policies and proposals on climate change and environmental matters he considers would meet the requirements of these treaties.

1.4 Integration with the development of other Mayoral strategies

- 13 The Mayor has a statutory duty to ensure consistency between adopted Mayoral strategies. Several of his strategies are currently being revised, including the London Plan and EDS. In preparing this MTS, the Mayor has had regard to these strategies and to the emerging policies in the draft London Plan and draft EDS.
- 14 The draft MTS was published and consulted upon contemporaneously with similar documents for the London Plan and EDS. However, the extended process for the new London Plan, including an Examination in Public, means that the MTS could consider only draft London Plan policies.
- 15 The Mayor has had regard to the policies in the emerging draft Air Quality Strategy, Climate Change Mitigation and Energy Strategy, Climate Change Adaptation Strategy, Waste Strategy and Health Inequalities Strategy.



2.1 The Mayor’s vision for London

- 16 The Mayor’s vision for London is set out in the public consultation draft of the London Plan, which states:
- 17 Over the years to 2031 and beyond, London should:
- 18 ‘Excel among global cities – expanding opportunities for all its people and enterprises, achieving the highest environmental standards and quality of life and leading the world in its approach to tackling the urban challenges of the 21st century, particularly that of climate change.’
- 19 ‘Achieving this vision will mean making sure London makes the most of the benefits of the energy, dynamism and diversity that characterise the city and its people; embraces change while promoting its heritage, neighbourhoods and identity; and values responsibility, compassion and citizenship.’
- 20 This high level, overarching vision is supported by six detailed objectives in the London Plan:
- 21 (a) ‘A city that meets the challenges of economic and population growth in ways that ensure a good and improving quality of life for all Londoners and helps tackle the huge issue of inequality, including inequality in health outcomes
- 22 (b) An internationally competitive and successful city with a strong and diverse economy and an entrepreneurial spirit that benefits all Londoners and all parts of London; a city which is at the leading edge of innovation and research, while also being comfortable with – and making the most of – its rich heritage
- 23 (c) A city of diverse, strong, secure and accessible neighbourhoods to which Londoners feel attached, which provides all of its residents, workers, visitors and students – whatever their origin, background, age or status – with opportunities to realise and express their potential; and a high quality environment for individuals to enjoy, live together and thrive
- 24 (d) A city that delights the senses and takes care over its buildings and streets, having the best of modern architecture, while also making the most of London’s built heritage and which makes the most of open and green spaces and waterways, realising its potential for improving Londoners’ health, welfare and development
- 25 (e) A city that becomes a world leader in improving the environment locally and globally, taking the lead in tackling climate change, reducing pollution, developing a low carbon economy and consuming fewer resources or using them more effectively
- 26 (f) A city where it is easy, safe and convenient for everyone to access jobs, opportunities and facilities, with an efficient and effective transport system which places more emphasis on walking and cycling and makes better use of the Thames; and which supports delivery of all the objectives of the London Plan’

27 The MTS, which must be consistent with the London Plan and other Mayoral strategies, responds specifically to the last of these objectives. However, in so far as better transport is not an 'end' in itself, but a means to improving broader economic, environmental and social outcomes, the MTS seeks to respond to, and support the delivery of, all the London Plan objectives. It is also consistent with national transport policy objectives¹.

2.2 The vision for London's transport system

28 The vision for the Capital is that:

29 'London's transport system should excel among those of global cities, providing access to opportunities for all its people and enterprises, achieving the highest environmental standards and leading the world in its approach to tackling urban transport challenges of the 21st century.'

30 Achieving this vision will mean making sure the transport system offers enhanced capacity and connectivity, is more efficient, integrated, safe and secure, supports London's growth and economic development and is fair to all users. It should also encourage a cycling revolution and mode shift to walking, public transport and use of the river, and offer better value for money to fare and taxpayers. Moreover, it should contribute to improving Londoners' quality of life, opportunities and the environment in all parts of London.

31 Six goals are set out for the achievement of this overarching vision. These goals are ambitious, given that availability of funding over the short and medium terms will be particularly constrained. The goals of the MTS are set out below.

Supporting economic development and population growth

32 Achieving the vision requires a transport system that connects people to jobs and meets the needs of a larger London in 2031 with a population of almost nine million, employment at almost five and a half million and over three million more trips being made each day. The strategy therefore proposes:

- An expanded National Rail network, better integrated with the rest of the transport system
- Greater Mayoral influence over National Rail service standards and service planning and development
- Crossrail, Thameslink and the Chelsea Hackney line to improve connectivity and capacity
- Increased capacity on all other National Rail lines and new orbital rail services on London Overground
- An upgraded Tube service including a separation² of services on the Northern line to increase service frequencies through the City, an extension of the Northern line to Battersea, providing greater capacity and

¹ National transport policy objectives are outlined in DfT (2008) 'Delivering a Sustainable Transport System (DaSTS)'

² A simplified train service pattern on the Northern line, enabling more trains to be run through the central sections thus increasing capacity on the crowded City branch

- more reliable journeys, and consideration of an extension of the Bakerloo line
 - A bus network that is developed to provide an even better value for money service, building on its success and expansion over the last decade
 - Support for more efficient movement of freight
 - Renewed efforts to make the most of the public transport system, including better and more comprehensive information provision, with better integrated fares and ticketing
 - Improved interchange and customer service standards
 - Better linkages between transport and land use planning to ensure the transport system can meet demand from new developments and that the best use of existing capacity and connectivity is made
 - Improve network connectivity in areas of London, for example, a package of river crossings in east London
- 33 The car will continue to have a role to play for journeys that cannot efficiently be catered for by public transport, walking or cycling, and the transport system will allow for car use where appropriate (where cars are used these should be fuel efficient, low emission including electric). The movement of freight by rail and water is encouraged, though most freight will continue to be carried by road, requiring break-bulk facilities for the transfer of freight to smaller, lower emission vehicles in sensitive areas. The MTS also promotes better
- management of the road network to make the most of available road space and to smooth traffic flows, manage congestion (potentially using road user charging, should other policy measures be insufficient to meet the strategy's goals), improving reliability and resilience.
- 34 Improved national and international links from London will be achieved with development of high-speed rail services in the UK and to more destinations in Europe, and seeking better use of existing capacity at Heathrow (and other airports) while resisting further expansion of the airport, due to resulting environmental, public transport overcrowding and traffic congestion impacts.
- Enhancing the quality of life for all Londoners**
- 35 A better journey experience will be achieved through more attentive staff, better information, newer and cleaner trains and buses (including the New Bus for London), less crowding and smoother flowing traffic, and greater use of the Thames and other waterways. Enhancements to the built and natural environment will improve perceptions of the urban realm, streets and town centres and deliver a step change in the appeal of walking and cycling as healthy, active travel options. London will have 'better streets' that are free from clutter and unnecessary signs, are vibrant, attractive and enjoyable places to use. Improved air quality, with health benefits for Londoners – will be achieved through LEZ enhancements, a cleaner, greener London vehicle fleet including a new greener bus for London, lower emission taxis, lower emission heavy goods vehicles (HGVs) and lower emission cars, such as EVs.

Improving the safety and security of all Londoners

- 36 The strategy will seek to continue the trend of reducing road traffic casualties and injuries. Increasing levels of cycling will lead to a virtuous circle of increased awareness among other road users and a reduced injury rate. Safety for public transport passengers will continue to be paramount. Implementation of best practice design guidance and improved surveillance (through police officer patrols, staff visibility and CCTV) will reduce crime rates and improve perceptions of personal safety and security.

Improving transport opportunities for all Londoners

- 37 The strategy will help deliver equal life chances for all. Improved availability and helpfulness of staff, together with better information provision, will provide more reassurance, help and advice to passengers. A 'whole journey approach' will deliver increased step-free access and other accessibility improvements to the bus, Tube and rail networks. Improvements to the streetscape will improve physical accessibility. Targeted fare concessions and door-to-door services will continue for specific user groups.

Reducing transport's contribution to climate change, and improving its resilience

- 38 The strategy will promote an increased attractiveness of low carbon modes of public transport, walking and cycling leading to further mode shift away from the car, and consequently lower emissions. An uptake of low carbon vehicle technologies and fuels will make

significant reductions in CO₂ emissions across all modes. Decarbonised electricity supply will make electric-powered transport more environmentally advantageous. Electric charging infrastructure will help support the use of EVs. A greater public awareness of the environmental impact of travel choices and driving style, together with targeted travel planning and car clubs will further reduce transport-related CO₂ emissions and tackle car dependency. Working with the freight industry, the Mayor will seek to ensure that freight movement in London is made as efficient as possible, including greater use of rail and water. Road user charging may be considered if required to meet the CO₂ emission reduction target (subject to technology enabling a fair scheme to be developed). Climate change adaptation measures will ensure London's transport system becomes more resilient to extreme weather events and rising sea levels.

Supporting delivery of the London 2012 Olympic and Paralympic Games and its legacy

- 39 The strategy will support the successful delivery of the 2012 Games Transport Plan, and the physical and behavioural legacy of the Games.

2.2.1 Transport network infrastructure enhancements

- 40 Figure 1 shows a number of key transport network improvements envisaged by the strategy (whether funded or not). London-wide improvements, such as the efficiency of the bus network, are not shown in this figure.

Figure 1: Enhancements to London’s transport infrastructure

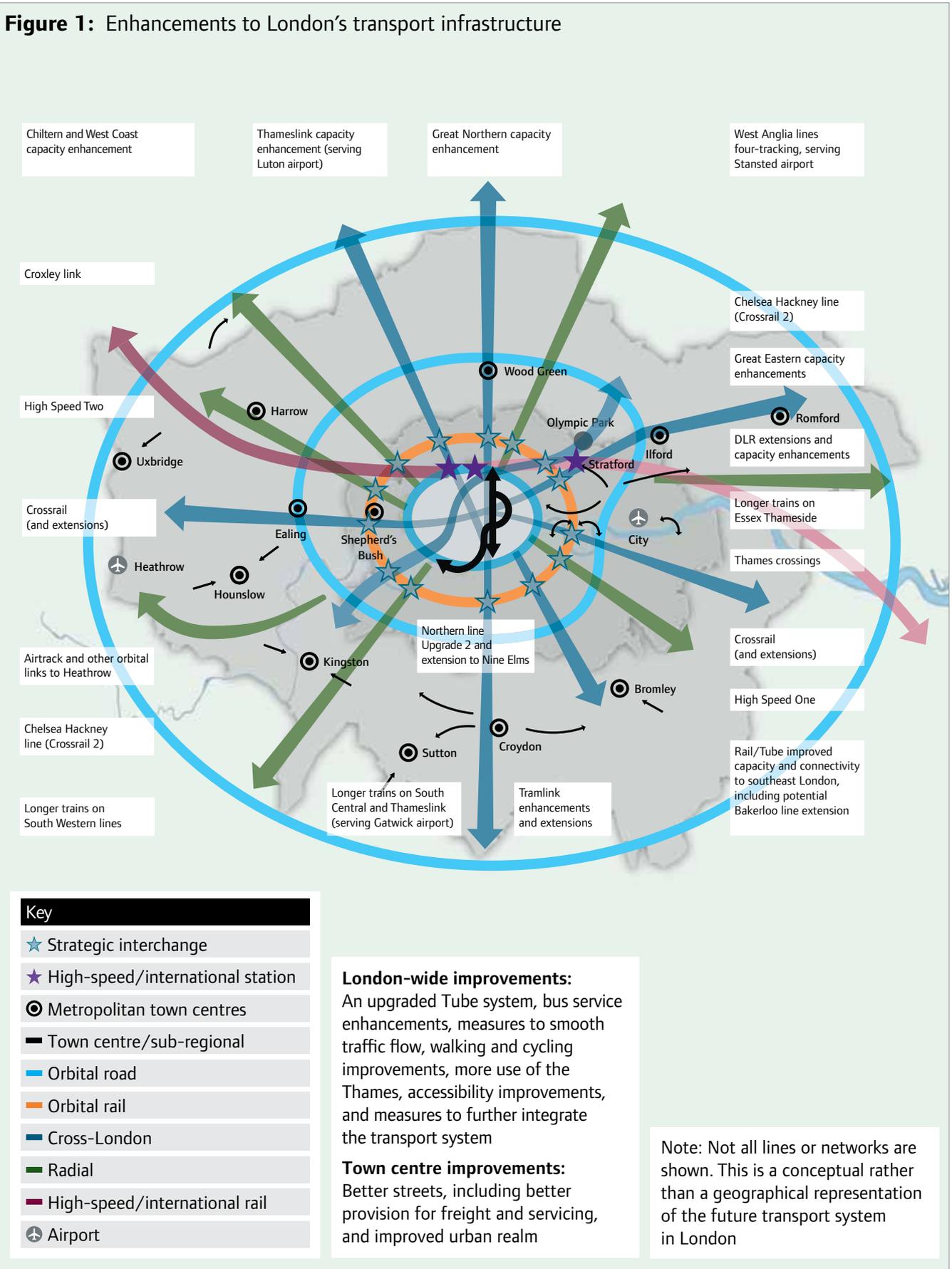
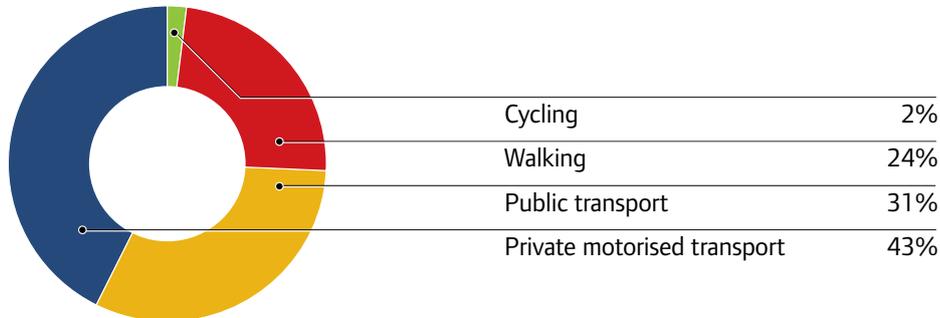
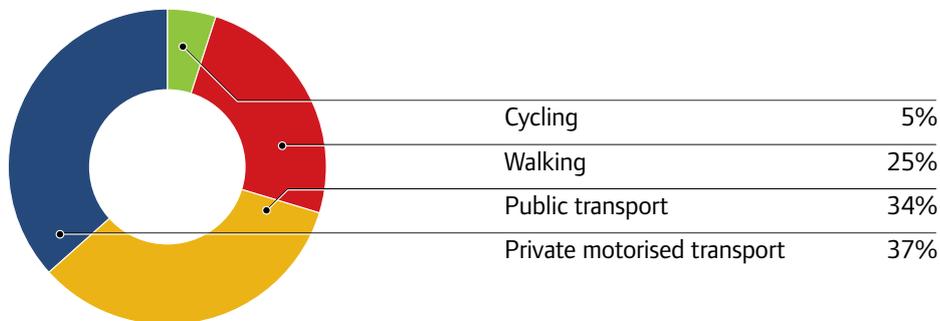


Figure 2: Mode share¹

2006



2031



Note: Do not add up to 100 due to rounding

Assuming no significant changes to road user charging apart from removing the charge in the Western Extension

2.2.2 Proposed outcomes

- 41 Analysis indicates that the change in mode share which could be achieved from the implementation of the MTS is shown in Figure 2, above.
- 42 The overall number of trips² in London is forecast to increase from the current level of 24 million per day to more than 27 million by 2031.
- 43 The six goals embraced by the MTS are consistent with national policy including Planning Policy Guidance (PPG) note 13 and DfT's Delivering a Sustainable Transport System (DaSTS), and will further the Mayoral

strategies' achievement of sustainable development in the period of the London Plan. The transport vision for London recognises the important links between the goals. Individually, the achievement of each goal will deliver tangible benefits, while the achievement of the vision will be greater than the sum of its parts.

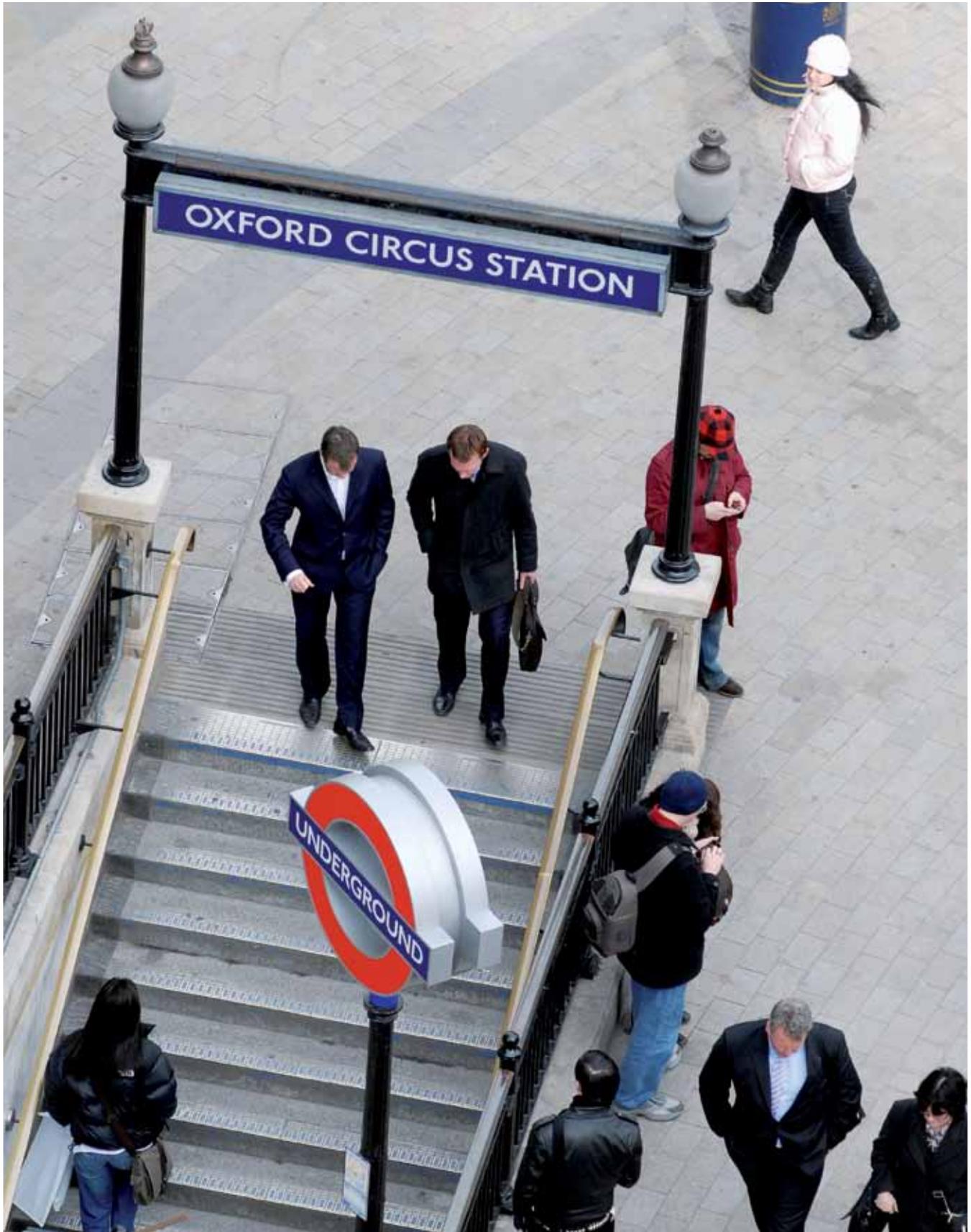
- 44 For each of the goals there is a set of related transport challenges which the strategy will need to tackle.
- 45 The outcomes sought from the MTS, in relation to each of the goals and challenges, are set out in Figure 3.

¹ Based on TfL counts and modelling

² A trip is a complete door-to-door movement, such as from home to the office, and can include several stages within it, such as a walk from home to the station, the journey on a train and then a further walk from the end station to the office

Figure 3: Proposed outcomes

Goals	Challenges	Outcomes
Support economic development and population growth	Supporting sustainable population and employment growth	<ul style="list-style-type: none"> • Balancing capacity and demand for travel through increasing public transport capacity and/or reducing the need to travel
	Improving transport connectivity	<ul style="list-style-type: none"> • Improving people's access to jobs • Improving access to commercial markets for freight movements and business travel, supporting the needs of business to grow
	Delivering an efficient and effective transport system for people and goods	<ul style="list-style-type: none"> • Smoothing traffic flow (managing delay, improving journey time reliability and resilience) • Improving public transport reliability • Reducing operating costs • Bringing and maintaining all assets to a state of good repair • Enhancing the use of the Thames for people and goods
Enhance the quality of life for all Londoners	Improving journey experience	<ul style="list-style-type: none"> • Improving public transport customer satisfaction • Improving road user satisfaction (drivers, pedestrians, cyclists) • Reducing public transport crowding
	Enhancing the built and natural environment	<ul style="list-style-type: none"> • Enhancing streetscapes, improving the perception of the urban realm and developing 'better streets' initiatives • Protecting and enhancing the natural environment
	Improving air quality	<ul style="list-style-type: none"> • Reducing air pollutant emissions from ground-based transport, contributing to EU air quality targets
	Improving noise impacts	<ul style="list-style-type: none"> • Improving perceptions and reducing impacts of noise
	Improving health impacts	<ul style="list-style-type: none"> • Facilitating an increase in walking and cycling
Improve the safety and security of all Londoners	Reducing crime, fear of crime and antisocial behaviour	<ul style="list-style-type: none"> • Reducing crime rates (and improving perceptions of personal safety and security)
	Improving road safety	<ul style="list-style-type: none"> • Reducing the numbers of road traffic casualties
	Improving public transport safety	<ul style="list-style-type: none"> • Reducing casualties on public transport networks
Improve transport opportunities for all Londoners	Improving accessibility	<ul style="list-style-type: none"> • Improving the physical accessibility of the transport system • Improving access to services
	Supporting regeneration and tackling deprivation	<ul style="list-style-type: none"> • Supporting wider regeneration
Reduce transport's contribution to climate change, and improve its resilience	Reducing CO ₂ emissions	<ul style="list-style-type: none"> • Reducing CO₂ emissions from ground-based transport, contributing to a London-wide 60 per cent reduction by 2025
	Adapting for climate change	<ul style="list-style-type: none"> • Maintaining the reliability of transport networks
Support delivery of the London 2012 Olympic and Paralympic Games and its legacy	Developing and implementing a viable and sustainable legacy for the 2012 Games	<ul style="list-style-type: none"> • Supporting regeneration and convergence of social and economic outcomes between the five Olympic boroughs and the rest of London • Physical transport legacy • Behavioural transport legacy



3.1 London's transport geography

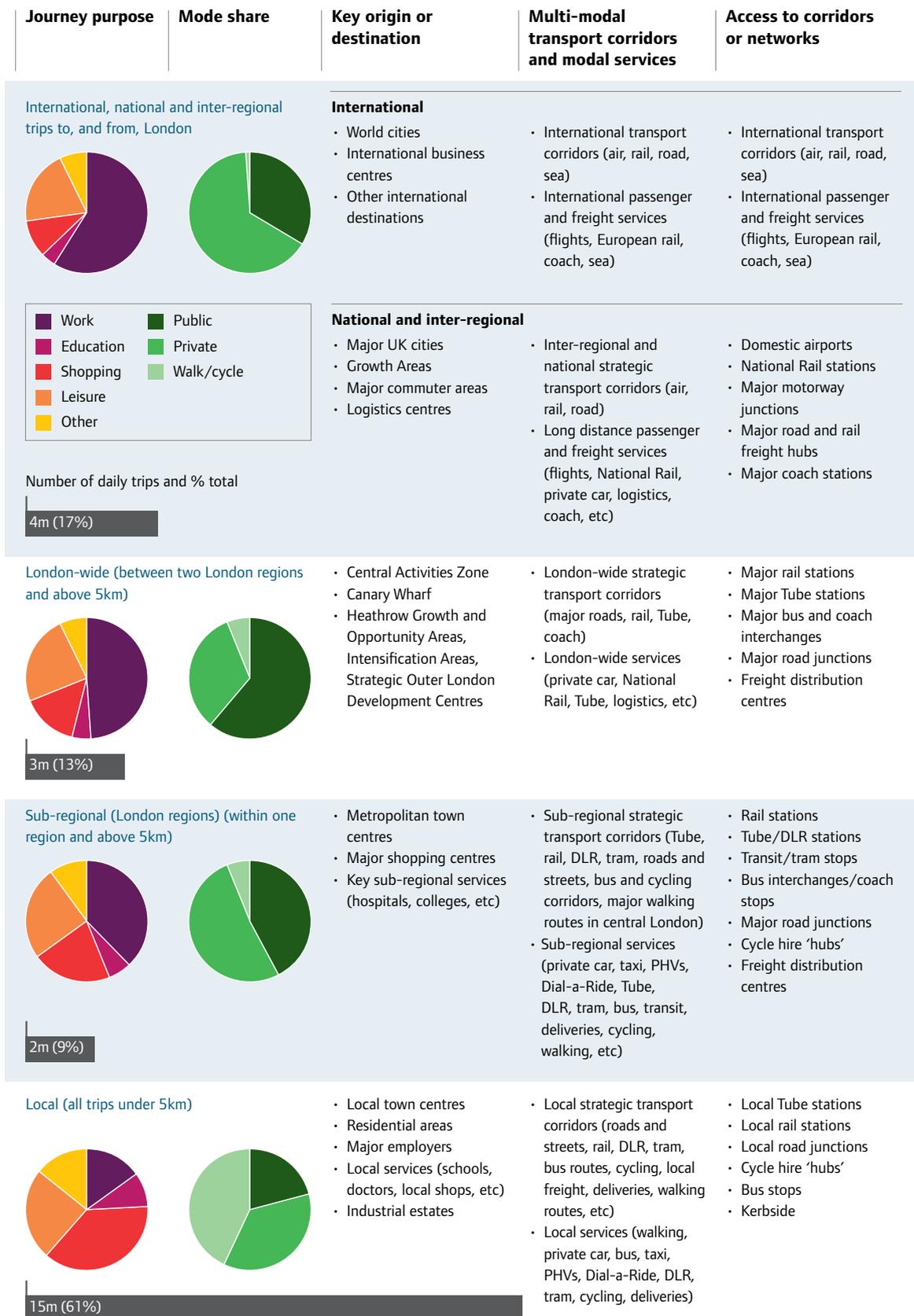
- 46 In order to develop a strategy that will achieve the six goals set out in chapter two, it is essential to have an understanding of London's transport connectivity in a wider spatial context. London's 'transport geography' exists on a number of levels: international, national, regional, sub-regional and local.
- 47 On a global scale, access to, and from, London to international air, sea, coach and rail services are important in economic and geo-political terms. Nationally, access to motorways and National Rail networks provides essential connectivity to, and from, the rest of the UK. Some 70 per cent of all rail travel is to, from or within London, while some 30 per cent of all

National Rail journeys take place wholly within London. At a regional London-wide level, the Underground and rail networks provide fast and frequent connections between London's suburbs and the central area. Locally, transport networks provide for trips to work, visit friends, go shopping, access local amenities and other services including health facilities. The types of journeys people make and the modes of transport used reflect this 'transport geography'. The same is true of freight movements, with long distance journeys made on national and international networks by air, sea, rail and road, for example by HGVs and/or container, and local deliveries on local roads by vans and smaller goods vehicles (LGVs).

- 48 It is essential that the strategy addresses the nature, location and scale of the transport issues arising at each of these levels, and



Figure 4: Travel demand and levels of transport networks serving London



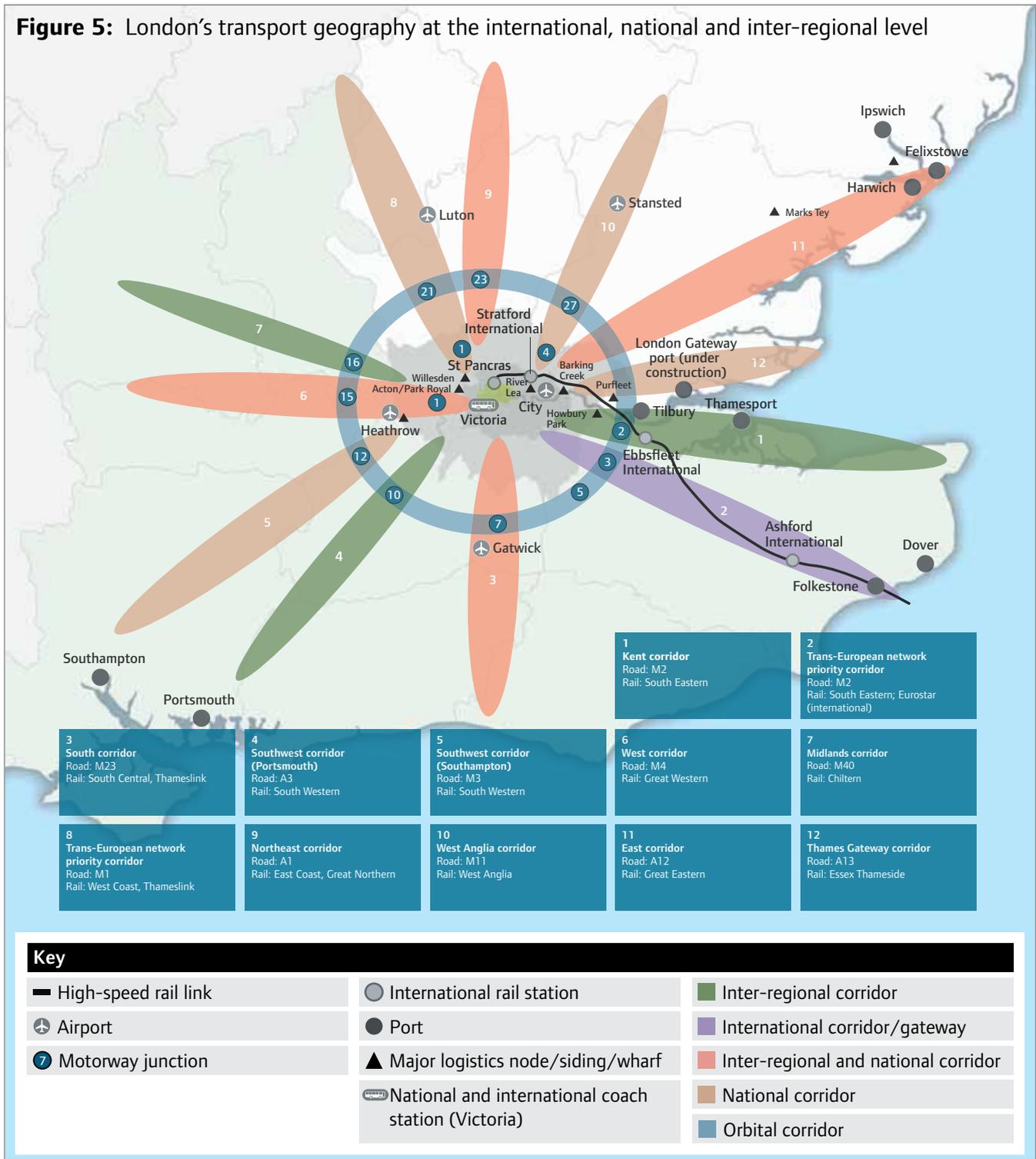
ensures that those organisations best placed to develop solutions to these challenges are enabled to do so. Figure 4 sets out the scale of demand, journey purpose and modes used for each of these levels of travel, and the interchanges between each level – for example, to interchange from the London-wide network to the national network.

- 49 Across London, and at each of these levels, it is possible to identify networks of transport corridors, together with key interchange hubs where they meet or intersect. In central London, many of these routes converge to form a single central hub of huge transport and economic significance. Defining the structure of London's transport geography at each of these levels, through the identification of networks of multi-modal strategic transport corridors, gateways and interchanges, has been important in designing a transport strategy to achieve the outcomes, priorities and solutions needed at each level.
- 50 The strategy requires a coordinated approach to ensure London's transport networks function effectively at all these levels, and to maximise the contribution of each level to the achievement of the goals of the strategy. However, they often share the same transport infrastructure, with different trips and priorities 'competing' for the use of the network. The interplay between these networks is an important factor in the challenges set out in this strategy and solutions will need to address the different types of trips.
- 51 Figure 5 illustrates London's transport geography at the international, national and inter-regional levels.

3.1.1 International travel

- 52 International transport corridors include air, rail and sea modes that bring passengers and freight into and out of the UK. Major international gateways include the five international airports (Heathrow, Gatwick, Stansted, Luton and City), with Heathrow catering for more international trips than any other airport in the world. While many of these gateways are outside the GLA area, they are still vital for London's economy. London is also directly connected to the European high-speed rail network via Eurostar services from St Pancras International. International coach services are accessible via Victoria Coach Station.
- 53 International freight trains, for example, from the Ford plant at Dagenham, link London to the Continent (and other international freight trains from elsewhere in the UK pass through London's rail system en route to mainland Europe). Principal UK international sea ports are also within easy reach of London, including Southampton, Felixstowe, Tilbury and Thamesport. Freight trains compete for rail paths with passenger trains and thus growth in rail freight will limit opportunities to expand passenger rail services. The strategy therefore seeks to remove unnecessary movement of freight by rail through London by supporting enhancements to the rail network outside the Capital to allow more use to be made of alternative routes where there are fewer conflicts.

Figure 5: London's transport geography at the international, national and inter-regional level



54 To sustain its global economic position, it is essential that London maintains these high levels of international connectivity, and continues to improve access to international gateways across and beyond the Capital that connect to international transport networks. Linking these gateways more effectively to regional and local networks and ensuring efficient onward distribution of passengers and goods is equally important.

3.1.2 National and inter-regional travel

National

55 London is the centre of a ‘mega-city region’ in the South East of some 24 million people. Commuters from outside the Capital fill almost one in five of the city’s jobs. It is estimated that the average value of output per worker in Inner London is £54,200 compared to £39,500 across the UK. At the national and inter-regional levels, multi-modal transport corridors incorporate the long distance passenger and freight services that connect London with major cities and other destinations across the UK.

56 Considerable improvements have been delivered in recent years, with upgrades to existing intercity railway lines, notably the West Coast Main Line, reducing average journey times from London to Manchester and Glasgow by 30 minutes. In addition, domestic services on the new international high-speed rail line are set to reduce commuting time from large parts of Kent to London, increasing central London’s employment catchment area.

57 Proposals for a new high-speed rail line between London and Birmingham and beyond are currently being considered by the DfT. These proposals set out in the DfT’s High-Speed Command Paper, published in March 2010, have been developed by High Speed Two, the company set up by the DfT to investigate options for a new high-speed rail line to relieve crowding on the West Coast Main Line, Britain’s most intensively-used intercity route, by 2025. There is scope to shift a considerable number of motorway trips to rail, relieving the M1–M6 (London–Birmingham–Manchester) corridor. Further extensions to Manchester and Leeds would see significant journey time savings, improving connectivity between London and other densely populated regions. Business travellers would be some of the key beneficiaries.

58 The Mayor is supportive in principle of the development of a new high-speed rail line to the north and locating the London terminus in the central area would maximise access to jobs and London’s population, and enable efficient onwards dispersal of high-speed line passengers. The proposals allow access to Heathrow via a connection with Crossrail in west London, though there is a need for further research before the final location of any such interchange can be confirmed

London and its neighbouring regions

59 London is unique among the British regions in that a significant proportion of its workforce resides in neighbouring regions. Coordination of the development of transport networks in London and its surrounding regions is essential

to ensure employers located in London have access to the widest possible labour markets. Therefore the economic success of London and the Greater South East (GSE) are inextricably linked (Figures 6 and 7).

- ⁶⁰ Figure 6 shows London within the context of the GSE, showing neighbouring areas which house the majority of London's non-resident workforce, located within approximately an hour's travel time from central London by rail. Radial trips from areas to the west tend to be less concentrated as there are a number of free-standing, sub-regional employment centres, such as Basingstoke, Reading and Milton Keynes which have experienced strong growth in recent years. Areas to the east of London, such as Kent and Essex, tend to have smaller employment bases, contributing to a greater net out-flow of residential labour, leading to more concentrated flows along radial corridors to London.
- ⁶¹ London has two adjoining regional bodies; the South East England Partnership Board (formerly South East England Regional Assembly, SEERA) and the East of England Regional Assembly (EERA). The Regional Transport Strategy for South East England is contained within the South East Plan, published by the Government in May 2009, and that for the East of England is contained within the East of England Plan, published in May 2008. The significant forecast levels of employment and population growth in the GSE will increase demand for transport to London and need to be catered for in the MTS.

3.1.3 London-wide travel

- ⁶² At a London-wide level, strategic transport networks play an important role in London's economy. Radial connections into central London are important for commuters and other travellers as are radial connections into and out of metropolitan town centres, Growth and Opportunity Areas, Strategic Outer London Development Centres¹ (SOLDCs), employment and service hubs and residential areas. Orbital transport corridors are also important to overall levels of connectivity. In Inner London, these are relatively well-developed and will be enhanced further through the development of the London Overground network. However, in Outer London they are less developed: current services and priority levels for orbital public transport reflect current demands which have tended to be lower in Outer London.
- ⁶³ As can be seen from Figure 7, the key origins and destinations include the Central Activities Zone (CAZ) and other major employment and growth areas identified in the London Plan. The CAZ and Isle of Dogs are the focus for London's high density, high value office employment, specialising in sectors such as financial and business services. Croydon and Heathrow are the two most significant employment locations in Outer London, generating a significant number of orbital commuting trips from elsewhere in the Capital as well as the outer metropolitan area.
- ⁶⁴ Figure 8 shows multi-modal strategic transport corridors across London to include major roads,

¹ The draft replacement London Plan puts forward the concept of 'Strategic Outer London Development Centres' as places with specialist economic functions of greater than sub-regional importance. They are intended to be the locations for strategically significant specialist growth which will not undermine the prospects of town centres or other business locations

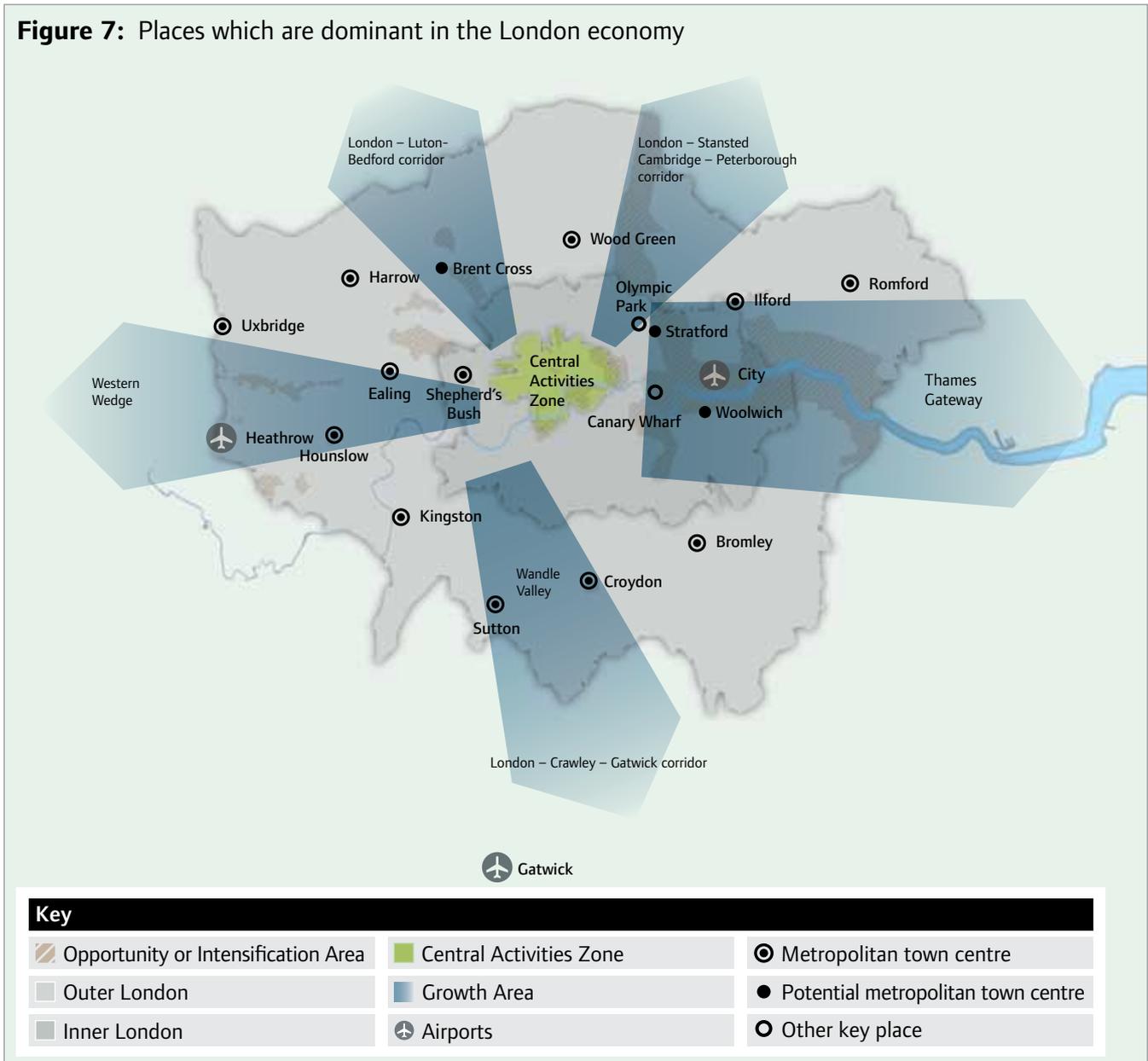


regional rail lines, the Underground and key bus corridors connecting the origin and destination hubs. Existing road and rail corridors are predominantly radial into the CAZ, but there are also major orbital links including the North and South Circular Roads, the emerging London Overground orbital rail route and the M25. Gateways include the rail stations that provide access to the regional rail lines. Major road and rail freight hubs could also act as gateways at the regional level and provide linkages nationally and locally, for example, the planned Howbury Park rail terminal and consolidation centre in Bexley, southeast London.

3.1.4 Sub-regional travel

- 65 TfL has been working closely with the GLA, the LDA and London boroughs to develop an integrated approach to sub-regional transport and land use planning. In recognition of the fact that journeys rarely end at administrative boundaries, the boundaries of sub-regions are intentionally flexible or fuzzy. This also facilitates collaborative working on issues of shared concern, including across the GLA boundary and along growth corridors. The sub-regions and their transport connectivity are set out in Figure 9.

Figure 7: Places which are dominant in the London economy

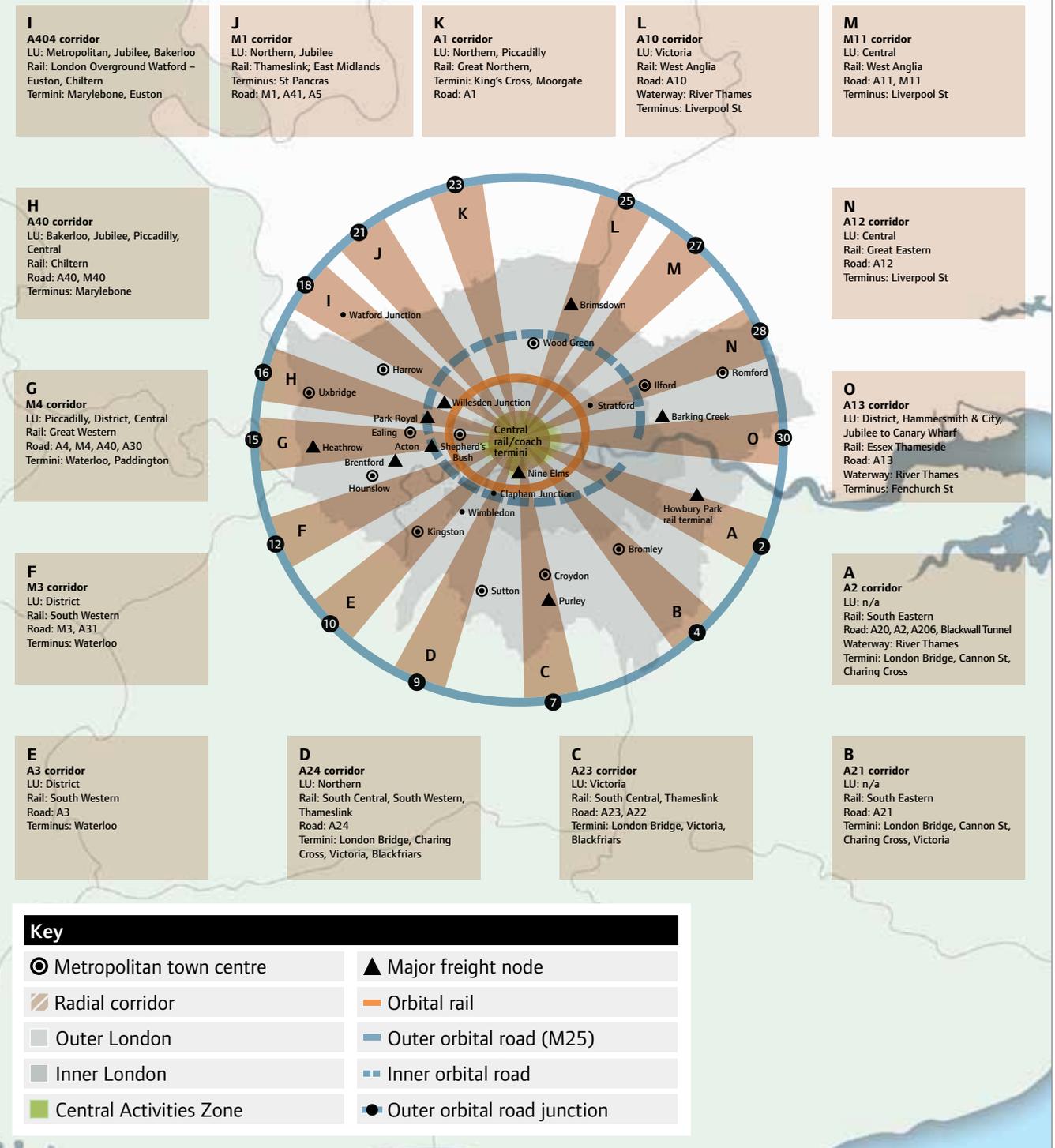


- 66 Historic growth and development patterns have resulted in significant differences in land use and transport infrastructure across London, presenting different challenges, opportunities and priorities for its sub-regions. The transport challenges that affect sub-regional ambitions need to be considered, in keeping with the approach outlined in the London Plan.
- 67 Improving connectivity will be a key priority for metropolitan and town centres and Opportunity and Growth Areas, where accessibility for business, retail opportunities and freight,

as well as education, health and other services, is important for social and economic development.

- 68 Improvements are already being made in sub-regional transport. The bus network has been significantly developed, and the London Overground upgrade will deliver additional capacity and better connectivity. However, connectivity remains strongest on corridors into central London; links into centres not lying within these radial corridors are in many cases poorer.

Figure 8: London-wide transport geography



- 69 Figure 9 illustrates the transport connections across London that serve the key places in the sub-regions, and also shows Opportunity and Growth Areas. Issues on these connections, and 'missing' connections will tend to require careful consideration as they play a crucial role in sustaining the sub-regions' development.

South London sub-region

- 70 South London primarily consists of the boroughs of Bromley, Croydon, Kingston, Merton, Richmond, Sutton and Wandsworth. It is mostly suburban in nature, with large areas of green space, lower density housing and strong town centres. The population of the region is forecast to grow by seven per cent to around 1.8 million in 2031¹. South London is especially reliant on the National Rail network for access into central London as there is limited access to the Underground network. Orbital travel within the region is mainly catered for by buses, with some orbital rail services, and Tramlink serving areas around Croydon.

East London sub-region

- 71 East London primarily consists of the boroughs of Tower Hamlets, Hackney, Newham, Greenwich, Bexley, Barking & Dagenham, Redbridge, Lewisham and Havering. It incorporates many communities and town centres, including the metropolitan town centres of Romford and Ilford. The region's population is forecast to grow by 28 per cent to 2.6 million in 2031². Much of the region

lies within the Thames Gateway Growth Area. The 2012 Games will also create legacy opportunities. The Thames has significantly influenced the pattern of land use and still presents both opportunities and transport challenges. The decline in the use of London's docklands for the movement of freight has led to significant regeneration initiatives and opportunities – with Docklands showing the potential for transformational redevelopment.

West London sub-region

- 72 West London primarily comprises the boroughs of Hillingdon, Harrow, Brent, Ealing, Hounslow and Hammersmith & Fulham. It is home to four metropolitan town centres (Ealing, Harrow, Hounslow and Uxbridge), the largest industrial park in London, and the largest urban shopping mall in Europe. The population of the region is forecast to grow by 10 per cent to 1.6 million in 2031³. While trips to central London are well-served by public transport (though often crowded), orbital links are far more limited. The region also includes Heathrow airport, the destination for more than 45,000 trips daily by London residents, of which over half are made by car.

North London sub-region

- 73 North London primarily comprises the boroughs of Barnet, Enfield, Haringey and Waltham Forest, but also considers transport issues in the parts of Camden, Hackney and Islington which lie outside central London. It is polycentric, with one metropolitan town centre

¹ Based on GLA forecasts, 2010

² Based on GLA forecasts, 2010

³ Based on GLA forecasts, 2010

Figure 9: London-wide transport connectivity

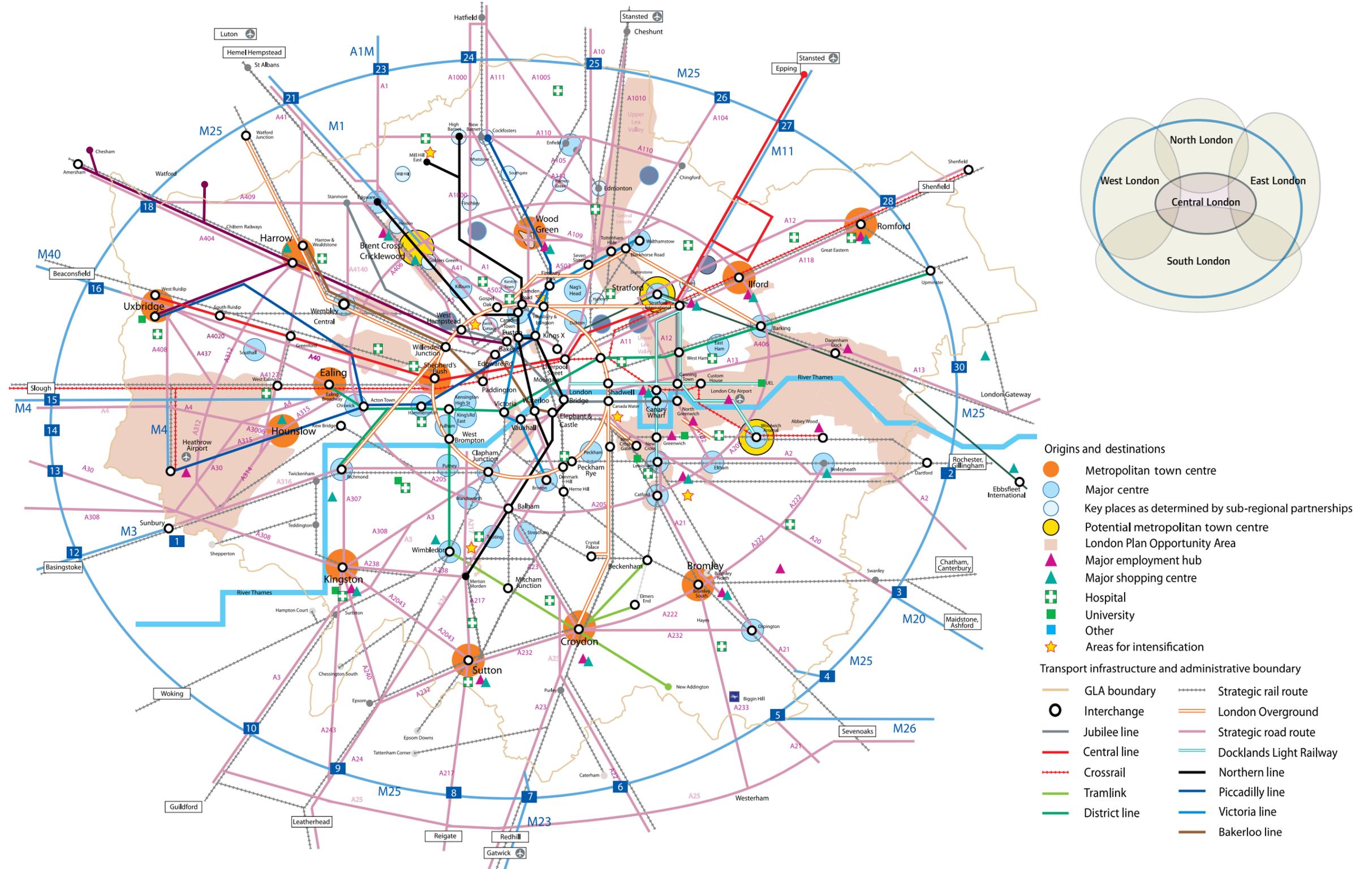


Figure 9: London-wide transport connectivity

(Wood Green) but many district centres. Barnet has more district centres than any other borough. The population of the region is forecast to grow by 15 per cent to over 1.2 million in 2031¹, with the most growth in Brent Cross/Cricklewood, Colindale and Upper Lea Valley. Many of these areas lie adjacent to transport infrastructure, but ensuring capacity for sustainable population and employment growth remains a challenge.

Central London sub-region

- ⁷⁴ Central London comprises the Cities of London and Westminster, the boroughs of Camden, Islington, Southwark and Lambeth and the Royal Borough of Kensington & Chelsea. The population is forecast to grow by 18 per cent to around 1.6 million by 2031².
- ⁷⁵ The variety and intensity of activity in the area, reliance on public transport, and continuing growth in journeys to, from and within it, place significant strains on the transport network, requiring efficiency and reliability. While most of central London has high levels of accessibility, there are areas at its fringes where this is not the case, and improving accessibility and supporting regeneration is important. In addition, Opportunity and Intensification Areas have the potential to change and expand the CAZ further, with opportunities for new development and employment growth.
- ### 3.1.5 Local travel
- ⁷⁶ Ensuring good door-to-door journey time and facilitating local movement in town centres, residential areas, and to local employers, services and leisure opportunities is essential for London's economy, and for the maintenance and improvement of people's quality of life. Representing more than 70 per cent of trips made by London residents, local trips are those millions of trips under five kilometres which are made daily to schools, local shops, leisure centres, health facilities, banks, etc. It is important to note that all journeys – whether seeking to access international or sub-regional transport networks – tend to start and end on the local transport network. For freight deliveries, for example, the ability to access premises and load and unload is vital.
- ⁷⁷ Shopping (and personal business) is the most common trip purpose for a local trip, accounting for more than a third of trips³. This is followed by leisure, which represents around a quarter of trip purpose. It is more sustainable and less costly for people to access goods and services which meet their needs locally. This saves journey time and reduces demand on the transport system. It is therefore beneficial for individuals and the transport system as a whole by reducing costs and congestion. As a majority of local trips are made by walking, cycling and public transport, their encouragement would support the achievement of CO₂, PM₁₀ and NO₂ emission reduction

¹ Based on GLA London Plan forecasts, 2010

² Based on GLA London Plan forecasts, 2010

³ Based on local trips made within a region (Travel In London, report number 1)

objectives. Local trips form the vast majority of journeys: everyone makes local journeys almost every day. It is therefore essential to facilitate local trip making, especially by walking, cycling and public transport.

- 78 More specifically, local trips in London are predominantly made by walking and cycling if the distance is less than half a kilometre. The car and bus are used for longer local trips between one and five kilometres, with lower levels of walking and cycling. A challenge will

therefore be to encourage further modal shift towards walking, cycling and the bus network for those short distance trips. In central London, where the average trip distance is smaller than in other London sub-regions, walking is the dominant mode of travel for almost half of all trips. However, further modal shift from the car and the Underground towards the bus, walking and cycling should be encouraged as some local trips are faster by bus, foot or cycle than Tube or private car.



- 79 To facilitate local travel, some improvements have already been made, for example, the bus network has been developed to improve local connectivity, with an increase in service volume of about 40 per cent in the last 10 years. However, more could be done to improve local movements, especially with regard to the urban realm and the provision of cycle parking, kerbside loading and delivery bays. A better allocation of surface space between pedestrians, cyclists and motorised modes is also required to cope with increased pressure on space and demand for a better journey experience for all.
- 80 Longer distance trips also entail local movement such as a walk to the bus stop, rail station, and sometimes a further local journey stage to the final destination. Improving access to stations, to buses, taxis and, when relevant, to private car users will also play an important role in improving door-to-door journey time.
- 81 At the local level, local, sub-regional and London-wide transport priorities are delivered through the borough LIPs and through Local Area Agreements, providing linkages between transport improvements and local economic and community development priorities. Further details of this process are given in part three, chapter seven, Delivery processes (Implementation plan).

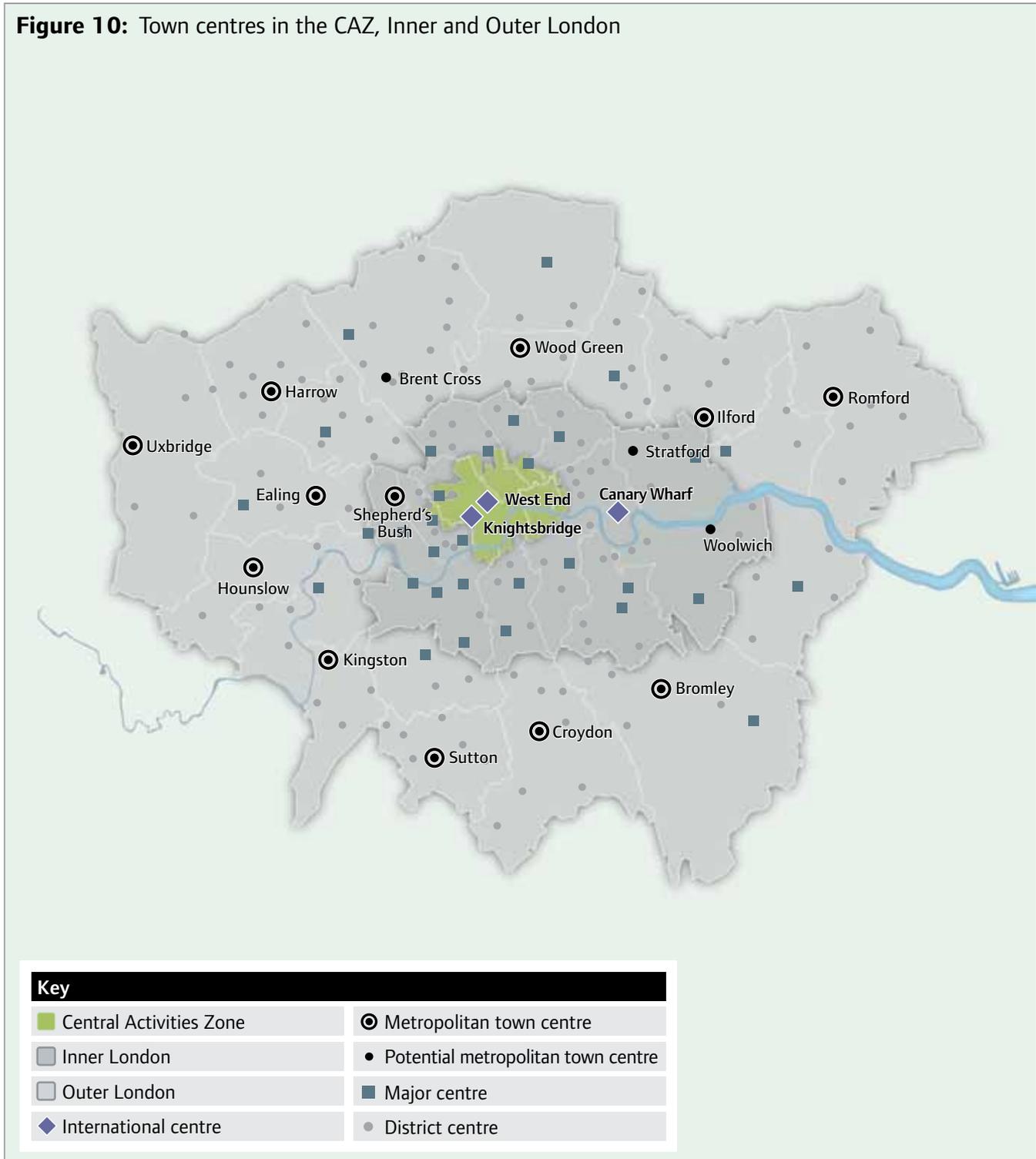
3.2 Integrating transport and land use planning

- 82 One of the Mayor's guiding principles, set out in 'Way to Go!' and underpinning the development of the new MTS, is to improve the integration of transport and land use planning. The combined review of the London Plan and the MTS, together with the parallel review of the Mayor's EDS, provides a major opportunity to achieve this.
- 83 London's land use planning geography can be divided into three discrete areas: the CAZ and Inner and Outer London, shown in Figure 10. While these areas can of course be further sub-divided in terms of specific land uses, they have a number of defining features that characterise them and help shape the transport challenges and priorities that the MTS must address.

3.2.1 Central Activities Zone

- 84 The CAZ comprises the City of London, the majority of the City of Westminster and parts of the London boroughs of Camden, Hackney, Islington, Lambeth, Southwark, Tower Hamlets and Wandsworth and the Royal Borough of Kensington & Chelsea. Canary Wharf is outside the CAZ, however, the linkages between the Isle of Dogs and the CAZ are critical to the business located in those areas.
- 85 The CAZ, while relatively small in area and home to less than four per cent of London's population (see Figure 13), currently contains more than a quarter of all London's jobs and is

Figure 10: Town centres in the CAZ, Inner and Outer London



the most economically productive part of the city. Uniquely (in London and the UK generally) much of this economic activity is global in scale, requiring high quality national and international connectivity to sustain it.

- 86 Morning peak travel into the CAZ is predominantly by public transport, with around 90 per cent of journeys made by bus, rail, or Underground. Within central London, walking is the predominant means of getting about, making up three quarters of trips wholly within the area, and plays a key role in the onward dispersal of passengers. While cycling makes up only a small proportion of the trips into and within the CAZ, it has increased significantly by around 90 per cent between 2000 and 2007¹. The world city functions within the CAZ also require significant freight and servicing activity, for example, in the original central London Congestion Charging zone, LGVs and HGVs make up about 25 per cent of the circulating traffic. The CAZ is intensively used and the trend is for more and more demands to be placed on it through the day and, in many areas, into the night. All these different demands mean that there are significant challenges facing the transport network in the CAZ and around its fringes.
- 87 This area contains more than a third of London's population. Many of London's areas of deprivation and regeneration are concentrated in Inner London, particularly around central London in a band from the northeast to the southeast. The London Plan identifies a number of Opportunity Areas on the eastern and southern fringes of the CAZ, and also in the Lower Lea Valley, around Brent Cross/Cricklewood in the north and in inner east London along the Thames Gateway. Canary Wharf is located in Inner London, but has many characteristics of the CAZ in terms of employment and travel behaviour.
- 88 Inner London is also the location for many London 2012 Olympic and Paralympic Games events with the Olympic Park at Stratford, and events being held around Greenwich, Docklands, Earls Court and Wembley, among other places. Ensuring that there is a lasting transport legacy for Inner London, with improved infrastructure and opportunities, is an important challenge.
- 89 Although less densely developed than central London, the Inner London boroughs are characterised by higher population and land use densities than those in Outer London. Although car use is higher than in central London, travel is generally still highly dependent on public transport and walking. While public transport accessibility is much higher in Inner than in Outer London, there remain pockets (mainly away from the radial rail corridors and the Underground network) where accessibility is poor.
- 90 Around one quarter (24 per cent) of Londoners' trips are entirely within Inner London. Walking accounted for the majority of trips within Inner London (46 per cent) with

¹ On the Transport for London Road Network, ie excluding cycling on borough roads

journeys by car accounting for 26 per cent, journeys by bus 18 per cent and journeys by Underground and rail seven per cent¹.

- 91 One of the key challenges for Inner London is tackling public transport crowding and road congestion, which have negative impacts on quality of life and the economic development of town centres within the area. The rail network is dominated by radial lines into central London which mostly originate from Outer or 'out of' London. As a consequence, Inner Londoners often experience severe crowding on radial rail services, making journeys less reliable and significantly less comfortable. Highway congestion is also a major issue. This has a negative impact on the reliability and efficiency of bus services, taxi and car journeys and the movement of freight.

3.2.3 Outer London

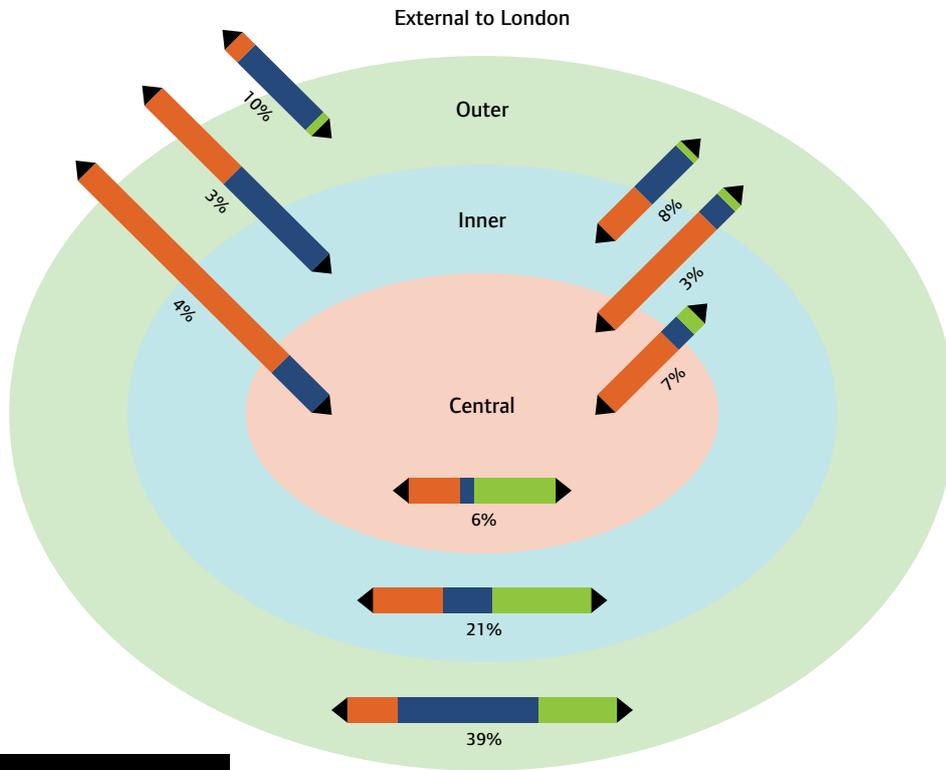
- 92 Sixty per cent of Londoners live in Outer London, which tends to be characterised by lower density development and higher residential populations. Outer London contributes significantly to the city's economy, providing 42 per cent of its jobs². Employment tends to be concentrated in the 12 metropolitan town centres which are the equivalent, in terms of the size of their economies, to many regional cities across the UK³. Heathrow airport is also a major centre of employment in Outer London. While there are, in general, fewer deprived areas than in Inner
- London, significant areas of deprivation exist, for example, in Barking & Dagenham and parts of Bromley and Enfield. A challenge for Outer London is therefore to improve access to jobs, services and opportunities to tackle deprivation and encourage inward investment and local job creation.
- 93 In Outer London, the car is the dominant mode of transport for trips originating there, accounting for 52 per cent of all trips by residents. London-wide, 48 per cent of all trips by residents are solely within Outer London. In 2006, around 70 per cent of London's road-freight mileage was in Outer London. Figure 11 shows the different modal split between journeys in Outer, Inner and central London and illustrates the higher mode share of car journeys in Outer London. Trip patterns tend to be more dispersed within the area due to larger distances between town centres. Much of this trip-making is radial to, and within, Outer London centres. Bus services provide an extensive network of local services into town centre hubs. However, with suburban trips being 'dispersed' and/or 'edge of centre' to 'edge of centre' in character, public transport connections therefore tend to be less direct, and take longer relative to car journeys. Many journeys in Outer London are short in distance and could be made by bicycle.
- 94 While average vehicle delays are lower in Outer London than Inner or central London, there are still areas where significant congestion

¹ TfL Travel in London report, 2009

² Planning for a better London, GLA, 2009

³ The new London Plan identifies Shepherd's Bush as a new metropolitan centre

Figure 11: Spatial pattern of travel across London, with mode shares

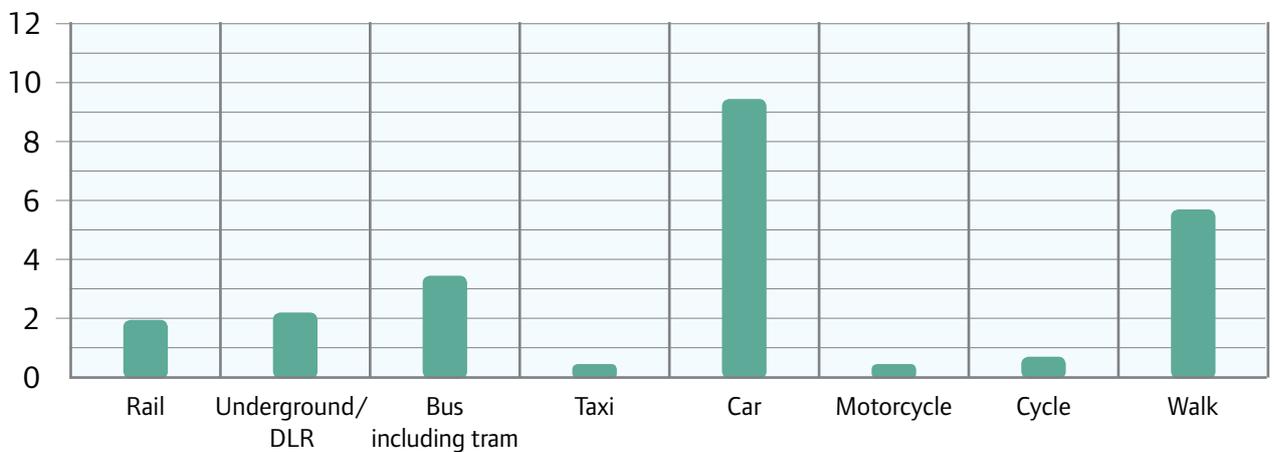


Key

- Public transport
- Car
- Walking and cycling

Note: Percentages are the daily 2005 to 2008 average proportion of all trips made to, and from, or within London. Figures include trips made by London and non-London residents and exclude freight. Data in this Figure is calculated using the Central Statistical Area. This covers a similar area to CAZ

Figure 12: Daily average number of trips (millions) in London, 2007



Note: Estimates of the daily average number of trips in London (including trips to, or from, London)

occurs, particularly in and around metropolitan town centres. Without adequate transport infrastructure improvements, as population and employment levels grow, delays to private, business, public transport and freight journeys are likely to increase, with journey time reliability deteriorating.

- 95 About one third of all trips within Outer London are made entirely by walking.
- 96 An aggregation of the trips shown in Figure 11 is shown in Figure 12. In terms of number of trips (though not necessarily total kilometres travelled), car is the dominant mode of transport, followed by walking, while bus is the third most used.

3.3 Planning for London's development

- 97 As set out by the London Plan, London is forecast to experience significant population and employment growth in the period to 2031. This is summarised in Figures 13, 14 and 15.
- 98 Historically, the spatial planning of London has reflected market developments and perpetuated an overall 'radial-centric' pattern of planning. Employment growth has largely been concentrated in central London (making the most of its economic productivity and agglomeration benefits) with some growth in metropolitan town centres and business parks, while housing development has been more dispersed. This has been an economically successful strategy, and the ability of public transport networks to more easily support such movements has contributed to a positive modal shift away from private car use that is unique in a city of London's size.

Figure 13: Population and employment distribution and forecast growth¹

	Population				Employment			
	2007(m)	2031(m)	2007(%)	2031(%)	2007(m)	2031(m)	2007(%)	2031(%)
CAZ	0.3	0.3	4	4	1.2	1.4	26	25
Inner (excl CAZ)	2.7	3.4	36	38	1.5	1.9	32	35
Outer	4.6	5.1	60	58	2.0	2.2	42	40
Total	7.6	8.8	100	100	4.7	5.5	100	100

¹ These projections have been supplied by the GLA. They are consistent with the projections underpinning the draft London Plan and Economic Development Strategy. The GLA update population and employment projections for London usually on an annual basis. Significant changes would influence the forecast levels and patterns of travel demand

Figure 14: Spatial distribution of population growth, 2007 to 2031

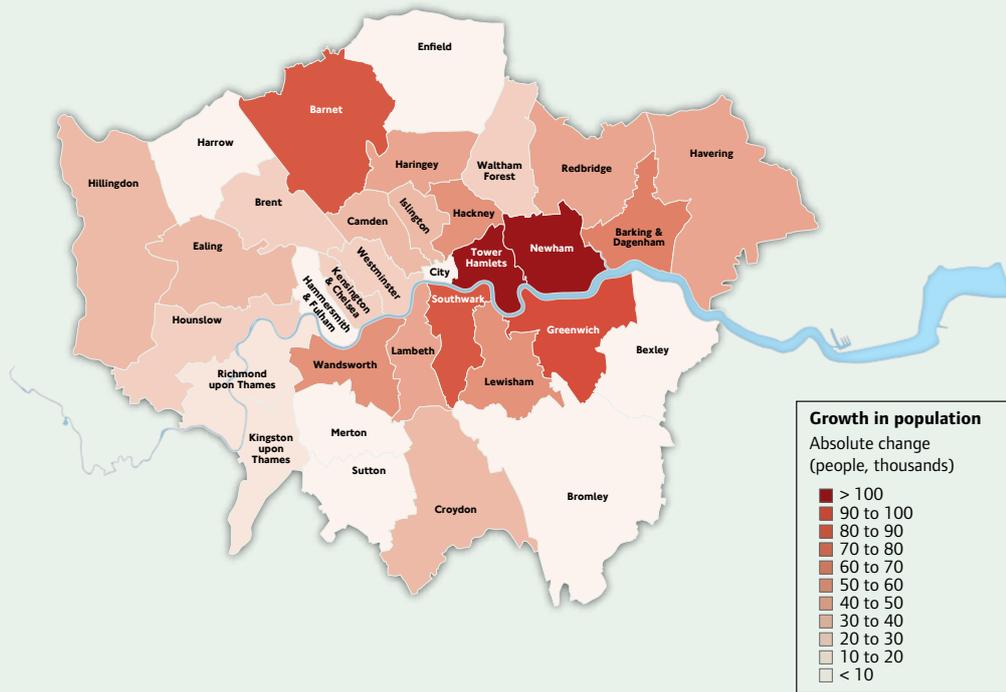
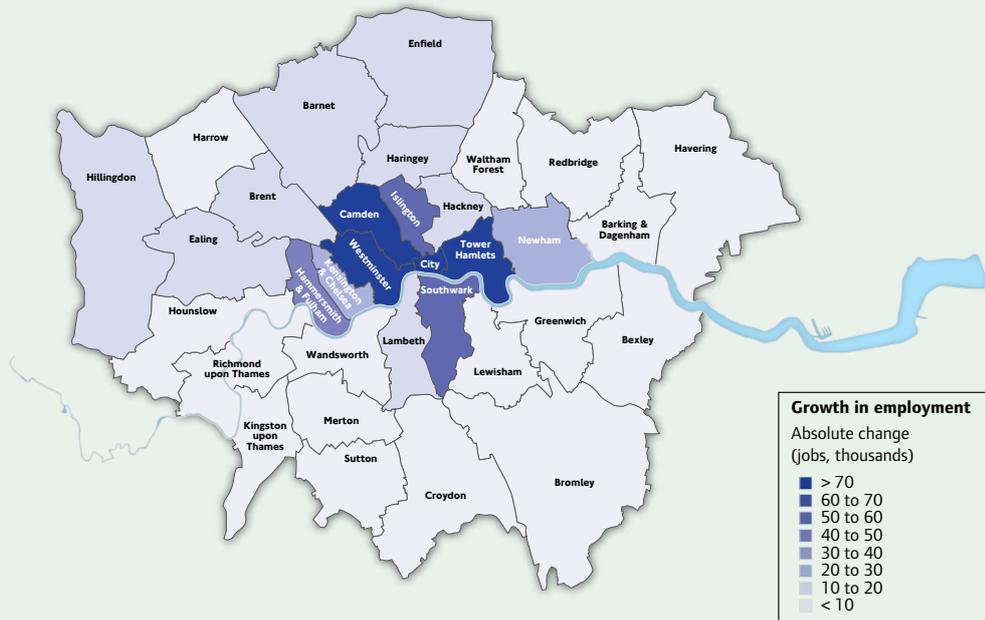
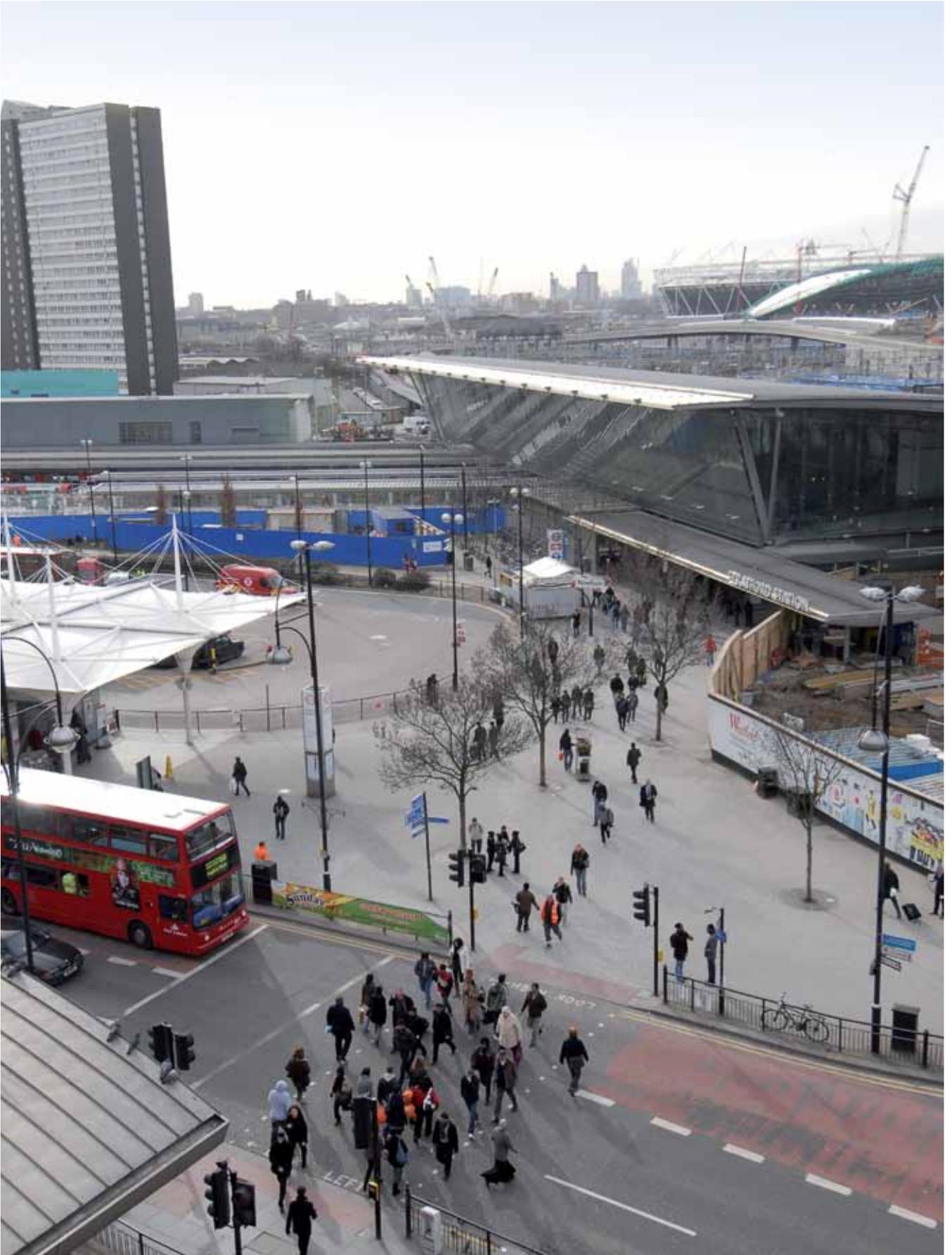


Figure 15: Spatial distribution of employment growth, 2007 to 2031



- 99 The trend of concentration of employment growth in central London is likely to persist: on current forecasts, over the next 20 years, 35 per cent of London's future employment growth is expected to be located within the CAZ and Canary Wharf. The CAZ will therefore continue to be important not only for London's economy, other areas of London and the surrounding regions, but for the UK as a whole.
- 100 Housing growth, however, will be more dispersed, albeit with highest rates of growth in Inner London. This pattern of growth has, and will continue to, place ever greater strains on the capacity of the radial transport networks into and out of central London, requiring the provision of ever more radial transport capacity.
- 101 Although continuing support of the economic development of the CAZ will remain a priority, the Mayor is determined to improve the provision of public transport while also placing more emphasis on the economic development of Outer London. The Outer London Commission was set up specifically to investigate and report on how this might be achieved. To support this work, the GLA, LDA and TfL undertook extensive analyses of various land use, transport and economic development scenarios. These tested differing sets of assumptions about the pattern of future jobs and housing growth, with greater levels of employment assumed in the Outer London town centres and proportionally less in the centre. In particular, by using high level transport modelling, this work sought to understand the overall implications of such a shift of emphasis on the key challenges identified in chapter two.
- 102 In transport planning terms, this work identified a number of significant implications. Locating more employment growth in Outer London (assuming this is offset by central London employment growing at a slower rate than previously assumed) can reduce trip lengths and bring about reductions in central London crowding and congestion. However, higher growth in Outer London, without any change in transport provision, could lead to more congestion and a small overall rise in London-wide transport-based CO₂ emissions. This is because existing trip patterns within Outer London are more car-dependent and less public transport-focused than trips from Outer London to central London. On its own, therefore, such a change of development focus does not achieve a wholly better transport outcome. Also, the transport improvement required to support such development could not be sustained without significant growth in Outer London which would undermine the 'suburban character' of many areas that the boroughs wish to maintain.
- 103 The key conclusion of the interim report from the Outer London Commission was that raising the economic performance of Outer London does matter – to Outer London, to London as a world city and to UK economic performance¹. However, the Commission considered that suitable levels of growth should be concentrated in already successful areas and not start from scratch; in particular, that the Outer London town centres should be the focus of transport investment to support

¹ Outer London Commission, 2009, Interim conclusions



this. MTS policies and proposals therefore reflect this approach.

¹⁰⁴ The MTS will also support other growth and intervention areas identified in the London Plan, for example, Opportunity and Intensification Areas, regeneration areas, Strategic Outer London Development Centres, and Strategic Industrial Locations (SILs). There are very large increases in housing and employment planned for many of these specific locations in the fringes of central London, the Thames Gateway and also in Outer London including Croydon, Brent Cross and Heathrow. These developments will need to be supported by transport improvements to ensure they are integrated within London's transport network, including maximising opportunities for walking and cycling.

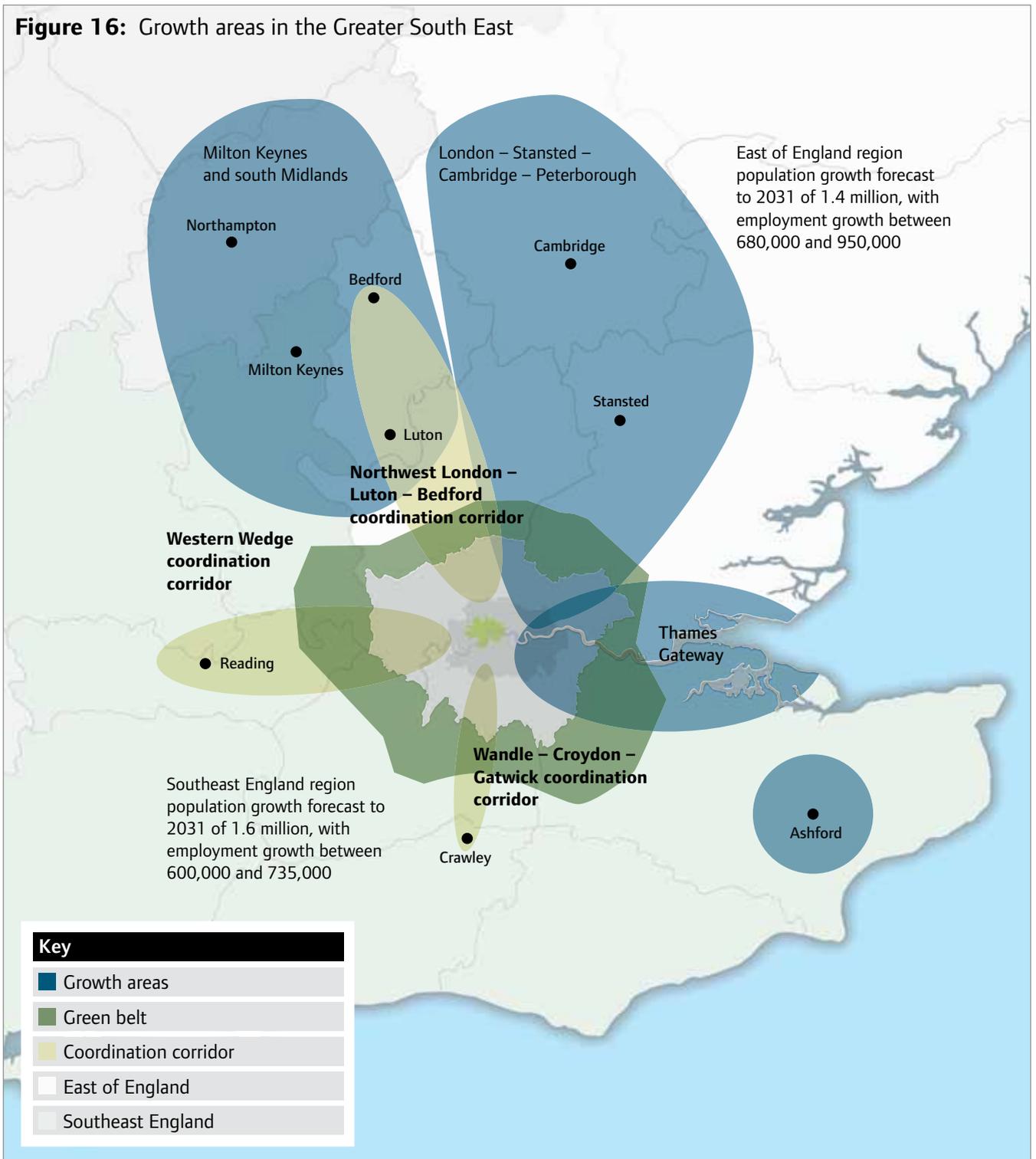
3.3.1 Regional population and employment growth

¹⁰⁵ Regional growth in southeast England also has implications for London's transport strategy. Southeast and the east of England regional population growth is forecast to increase by three million by 2031, shown in Figure 16.

¹⁰⁶ This growth can be expected to increase the volume of travel between the regions and London, placing further demands on the regional motorway and trunk road networks and regional rail services. The MTS seeks to address this by proposing improvements to inter-regional transport connectivity and capacity.



Figure 16: Growth areas in the Greater South East



Mayor's Transport Strategy – Part two

Challenges, policies and proposals



Chapter four – Challenges and strategic policies

4.1 Introduction

- ¹⁰⁷ Chapter three has set out the context for the transport strategy: London's transport system provides international, national, London-wide, sub-regional and local connections. The way in which different modes are used reflects the land use pattern of London, with marked differences between the CAZ, Inner and Outer London. London is forecast to experience significant growth in population and employment which have implications for the transport strategy.
- ¹⁰⁸ This chapter describes the main challenges facing the transport system within that context, and sets out the policies required to meet the strategy's six goals. The chapter considers each goal and its related challenges, as identified in Figure 2, in turn.
- ¹⁰⁹ This and the following chapter set out a number of policy commitments or requirements, which have implications for TfL and a range of other delivery partners, including the London boroughs, the GLA, LDA, ODA, Network Rail, the police and DfT. These commitments and requirements fall into two categories: policies and proposals. Policies are shown in red boxes, and proposals in green. The proposals that are directly related to the delivery of the policy are listed under it. These proposals are then set out in chapter five. It should be noted, however, that the strategy forms a complete package and all proposals contribute to some extent to achieving each of the strategy's goals. Details of proposals that are currently funded or unfunded are set out in chapter seven¹.

4.2 Supporting economic development and population growth

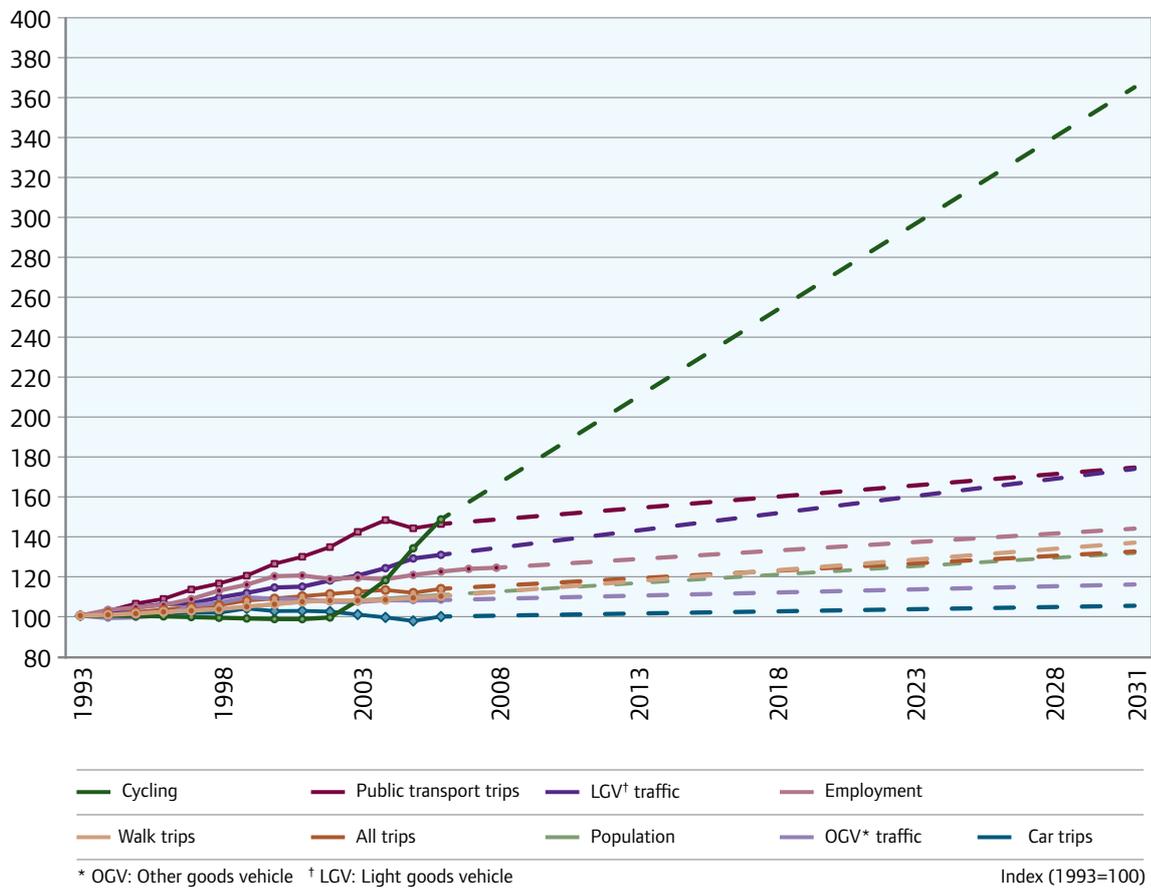
4.2.1 Supporting sustainable population and employment growth

London's growth

- ¹¹⁰ As highlighted in chapter three, London's economy and population have expanded significantly since the early 1990s, and are projected to grow further in future. In 2007, the city was home to 7.6 million people and 4.7 million jobs, generating about 24 million trips a day. In spite of the current economic conditions, around 1.25 million more people – and more than 750,000 additional jobs – are expected to be accommodated in London by 2031, which in turn, will lead to at least three million more trips each day.
- ¹¹¹ Figure 17 shows recent trends in travel demand and the forecast levels to 2031, assuming delivery of the current TfL Business Plan and National Rail High Level Output Specification (HLOS) investment. Use of public transport and cycling will rise at a faster rate than population growth, while car use (for London as a whole) increases only marginally².
- ¹¹² Growth in freight movement is also expected, with the number of LGVs forecast to grow by up to 30 per cent between 2008 and 2031, accounting for 15 per cent of traffic

¹ Links between the MTS and London Plan policies can be found in Annex B

² Travel in London 2, Table 2.1, TfL 2010. Trips are indexed to show relative differences in growth rates. They originate from data for complete one-way movements to, from or within London on an average day. In the base year (1993) there were 20.9 million trips daily in total (5.1 million public transport, 10.3 million private motorised transport, 0.3 million cycle, 5.2 million walk trips)

Figure 17: London trends and forecast in population, employment and trip making, index from 1993

London trends (since 1993) and 2031 projections for population, employment and trip-making – with TfL Business Plan and HLOS National Rail investment. The MTS package, including currently unfunded policies, will affect the trends in trips including achieving the Mayor's aim of a 400 per cent increase in cycling from 2000. This assumes constant trip rates. However, trip rates may vary and hence these forecasts should be considered as indicative

on London's roads. Freight tonnage carried by rail is expected to increase by 30 per cent nationally between 2006 and 2015, although some 85 per cent of all freight movement will remain carried by road.

Growth in demand for travel between London and neighbouring regions

113 Increases in trips in all areas are forecast, however, there is likely to be strong growth in trips from outside the London area, reflecting the strong linkage between the economies of London and the Greater South East and population and employment growth

in these neighbouring regions. Rail demand (passenger kilometres) is projected to grow by approximately 35 per cent between 2006 and 2031. Many parts of the network are already at capacity or will reach it long before 2031. However, while planned improvements will alleviate crowding on many routes, significant crowding will remain in certain key locations. If no action is taken to increase London's national connectivity by rail, growth will be constrained and more traffic will be forced on to already congested roads.

Growth in demand for travel within London

- 114 Strong growth in demand will occur in Inner London as a result of significant increases in population and jobs in this part of the city. This will exert pressure on the already congested roads and more crowded public transport in this area.
- 115 Demand increases on radial routes to central London puts pressure on the rail and Tube networks and increases crowding, while increases in travel in Outer London tends to put pressure on the road network (cars and buses) and hence increases congestion.
- 116 If London is to develop more sustainable patterns of growth and development, a more effective integration of land use and transport planning is needed. CAZ and the Docklands will remain the focus for the most significant employment growth, and radial transport links will continue to be essential for commuting into central London. This growth will put further pressure on these radial links and increases the need for investment in new rail, the Underground; and to make best use of the bus network and manage the limited road space even better.
- 117 The London Plan also seeks to support the development and growth of Outer London in appropriate locations, such as the town centres (and thus closer to where people live) and strategic development centres. This requires improvement in radial connectivity to central London as well as improving transport links into metropolitan and other Outer London town centres.

Policy 1

The Mayor, through TfL, and working with the DfT, Defra and other government agencies, regional development agencies, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to develop London's transport system in order to accommodate sustainable population and employment growth.

This policy is taken forward by the proposals in chapter five.

4.2.2 Improving transport connectivity

4.2.2.1 Supporting and developing London's international, national and inter-regional transport connectivity

- 118 London is an international city, rivalled only by New York in its role in the global economy, and as such it is reliant on the international trade of skills, goods and services. It is a leading city destination in the world for international travel, attracting around 15 million international and 11 million UK overnight visitors every year. London also makes a vital contribution to the UK economy, generating 18 per cent of the country's Gross Value Added from only 13 per cent of the population. It is also the centre of the Greater South East, the fastest developing area in the country, and the 2012 Games will showcase the city to a global audience.



119 Sufficient, fast, efficient and reliable international, national and inter-regional links are therefore essential for continued success of the London and UK economy. Expanding access to business and employment markets and improving the speed and reliability of passenger and freight movements will maximise the efficiency of business operations and improve productivity. A number of improvements are being delivered over the next 10 years and further improvements beyond 2017 will be required to ensure London remains a premier world city. Improved international, national and inter-regional links also form part of the DfT's national transport strategy, 'Delivering a Sustainable Transport System'.

120 The Mayor recognises the important role of aviation in providing international connectivity vital for London's economy. However, he believes the aviation industry should meet its full environmental and external costs, as set out in the draft replacement London Plan, policy 6.6c.

Policy 2

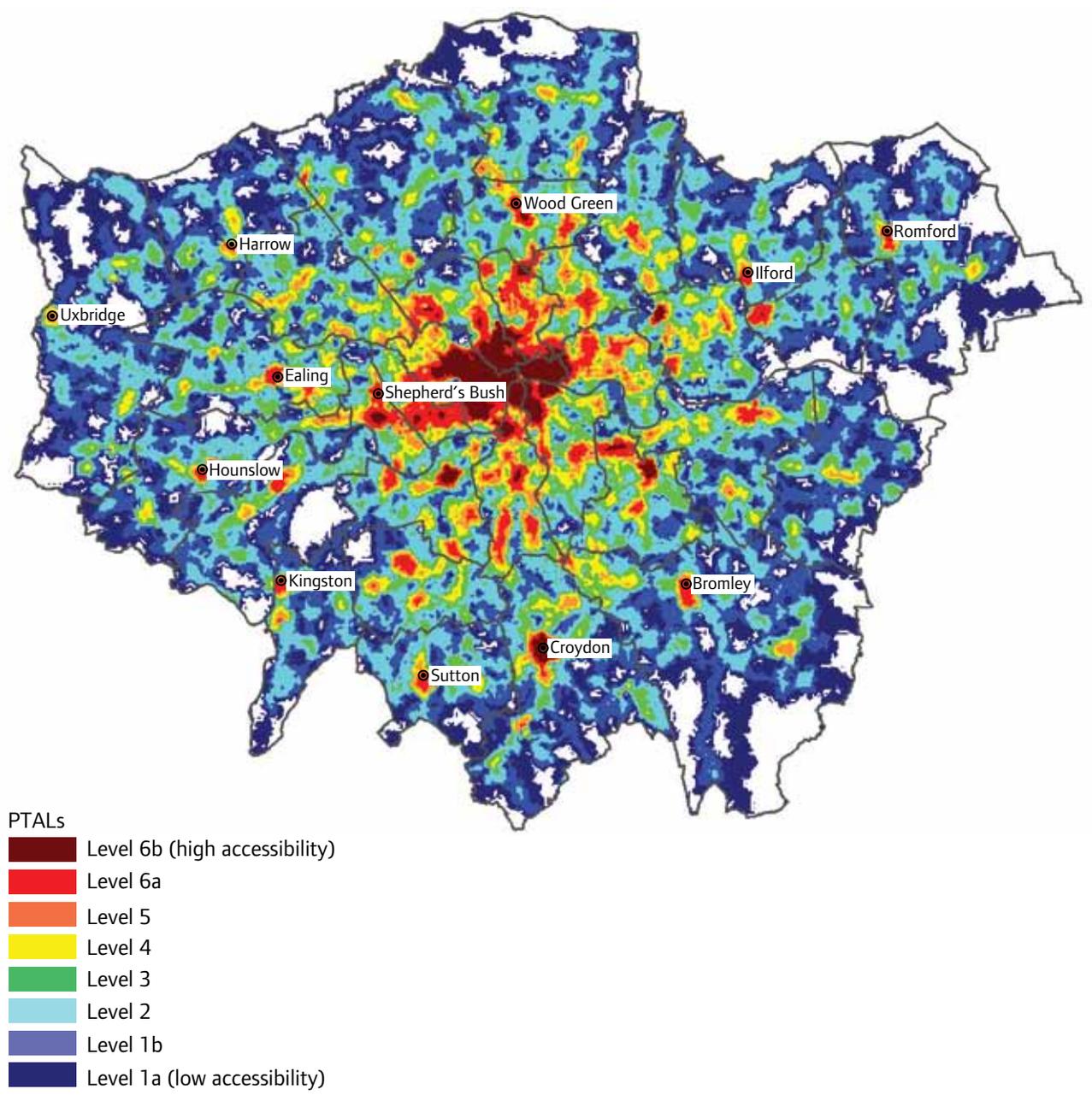
The Mayor, through TfL, and working with the DfT, government agencies, Network Rail, train operating companies, London boroughs, coach operators and other transport stakeholders, will support sustainable capacity enhancements to inter-regional, national and international rail and coach services, high-speed rail hubs and the strategic road network serving London.

This policy is taken forward by proposals: 1, 2, 3, 4, 5, 6, 7, 8, 11, 28, 48, 49 and 50.

4.2.2.2 Increasing transport accessibility (London-wide)

121 Better transport provision is key to improving accessibility to jobs, services, education and training opportunities and social networks. Currently, more than 90 per cent of Londoners live within 400 metres of a bus stop or station. A standard measure of accessibility in London is the public transport accessibility level (PTAL) which uses the range, proximity and frequency of public transport services for any given location to score accessibility to the transport system at peak times. Figure 18 shows that the areas of the Capital with highest PTAL are in central

Figure 18: Public transport accessibility levels (PTALs), 2006



London and town centres. Those with the lowest are generally areas with low population densities in Outer London. Parks, green belt, metropolitan open land and the Lea Valley appear as pockets of low public transport accessibility.

- 122 The implementation of rail schemes including Crossrail, Thameslink and the East London line extension will mean the percentage of Londoners with high levels of accessibility to the public transport network (PTAL 4 or above) will rise from 31 per cent in 2009 to 38 per cent in 2020. Improved accessibility will continue to be a consideration¹ for the planning of the bus network, while there will be investment to encourage a step change in walking and cycling. This will improve accessibility at a local level, improve access to, and from, public transport services, increase levels of physical activity and improve access for people on lower incomes.
- 123 London is increasingly becoming a '24/7' city and Londoners and visitors to the Capital expect public transport services to be provided accordingly. Much has been done over the last decade to increase off-peak and weekend service levels although service frequencies are still, in many cases, lower reflecting lower levels of demand. This is particularly the case on parts of the National Rail network where service frequency can be lower at off-peak times and weekends.
- 124 The planning system may be able to determine the overall pattern of land uses, but the way both the public and private sector provide their activities and facilities, can have a considerable

impact on how people access their services, with consequent demands for travel. The way healthcare, education and retailing is provided, for example, in terms of transport accessibility can be changed without necessarily having to change land use patterns or requiring planning permissions. Joint working between service providers is therefore essential to ensure investment decisions are made that promote maximum accessibility for all, and make the best use of available capacity and connectivity of the transport system.

Policy 3

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to improve public transport accessibility and conditions for cycling and walking in areas of lower PTAL, where there is an identified need for improving accessibility; and to improve access to economic and social opportunities and services for all Londoners.

This policy is taken forward by proposals: 9, 15, 16, 22, 23, 36, 45, 46, 51, 52, 54, 57, 58, 59, 60, 83, 84 and 85.

4.2.2.3 Delivering radial capacity and connectivity improvements into central London

- 125 Although the Mayor is keen that London's economic success is shared throughout the city, he fully supports the continued success of the

¹ Bus service planning guidelines are to provide services which are: comprehensive, frequent, simple, reliable, accessible and value for money

central London in order to maintain London's position as a leading global centre. Due to an unrivalled range of services, from museums to shops, and a growing number of jobs, the CAZ will remain the largest trip destination in London. As it continues to grow, the Docklands area is increasingly generating similar 'radial' trips which need to be supported by the strategy. It is therefore important that all areas of London have appropriately sufficient connectivity to central London (as well as to Docklands).

- ¹²⁶ Figures 19 and 21 show the extent of Tube, DLR and National Rail crowding on the current networks in 2006. Crowding can be seen on radial routes to the City and West End and on the broad northeast-southwest and north-south corridors and between the City and Docklands.
- ¹²⁷ Figures 20 and 22 show the extent of Tube, Docklands Light Railway (DLR) and National Rail crowding in 2031, following the delivery of Crossrail and other committed investment (for analysis, known as the 'reference case') across the Underground and National Rail network. Despite a public transport capacity increase of above 30 per cent to 2031, the increase in demand for travel resulting from population and employment growth (and the spatial pattern of that growth) will in many areas match the increase in capacity. Crowding on some links improves; on others it worsens when the effect of demand growth (from higher population and employment) to 2031 is greater than the investment to 2018. Overall, crowding – measured as the proportion of Tube/rail passenger kilometres which are in excess of

Passenger Guideline Capacity – is expected to be lower in 2031 than 2006. But, crowding will persist, continuing to make journeys uncomfortable for the individual and restricting economic growth. In particular, crowding persists on the broad northeast-southwest and north-south corridors and links in the vicinity of the City and Docklands. These conditions will persist unless there is further intervention. This strategy is the Mayor's response to this crowding, as well as other transport challenges.

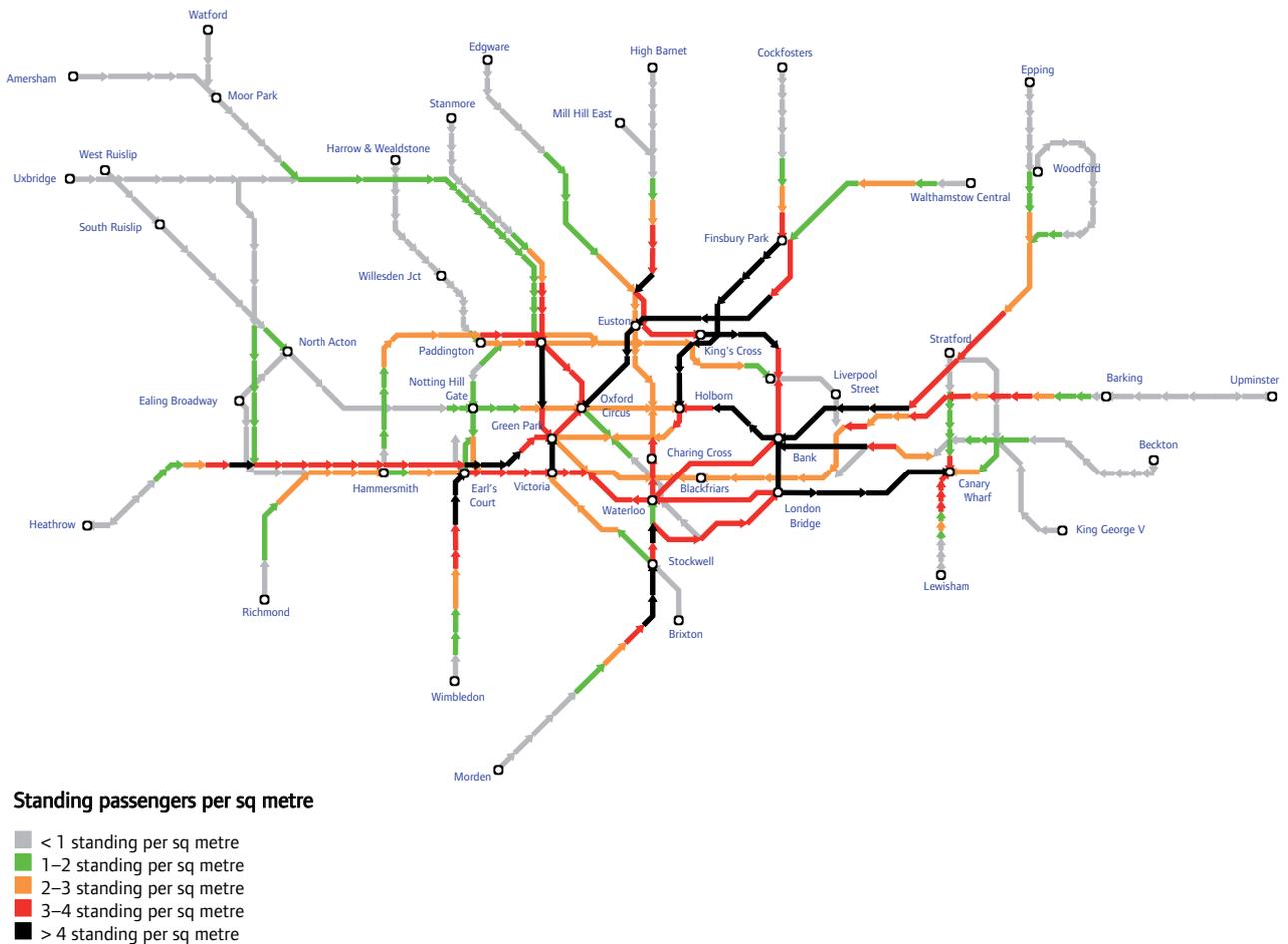
Policy 4

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to improve people's access to jobs, business' access to employment markets, business to business access, and freight access by seeking to ensure appropriate transport capacity and connectivity is provided on radial corridors into central London. In particular, the Mayor will seek to maximise public transport connectivity and capacity benefits on the two main east-west and north-south corridors (incorporating the Crossrail and Thameslink projects respectively). The Mayor will also explore opportunities to make greater use of the Thames for east-west passenger and freight transport across the city.

This policy is taken forward by proposals: 5, 6, 7, 8, 9, 11, 15, 17, 19, 22, 23, 36, 37, 38, 54 and 128.

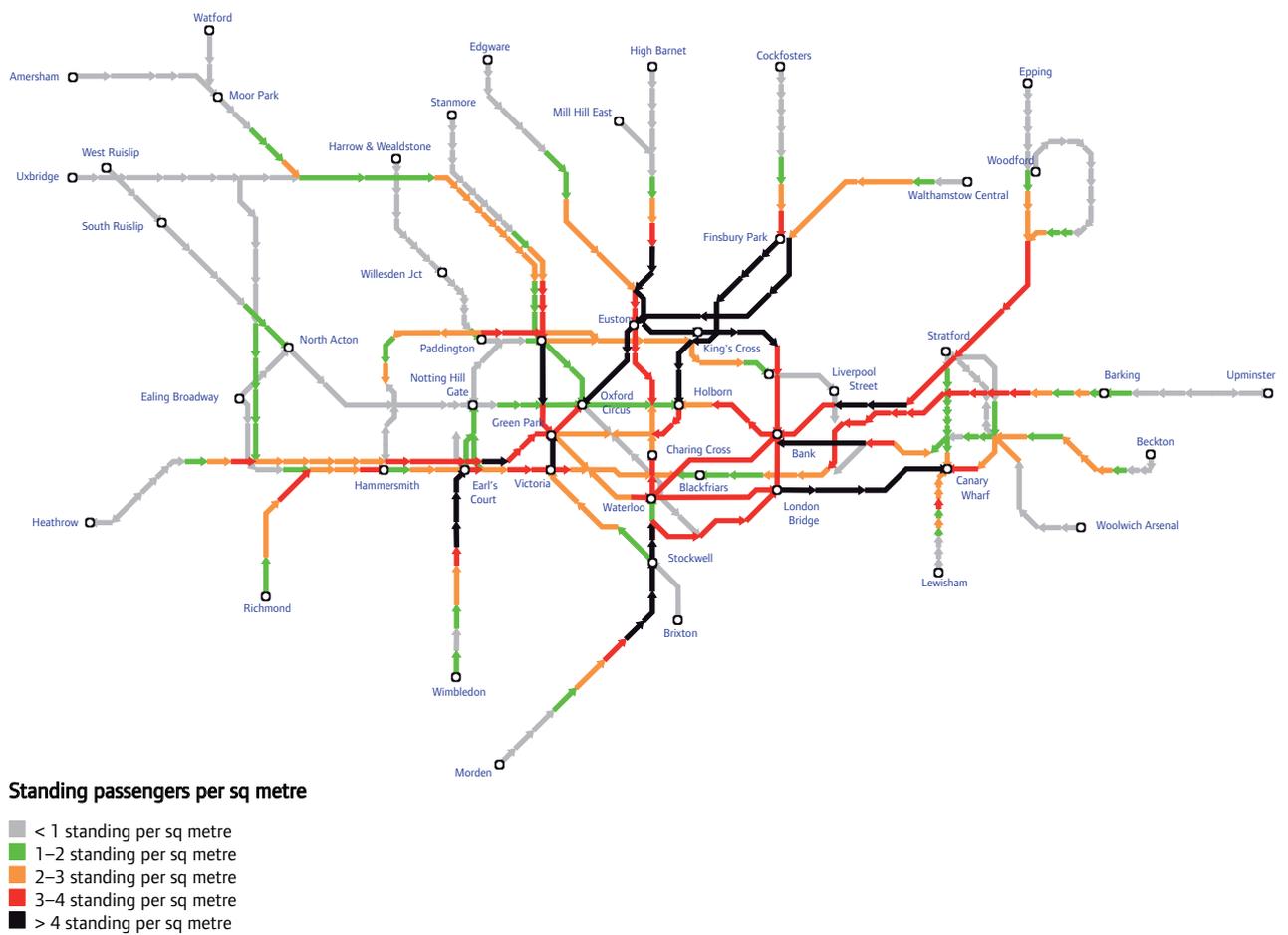
¹ The 'reference case' is defined in section 6.1 and the glossary

Figure 19: Tube and DLR crowding, 2006



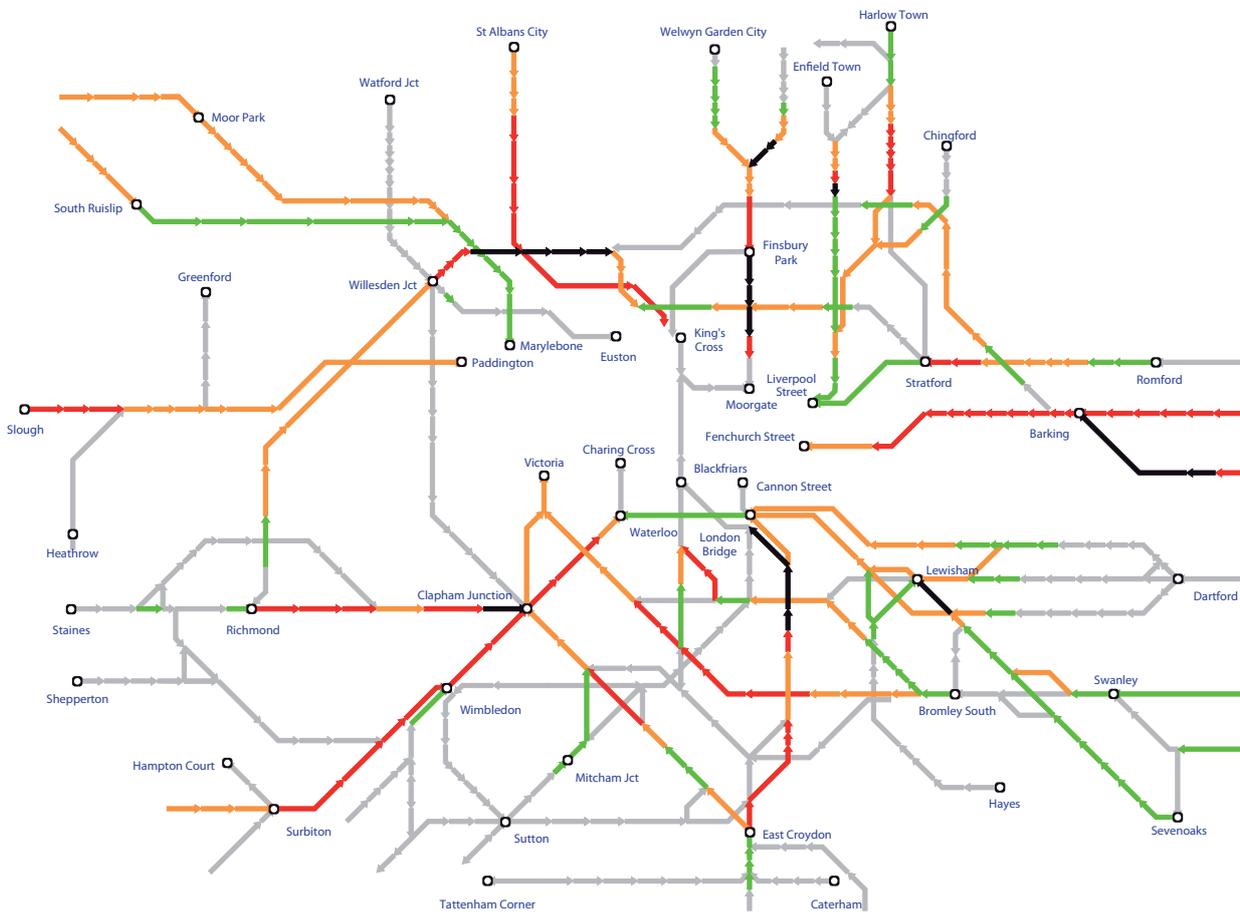
This schematic map does not include all details of the network

Figure 20: Tube and DLR crowding, 2031 (with committed funding/reference case)



This schematic map does not include all details of the network

Figure 21: Rail crowding, 2006

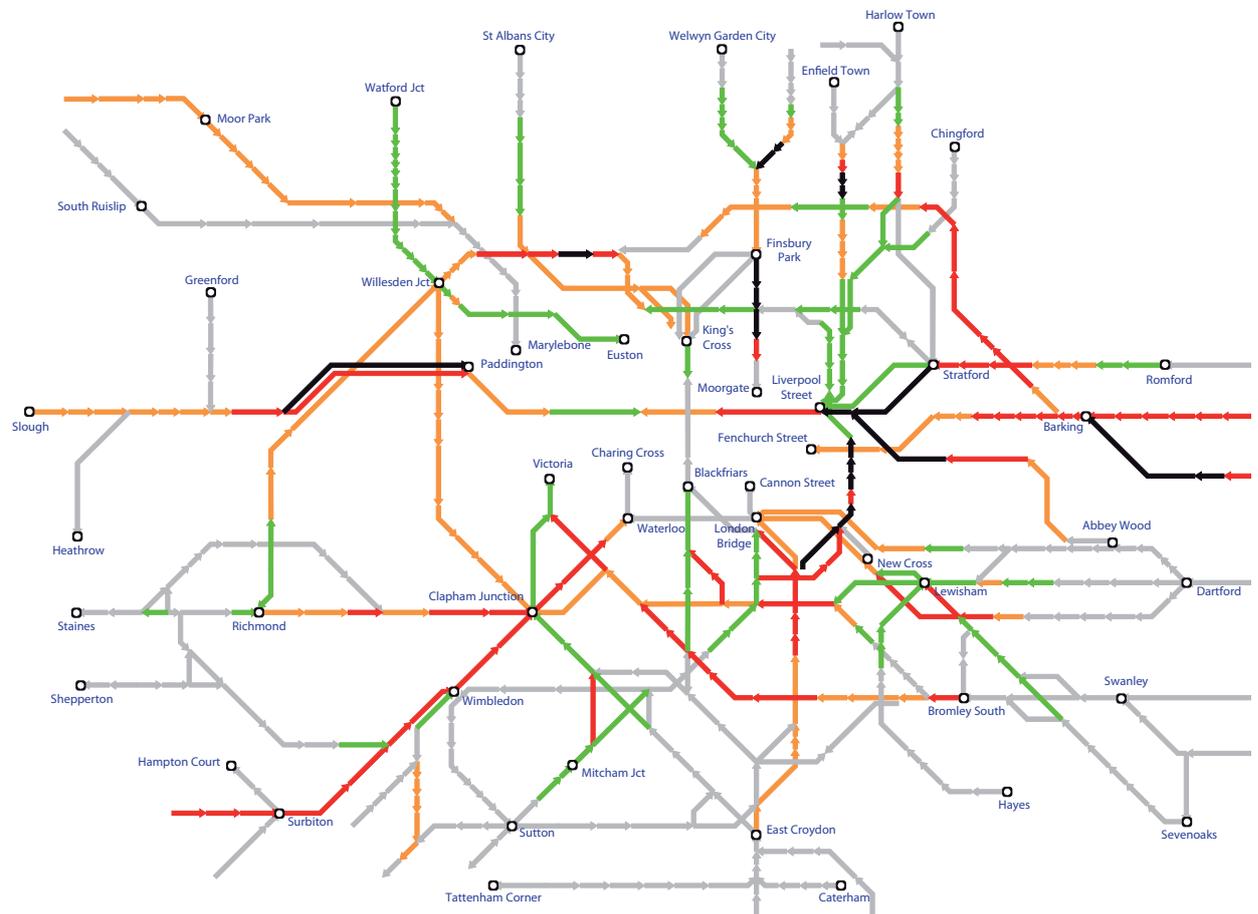


Standing passengers per sq metre

- < 1 standing per sq metre
- 1–2 standing per sq metre
- 2–3 standing per sq metre
- 3–4 standing per sq metre
- > 4 standing per sq metre

This schematic map does not include all details of the network

Figure 22: Rail crowding, 2031 (with committed funding/reference case)



Standing passengers per sq metre

- < 1 standing per sq metre
- 1–2 standing per sq metre
- 2–3 standing per sq metre
- 3–4 standing per sq metre
- > 4 standing per sq metre

This schematic map does not include all details of the network

4.2.2.4 Delivering transport improvements within central London

- ¹²⁸ Given the high levels of demand and the pressures on transport infrastructure and space, it is unsurprising that there remain significant transport challenges within the CAZ, despite the high levels of investment. It is essential that the currently planned capacity investment in Crossrail and the Tube is delivered; however, this will also pose challenges in terms of managing the disruption caused during construction.
- ¹²⁹ The demands for road space for public transport, freight, private cars, taxis, coaches cycling and walking and for the public realm are very acute in the CAZ due to the density of activity in the area. The quality and management of streets and public spaces is becoming ever more important to the boroughs within central London, whose decisions deliver many of the transport improvements. This is further reinforced by the need to access the utility infrastructure beneath the roads and the need for space for waiting and loading (including cycling, coaches, taxis, buses and freight) and transport facilities. Balancing these different demands and managing the road network effectively is a major challenge within the CAZ. Improving the quality and experience of the central area and its public realm will be a prime objective in this regard, particularly for pedestrians.
- ¹³⁰ Another key focus for the CAZ is the maintenance and enhancement of the capacity of termini and interchanges and the ability to disperse passengers to their onward destinations. Elsewhere, the strategy sets out the importance of radial links into central London. While this will help commuters and others to access the CAZ effectively, the stations and transport system within the area need to be able to cope with these additional pressures. The rail termini in the CAZ currently experience very high levels of crowding, particularly during the morning peak. Many lines and stations on the Underground and bus services, and the areas around stations, also experience significant congestion and crowding where passengers interchange to continue their journeys.
- ¹³¹ Many of these onward journeys across the CAZ are short distance journeys that could be walked, particularly if passengers are aware of alternative options. The strategy will seek to relieve the pressure on central London termini by developing strategic interchanges to facilitate orbital movement and help people to avoid travelling through central London if they do not need to (this is set out in section 5.10).
- ¹³² Beyond this, the priority challenges for the CAZ include alleviating crowding more widely on the public transport network and ensuring greater resilience; maximising access to business and employment markets (on a London-wide, national and international scale); and addressing environmental concerns including air quality.
- ¹³³ Alignment between transport and regeneration priorities will also be of fundamental importance to achieving sustainable growth within central London. There are a number of

areas at the fringes of, or surrounding, the CAZ where improving accessibility and supporting regeneration is of particular concern; for example, Vauxhall/Nine Elms, Elephant & Castle, Peckham, Brixton, Earls Court and the City fringe. In many cases, investment in public transport will be key in terms of enhancing accessibility and supporting development opportunities. It will also be important to ensure that the Opportunity Areas, areas for intensification and strategic development centres are well served by transport to enable their sustainable development.

Policy 5

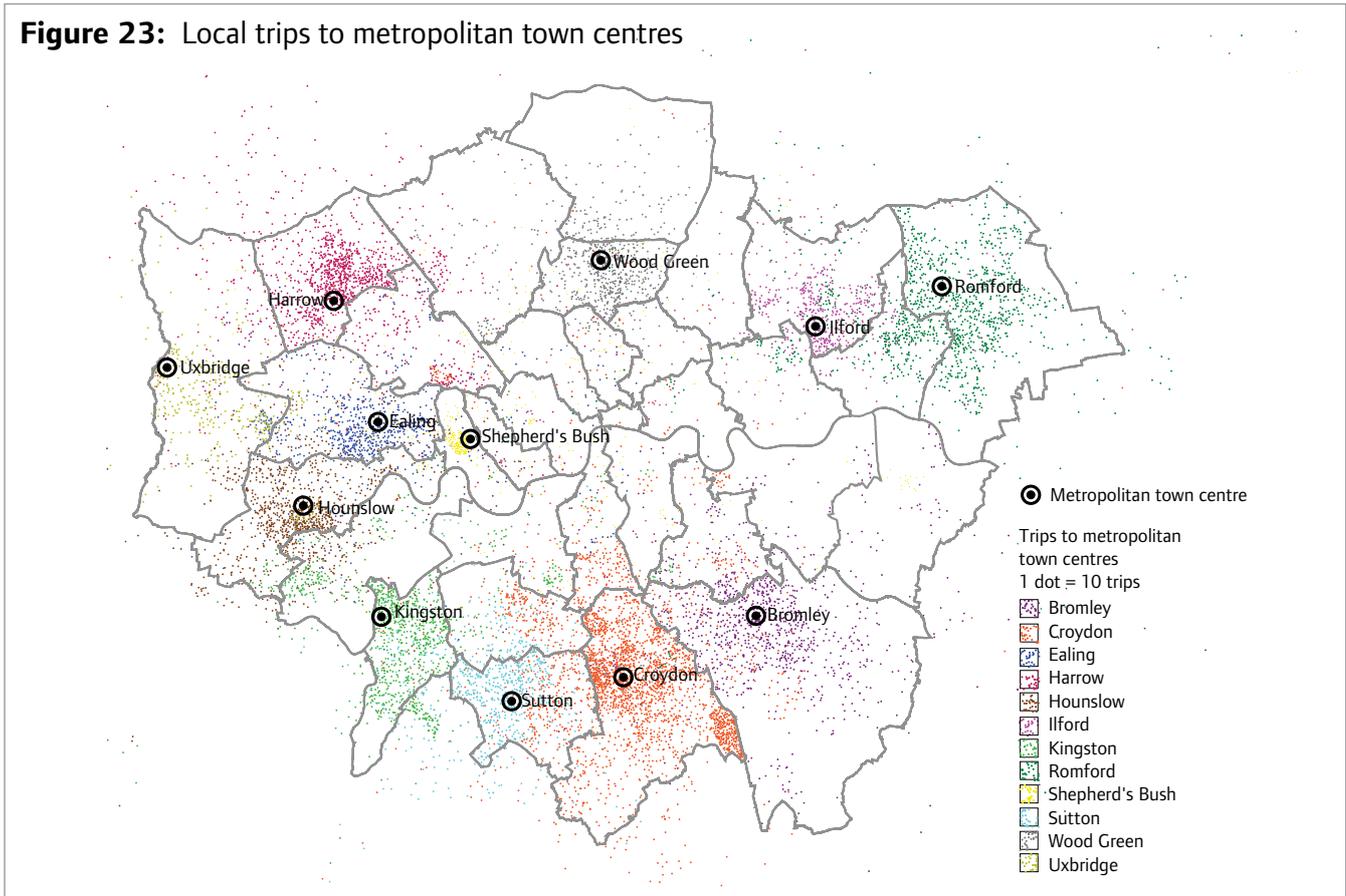
The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to ensure efficient and effective access for people and goods within central London through providing improved central London connectivity and appropriate capacity. This will include improving access to major public transport interchanges for pedestrians, cyclists and by public transport.

This policy is taken forward by proposals: 5, 7, 9, 11, 15, 17, 19, 22, 23, 26, 30, 31, 32, 33, 36, 37, 45, 54, 56, 60, 124, 126 and 129.

4.2.2.5 Delivering radial capacity and connectivity improvements to Strategic Outer London Development Centres and metropolitan town centres

- 134 Supporting the sustainable growth and continued viability and vitality of the 12 existing and three potential metropolitan town centres and the emerging Strategic Outer London Development Centres are spatial priorities in the London Plan.
- 135 Strategic Outer London Development Centres, as described in the London Plan in policy 2.16, could play a significant role in achieving a step change in the economic performance of Outer London. They potentially or already function above the sub-regional level and therefore have broad catchment areas.
- 136 Competition from regional shopping centres and the ease of access to areas such as the Thames Valley and Cambridge/Stamsted corridor for high tech employers has placed great pressure on London's town centres. Each of the metropolitan town centres have a distinct catchment area which is illustrated in Figure 23. In some cases, this includes areas outside London.
- 137 Good transport links from the surrounding areas, including outside London, are required to allow easy, efficient access to jobs and services to enable Strategic Outer London Development Centres to grow in strength, metropolitan town centres to compete and to remain successful, and for the potential metropolitan town centres to fulfil their role. Potential enhancements

Figure 23: Local trips to metropolitan town centres



includes those shown in Figure 24. There are also potential opportunities to continue to improve bus, cycling and walking accessibility to all of these centres.

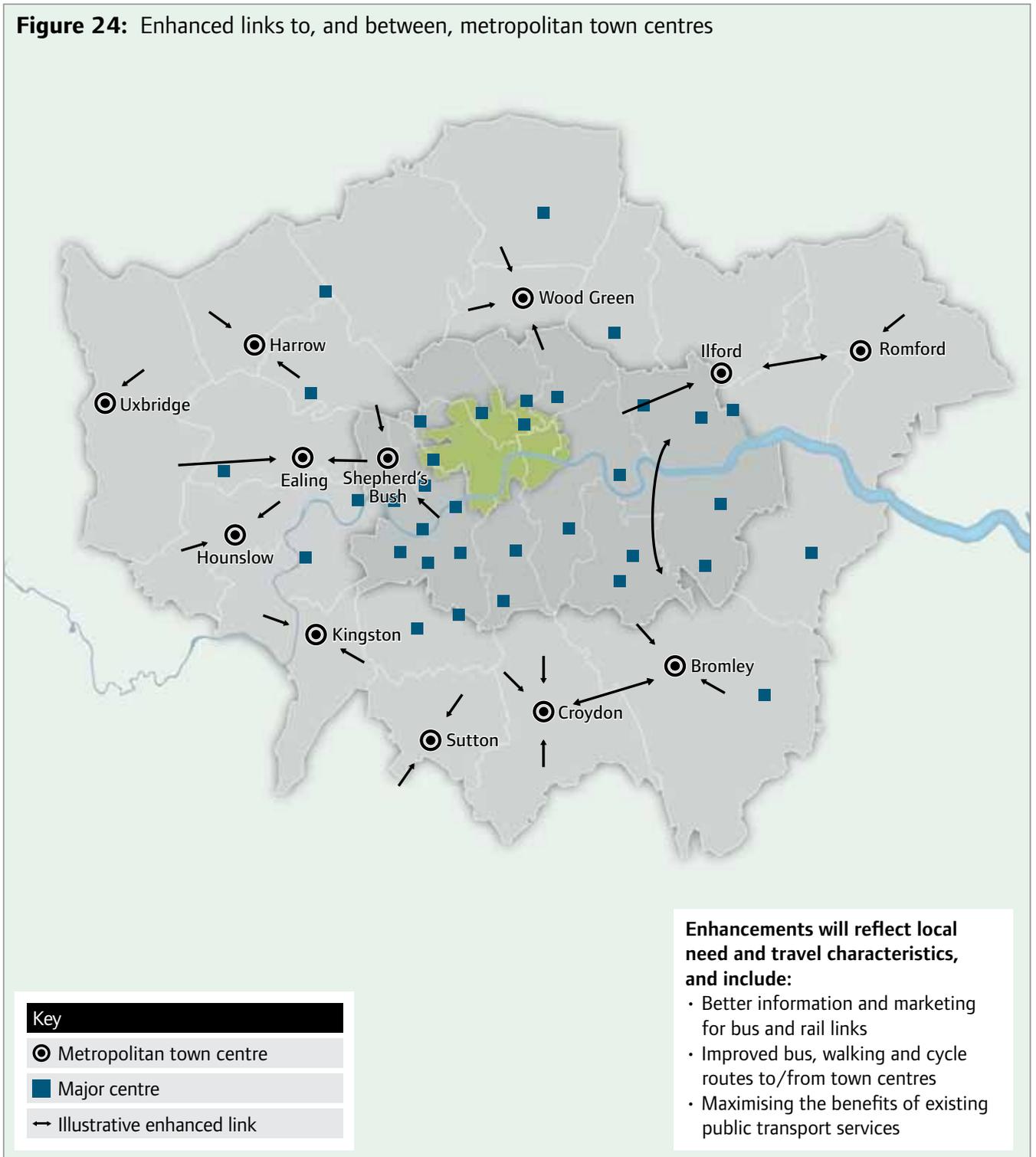
- 138 Detailed transport proposals for Strategic Outer London Development Centres and town centres will be developed, taking into account connectivity and crowding on radial corridors to, and from, the town centres as part of the London sub-regional transport plan process. These will be encouraged through other work, all of which will acknowledge the important role of the London boroughs in determining local priorities.

Policy 6

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other transport stakeholders, will seek to provide appropriate connectivity and capacity on radial transport corridors into current and potential metropolitan town centres and to Strategic Outer London Development Centres.

This policy is taken forward by proposals: 16, 23, 30, 31, 34, 45, 52, 54 and 127.

Figure 24: Enhanced links to, and between, metropolitan town centres



4.2.2.6 Orbital connectivity

- ¹³⁹ London's transport system provides for orbital travel through existing orbital bus services, orbital London Overground and National Rail suburban services and orbital roads such as the North and South Circulars. However, planning and undertaking orbital journeys can still be difficult. The strategy will seek to improve Londoners' awareness of orbital public transport options as well as making improvements to the services themselves where value for money can be demonstrated. The strategy will also seek to improve orbital road links.
- ¹⁴⁰ Because of the relatively low demand for orbital public transport, particularly in Outer London (compared to radial transport to central London), the most value for money approach will be (following the delivery of the London Overground investment which will significantly improve orbital public transport connectivity in London) to invest in better journey planning information and improved interchange quality. This will involve focusing on strategic interchanges, and better integration of the National Rail network with other transport modes; and bringing stations, service frequency and quality to minimum standards.
- ¹⁴¹ The Mayor will also review opportunities to improve orbital travel opportunities by better linking radial services to Outer London town centres, for example, by combining two separate services or by improving interchange between the services.

Policy 7

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other transport stakeholders, will seek to increase public awareness of existing and planned orbital public transport connectivity in Inner London; and seek to improve orbital connectivity in Outer London, particularly between adjacent metropolitan town centres, where shown to be value for money.

This policy is taken forward by proposals: 14, 15, 16, 23, 34, 39, 45 and 46.

4.2.2.7 Delivering transport improvements within metropolitan town centres

- ¹⁴² London's town centres are a spatial priority in the London Plan. They provide access to a wide range of services and are central to the achievement of integrated transport and land use planning. They also enable all parts of London to make more of a contribution to the city's economic success, complementing the role of the CAZ and underpinning a balanced 'polycentric' structure.
- ¹⁴³ In accordance with the 'lifetime neighbourhoods' principle set out by the London Plan (policy 7.1), town centres should be welcoming, accessible and inviting for everyone, regardless of age, health or disability.
- ¹⁴⁴ Protecting and enhancing the vitality and viability of London's town centres is therefore

Spotlight

Transport and town centres

In addition to London's 12 metropolitan town centres, there are 115 other important major and district town centres. These each provide their own mix of employment, retail, cultural and social activities for the people and businesses located there, or that travel to them.

The importance of these centres is illustrated by the fact that 18 of the top 20 destinations in Outer London are town centres, with shopping and employment the main reason for travelling to them. Despite almost a third of people travelling to town centres on foot or bicycle, the majority, around half, travel by car. For instance, only one in eight trips to district centres in Outer London is made by public transport.

When travelling to town centres of all sizes, approximately two thirds of people travel less

than three kilometres. These journeys are an ideal length to walk and cycle, or take public transport. Providing convenient, good quality bus access to town centres and improving walking and cycling links will encourage mode shift away from the car and ensure that more people have access to the opportunities they need.

In addition to strategic improvements to the transport network, the Mayor and TfL will work with the boroughs to develop a package of improvements within local town centres. This will focus on providing better streets and facilities to make walking and cycling easier and to improve the public realm making town centres more attractive places to live, work and visit and helping to deliver 'lifetime neighbourhoods'.



a priority for the strategy, through better access for people and freight, improving the public realm and security, and making them more attractive places to live and for businesses to locate. This will complement policies in the London Plan and EDS and will help town centres to compete with out-of-centre business parks, shopping centres and new housing developments beyond London's boundary. As a result, they will contribute to a compact city, reduced emissions and traffic congestion, making it easier for all to access jobs, services and leisure opportunities.

- ¹⁴⁵ The Mayor's manifesto commitment was to work much more closely with the boroughs and recognise that decisions on local transport needs are often best made by those closest to them. Each town centre is different and therefore a package of measures will be required. Interventions could include improved public realm in the retail and leisure core, improvements in freight access, loading and unloading, introducing cycle hire and cycle superhighway schemes, improving bus access to the town centre, better pedestrian wayfinding through Legible London, park and ride/park and bike, and improved car parking with priority given to low emission or electric vehicles.

Policy 8

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other transport stakeholders, will support a range of transport improvements within metropolitan town centres for people and freight that help improve connectivity and promote the vitality and viability of town centres, and that provide enhanced travel facilities for pedestrians and cyclists.

This policy is taken forward by proposals: 24, 26, 27, 30, 40, 45, 54, 57, 60, 61, 79, 80, 84, 85, 115, 119, 124 and 126.

4.2.3 Delivering an efficient and effective transport system for people and goods

4.2.3.1 Integrating land use development with transport planning

- ¹⁴⁶ Using land use policies contained within the London Plan, the Mayor will encourage patterns and forms of development that improve accessibility of services and reduce the need to travel. High trip generating development will be encouraged in areas with good public transport access and sufficient existing or planned public transport capacity. In east London, in particular, a priority is to maximise development opportunities around existing or committed transport infrastructure, making the best use of available capacity (for example, the Royal Docks).

- 147 Through setting appropriate parking standards, encouraging smarter travel planning and making public transport more attractive, the Mayor will encourage the use of public transport, walking, cycling and car sharing.
- 148 The Mayor will also ensure that land for transport is safeguarded where necessary in accordance with London Plan policy 6.2, to allow for efficient operation and future expansion of the transport network, for passengers and freight.
- 149 Although the borough is the local planning authority for development proposals in London, major planning applications that meet certain criteria are referred to the Mayor for his consideration. As part of this process, TfL provides advice on transport impacts and mitigation to ensure that new developments are fully integrated with the transport network. This includes ensuring that transport accessibility, capacity and connectivity is sufficient to cater for new residential and commercial development. Where necessary, improvements to the transport network are secured as part of this process. TfL offers a pre-application advice service that enables developers to identify transport issues at an early stage in the planning process.
- 150 For all planning applications that meet the criteria for referral to the Mayor, comprehensive transport assessments, travel plans, delivery and servicing plans (DSPs) and construction logistics plans (CLPs) will need to be submitted in accordance with TfL best practice guidance. These documents should demonstrate how the application complies with transport policies in the London Plan and include measures to address likely impacts on the transport network.
- 151 The proposals contained within the MTS and sub-regional transport plans will need to be included in borough core strategies in their Local Development Frameworks and will inform the use of section 106 agreements and/or tariffs to secure transport improvements or mitigation as part of the development control process.

Policy 9

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other transport stakeholders, will use the local and strategic development control processes to seek to ensure that:

- a) All high trip generating developments are located in areas of high public transport accessibility, connectivity and capacity (either currently or where new transport schemes are committed)
- b) The design and layout of development sites maximise access on foot, cycle and to public transport facilities, for example, via safe walking and cycling routes and provision of secure cycle parking
- c) Access for deliveries and servicing, maximise the opportunities for sustainable freight distribution where possible

- d) Land for transport use is safeguarded in line with London Plan policy and Supplementary Planning Guidance
- e) Planning contributions are sought for transport improvements where appropriate

This policy is taken forward by proposals: 2, 9, 15, 22, 36, 37, 38, 39, 45, 48, 49, 50, 51, 54, 57, 58, 60, 97, 99, 119 and 126.

4.2.3.2 Reliability and resilience

¹⁵² A significant challenge in ensuring the reliability and resilience of the transport system is its age. London has some of the oldest, and most intensively used, transport infrastructure in the developed world. This, coupled with a substantial inheritance of long-term under-investment and deferred renewals, presents some exceptional infrastructure challenges. Breakdowns and system failures as a result of deferred maintenance and life-expired assets can significantly undermine the efficiency of transport operations. Although good progress has been made in recent years in reducing maintenance backlogs, substantial programmes of further investment will be required into the future.

¹⁵³ The reliability of the Capital's transport networks is important to both businesses and individuals. Congestion, both on the road and public transport networks, represents a significant cost to businesses which rely on transport not only so their workforce and customers can reach them, but also to ensure their goods can be transported quickly and cheaply. Surveys show

that businesses rate the reliability of transport journeys (both passenger and freight) as being of greater significance than absolute journey time, hence the importance of 'smoothing' traffic flows and, in particular, improving journey time reliability. Figures 25 and 26 show the extent of highway congestion (in terms of average delay per vehicle kilometre travelled – it is currently not possible to forecast journey time reliability) in 2006 and 2031, following implementation of the TfL Business Plan, Crossrail and HLOS investment. It can be seen that congestion is widespread in central and Inner London, and extends to Outer London town centres and large areas of south London.

¹⁵⁴ The impact of system failures and breakdowns is greatly increased the more the Capital's transport systems are operated at, or beyond, their designed capacities, reducing the resilience of the network to cope with delays or unforeseen events. Lack of resilience puts London's economic growth at risk as even relatively minor incidents can cause disruption for large numbers of users.

¹⁵⁵ Much is already being done to deal with incidents and disruptions. However, population and employment growth, coupled with ageing assets and continuing utilities works, will continue to put pressure on the already congested road network and, consequently, the probability of delays will rise. Increases in road freight will mean that more of the network will have to function at or beyond peak capacity, potentially reducing resilience to delays. A key challenge is therefore to manage and maintain the transport network, as well as

Figure 25: Highway congestion, average vehicle delay, 2006

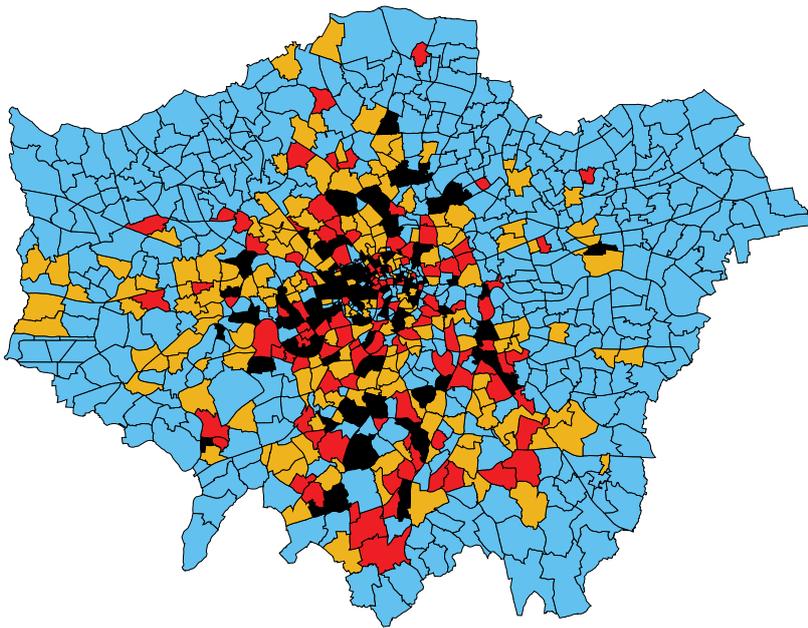
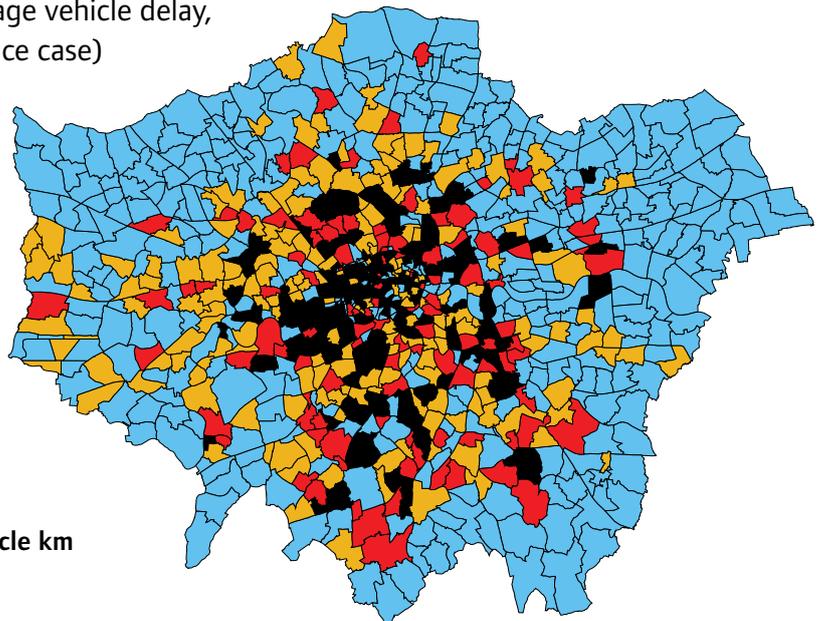


Figure 26: Highway congestion, average vehicle delay, 2031 (with committed funding/reference case)



Average vehicle delay (minutes) per vehicle km

- Greater than 2
- 1.5 to 2
- 1 to 1.5
- Greater than 0

Average vehicle delay in the morning peak compared to free flow times

managing demand if required, in such a way as to continue to provide a reliable service.

- ¹⁵⁶ Between them tax and farepayers bear the cost of providing London's transport system. While the transport network should deliver a fast, reliable, efficient and safe service, it should also do so in a cost-effective way. This means tightly controlling operating costs and capital expenditure, while optimising the use of existing infrastructure.
- ¹⁵⁷ To minimise the costs borne by the fare and taxpayer, TfL will continue to review its operations to identify and implement further worthwhile measures to reduce costs and deliver greater efficiency.

Policy 10

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders including the private sector, will seek to improve the efficiency and effectiveness of the operation of the transport system, bring transport assets to a good state of repair, and then maintain them in that condition.

This policy is taken forward by proposals: 10, 11, 12, 13, 17, 18, 19, 21, 23, 24, 30–39, 45, 46, 115, 116, 117, 118, 119, 121, 122, 123, 129 and 130.

4.2.3.3 Changing travel behaviour

- ¹⁵⁸ In order to make the best use of London's limited road space, encouragement of more efficient modes of transport in terms of road space will continue, in particular buses, cycling and walking. Alongside this, TfL will continue to work with the boroughs to deliver a smarter travel initiatives to encourage people to choose between the full range of travel options and increase the share of journeys made by walking, cycling and public transport.
- ¹⁵⁹ To achieve the desired economic and other strategy outcomes, challenging mode shifts are necessary. The strategy intends to build on the significant achievements to date, with an aim of increasing the mode share¹ of public transport, walking and cycling from 57 per cent to 63 per cent² (34 per cent public transport, 25 per cent walking, five per cent cycling)³ or further should road user charging be required to meet the strategy's goals. This means that between 3.5 and 4.5 million extra trips each day will need to be made by public transport, walking and cycling to support the growth envisaged in the London Plan (allowing for mode shift as well as population and employment growth). The mode shifts are challenging but achievable with the investment and policies set out by the strategy.

¹ In terms of trips, there has been about a five per cent increase in public transport mode share between 2000 and 2008. In terms of journey stages, there has been a seven per cent increase in public transport mode share between 2000 and 2008. See mode share in glossary

² The projected mode share change from the strategy is set against a 2006 baseline

³ Numbers rounded to the nearest one per cent

Policy 11

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to reduce the need to travel, encourage the use of more sustainable, less congesting modes of transport (public transport, cycling, walking and the Blue Ribbon Network), set appropriate parking standards, and through investment in infrastructure, service improvements, promotion of smarter travel initiatives and further demand management measures as appropriate, aim to increase public transport, walking and cycling mode share.

This policy is taken forward by proposals: 51, 52, 53, 54, 57, 59, 61, 83, 115, 116, 120, 125, 127, 129 and 130.

4.2.3.4 Improving efficiency of freight distribution

- ¹⁶⁰ Freight and servicing is vital for ensuring London is able to function as a dynamic world city. Freight accounts for 17 per cent of all London's traffic and is the second largest user by mode on London's streets. The London Freight Plan (2007) specifies a number of projects to improve the distribution of freight across London. DSPs are one such example, which aim to help increase the operational efficiency of the highway network, reduce conflicts with other street users and contribute to a reduction in CO₂ emissions, congestion and collisions. DSPs will also help increase the availability and use of safe and legal loading facilities and will eventually be integrated into the travel plan process, and monitored in the same way. Consolidation centres and break-bulk facilities – facilitating the use of low carbon vehicles for the movement of freight in sensitive areas – will also be needed to improve the efficiency of freight distribution. In addition, TfL aims to increase the number of freight operators adhering to best practice guidance, and promoting FORS (see section 5.24).
- ¹⁶¹ These measures, coupled with the projects in the London Freight Plan, will all work together to greatly help improve the efficiency of the distribution of freight across London. Further implementation of the schemes will contribute to an improvement in road network efficiency (see section 5.6), including measures to smooth traffic flow. Road user charging may also be needed to help meet the goals of the strategy depending on the success of these measures (see section 5.27).
- ¹⁶² The London Plan identifies a number of SILs each of which requires suitable access for people and for freight transport to ensure they can be developed to support sustainable economic growth.

Policy 12

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders including business and the freight industry, will seek to improve the distribution of freight through the provision of better access to/from Strategic Industrial Locations, delivery and servicing plans, and other efficiency measures across London.

This policy is taken forward by proposals: 3, 2, 30, 31, 32, 33, 38, 39, 50, 117, 118, 119, 124, 129 and 130.

4.3 Enhancing the quality of life for all Londoners

4.3.1 Introduction

¹⁶³ Transport has a fundamental impact on the quality of life for all Londoners. In many cases, these impacts are very positive. Over the last 200 years, first through mass access to public transport systems (trains, buses, etc), and secondly, with the increasing availability of private cars and road freight vehicles, transport improvements have enhanced personal freedom, education, social and life opportunities.

¹⁶⁴ However, it is also well understood that an ever increasing ability and desire for mobility brings with it significant negative impacts. Some of these are so substantial, for example, safety hazards and climate change as to warrant specific challenges for the strategy

in their own right. Others, however, such as transport's impact on air quality and noise, also present significant challenges to which the strategy must respond in tandem with the Mayor's other strategies. London's air quality remains the poorest of any English region and improvements will directly contribute to improved health for all Londoners, especially younger people. Exposure to transport noise is higher than in many other parts of the country. Easy access to mechanised transport and a more sedentary way of life has, at least in part, created a significant negative effect on overall levels of fitness and obesity. However, promoting more physically active forms of transport like cycling and walking has tremendous potential to reverse this.

¹⁶⁵ Good transport planning can connect communities, enhance streetscapes through development of 'better streets' initiatives and encourage active travel. It can also protect and support the natural environment. TfL alone manages a substantial proportion of the Capital's wildlife habitats. However, bad planning can marginalise or sever communities, create eyesores or harm the urban landscape. It can also pollute, damage or destroy delicate eco-systems and hugely undermine the quality of life.

¹⁶⁶ Finally, the Mayor has made it a particular priority to improve the quality of Londoners' overall daily travel experiences whether as drivers, pedestrians, cyclists or public transport users.

¹⁶⁷ Although ‘quality of life’ may mean different things to different audiences, this section presents five key aspects of quality of life upon which transport has an impact. Many of the policies and proposals elsewhere in this strategy will also impact positively upon quality of life and provide for a more sustainable future for London.

4.3.2 Improving journey experience

¹⁶⁸ Transport provides access to employment and other enriching activities. However, the experience of travelling itself can sometimes be, at best, unpleasant and at worst affect our health and wellbeing. Congestion, litter strewn streets, and poorly-maintained roads can be uncomfortable and hazardous for pedestrians, cyclists and motor vehicle occupants, while delays and crowding can contribute to a poor quality of service on public transport. Making systems easier to use and more comfortable will reduce stress and discomfort and improve health, wellbeing and quality of life.

¹⁶⁹ The strategy will promote and improve the journey experience for all Londoners by, for example, delivering new trains, some of which will be air-conditioned, refurbishing stations and improving interchanges following best practice guidelines. It will also provide better information (helping people make best use of their time), increased rail and Tube capacity to tackle crowding, improved reliability (reducing the stress and frustration it can cause), improved public transport staff service and will create ‘better streets’ and town centres.

Policy 13

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will expand the capacity and quality of public transport services, improve passenger comfort and customer satisfaction, reduce crowding, and improve road user satisfaction.

This policy is taken forward by proposals in sections: 5.2, 5.3, 5.4, 5.5, 5.6, 5.9, 5.10, 5.13, 5.14, 5.15, 5.16, 5.17, 5.18, 5.19, 5.24, 5.25, 5.26 and 5.27.

4.3.3 Enhancing the built and natural environment

¹⁷⁰ London’s built and natural environment with its special character and diversity makes an important contribution to people’s quality of life, the Capital’s economy, culture and it enriches our living and working environment. Furthermore, London’s open spaces provide opportunities for exercise and relaxation and so contribute to Londoners’ health and wellbeing.

¹⁷¹ The built environment encompasses not just designated heritage assets such as listed buildings, but buildings, public spaces and other features that are not statutorily protected yet make an important contribution to the character, distinctiveness and cultural identity of London. The natural environment ranges from residential gardens and squares, through to great parks, the Thames and wild spaces that include ancient woodland, heath and downland.

- 172 The Mayor has the responsibility to balance the new with the old, delivering well-designed transport and public spaces, be they streets, passages, broadways or squares. Streets should be clean, liveable, healthy places which make a big difference to people's quality of life. They should encourage people to walk and cycle, providing space to move in densely populated areas, and where appropriate, provide inspiring places where people want to stay.
- 173 Traffic and street infrastructure can have a significant effect on the setting and amenity of the historic and built environment which in turn affects people's enjoyment and wellbeing. Improving the built environment will work to address this while other aspects of the transport strategy will also contribute, for example, proposals that moderate traffic volume, speed, noise and emissions, and declutter the street.
- 174 Land that is owned or managed as part of London's transport system forms an excellent network of green spaces throughout the Capital comprising a variety of habitats, chiefly woodland, scrub and rough grassland. There are opportunities for enhancing the biodiversity of these line and roadside areas without compromising the operation of the transport system, and through the design, maintenance and setting of walking routes, cycle Greenways, and riverside areas.
- 175 London's strategic network of water spaces, the Blue Ribbon Network, is an important element of London's natural environment.

It not only provides opportunities for sustainable transport but also for the preservation and enhancement of biodiversity, recreation, and the protection of important landscapes and views.

- 176 All policies and proposals promoted or brought forward by the strategy will not adversely affect the integrity of any European site of nature conservation importance¹, either alone or in combination with other plans and projects. Where an assessment is more appropriate at sub-regional or local level planning, it will be undertaken in accordance with best practice to ensure the aims of the objectives of the strategy are upheld. Any policies and proposals which have the potential to improve accessibility to such European sites will be assessed to ensure the effect of increased visitor pressure does not adversely affect their integrity.

Policy 14

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to improve transport's contribution to the built and natural environment.

This policy is taken forward by proposals: 83, 84, 85, 90 and 113.

¹ Such sites include 'Special Areas of Conservation', 'Special Protection Areas' and 'Ramsar sites' as listed under the EC Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora). These sites make a significant contribution to conserving designated habitats and species

4.3.4 Improving air quality

- ¹⁷⁷ Air quality is critical for health and wellbeing. It has been estimated that Europeans each lose an average of eight months of life expectancy due to the impact of air quality. Many vulnerable people, such as children, older people and those with existing heart and lung conditions, are restricted in the range of activities they can undertake as a result of air pollution. Approximately 690,000 people in London have asthma, which is exacerbated by high levels of air pollution.
- ¹⁷⁸ The highest concentrations of particulates (PM₁₀) and oxides of nitrogen (NO_x), the two main types of harmful air pollutants in London, are found around busy roads, diesel railways and Heathrow. Transport is responsible for more than two thirds of PM₁₀ emissions in London and nearly half of NO_x emissions.
- ¹⁷⁹ The Mayor has a legal obligation to achieve meeting national and European targets for air quality in London, and a statutory duty to have an Air Quality Strategy. To protect human health, the EU has set 'limit values' for PM₁₀ and nitrogen dioxide (NO₂). Despite improvements in recent years, London's air quality does not meet PM₁₀ 2005 limit values, and is at risk of not meeting PM₁₀ limit values by 2011 at some central London locations. Longer-term, the Mayor has an ambition for London to have the cleanest air of any major European city. Due to road transport in particular being a large source of these air pollutants, the MTS will play a key role in supporting the Mayor's Air Quality Strategy,

thereby enabling London to meet these limit values and improving quality of life for all Londoners.

- ¹⁸⁰ Poor air quality is known to have adverse effects on habitats including European designated sites of nature conservation importance. The Mayor's commitment to a reduction in polluting emissions from transport also aims to reduce the adverse impact of poor air quality on such sites.

Policy 15

The Mayor, through TfL, and working with Defra, the DfT, Network Rail, train operating companies, freight operators, London boroughs and other stakeholders, will seek to reduce emissions of air pollutants from transport.

This policy is taken forward by proposals: 25, 91 – 100, 103, 105, 108, 109, 113, 129 and 130.

4.3.5 Improving noise impacts

- ¹⁸¹ Noise is a quality of life issue as it can significantly affect health and wellbeing. It can lead to increased annoyance, anxiety, sleep disruption and can be associated with cardiovascular disease through increased blood pressure. More people in London are more bothered by noise from transport than by loud neighbours. The Mayor has a legal duty to address ambient noise (ongoing unwanted sound in the environment such as transport and industry) and is required to have an Ambient Noise Strategy. The MTS thus can contribute

Case study

Working with the NHS to improve access to health services

TfL works in partnership with the NHS and the London boroughs to ensure that its policies are integrated with the wider objectives of promoting active lifestyles, sustainable transport and reducing health inequalities. Around one million journeys taken in London every day are health-related, so TfL has been working closely with the NHS to improve both organisations' understanding of the issues around access to healthcare.

TfL, in partnership with NHS London, has developed an analysis tool, the Health Services Accessibility Tool (HSTAT) which analyses the travel implications of altering patterns of health service provision. It can assess the impact of new and altered services on travel time by public transport, car, walking and cycling at peak and non-peak times, and can consider the impact on particular demographic groups,

using data from the Census together with TfL's CAPITAL transport model. This analysis helps TfL work with the boroughs and health providers to plan good public transport to hospitals and other healthcare facilities to improve access to these essential services.

One example is the re-routing of the 493 bus route between Wimbledon and St. George's Hospital (Tooting) to run through an area with a low level of bus service. Views of hospital staff, patients and visitors were taken into account when planning the service and the changes also benefitted local residents.

TfL will continue to work with the NHS to share best practice and ensure that transport and health strategies are mutually supportive wherever possible.



to a better noise climate within London, enhancing the health and wellbeing of all.

Policy 16

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, freight operators, London boroughs and other stakeholders, will seek to reduce noise impacts from transport.

This policy is taken forward by proposals: 48, 86, 87, 88, 89 and 113.

4.3.6 Improving health impacts

- ¹⁸² Transport is a key determinant of health and wellbeing both directly and indirectly. The transport strategy therefore represents an opportunity to improve health and remove some of the adverse impacts on health. Ill-health significantly affects people's quality of life and also has implications for their communities and the wider economy (through the direct costs of providing health services and public support), as well as the indirect costs of absenteeism and unemployment. Ill-health costs the UK economy approximately £100bn annually and 175 million working days are lost each year.
- ¹⁸³ Ill-health is unevenly distributed within London. In a single London borough average life expectancy can vary by as much as 10 years between people living in the most and least deprived neighbourhoods.
- ¹⁸⁴ Transport affects both physical and mental health, in several ways. For example, it has a direct and adverse effect through road traffic collisions, while air pollutant emissions are harmful to health. Conversely, it can offer an opportunity for physically active travel – walking and cycling – and this can provide a clear health benefit by reducing the risks of developing heart disease and diabetes.
- ¹⁸⁵ The Mayor has a duty to address health inequality and will do so partly through this transport strategy. For example, this strategy will seek to improve health outcomes for neighbourhoods close to major arterial roads which bear a disproportionate amount of adverse health effects from air pollution, noise and road traffic injuries.
- ¹⁸⁶ In addition, there is a significant opportunity for the MTS to help combat increasing levels of obesity in London's population. The latest available records suggest that two-thirds of adults in England do not meet the Chief Medical Officer's recommendation for physical activity, and almost as many are classified as overweight or obese. The rise of childhood obesity is a particular cause for concern with more than 10 per cent of London's four to five-year-olds being classed as obese, rising to more than 20 per cent of 10 to 11-year-olds.

- ¹⁸⁷ Nearly one in 10 early deaths in the UK is due to excess weight and, on average, obese people die 11 years earlier. Increased levels of walking and cycling will help to reduce obesity levels in London and ultimately help to reduce the number of early deaths it can cause.
- ¹⁸⁸ Walking and cycling can benefit mental as well as physical health. Moderate exercise has been found to reduce levels of depression and stress, improve mood and raise self-esteem.

Policy 17

The Mayor, through TfL, and working with the DfT and other government agencies, the London boroughs, health authorities and other stakeholders, will promote healthy travel options such as walking and cycling.

This policy is taken forward by proposals: 51, 52, 53, 54, 55, 57, 58, 59, 60, 61, 62, 68, 115 and 116.

- ¹⁹⁰ Safety on public transport services is good with passenger fatality rates low. Even so, fear of crime and antisocial behaviour remains a significant issue.
- ¹⁹¹ Notwithstanding the tremendous reductions that have been achieved in road casualties in recent years, London's road network still has an unacceptable number of road casualties and much more remains to be done.
- ¹⁹² A safe, well-designed and maintained public realm also determines perceptions of safety for pedestrians and cyclists. It is an important factor in encouraging take-up of these modes, for example, with regard to children walking and cycling to school. Fear of crime and personal security concerns are key issues in determining whether people will combine walking or cycling with longer journeys by public transport. It is also important to ensure journeys by taxi and private hire vehicle (PHV) are as safe as possible for passengers and drivers.

4.4 Improving the safety and security of all Londoners

4.4.1 Introduction

- ¹⁸⁹ The safety and security of all Londoners is of paramount importance to the Mayor. His goal is to make London a safer place to live, work and visit. Lack of safety and security (perceived or actual) is a barrier to travel for some and reduces their ability to access services and opportunities. Improving safety and security will also help to address wider challenges, including improvements to the quality of life and making London a fairer and more prosperous city.

4.4.2 Reducing crime, fear of crime and antisocial behaviour

- ¹⁹³ Crime levels on public transport services are low, although fear of crime and antisocial behaviour remain a significant issue. Ensuring the personal security of all those travelling in London, as well as public transport staff, remains extremely important to the Mayor. This strategy seeks to continue reducing the rate of crime on the transport network as the overall volume of travel increases. Policies and proposals that aim to reduce the crime rate should also reduce the fear of crime, delivering wider benefits to society.

- ¹⁹⁴ Much progress has been made over the past five years in reducing the crime rate, however, maintaining and building upon these improvements is a resource-intensive process. Therefore, it remains important to ensure that expenditure on staff, technology, design and other programmes to reduce crime and the fear of crime is focused and targeted at those areas where needs are greatest.

Policy 18

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to reduce the rate of crime, the fear of crime and antisocial behaviour on London's transport system.

This policy is taken forward by proposals: 13, 18, 21, 26, 27, 41, 42, 60, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83 and 84.

4.4.3 Improving road safety

- ¹⁹⁵ The last decade has seen improvements in reducing deaths and injuries on London's roads, but reducing casualties still remains a significant challenge and the benefits have not been shared equally between communities and road users. This strategy seeks to ensure all Londoners benefit from the improvements proposed to make roads safer.

Policy 19

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders including the police and road safety partnerships, will seek to improve road safety for all communities in London and implement measures that contribute to any targets that may be set by the Mayor from time to time.

This policy is taken forward by proposals: 54, 60, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 83, 84, 129 and 130.

4.4.4 Improving public transport safety

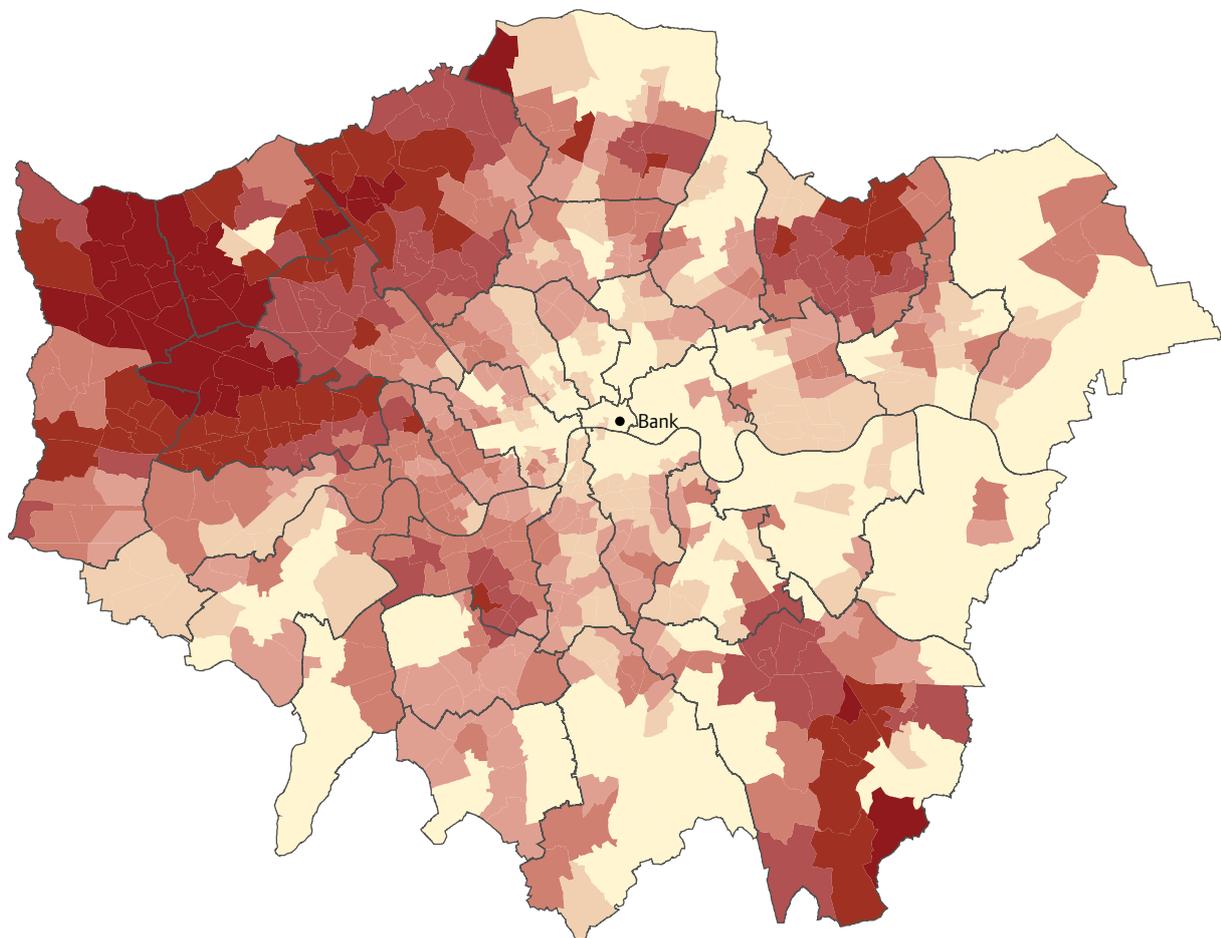
- ¹⁹⁶ The injury risk posed to passengers and staff on London's public transport networks is already very low. The strategy seeks to ensure that high health and safety standards are maintained as public transport provision expands, and to reduce the risk of disruption from unpredictable events.

Policy 20

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will implement measures that seek to improve operational safety and security on public transport.

This policy is taken forward by proposals: 18, 20, 63, 110, 111 and 112.

Figure 27: Public transport journey relative time differential to/from Bank by physically accessible route in comparison to quickest route



Absolute difference in average journey time (minutes) to Bank

- >45 minutes
- 30 to 45
- 20 to 30
- 10 to 20
- 5 to 10
- 1 to 5
- <1

This is an illustrative example and relative journey times will vary depending on destination. Journey times based on the network in 2006

4.5 Improving transport opportunities for all Londoners

4.5.1 Introduction

- ¹⁹⁷ Despite London's economic success over the last few years, not everyone has benefited from its prosperity. Whether through lack of educational or employment opportunities, disability, personal mobility, age, ethnicity or other factors, many Londoners are still excluded from much of what the city has to offer. The Mayor's framework for equality is set out by 'Equal Life Chances for All'¹. Meeting the needs and expanding opportunities for all Londoners – and where appropriate, the needs of particular groups and communities – is key to tackling the huge issue of inequality across the Capital. The provision of a more accessible transport system and improved transport connectivity and capacity is an important part of meeting this commitment.
- ¹⁹⁸ In terms of the accessibility of transport services, much has been achieved in recent years: more than 90 per cent of Londoners now live within 400 metres of a bus stop (five minutes walk at an average walking speed) and all of the bus fleet, bar heritage Routemasters, are accessible. At bus stops which require it (45 per cent of the total at present), raised kerbs and improved layouts to help reduce the gap between pavement and bus have been provided. About a third of National Rail stations and 20 per cent of Underground stations are accessible from street to platform, and
- the DLR network and Tramlink are both fully accessible from street to carriage. However, improving accessibility is not just about physical measures, it also includes: providing better information and communications; improving staff and public attitudes towards disabled, older and young people; improving the actual and perceived safety and security of transport services and travel; and ensuring that fares – which provide a necessary financial contribution to the cost of providing public transport services – do not unduly exclude people from the opportunities the Capital offers.
- ¹⁹⁹ While London boasts some of the wealthiest places in the country, it is also home to some of the most deprived. Some of these areas suffer from chronic deprivation including concentrations of low skilled and, in some cases, more vulnerable people, with few expectations and a lack of job opportunities. Experience shows that this decline also leads to degradation of the physical environment, increased crime levels, lower educational standards and can also affect people's health. Inevitably these factors contribute further to lessening economic opportunities and quality of life.
- ²⁰⁰ Poor transport is often a significant barrier in such situations, for example, in restricting access to jobs, services, education and training opportunities, and social networks. Poor land use planning can also contribute by designing and locating new developments and services remote from the local population and with little thought of how easily they can be accessed by a variety of modes of travel. Better transport,

¹ 'Equal Life Chances for All' is the Mayor's framework to address deprivation and inequality. Published by the GLA, 2009

combined with better land use planning (as well as initiatives to tackle other barriers such as cultural, safety, low aspirations or educational achievement) can break these spirals of decline by improving accessibility and raising aspirations. It can also act as a significant catalyst for regeneration, and play a role in widening the benefits of economic prosperity.

4.5.2 Improving accessibility

- ²⁰¹ In spite of the great strides that have been made in improving the quality, quantity and accessibility of London's transport system, not all Londoners – particularly disabled Londoners – are able to take full advantage of the benefits the city offers.
- ²⁰² Engagement with stakeholder groups has shown that disabled people want to make safe, reliable and accessible journeys and want access to the right information so they can plan their journey appropriately. However, disabled people, whether they have mobility or other impairments, face additional barriers to travel. These barriers can be physical such as uneven pavements or crossings, steps or steep inclines, and street furniture. They may also need assistance from staff, more information about services, assistance during service interruptions, while a positive and helpful approach from other transport users can also improve the journey experience.
- ²⁰³ The physical accessibility of the transport network can limit the journey opportunities for some people whose only option is to take accessible but longer routes. Figure 27 shows

the additional journey time for physically accessible routes to Bank station in central London. From most areas beyond the immediate fringes of central London, journeys take up to an hour longer.

- ²⁰⁴ Ensuring the transport system is accessible from the start to the end of the journey, by overcoming the barriers that exist for some users, will enable more 'spontaneous' travel that will benefit the economy and help overcome some pressing social problems. The approach being taken by the strategy therefore is to ensure the whole journey is accessible. This has been termed the 'whole journey approach' to accessibility.

Policy 21

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to increase accessibility for all Londoners by promoting measures to improve:

- a) The physical accessibility of the transport system, including streets, bus stops, stations and vehicles
- b) Information provision, staff service and the travelling environment

This policy is taken forward by proposals: 5, 9, 13, 18, 19, 21, 22, 23, 24, 25, 26, 27, 29, 40, 41, 42, 43, 44, 45, 60, 83, 84 and 115.

Case study

Transport and the development of London Docklands

The former London docks have been transformed into a vibrant mixed-use area with a major new financial district at Canary Wharf, residential areas and leisure facilities, including The O2 Arena and ExCel. The 2012 Games will also have a major presence here with events taking place at ExCel and The O2. The introduction of new transport networks has been integral to the success of the area. Without the DLR opening in 1987 (and being extensively upgraded and extended ever since), the Jubilee line extension opening in 1999

and road connection improvements such as the Limehouse Link, the London Docklands would not have developed as it has.

Canary Wharf is now one of the most sustainable locations in the Capital in terms of travel demand with very high levels of public transport use and low car use. This is because development has been planned around the transport network to ensure maximum access to rail stations and bus links.



4.5.3 Supporting regeneration and tackling deprivation

Tackling deprivation

- ²⁰⁵ Some of London's most deprived areas are concentrated in areas with relatively poor access to employment and essential services, while others are located in very high PTAL areas, within easy reach of the City, West End and Isle of Dogs. This demonstrates the complex nature of the 'opportunities for all' challenge in London. The causes of deprivation are multi-faceted; therefore tackling it will require action to be taken not just in the field of transport, but across a number of policy areas and by a range of agencies.
- ²⁰⁶ Improving the availability of public transport services and providing better walking and cycling routes and facilities in deprived areas is the first step in giving people the opportunity to access jobs and services. However, measures which address specific concerns, such as the fear of using public transport and walking at certain times must be provided so more people can realise this opportunity.
- ²⁰⁷ Research on barriers to using the DLR has shown that a high proportion of people living in deprived areas do not use public transport through fear of crime or antisocial behaviour, or cannot access the places they want due to safety or severance issues. This is often due to concerns about the safety and security of the

streets and public spaces that people need to use on their way to, and from, bus stops and stations, on public transport services and local walking journeys. Removal of physical barriers to travel, such as providing pedestrian crossings, will help reduce the severance effect of busy roads, railways and waterways. Better design and maintenance of the street environment, for example, removal of litter and graffiti, and increased presence of uniformed staff on the street, at the station or on the bus or train will help allay Londoners' and tourists' fears and encourage more people to use public transport, walk or cycle.

Policy 22

The Mayor, through TfL, and working with the LDA, DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to enhance connectivity, reduce community severance, promote community safety, enhance the urban realm and improve access to jobs and services in deprived areas.

This policy is taken forward by proposals: 5, 6, 7, 8, 9, 12, 14, 15, 19, 22, 23, 34, 39, 50, 60, 74, 76, 77, 80, 83 and 85.

Targeting transport investment in regeneration areas

- 208 The London Plan identifies areas that have a greater need for investment to accommodate London's growth, to expand opportunities for all and address the significant issue of deprivation in London's poorest communities. The LDA and others, such as the Homes and Communities Agency, will also focus investment according to the spatial priorities contained within the EDS. It is therefore essential that transport funding decisions are linked to the activities of other regeneration bodies to maximise the return on public sector investment and to ensure that regeneration is sustainable in terms of travel choices.
- 209 Neighbourhoods in need of regeneration are found across London but are concentrated in Inner London, particularly to the east. These neighbourhoods represent the largest concentration of deprivation in the country. As mentioned above, there is no clear correlation between deprivation and public transport accessibility, however, investment in new transport links in these areas can make a positive contribution to local regeneration objectives when coordinated with the spatial planning process. The classic example is the development that has occurred in the last 20 years on the Isle of Dogs. The scale of this was only made possible by the DLR and Jubilee line extension (see the case study on transport and the development of London Docklands). However, regeneration can also be achieved through improved local transport, for example, bus services developed to better serve housing estates and local neighbourhoods.
- 210 London's Opportunity Areas have the greatest potential for brownfield development, each being typically capable of accommodating at least 2,500 homes and/or 5,000 new jobs. In order for this growth to be sustainable and not adversely impact on other desired outcomes, such as CO₂ emission reduction targets, it must be linked closely to existing or potential improvements in public transport capacity and accessibility. The development of Opportunity Area Planning Frameworks (OAPs) in partnership between the GLA Group and boroughs will be the mechanism of directly linking land use and transport planning in each Opportunity Area. This will ensure there will be the appropriate level of transport capacity and connectivity to support the growth targets set out in the London Plan.
- 211 London's Intensification Areas are built-up areas with good existing and potential public transport capacity and accessibility which can support significant redevelopment at higher densities. There is a need to closely link land use and transport planning through the preparation of Intensification Area Framework Plans, to ensure that transport capacity and connectivity can support the required levels of growth. The Mayor

recognises the important role of the boroughs in developing local solutions. As a result, further assessment of the transport measures that may be required to support growth in the Opportunity and Intensification Areas will be undertaken in partnership with the boroughs as part of the sub-regional transport plan process.

- ²¹² In addition, strategic assessment frameworks developed by TfL to assess the merits of proposed transport schemes will contain criteria concerning the potential contribution to supporting the development of Intensification Areas and Opportunity Areas. This process will therefore provide a direct link between the London Plan and transport investment decisions concerning these areas.

Policy 23

The Mayor, through TfL, and working with the LDA, DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will support regeneration of Opportunity Areas and Areas for Intensification as described in the London Plan.

This policy is taken forward by proposals: 2, 5, 8, 9, 14, 15, 16, 17, 19, 22, 23, 34, 38, 39, 46, 50, 54 and 60.

4.6 Reducing transport's contribution to climate change and improving its resilience

4.6.1 Introduction

- ²¹³ Under the GLA Act 2007, the Mayor has a legal duty to have regard to climate change and to take action to address both the causes and its consequences. London, as a leading city in the developed world, intends to take a lead in establishing a pathway to a sustainable future for other cities to learn from and follow. The Mayor has responded to this first requirement by setting a specific target to reduce London's CO₂ emissions by 60 per cent from their 1990 levels by 2025. He is currently preparing a Climate Change Mitigation and Energy Strategy (CCMES) and also a Climate Change Adaptation Strategy to fulfil the second requirement.

4.6.2 Reducing CO₂ emissions

- ²¹⁴ CO₂ is London's dominant greenhouse gas emission and ground-based transport is a significant source, accounting for around 22 per cent of overall emissions (currently almost 10m tonnes of CO₂ per year). Figure 28 illustrates the sources of ground-based transport CO₂ emissions in London.
- ²¹⁵ The Mayor's target for London CO₂ emissions reductions is extremely challenging and will set London on a course to realise the Mayor's vision of London as one of the world's leading low carbon cities. The Climate Change Act

2008 defined national obligations for a 34 per cent reduction in greenhouse gas emissions by 2020, and 80 per cent reduction by 2050, both from 1990 levels. As a result, London is also on track to meet obligations under the interim UK carbon budgets (five-year, successively tighter, legally binding emissions caps set by the Government) that are defined for the period to 2022.

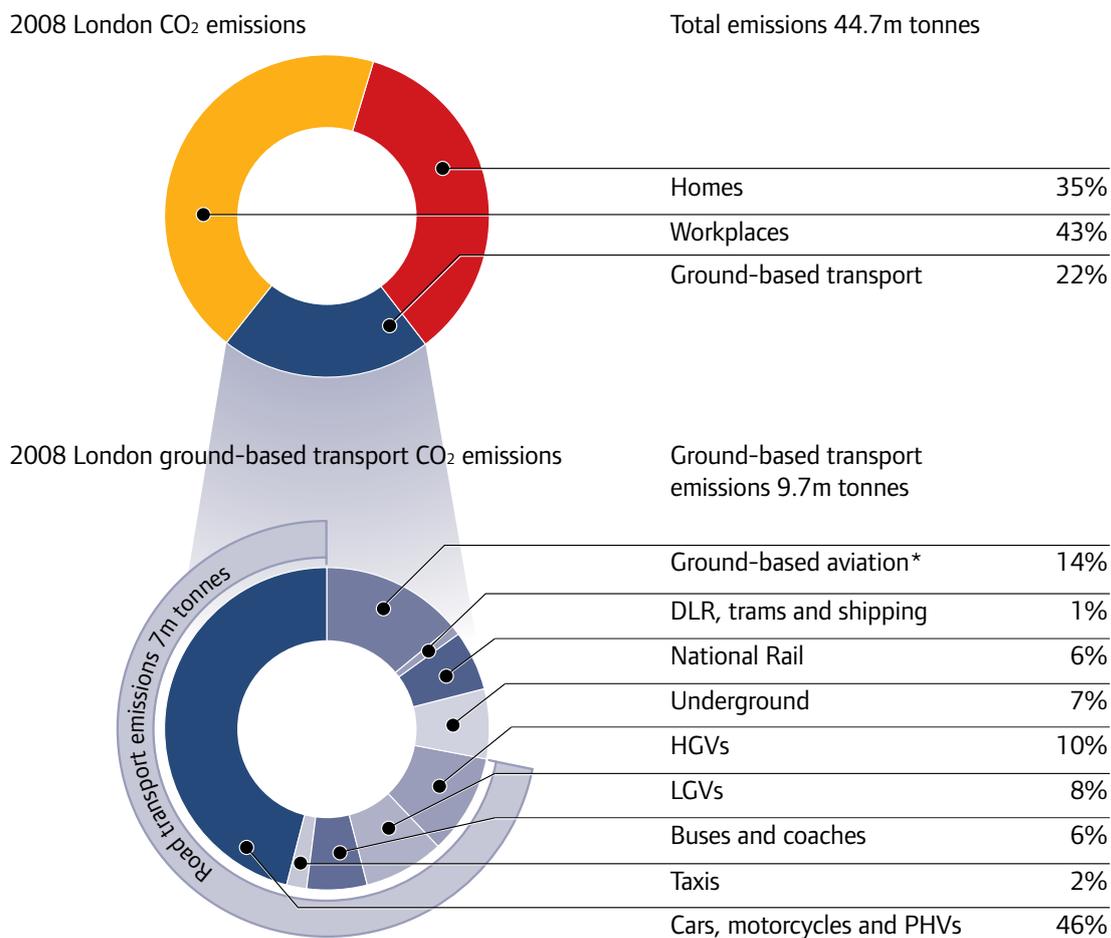
- 216 The draft Mayor's CCMES considers CO₂ emissions from homes, workplaces and transport. Although there is uncertainty concerning the precise potential contribution from each sector, research and analysis carried out in the preparation of CCMES has identified potential policies that are particularly effective in reducing CO₂ emissions from homes. The transport sector's necessary contribution to the Mayor's London-wide CO₂ emissions reduction target could therefore reduce accordingly. Given the uncertainty of the relative contribution of CO₂ emissions reductions from the three sectors, it is anticipated that the transport sector will need to reduce its CO₂ emissions by between 45 and 55 per cent by 2025 to contribute sufficiently to achieving the Mayor's overall CO₂ reduction target for London of 60 per cent by 2025 from a 1990 base.
- 217 Since 1990, population and employment have increased by around 10 per cent and travel demand in London has increased by about 15 per cent. However, since 1990 CO₂ emissions from ground-based transport in London have remained largely constant, indicating that CO₂ efficiency and travel demand have increased at approximately equal

rates. Accelerated population and employment growth is anticipated in London in the period to 2025, and beyond to 2031. It is clear that achievement of CO₂ emissions targets will require fundamental changes in transport CO₂ efficiency and/or our travel behaviour far in excess of that experienced by previous generations. It will require initiatives not just from the Mayor, TfL and the boroughs, but also from Government, the EU, motor manufacturers and the wider international community. Ultimately, the level of success in developing and implementing low carbon transport solutions will determine whether more stringent measures will be required to change travel behaviour to meet CO₂ target reductions.

Policy 24

The Mayor, through TfL, and working with the DfT, Defra and other government agencies, Network Rail, train operating companies, freight operators, London boroughs and other stakeholders, will take the necessary steps to deliver the required contribution from ground-based transport to achieve a 60 per cent reduction in London's CO₂ emissions by 2025 from a 1990 base; and to contribute to further targets that may be set by the Mayor from time to time.

This policy is taken forward by proposals: 1, 2, 4, 7, 8, 9, 12, 14, 17, 22, 25, 26, 27, 30, 31, 33, 38, 39, 45, 46, 47, 50–54, 57–62, 87, 91, 92, 93, 95–109, 113, 115–119, 125, 127, 129 and 130.

Figure 28: Transport's contribution to London's CO₂ emissions

Source: London Energy and Greenhouse Gas Inventory, 2008 (LEGGI)

* Including take-off and landing cycles to an altitude of 1,000 metres

4.6.3 Adapting to climate change

218 Some degree of climate change is now inevitable. The transport system will need to adapt to a changed climate of warmer and wetter winters and hotter and drier summers, with more frequent and intense extreme weather. The transport system's infrastructure

and operation will need to be designed and developed to become more resilient to extreme weather such as intense periods of rainfall, drought, summer heat and higher sea levels. Londoners and London's transport system are vulnerable to the long-term changes in climate and the impacts of more frequent and intense extreme weather. While the changes

to the long-term trends can be responded to through gradual systemic improvements, the threats from extreme weather already present significant challenges.

- 219 The Climate Change Act 2008 requires the Secretary of State to provide updates, at a minimum of five-yearly intervals, on the risks to the UK posed by climate change and a programme setting out how the risks will be addressed. The Act empowers Government to require organisations to compile and publish reports on:
- The current and future predicted impacts of climate change
 - Proposals for adapting to climate change
- 220 The first report from the GLA is required by the end of 2010 and TfL will be a major contributor.

Policy 25

The Mayor, through TfL, and working with the DfT, Defra and other government agencies, Network Rail, train operating companies, London boroughs and other stakeholders, will take necessary steps to adapt the transport system and improve its resilience and public safety to the anticipated impacts of climate change.

This policy is taken forward by proposals: 110, 111, 112, 113 and 114.

4.7 Supporting delivery of the London 2012 Olympic and Paralympic Games and its legacy

- 221 Hosting the 2012 Games is a great honour for London. It also presents a huge challenge, with more than seven million tickets available and at least 600,000 spectators expected in London on the busiest days. In addition, there will be around 16,000 athletes and team officials, and over 45,000 technical officials, press, broadcasters, marketing partners and members of the 2012 Games family.
- 222 The Mayor is committed to making the 2012 Games the most accessible, inclusive and environmentally friendly games ever. In terms of transport, the ODA has the aim of ensuring that every spectator travels to the Games by public transport, walking, cycling or temporary park-and-ride services where needed. The ODA has been consulted on this strategy and in preparing it, the Mayor has had regard to the Olympic Transport Plan.
- 223 A key challenge during the 2012 Games will be to minimise the impact on Londoners' everyday activities, and to ensure that businesses can continue to operate in central, Inner and Outer London. With the Olympic (and then Paralympic) Route Network in place, the delivery and servicing activity for London will need to continue to operate. Addressing this challenge will help to ensure that hosting the Games is a positive experience for all.
- 224 The ODA is committed to ensuring a lasting transport legacy. This includes providing new

infrastructure, enhanced and new public transport services, training and employment opportunities in the transport sector, and the regeneration of east London. This lasting legacy must be aligned with, and supportive of, the MTS vision and objectives.

225 The 2012 Games will mean that many Londoners are required to change the way they travel during the event. There is an opportunity to create a lasting legacy in terms of changes in travel behaviour of benefit to the Capital, either through reduced crowding and congestion, or the health and environmental benefits of an increase in walking and cycling, as well as through the inspiration of the athletes themselves.

226 The 2012 Games will be located in some of the most deprived communities in the country. In November 2009, the five host boroughs¹ published a Strategic Regeneration Framework (SRF) which outlined a shared Olympic legacy vision which goes beyond the Olympic Park and sporting arenas.

227 A 'principle of convergence' is at the centre of the vision. Namely, that within 20 years the communities in the five boroughs will enjoy the same social and economic chances as their less deprived neighbours across London. Key indicators of convergence include more local residents in jobs, fewer children living in poverty, higher educational attainment, fewer chronic health problems and higher levels of physical activity. Achieving this convergence will mean a pace of change that, in many cases, is two to three times the average London improvement rate.

228 The Mayor is committed to supporting the boroughs in achieving convergence as this will benefit the local area and the whole of London. Maximising the benefits of the Olympic Park is the Mayor's highest regeneration priority. His London Plan promotes the development and implementation of a sustainable legacy from the Games to deliver fundamental economic, social and environmental regeneration in east London. This includes new cycling connections within and around the Olympic Park; supporting a media and creative industry cluster; and, promoting the park and its venues as an international visitors' destination. It is crucial therefore that all stakeholders work together to realise the full potential of hosting the event.

Policy 26

The Mayor, through TfL, and working with the ODA, DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will ensure delivery of the committed transport infrastructure required for the London 2012 Olympic and Paralympic Games, and its successful operation during the Games; and will maximise the benefits of its physical and behavioural legacy to support the principle of convergence.

The behavioural legacy of the Games will be taken forward by proposals 1, 47, 54 and 116.

229 The delivery of the committed transport infrastructure upgrades is on schedule to support the 2012 Games. This includes upgrades to the Northern, Central and Jubilee lines, the DLR and London Overground, as well as walking and cycling improvements.

¹ The London boroughs of Tower Hamlets, Hackney, Greenwich, Newham and Waltham Forest

Spotlight

The London 2012 Olympic and Paralympic Games Transport Plan

The Olympic Transport Plan aims to ensure a successful, sustainable 2012 Games and leave a legacy that will benefit Londoners for many years to come. It has planned for three key groups of people to move around the Capital efficiently during the Games:

- The Games Family – around 50,000 people (especially athletes) will require transport on any one day for training, competition or recreational purposes
- Spectators – around 600,000 spectators will use public transport to travel to the Games on the busiest days of the competition. Every person with a ticket to an event will be given free public transport
- The Games workforce – around 100,000 will travel by public transport

The plan will aim to make the most of the new investment in public transport, walking and cycling that is being delivered across London in the run up to the 2012 Games.

The plan also seeks to ensure that increased demand for transport services during the Games has a minimal impact on existing transport networks and commuters' regular journeys within London. This will be managed through the Olympic Transport Operations Centre, established to manage all modes of transport for the Games Family, spectators, workforce and for all those travelling for reasons unconnected with the Games. This will help TfL, other transport operators, the police, local authorities and those running the event to keep London moving.





5.1 Introduction – a balanced and integrated approach

- ²³⁰ Chapter four outlines the strategic policies that are required to meet the objectives of the MTS. There are a number of tools available to implement these policies such as investing in the transport network to provide more capacity and better connectivity, managing and influencing the demand for travel, and the introduction of new technology to reduce emissions. As always, there are trade-offs which means a balanced approach must be taken.
- ²³¹ London's transport network is finite and there is often competition for this limited space, whether it is for road space or rail paths. In striking the right balance the proposals in this chapter recognise that all the varying needs of London need to be met – the needs for international links (as a global city), for national links (as a national capital), and more local links (London is a place where people live, visit and work). The proposals set out in this chapter cater for all of these needs.
- ²³² The specific transport proposals have to be considered in terms of effectiveness, acceptability and cost. There may be an obvious 'best mode for the task', for example, only rail-based modes can provide the sufficient capacity to cater for the very high volume 'same time, same place' demand that occurs twice a day during the week to, and from, central London. Similarly, regular high to medium volume demand over a short to medium distance, particularly in growing areas such as the London Thames Gateway can be best accommodated by bus, tram or light rail such as the DLR, whereas the more dispersed trips in Outer London tend to favour bus, bike (over a shorter distance) and car. Local short distance journeys present the best opportunity for walking and cycling.
- ²³³ As a consequence, different areas of London require different policy interventions. Proposals for central London will inevitably focus on tackling congestion, increasing the capacity of the rail network, encouraging walking and cycling, and managing demand. In Outer London, proposals need to acknowledge the role of the car, especially low emission cars. For Outer London town centres, measures to improve bus accessibility, public realm, walking and cycling will generally be prioritised. There may be places where a number of options are possible. In these cases further work will be required to assess the most effective solution, bearing in mind the cost of the scheme in construction and during operation. The need to recognise affordability and business case constraints will be paramount given the current financial environment, and this will inevitably preclude some schemes.
- ²³⁴ Due to the dispersed nature of trips in Outer London, the role of the car is acknowledged as sometimes necessary, particularly for medium to longer distance trips. The use of cleaner, low emission cars will be encouraged over others.
- ²³⁵ Most freight is moved by road. While a mode shift from road to rail and water is needed to achieve the goals of the strategy, for some

types of freight, and for many servicing trips, access by road will remain a requirement. The strategy therefore needs to ensure that the freight left on the roads (which will be the majority) is moved as efficiently as possible while contributing to goals of the strategy. This will require cleaner, better driven vehicles, better journey planning and the integration of freight and land use planning.

- 236 Interventions can also be temporal as well as spatial. The need to satisfy and cater for peak demand means there is spare capacity off-peak. Greater use of transport throughout the week can help cover the fixed costs of provision and make the best use of investment. The seven-day week, 365-days-a-year, diverse economy is something the London Plan seeks to encourage through policy support for tourism, retail, arts and entertainment and emerging

economic sectors, as well as more flexible working practices. This highlights the need for a transport strategy that is integrated with other broader policy areas such as land use planning, education and healthcare provision.

- 237 The proposals for each mode or policy area contained in the following chapter are derived from how they can best support the strategic transport policies set out in chapter four, with regard to the nature of the mode and policy objectives. They have also been developed using an integrated approach, taking account of wider strategies within London such as the London Plan, EDS, Air Quality and Housing strategies, as well as looking beyond the GLA boundary to the Greater South East region.



Proposals to manage and enhance the transport system

5.2 National Rail, Crossrail, Thameslink, London Overground, DLR and Tramlink

5.2.1 Introduction

²³⁸ London is more dependent on rail than any other city in the UK: 70 per cent of all rail travel (including Tube journeys) in the UK is to, from or within the Capital. London's success is bound up with the future of its rail network and services. It is vitally important, therefore, that Network Rail and the train operating companies better serve the city's needs, and that the Mayor has greater input and influence over planning and delivery of their services.

5.2.2 International and National Rail links and services

International rail passenger links

²³⁹ The strategy fully supports expansion of international rail services that improve London's connectivity with Europe and provide a viable alternative to air travel.

²⁴⁰ Eurostar services currently run non-stop or make only one intermediate stop between St Pancras International and the Channel Tunnel, with services calling at either Ebbsfleet International or Ashford International. Beyond 2010, EU policies will permit competition for international rail services, which may result in an increase in international high-speed rail services to/from London. This will provide an opportunity to encourage European destinations and to use Stratford International station to reduce congestion at St Pancras International, and provide better international connections to the Isle of Dogs and east London.

Proposal 1

The Mayor, through TfL, and working with the DfT, Network Rail, the operators of international rail services and other transport stakeholders, will encourage the provision of direct international rail services to a wider range of European destinations, with some of those new services serving Stratford International station.

International and national rail freight

- ²⁴¹ International and national movement of freight plays an important role in the success of London's economy. The Mayor will work with others to seek to deliver enhanced rail freight capacity through supporting new terminals to facilitate efficient movement of goods; and encourage transfer of freight from road to rail wherever possible.
- ²⁴² The new £1.5bn container port, known as London Gateway, near Tilbury, will provide substantial additional port capacity in the South East when it opens, generating new rail freight flows through London.
- ²⁴³ A rail connected freight transshipment facility at Howbury Park, near Slade Green, is being developed, and is expected to open in 2010, enabling the transfer of road freight to rail. A new rail freight hub is also proposed at Brent Cross/Cricklewood.
- ²⁴⁴ High Speed One (HS1) is an under-used facility for rail freight and has the unique benefits of the larger European gauge clearance for 'high-cube' containers and the possibility of express freight services carrying high value goods. To enable this, terminal facilities are required, with the London riverside area of the Thames Gateway being the identified site.

Proposal 2

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, freight operating companies, London boroughs and other transport stakeholders, will support the development of more rail freight terminals in or near London, including connections to HS1 for international freight, in line with the London Plan policy to identify new sites for strategic rail freight interchanges.

- ²⁴⁵ A number of rail routes in London are used by freight services passing through the Capital, for example, on their way to the Midlands from Channel ports and from Europe via the Channel Tunnel. While the use of rail for these kinds of freight movements is supported, this 'through' traffic should have a minimal impact on the capacity of the passenger rail network and on local communities through noise.

Proposal 3

The Mayor, through TfL and working with the DfT, Network Rail, train operating companies, freight operating companies, London boroughs and other transport stakeholders, will support the development of National Rail routes that relieve London of freight without an origin or destination in the Capital.

Domestic high-speed rail

- 246** The introduction of the first domestic high-speed services in the UK on HS1 in 2009, has significantly reduced journey times from Kent and the Thames Gateway to central London. Elsewhere, domestic rail service journey times from London to the regions can be longer than passenger expectations, particularly when compared to European competitors who have invested in high-speed rail networks.
- 247** Capacity is critical on a number of main lines out of London, in particular the East Coast Main Line to Yorkshire, the northeast and Scotland, and the Great Western Main Line to the southwest and south Wales. The West Coast Main Line to the west Midlands, the northwest and Scotland has recently benefited from a £9bn upgrade allowing faster and more frequent services. However, according to Network Rail, by 2020, the main line from London to Birmingham and the northwest will be full, given projected growth.
- 248** Proposals for a second high-speed line to link the centre of London with Birmingham, in the first instance, as part of a possible wider domestic high-speed rail network, are currently being considered by the DfT. This is based on a detailed set of proposals developed by High Speed Two, the company set up by the DfT to investigate options for a new-high speed line from London to the West Midlands and potentially beyond. According to the DfT's High Speed Rail Command Paper, published in March 2010, such a new line could deliver well over £2 of benefits for every £1 spent on

building the line, in addition to journey times of 49 minutes from central Birmingham to central London. Were the line to be extended north from Birmingham, to Manchester and Leeds (in a Y-shaped network), it could offer journey times of around 75 minutes between both cities and London, as well as releasing significant capacity on the existing West Coast Main Line (and other routes) for more commuter and freight services. The current plans allow access to Heathrow via a connection with Crossrail in west London, providing the potential for improved connectivity between Heathrow airport and other parts of the UK by high-speed rail. However, further thorough research is required to determine the optimum location for such an interchange.

Proposal 4

The Mayor and TfL support the development of a national high-speed rail network and will work with the DfT, Network Rail, High Speed Two and other transport stakeholders to ensure that the main London terminal for any new high-speed line is centrally located, well-connected to the existing public transport network, and widely accessible to maximise access to jobs and London's population. It is currently considered that Euston best meets these criteria. Further evaluation will be made of this and other potential termini, in particular, in relation to links to Heathrow.

5.2.3 London and the South East rail links and services

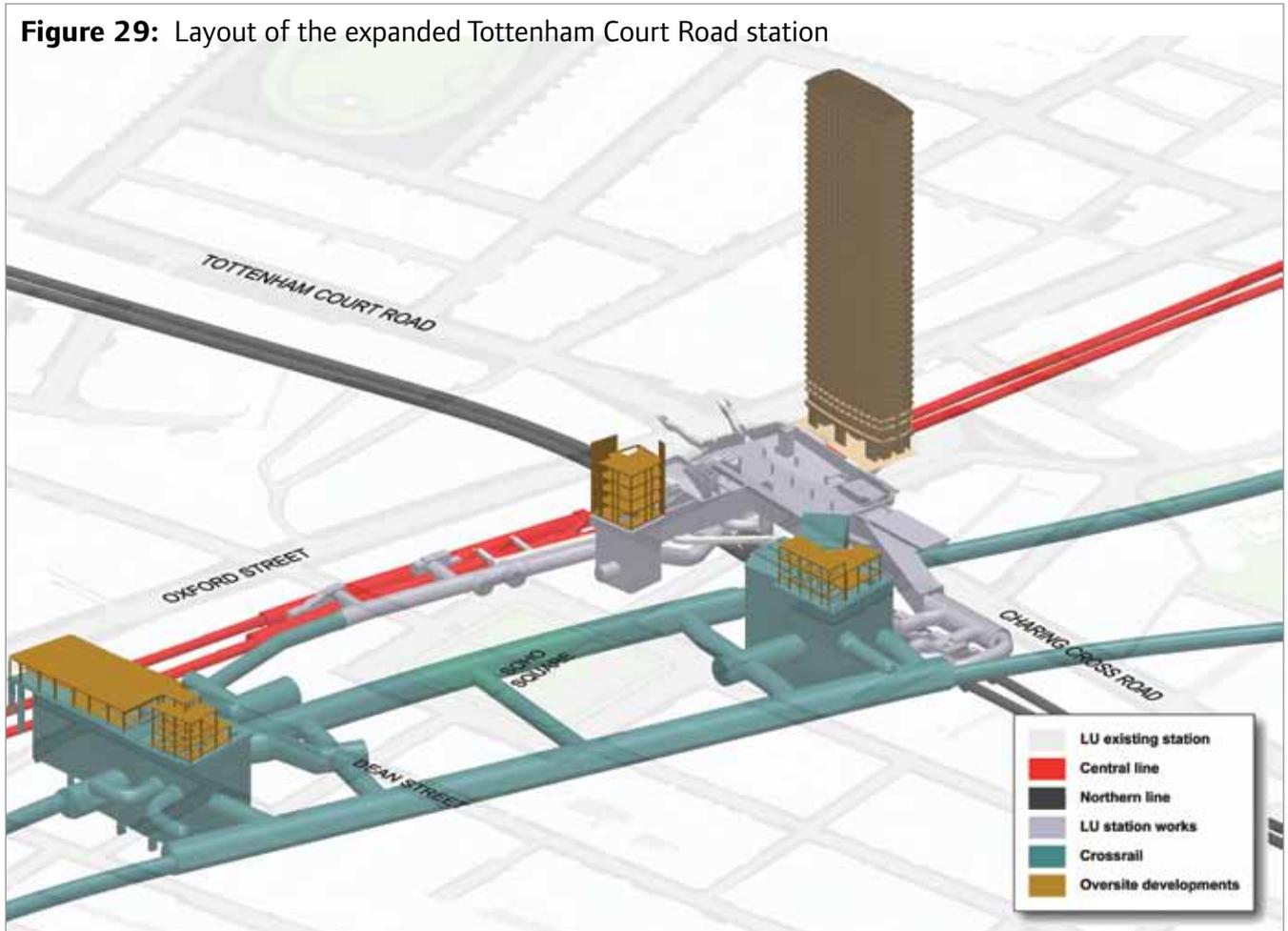
Accommodating growth on the National Rail network

- ²⁴⁹ Rail will continue to be the dominant mode in accessing central London, with three quarters of all trips from Outer London to central London made by National Rail, Tube and DLR. As the number of trips in London increases, inevitably the demand on the National Rail network will increase, by approximately 35 per cent by 2031.
- ²⁵⁰ BAA/Heathrow Airport Limited have recently applied to the Secretary of State for Transport as part of the Transport and Works Act 1992 process, to authorise construction of Airtrack, a new rail link connecting the existing rail line from Waterloo to Reading with Heathrow Terminal 5. More information about Airtrack is contained in the airports section of the MTS.
- ²⁵¹ The DfT has also announced its intention to electrify the Great Western Main Line from London Paddington to Oxford, Bristol and Swansea. The Mayor welcomes this project and is committed to working with the DfT to maximise the benefits to London, including the potential to extend Crossrail westwards to Reading. The Mayor also remains committed to seeing other rail electrification proposals taken forward, such as Gospel Oak to Barking (which will also contribute to improving air quality).

Crossrail

- ²⁵² Crossrail is the biggest transport project in Europe and a scheme of national importance that will provide a rail spine across London from east to west, as shown in Figure 30. It is needed to underpin the most rapid economic growth areas of London and will be a significant capacity addition to the transport network. Figure 29 illustrates the immense scale of the scheme with the example of the new station at Tottenham Court Road. This will transform access to this area of the West End from the current crowded and congested conditions to a spacious, high quality and attractive travel environment, capable of supporting local economic intensification.
- ²⁵³ When completed in 2017, Crossrail will enable the City and Canary Wharf to continue to maintain their leading business status in the world, support the continued development of the West End, help to lock-in the legacy benefits of the 2012 Games, and transform the Thames Gateway through links to northeast and southeast London and on into Essex.
- ²⁵⁴ Crossrail will facilitate easier, faster and for the first time, direct journeys by public transport from Heathrow to Canary Wharf, as well as better links to London's other central business areas, helping to improve London's international links. Crossrail is the only transport project that can deliver the capacity needed to support more jobs in central London and the Isle of Dogs, improve the east-west employment corridor and support development of new employment areas and new jobs in areas

Figure 29: Layout of the expanded Tottenham Court Road station

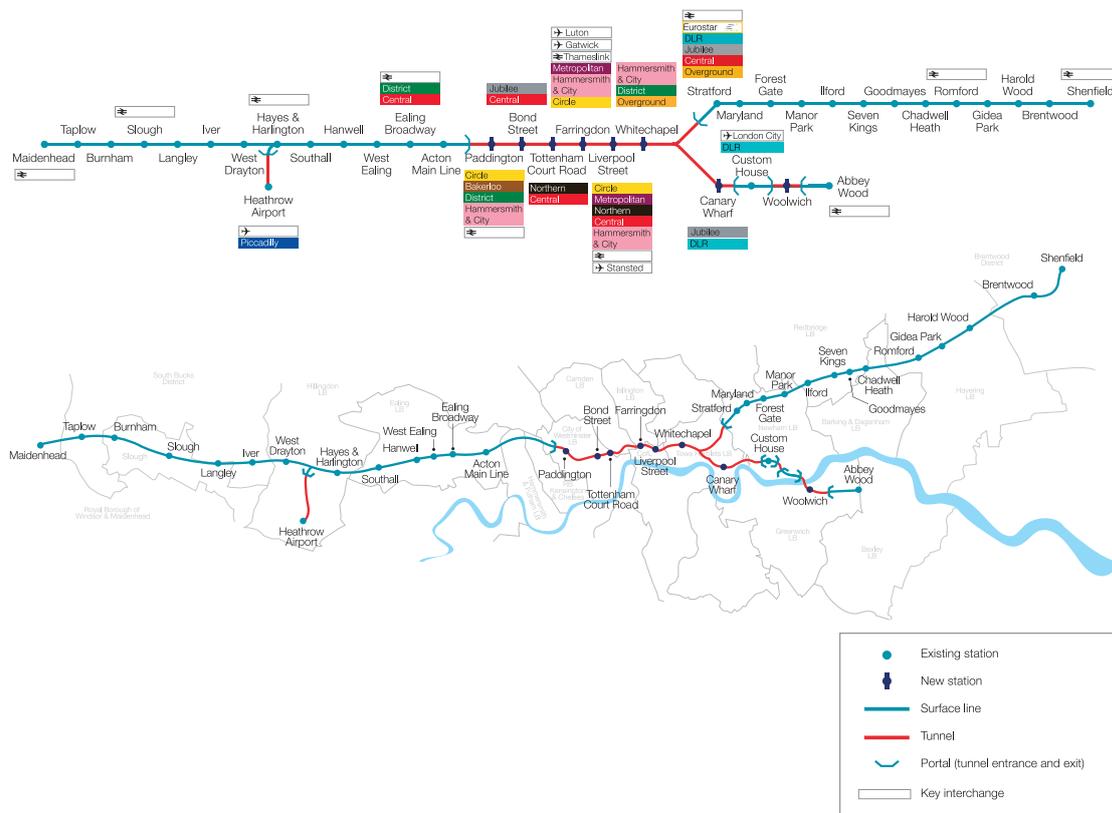


such as the Thames Gateway. Without Crossrail, London will be prevented from continuing the development of its second business centre at Canary Wharf, and maximising its contribution to the wider UK economy.

255 Crossrail provides the largest single increase in public transport capacity exactly where it is most needed. It will add 10 per cent to the overall capacity of London's rail network through the provision of 24 high-capacity, 10-coach trains an hour in each direction in the

central section during peak periods. According to forecasting work undertaken by TfL, an additional 5.8 million passenger kilometres are added to peak capacity and Crossrail will deliver significant crowding relief on the Tube (including the Central, Piccadilly, Metropolitan, Hammersmith & City, Circle and Jubilee lines) and the DLR.

256 As a project of national significance, Crossrail will bring transport improvements that will be felt across the country. The scheme will be a

Figure 30: Crossrail route connections and regional maps

catalyst for safeguarding a national economy inextricably linked with that of London (see spotlight on the wider economic benefits of Crossrail). The provision of high quality information to keep people informed about the construction programme, especially to minimise inconvenience to users of other transport services, local residents and businesses, will be a high priority for Crossrail. Overall the benefits of Crossrail are estimated to be worth at least £36bn in current prices to the national GDP over the next 60 years.

Proposal 5:

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, freight operating companies, boroughs and other transport stakeholders, will seek to ensure that Crossrail is delivered by 2017, and that it is fully integrated with the rest of London's public transport system; that the impacts of construction on residents and businesses are minimised as far as possible; and that the future benefits Crossrail brings are monitored to ensure the rail link achieves its objectives.

Spotlight

The wider economic benefits of Crossrail

Crossrail will deliver significant benefits to the national economy, the wider southeast region as well as to London. In addition to the wide ranging transport benefits, such as reduced crowding, additional capacity, new direct links across the Capital and reduced journey times, Crossrail also delivers a range of direct economic benefits. It supports a development potential of more than 260,000 jobs and 70,000 people within the key Opportunity Areas alone (Isle of Dogs, City fringe, Lower Lea Valley, Paddington) and is expected to generate up to 30,000 extra jobs – through productivity improvements in central London by 2027.

The Crossrail project will employ up to 14,000 people at the peak of construction between 2013 and 2015, and will contribute to an ongoing pool of skilled workers through the new tunnelling academies being established by the Mayor. In the longer-term, Crossrail will generate an estimated 1,000 jobs when fully operational. Crossrail will also require the services of regionally-based manufacturers and other suppliers.

Crossrail will serve significant new residential areas, for example, parts of the Thames Gateway and beyond in the South East and East of England regions, where employment accessibility will be significantly enhanced, bringing an additional 1.5 million more people across London within an hour's travel of the West End, City and Docklands. However, it is not just central London and Docklands economies which benefit from Crossrail, Outer London gains considerable benefits too, as illustrated in Figure 30. Crossrail also links key Outer London metropolitan town centres, such as Romford, Ilford and Ealing, delivering further regeneration benefits.

It will be important that other public investment is coordinated to maximise these benefits. To this end, the LDA is developing a Crossrail Regeneration Investment Plan to identify and prioritise potential interventions that would bring further regeneration benefits to the areas around key Crossrail stations.



²⁵⁷ London is the centre of the Greater South East region of England, the fastest developing area of the country, with a number of nationally designated Growth Areas. Continued economic growth is mutually beneficial – much of London's workforce live beyond the GLA area. It is therefore important to look across regional boundaries. Future extensions of Crossrail, to the east and west, could help reduce congestion and improve connectivity and, together with longer trains, ensure maximum benefit is derived from the Crossrail infrastructure.

Proposal 6

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies and other stakeholders, will consider future extensions of Crossrail that reduce congestion and improve connectivity on London commuter routes.

5.2.4 London-wide rail links and services

High Level Output Specification investment in rail capacity

²⁵⁸ In July 2007, the DfT presented the HLOS detailing the development of the National Rail network to 2014 (control period four). The HLOS was accompanied by a Statement of Funds Available (SoFA), which detailed proposals for funding arrangements for the railways in the same time period to deliver the proposals put forward in the HLOS. The SoFA has now been reviewed by the Office of Rail Regulation, agreed with the DfT and approval given to Network Rail's Delivery Plan

to implement HLOS. As such, HLOS is now a committed programme of National Rail funding from the DfT to 2014. The process is planned to be repeated for control period five, from 2014 to 2019.

²⁵⁹ The improvements to London's rail network to be achieved by 2014 through HLOS, forms a key element of the MTS and it is essential that Thameslink and the remainder of the committed HLOS1 programme are completed to their original planned specification. The improvements are shown in Figure 31, and include:

- Improvements to capacity on each of London's main radial rail corridors, including the Thameslink programme and 900 new carriages by 2014 (Thameslink by 2016)
- Improved reliability
- Acceptance of Oyster at all National Rail stations in London from January 2010
- Improving access at stations through the Access for All obstacle-free stations programme. Approximately 50 per cent of stations in the first phase are located in London or the South East
- Enhancements to the freight gauge and route capacity on the Felixstowe – Nuneaton line (providing a direct route avoiding London for freight trains, which releases capacity for more passenger trains in London)
- Gauge enhancements to the Gospel Oak – Barking line, which will provide a route for rail freight services from the east to the north of London

Spotlight

Thameslink

The Thameslink Programme is a £5.5bn project to deliver a high capacity, north-south rail spine through central London that complements the east-west Crossrail route. It is planned for completion in 2016 and will provide greater capacity, higher frequencies, new services and improved access to central London from a range of destinations within the Capital and across southeast England.

Major benefits from the works to expand the capacity and operating network that will use Thameslink, include a capacity increase in the core section between Farringdon and Blackfriars

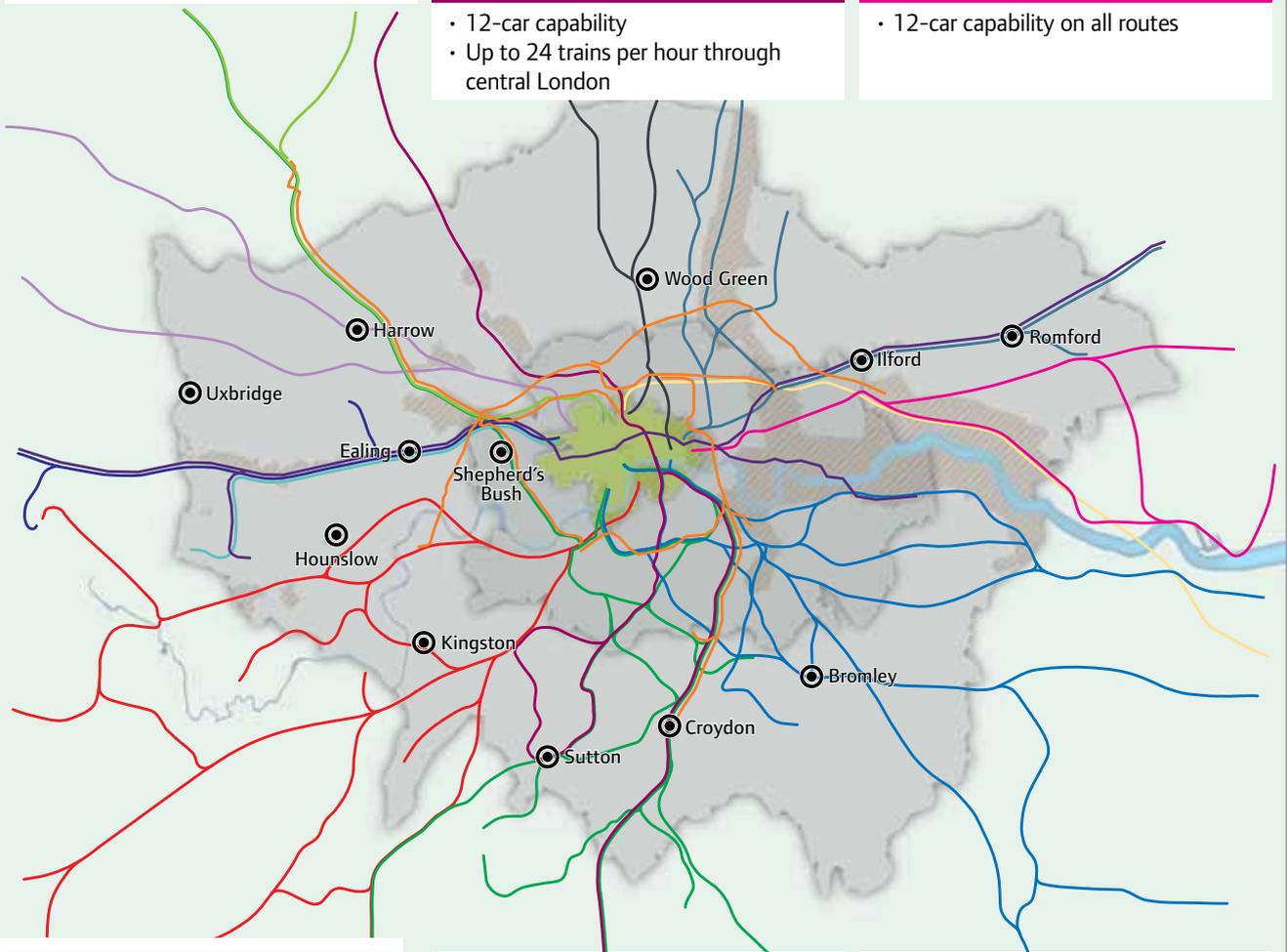
of 127 per cent by 2016. Large-scale works include the rebuilding of Blackfriars station, which will become the first station to span the Thames, providing direct access to both the north and south banks; Farringdon, will have 12-car platforms and become a major interchange between Thameslink and Crossrail; London Bridge will be significantly rebuilt to provide a major increase in capacity and better facilities for passengers. A new station will also be provided at Brent Cross/Cricklewood as part of the comprehensive redevelopment of this area.



An artist's impression of Blackfriars station courtesy of Network Rail

Figure 31: Committed enhancements to London's rail network¹

London Overground <ul style="list-style-type: none"> • New routes from: Dalston to New Cross, West Croydon and Crystal Palace • Connection between East London line and North London line at Dalston • Surrey Quays to Clapham Junction extension, completion of new orbital route 	Chiltern <ul style="list-style-type: none"> • Frequency improvements 	Great Northern <ul style="list-style-type: none"> • Frequency improvements
	West Coast <ul style="list-style-type: none"> • Trains lengthened and frequency increased 	West Anglia <ul style="list-style-type: none"> • 12-car capability Stansted and Cambridge
Crossrail core scheme <ul style="list-style-type: none"> • New route from Maidenhead and Heathrow to Shenfield and Abbey Wood with 24 trains per hour through central London 	Great Western <ul style="list-style-type: none"> • Electrification • New Crossrail services 	Great Eastern <ul style="list-style-type: none"> • Additional services • New Crossrail service
	Thameslink <ul style="list-style-type: none"> • 12-car capability • Up to 24 trains per hour through central London 	Essex Thameside <ul style="list-style-type: none"> • 12-car capability on all routes



Key	
	Opportunity or Intensification Area
	Outer London
	Inner London
	Central Activities Zone

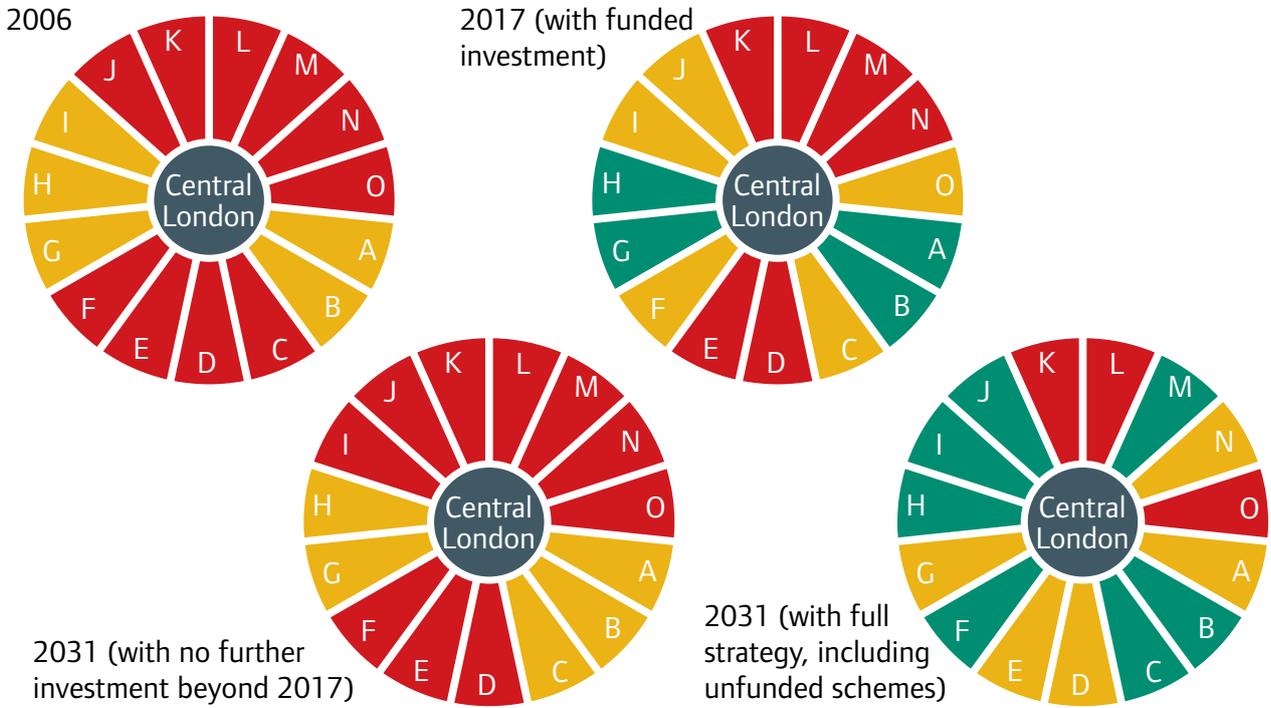
South Western <ul style="list-style-type: none"> • 10-car Windsor lines and inner suburban capability

South Central <ul style="list-style-type: none"> • 10-car inner capability
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South Eastern <ul style="list-style-type: none"> • 12-car inner suburban trains

¹ Committed in HLOS control period four

Figure 32: National Rail and Tube ‘stress’ on radial corridors into central London



Moderately ‘stressed’ corridor	On average residents in the corridor experience moderate levels of crowding on rail public transport on their way to central London during morning peak for some part or all of their journey
Highly ‘stressed’ corridor	On average residents in the corridor experience high levels of crowding on rail public transport on their way to central London during morning peak for some part or all of their journey
Severely ‘stressed’ corridor	On average residents in the corridor experience severe levels of crowding on rail public transport on their way to central London during morning peak for some part or all of their journey

Note: Corridor letters correspond to corridors in Figure 8

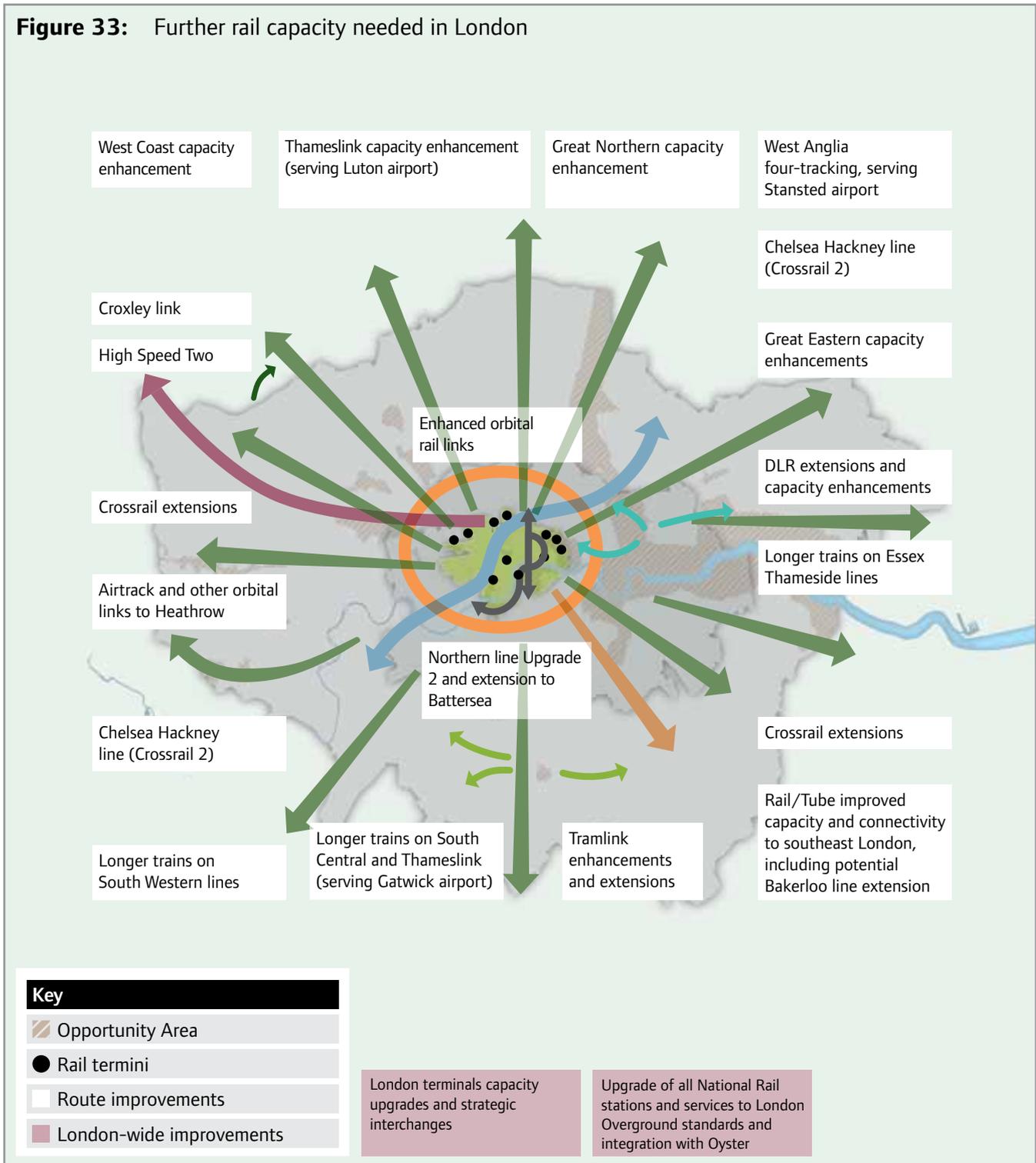
Proposal 7

The Mayor, through TfL, will seek to ensure that Network Rail and the train operating companies deliver the committed improvements to the rail network and services in London as set out by the DfT’s High Level Output Specification for the period 2009 to 2014.

Further rail investment beyond the current programme

260 Despite the significant investment in the National Rail network planned in the TfL Business Plan and HLOS, congestion will still be a significant issue on some radial rail corridors (Figure 32). Additional schemes and interventions, as set out by this strategy, will therefore be required to address specific capacity and connectivity problems in the longer-term. As most of these will need to

Figure 33: Further rail capacity needed in London



be delivered by Network Rail and the train operating companies through the franchising system, it is essential that TfL works closely with the DfT to influence the future HLOS and franchising process to deliver the improvements that are vital to London's growth. TfL will continue to press Network Rail to develop their route utilisation strategies as part of an on-going process to develop proposals for enhancing the National Rail network. In addition, TfL will work closely with Network Rail to inform franchise specifications, and inform the HLOS process.

- 261 Figure 33 illustrates a number of options to enhance the capacity provision on radial rail routes to central London to address the levels of crowding and congestion after the measures in the TfL Business Plan and HLOS have been implemented. The effectiveness of these schemes at reducing rail and Tube crowding, when combined with other capacity improvements on the Underground network, are shown in Figure 34.
- 262 In order to support Opportunity Areas set out in the London Plan, it may be appropriate to improve access to rail services by providing additional stations. The case for such new stations will be identified as part of the sub-regional planning and Opportunity Areas Planning Framework processes.

Proposal 8

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other transport stakeholders, will seek further rail capacity across London's rail network, beyond those schemes already committed.

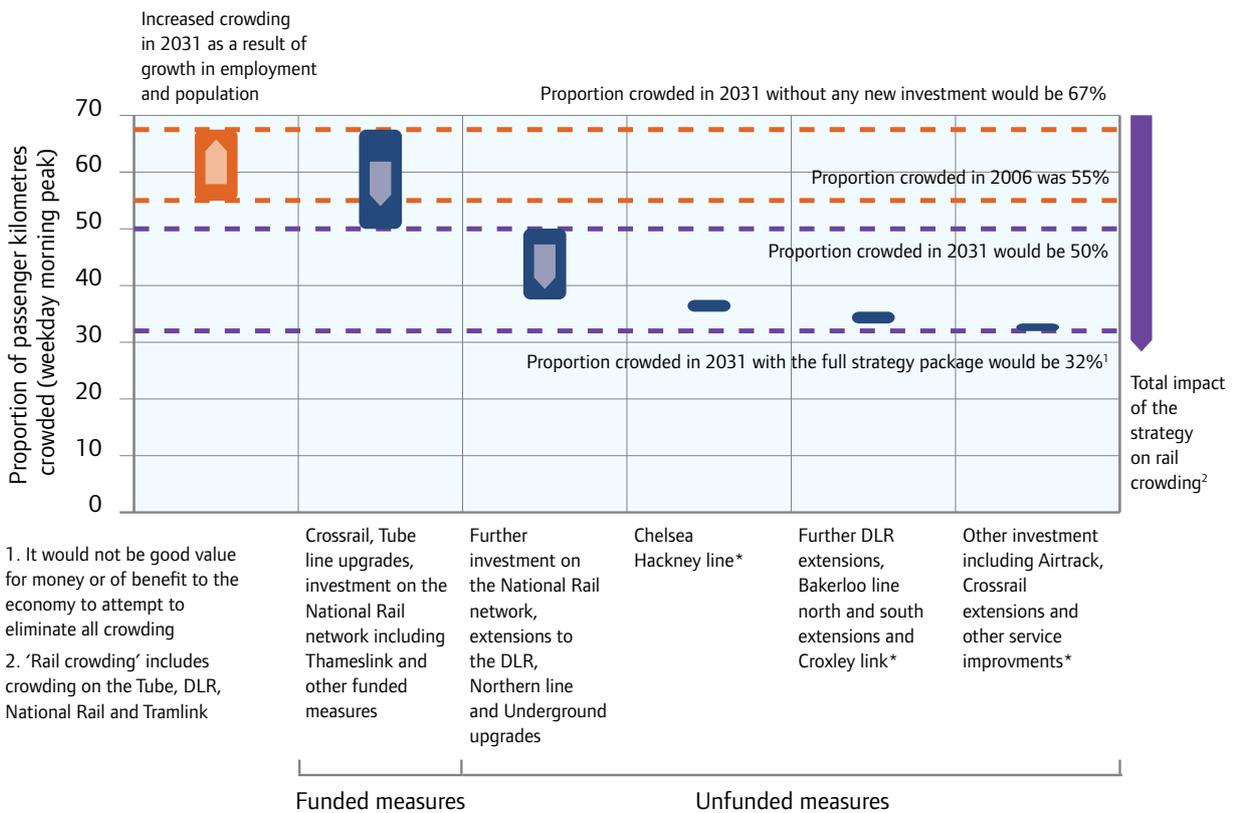
The highest priorities in the medium term are to further increase capacity on London Overground; on southwest routes; on West Anglia routes, including access to Stratford; on Great Northern services; and at congested stations.

In the longer term, further capacity solutions may be required on a number of rail corridors, such as the Brighton Main Line.

Chelsea Hackney line

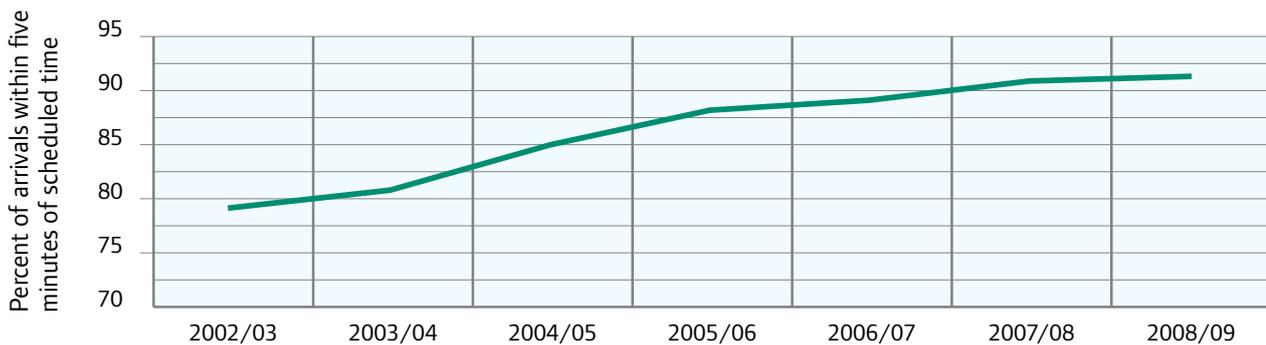
- 263 The Chelsea Hackney line (or Crossrail 2) provides significant new rail capacity on the northeast to southwest corridor and major congestion relief to existing rail and Tube lines. The route of the line is safeguarded by Government and it is essential that this safeguarding remains in place to protect this important new line. Forecast demand shows that crowding and congestion remains a significant issue in this corridor (Figure 32), even with new investments such as Crossrail and Thameslink in place. This new line is needed in the longer term to reduce crowding on existing routes, but also to provide the capacity that is required to meet London's growth and provide connections to the National Rail network, including dispersal of people across London from the main line termini. The introduction of HS2 will increase this need considerably.

Figure 34: The potential benefits from implementing measures beyond those in the TfL Business Plan and HLOS to reduce crowding on London's rail and Tube network



* Note: These schemes improve accessibility (connectivity more so than crowding)

Figure 35: National Rail punctuality (London and southeast operators total, including peak services)



- 264 It is important that the route of the Chelsea Hackney line is reviewed to ensure it is providing the maximum benefits and value for money.

Proposal 9

The Mayor will support new rail capacity in the broad southwest to northeast corridor, for example, new lines or services using the Chelsea Hackney line safeguarded alignment. TfL will undertake a review of the route to ensure it is providing the maximum benefits, including helping the onward dispersal of passengers from central London termini and value for money.

National Rail reliability

- 265 National Rail punctuality has improved considerably since 2002/03 as a result of the improved maintenance of infrastructure by Network Rail, investment in new trains and signalling, franchise reorganisation to better reflect rail network geography, franchise performance incentives and improved timetabling. However, despite these substantial achievements, there is still room for further improvement (see Figure 35).

Proposal 10

The Mayor, through TfL, will seek to ensure that the DfT, Network Rail and the train operating companies achieve the HLOS 'public performance measure' for reliability, as well as an overall reduction in significant lateness and cancellations for London and southeast services.

Station capacity enhancements

- 266 Many National Rail stations are congested, especially at peak times and enhancements to station capacity are required to improve customer service and to enable London's growth in rail demand to be accommodated. Schemes will be taken forward where they are shown to be value for money and affordable.

Proposal 11

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies and London boroughs, will seek to deliver capacity enhancements at some of London's most congested stations. The highest priorities include:

- a) Central London termini station congestion relief and onward distribution enhancements (the potential of all onward modes will be considered)
- b) Clapham Junction station capacity enhancement (new improved links between platforms, additional entrances and more ticketing facilities)
- c) Improved capacity at National Rail stations with severe congestion, including Finsbury Park, Bromley South, Wimbledon, Vauxhall and Barking
- d) Improved capacity at National Rail stations with moderate congestion, including Willesden Junction, Balham, West Croydon, Putney, Norwood Junction and Surbiton

Improving customer standards across the National Rail network in London

²⁶⁷ Despite improvements in National Rail services being delivered by Network Rail, TfL and others over the next 10 years, rail passengers still do not always benefit from the level of service or frequencies that those who travel on the Tube enjoy, particularly outside peak hours. The Mayor is keen that London benefits from a full seven-day railway, supporting the Capital's diverse economy with regular, frequent services operating seven-days-a-week, without disruptions due to engineering works, except where absolutely necessary. The Mayor also believes that train operating companies should provide sufficient capacity in terms of train lengths, to sufficiently meet demand at all times. This includes weekends when acute crowding can occur due to shorter train formations.

²⁶⁸ The Mayor will promote a common service standard across the London rail network and believes that Overground service standards provide an evidenced template to follow. This has been adopted almost in full for the recent South Central refranchise with more than 40 stations and extensive patterns of routes. The specified minimum standards include:

- Staffing over the traffic day
- Oyster acceptance and retailing via ticket machines within Travelcard Zones 1 – 6
- Station facilities such as seating and shelters
- Multi-modal customer information at stations, through posters and electronic

means, on-system and off, scheduled and real time

- Security features such as lighting, CCTV and Help points
- Graffiti removal, litter removal and cleaning
- Train frequency of at least four trains per hour on each route where the infrastructure allows, up to 23:00
- First and last trains broadly aligned with the Underground's operating hours
- Cycle parking to basic standard and monitoring regime at every station within two years

²⁶⁹ This will require the influencing of the franchise process, but could be better achieved by the Mayor having greater powers over suburban passenger services. It will also require a reduction in disruption to passenger journeys at weekends, acknowledging that sometimes, the undertaking of maintenance works at these times will remain inevitable. Network Rail is already looking at how some engineering works could be undertaken through shorter overnight 'possessions' instead, possibly through undertaking more preparatory work off-site.

Spotlight

Central London rail termini

Increasing population and employment, plus the additional capacity on much of London's rail network through the current rail investment programme, means rail arrivals into central London termini are forecast to increase by about 25 per cent by 2031. This will result in increased strain on National Rail termini, and on the transport networks and services within central London.

Limited concourse space means that station crowding is a key issue. High levels of connectivity and very large volumes of interchange passengers add extra complexities to this crowding and movement. The main termini and interchanges, which are already at, or near, capacity during peak periods need to be reviewed to ensure they are safe and efficient into the future.

Congestion relief schemes such as those at King's Cross St. Pancras and the proposed scheme at Victoria can go a long way to relieving the problems. However, these schemes are expensive and disruptive, take time to deliver and ideally need to be linked with increases in onward dispersal capacity. Encouraging more onward trips by walking and cycling is a quick and cost-effective way to free-up capacity on the Underground and buses, and ensure that limited space on these services is used more effectively. Better streets, better information provision and better facilities for cyclists, for example, cycle parking will help. The strategic interchange concept, improving and encouraging interchange at stations away from the central London termini, would also help onward dispersal (see proposal 46).



Proposal 12

The Mayor, through TfL, and working with Network Rail, the train operating companies and other transport stakeholders, will encourage the achievement of a seven-day railway by better planning and management of necessary engineering and maintenance work on the railway.

Proposal 13

The Mayor, through TfL, and working with Network Rail, the train operating companies and other transport stakeholders, will encourage the provision of rail services in London that meet common service standards, including improved ambience, amenities and wayfinding at all stations, and staff availability at each station. It is intended these improvements will be rolled-out as franchises are renewed. However, they would be better achieved if the Mayor had more control over suburban rail services in the London area.

centre at New Cross Gate. The North London Railway, also part of London Overground, is to be increased in capacity by up to 50 per cent and will also provide more frequent services. A further phase now approved will see the completion of the Inner London orbital rail network between Surrey Quays and Clapham Junction. Completion of the London Overground network enhancements in 2012 will provide an orbital rail network in Inner London that will allow, either directly or with a single change of trains, journeys such as Clapham Junction to Dalston and Crystal Palace to West Hampstead. This network of Overground rail services is shown in Figure 36. The DLR extension to Stratford International in summer 2010 will also improve orbital frequency and capacity in east London.

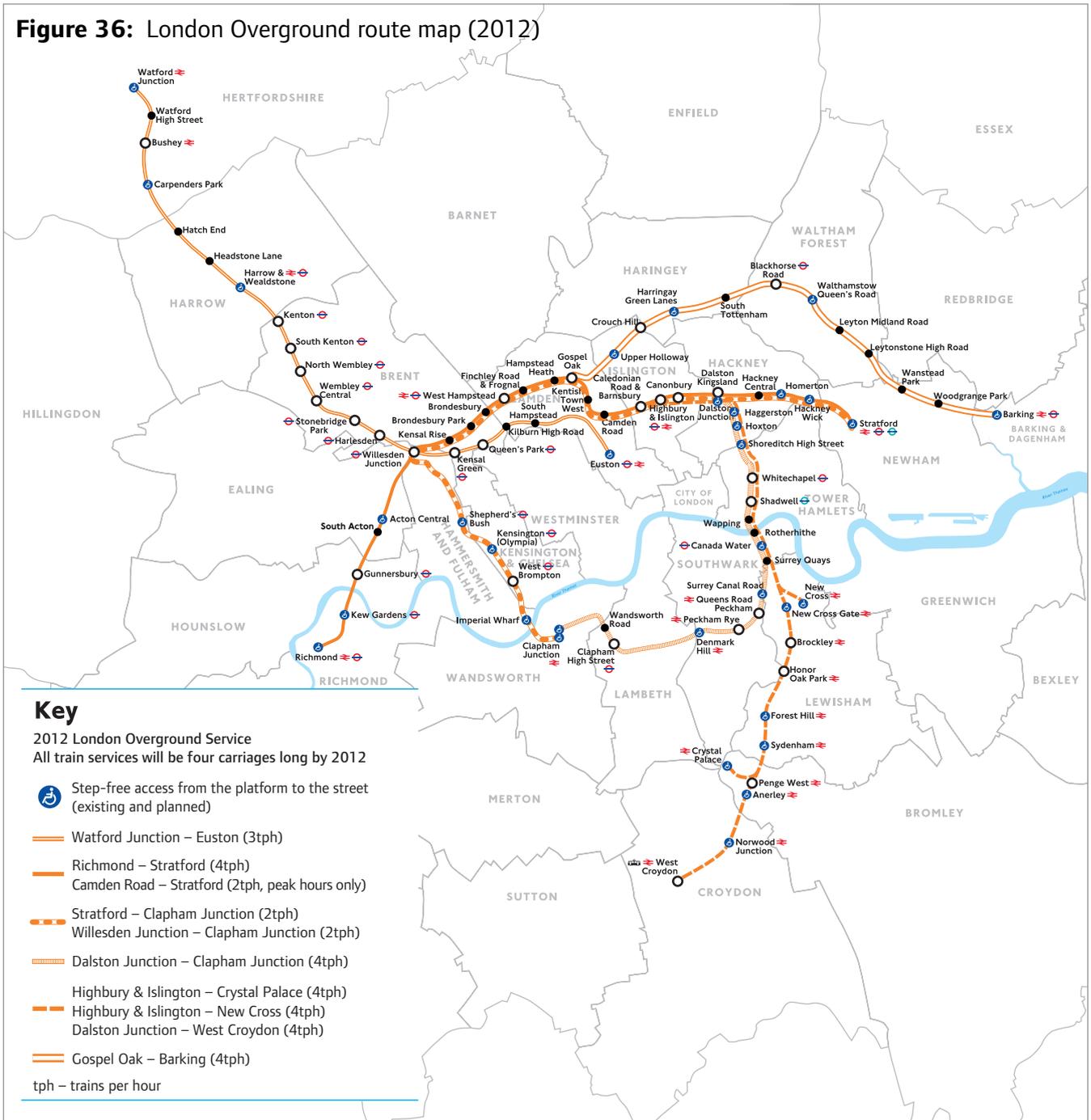
- ²⁷¹ There are, however, significant further opportunities to improve orbital travel, such as by providing or improving interchange opportunities where radial and orbital lines cross. Forecasting shows that rapid demand growth can be expected over the next few years, which means that parts of the Overground could justify investment in longer five or six-car trains. TfL will also investigate where there may be additional routes that warrant extensions to the Overground, if found to be feasible.

5.2.5 Local and orbital rail links and services

London Overground

- ²⁷⁰ Work on London Overground includes reinstatement of disused National Rail routes to link the East London and North London lines at Dalston, modifying existing infrastructure to reach West Croydon and Crystal Palace (the East London line extension) and delivering a rolling stock maintenance and control

Figure 36: London Overground route map (2012)



Proposal 14

The Mayor, through TfL, working with the DfT and Network Rail, will deliver the committed investment in the Overground network, investigate the feasibility of providing further capacity to assist orbital movement, and will review potential benefits of extensions to the network of services.

5.2.6 Docklands Light Railway

272 Since opening in 1987, the DLR network has grown to become a vital part of London’s public transport system supporting growth and regeneration in the Thames Gateway (see London Docklands case study). Improvements to the DLR include a network extension to Stratford International and delivery of 55 new

carriages to enable three-car operation on most of the system by 2010 (with further station and infrastructure enhancements to follow). Delivering new rolling stock to maximise the benefits of full three-car operation across the network, double tracking between Bow Church and Stratford, installing a new signalling system and renewing and replacing the existing rolling stock will all contribute to ensuring that the DLR is fully able to support continued growth and regeneration in the Thames Gateway area.

- 273 An extension of the DLR to Dagenham Dock has been identified as a key component of the current housing plans for Barking Riverside. There is also further scope to extend the DLR network in the longer term to provide better links to Stratford, improved orbital links and connectivity in the Thames Gateway, and better integration with the central London transport system, for example, through a westwards extension from Bank to Victoria.

Proposal 15

The Mayor, through TfL, will support safeguarding the route of the DLR Dagenham Dock extension as part of the housing proposals for Barking Riverside, and will investigate the feasibility of further capacity and network expansion of the DLR including options south of Lewisham, west of Bank and north of Stratford International.

5.2.7 Tramlink

- 274 Tramlink has been a great success since opening in 2000, providing important orbital links into Croydon and connections to neighbouring Outer London town centres – and encouraging a shift from car to public transport. Improvements to Tramlink as part of a £54m investment in maintenance, renewals, upgrades and capacity enhancement, are taking place between now and 2015.

- 275 Beyond these initial improvements, consideration will be given to looking at further extensions of Tramlink, with a strong focus on a potential north-south axis, in order to accommodate Croydon's future growth needs, and potentially to improve east-west links to neighbouring Outer London town centres to support improved orbital connectivity. Both short extensions to provide better access from key centres to Tramlink, and longer extensions opening up completely new routes are being considered.

Proposal 16

The Mayor, through TfL, and working with the London boroughs and other transport stakeholders, will investigate the feasibility of providing extra capacity on the Tramlink network and will review potential benefits of extensions to the system.

5.3 London Underground

5.3.1 Introduction

- ²⁷⁶ Over the last decade, the Underground has experienced unprecedented growth in demand, with more than a billion passenger journeys a year now made by Tube. The Underground carries as many passengers as the entire National Rail network with up to four million journeys made each day, on 11 lines serving 270 stations. The Underground now provides a higher volume of service than ever before while achieving a record 79 out of 100 in terms of customer satisfaction.
- ²⁷⁷ The strategy for the Tube is based on understanding customer needs by combining a reliable train service with the highest standards of customer care. This means renewing the network's infrastructure (rolling stock, signalling, track, civil structures and stations) to allow train service capacity to keep up with rising levels of demand, and creating a welcoming and secure environment, offering personal service to customers, providing accurate and timely service information, and creating ease of access.
- ²⁷⁸ LU has embarked on its largest investment programme for 70 years, focusing on improving reliability, delivering faster journey times, along with increasing capacity across the network.

5.3.2 Renewal and repair of the network

- ²⁷⁹ The Tube is the oldest metro system in the world, with some infrastructure dating back to the 1860s. After decades of under-investment, the network is now undergoing a major transformation programme comprising asset renewal, rebuilding and refurbishment. The key elements of the programme are:
- Rolling stock – replacing the majority of train fleets, which if not renewed would have an average age of 50 years in 2031, 15 years beyond their design life. The new trains will allow quicker, more reliable journeys and have higher capacity. Where possible, innovative technologies and design solutions will be used, for example, regenerative braking and walk-through carriages
 - Signalling – existing trackside assets, which are more than 40-years-old in many cases, will be replaced with computer based systems which will reduce delays and increase network capacity by allowing for a higher frequency of service. New service control centres will enable better information provision to customers and allow staff to manage the train service more effectively, delivering improved journey time reliability and minimising service disruptions
 - Track – reduce the backlog of investment to reduce safety risks, and remove speed restrictions brought in to manage safety risks to increase capacity

- Civil structures – renew assets such as bridges, viaducts, embankments and drainage systems to maintain a safe service, reduce the risks of flooding, and the service effects of speed and weight restrictions
- Stations – modernise stations by replacing safety and service critical systems such as fire, public address, CCTV, lifts and escalators

²⁸⁰ Much of this work is brought together in a programme of line upgrades which will provide some of the capacity required to support the Capital's economy and meet the demands of the future. Without the line upgrades it would not be possible to maintain the service that is currently delivered. Work to upgrade each line is therefore the cornerstone of the strategy for the Tube. By the end of the current programme, the Tube network will provide up to an additional 30 per cent capacity. New trains and signalling systems will allow more trains to run, providing quicker and more comfortable journeys. Beyond this, the Tube will require investment to ensure that its asset condition remains in a state of good repair and does not fall to the levels seen through earlier decades of under-investment.

²⁸¹ The network faces the tremendous challenge of keeping London moving on a daily basis while simultaneously rebuilding the system. This massive task cannot be achieved without some disruption to services. In order to facilitate these works and carry out regular essential maintenance, some weekend closures are necessary. The high profile campaign advising customers to 'check before they travel' has proven highly successful and will continue,

employing many TfL Travel Tools to help customers plan their journeys.

²⁸² By 2012, this programme will deliver an upgrade of the Jubilee, Victoria and Northern lines. By 2020, upgrades will have been completed on the Piccadilly line, Sub-Surface Railway and the Bakerloo line, with a further upgrade on the Northern line. These are described in the Spotlights on pages 133, 137 and 138. The replacement of the Central line fleet will follow, delivered into service from 2020. Considerable benefits and efficiencies can be achieved by specifying lighter, more energy efficient and higher capacity trains for this and the Bakerloo line.

Proposal 17

The Mayor, through TfL, will seek to deliver upgrades to all Tube lines in a phased programme to provide a significant increase in network capacity. This will involve a combination of new rolling stock and/or signalling systems and other asset replacement. As part of this, continued investment to bring the network to a good state of repair and maintain it at that level will be supported.

5.3.3 Station refurbishments and accessibility

²⁸³ Between 2003 and 2009, 124 stations were refurbished and this programme will continue subject to availability of funding. This programme is delivering key system improvements (CCTV, public address, communications equipment and fire systems),

Spotlight

Transforming the Tube

Over the last decade, the number of journeys made on the Tube has risen to record levels of more than one billion journeys a year. To support this growth and correct historic under-funding, LU has embarked on its largest investment programme for 70 years.

The line upgrades, which will include new signalling and control systems, as well as the introduction of new trains on some lines, will focus on improving reliability. They will deliver faster journey times and increase capacity by up to 30 per cent across the network. By 2012, this programme will deliver an upgrade of the Jubilee, Victoria and Northern lines, each providing between 20 and 33 per cent more capacity into central London.

By 2020, upgrades will have been completed on the District, Circle, Hammersmith & City and Metropolitan lines (including air-conditioned trains) increasing capacity across the sub-surface network, while the Piccadilly line upgrade will provide a 24 per cent increase in line capacity. A second upgrade of the Northern line will ensure further service enhancements¹. The Bakerloo line will also be upgraded.

Other enhancements include: major station improvements at Victoria, Paddington (Hammersmith & City), Tottenham Court Road, Bond Street and Bank; cooling the Tube; power upgrades to cater for expanded services; and accessibility improvements.

¹ See Spotlight on Northern line Upgrades 1 and 2 on page 138



as well as improving customer service features. These include, passenger Help points, new electronic information displays in ticket halls and on platforms, improved seating and lighting, as well as improvements to accessibility features such as tactile strips and colour-contrasted handrails for visually impaired people.

- ²⁸⁴ TfL is committed to improving accessibility from street level to platform level on the Tube network. Over time, TfL will seek to increase the accessibility of the network, building upon the foundation of step-free stations already in place (see section 5.9).

Proposal 18

The Mayor, through TfL, will continue to deliver an ongoing programme of Tube station refurbishments and asset stabilisation to ensure stations are operable and deliver customer service requirements, and continue to improve station accessibility over the life of the strategy.

5.3.4 Station congestion relief

- ²⁸⁵ To relieve congestion experienced by Tube customers at key locations across the network, and to enable quicker journeys, some stations require more extensive improvements to ensure safe and efficient station operations while also enhancing passengers' journey experience. The delivery of capacity enhancements to strategic Underground stations and interchanges is critical to the functioning of the Tube as an integrated network to assist existing passenger flow, and cater for future increases in demand.

- ²⁸⁶ Congestion relief is required at the key central London interchanges of Victoria, Tottenham Court Road, Bond Street, Paddington (Hammersmith & City) and Bank. Capacity increases at these stations will optimise the benefits of investment from the line upgrades, Crossrail and other developments. They will also greatly improve central London step-free access.

- ²⁸⁷ Further station improvements at, for example, Vauxhall, Finsbury Park and Highbury & Islington, will improve strategic access to, or interchange across, the network (see section 5.10.2, Strategic interchanges).

Proposal 19

The Mayor, through TfL, and working with the London boroughs, private developers and other transport stakeholders, will develop and implement a prioritised programme to deliver station capacity and accessibility enhancements at London's most congested Underground stations, including:

- a) Congestion relief schemes to complement Tube line upgrades and/or integrate with Crossrail at the key central London interchanges of Victoria, Tottenham Court Road, Bond Street, Paddington (Hammersmith & City) and Bank
- b) Schemes at further strategic Tube interchanges that are critical to London's transport system (for example, Vauxhall, Finsbury Park, Highbury & Islington, Holborn, Camden Town, Oxford Circus, Edgware Road and Northern line City branch, in particular Old Street and Moorgate)

c) Major strategic multi-modal/National Rail interchanges on to the Underground network to disperse onward demand arising from National Rail proposals (HLOS2 and HS2 proposals), for example, London Bridge, Euston, Liverpool Street, Paddington, Elephant & Castle and Waterloo

5.3.5 Cooling the Tube

²⁸⁸ High tunnel temperatures during the summer months are one of the biggest challenges facing the Tube, particularly for the deep tunnelled sections of the Underground, such as the Victoria line. These are generally closed systems where the major proportion of the energy that enters (for example, train motors) is released as heat, which in turn raises temperatures in the tunnels and on the trains. As a result of increased train service capacity (primarily through higher train frequencies) and reduced journey times (mainly through quicker acceleration and faster maximum speeds), electricity use on the Underground is anticipated to increase by 2020, resulting in more heat being released in the tunnels. This will be exacerbated by increasing passenger numbers and possible increases in air temperature due to climate change. Therefore maintaining safe temperatures on deep tunnelled sections of the Tube will present an ever increasing challenge in future. Already the Tube has implemented a programme to tackle heat on the network, and this will continue over the duration of the strategy.

Proposal 20

The Mayor, through TfL, will implement the following measures to cool the Underground:

- a) New air-conditioned rolling stock across the sub-surface (Metropolitan, Circle, Hammersmith & City and District) lines, introduced progressively from 2010
- b) Improved ventilation shafts and replacement of out of service fans

5.3.6 Customer care

- ²⁸⁹ The core renewal programme is essential to deliver a safe and reliable service, but TfL aspires to the highest standards of customer care. Customers most value getting from A to B as quickly and reliably as possible, but valued almost as much are the different aspects of service experienced during the journey. Customers value personal security, a welcoming environment, accurate and timely information, and when they need assistance, they want high quality personal service from staff.
- ²⁹⁰ In 2008, for the third year running, the Underground carried more customers than ever before, in excess of one billion. At the same time, customer satisfaction with the service also reached a record high of 79 out of 100. Most people scored the overall service provided at nearly eight out of 10.
- ²⁹¹ Customer information and personal service from staff will be especially important as the renewal programme, which can disrupt service, is delivered over the next decade. TfL will continue to invest in customer-focused training

for Tube staff including disability awareness training, and in information systems to deliver the right information to customers when they want it, when planning or undertaking journeys on the network.

- ²⁹² Customers value the presence of staff especially when travelling at night. The Underground will continue to staff its stations and invest in systems which enhance the management of the station, such as CCTV, as well as ensuring stations are well-lit and visibly managed, all clean and graffiti free.
- ²⁹³ There is a rich heritage of art and design on the Tube. High quality, value for money design will continue to be a feature of the Investment Programme. Art on the Underground, LU's art programme, continues the Tube's long tradition of working with artists. Licensed busking and 'Poems on the Underground' bring music and poetry to the wide-ranging audience of customers on the network. These initiatives can delight customers and improve the travelling environment.

Proposal 21

The Mayor, through TfL, will continue to develop and implement measures to deliver the highest standards of customer care on the Underground, including the provision of high quality information about engineering works that affect regular Tube services, and improved information on the accessibility of the Tube network highlighting step-free and mostly step-free routes.

5.3.7 Further improvements and extensions to the network

- ²⁹⁴ Beyond the funded investment programme, even with the introduction of Crossrail and Thameslink, crowding will remain on the Tube network. This crowding is shown in Figure 20 and contributes to the corridor 'stress' shown in Figure 32.
- ²⁹⁵ There are opportunities for improvements to other aspects of the transport system, particularly the (national) rail network to relieve crowding on the Tube. Potential new lines, such as Chelsea Hackney, would also be designed in part to reduce Tube crowding where possible. These potential enhancements are described in section 5.2.
- ²⁹⁶ Over the lifetime of this strategy, there are also opportunities for further enhancements and extensions to the Tube network to improve journey times and provide additional capacity essential for the continued growth of London. Any potential schemes will be subject to a thorough value for money and feasibility analysis, and will be considered in the light of any future funding constraints. They will also be integrated with enhancements to other elements of the transport system, in particular the rail network.
- ²⁹⁷ Further enhancements (beyond the funded upgrades) to the Northern line are possible. With private sector funding, there is the potential to extend the line to Battersea to support developer-led growth in the Vauxhall/Nine Elms/Battersea Opportunity Area, an area

Spotlight

Sub-Surface Railway upgrade

The Sub-Surface Railway lines comprise the Circle, District, Hammersmith & City and Metropolitan lines, covering more than 300km of track and representing around 40 per cent of the Tube network. It is the part of the network in greatest need of renewal. The upgrade will be delivered progressively over the next decade and will provide the greatest capacity improvements across the entire network, helping to reduce congestion and accommodate predicted growth.

In July 2009, LU issued an invitation to tender for the resignalling of the sub-surface lines. This contract is the single Tube element of the Investment Programme.

From December 2009, a new service pattern was introduced on the Circle line, almost

doubling the frequency of trains on the Hammersmith branch. It also improved the reliability of the Circle line, with knock-on benefits for reliability across the whole of the Sub-Surface Railway. The new service pattern will be followed by the introduction of a new signalling system to allow higher train service frequencies.

From 2010, 199 new, larger trains will enter service. They will feature energy-saving regenerative braking, walk-through carriages, better accessibility, improved customer information (audio and visual) and enhanced security. The Circle and Hammersmith & City line trains will also have an additional carriage. Most significantly, the new trains will be the first to be air-conditioned on the Tube network.



Spotlight

Northern line Upgrades 1 and 2

The Northern line will be upgraded in two phases, known as Upgrades 1 and 2. Work has commenced on the first upgrade which will introduce new computerised signalling and a new control centre to reduce journey times in the morning peak by 18 per cent and increase capacity by around 20 per cent.

However, even with the delivery of Upgrade 1, forecast growth in demand will continue to place severe pressure on London's north-south routes, particularly through the City, producing crowding levels similar to that experienced today. Hence there is a need for a further upgrade.

Upgrade 2 will recast and partially separate the services on each of the two central London branches of the line. This will reduce journey times, deliver an additional 33 per cent capacity on the City branch, a 17 per cent increase on the Charing Cross branch and consequently reduce crowding. The upgrade will comprise additional rolling stock alongside the existing fleet, additional train stabling facilities, power, improved signalling and tunnel cooling.

Together, the two upgrades will transform the Northern line. On the City branch, during the busiest parts of the morning peak, service frequencies could rise from the current 20 trains per hour (tph) to 24tph following the first upgrade, eventually reaching a potential 32tph in the northbound direction following partial separation.

Morning peak hour frequencies
(trains per hour per direction)



Key	
	Northern line
	Current peak morning frequency
	Peak morning frequency after Upgrade 1
	Peak morning frequency after Upgrade 2

identified as capable of accommodating 20,000 to 25,000 new jobs and 16,000 homes by 2031.

- 298 The Bakerloo line has an important role in London's transport geography, serving the strategic northwest-southeast corridor with its important regeneration zones including Harlesden, Paddington, Elephant & Castle and inner southeast London. A Bakerloo southern extension would allow the line to serve inner and outer southeast London. This would create a new southeast to northwest strategic route through the Capital, serving areas with poor transport accessibility and freeing up National Rail capacity at London Bridge for other service improvements.
- 299 The Croxley rail link, providing a new connection between Croxley station on the Watford branch of the Metropolitan line and the now closed Croxley Green branch line is a long standing proposal championed by Hertfordshire County Council. Although outside the GLA boundary, the link is supported by the Mayor as it improves the regional connectivity of northwest London by linking the Tube network to the important National Rail interchange at Watford Junction and the employment, retail, leisure and healthcare opportunities in Watford town centre.

Proposal 22

The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek longer-term enhancements and extensions to the Underground network, including:

- a) A privately funded extension of the Northern line to Battersea to support regeneration of the Vauxhall/Nine Elms/Battersea area
- b) A potential southern extension to the Bakerloo line will be reviewed further. This would utilise spare line capacity, improve connectivity and journey times, while providing relief to congested National Rail approaches to central London from the south/southeast, subject to resources and the results of further study
- c) A link at Croxley to join the Watford branch of the Metropolitan line to Watford Junction (funding to be secured by Hertfordshire County Council in conjunction with the DfT)

5.4 London's bus network

5.4.1 Introduction

³⁰⁰ The bus has become one of London's transport success stories over the last decade. The Capital's buses now carry 2.2 billion passengers each year – the highest level since 1962, with service levels also at their highest since 1957. Figure 37 shows the trend since 1971.

³⁰¹ Key achievements include:

- All buses are fitted with the iBus real time audio and visual Next Stop signs
- A highly accessible network, where more than 90 per cent of London residents are within 400 metres (approximately a five minute walk) of a bus stop and all buses (except heritage Routemasters) are wheelchair accessible
- Reliability is at the highest level ever recorded. This has been achieved through additional resources, incentivised contracts, improved bus priority, enforcement and central London Congestion Charging
- Measures to make the system easier to use, including straightforward service patterns, better information, improved bus stops and stations, simplified ticketing and improvements to driver training based on compulsory disability awareness training
- Vehicle enhancements such as CCTV coverage of the whole fleet, successful trials of both diesel-electric hybrid and hydrogen fuel cell engine technology

³⁰² As a result, customer satisfaction levels have increased substantially in recent years (see Figure 38).

³⁰³ Buses play a key role in providing access to jobs and services and are the most widely-used form of public transport across London. Buses are the predominant mode for public transport within the suburbs and Inner London. Outer London, in particular, relies on the bus network to provide access to, and between town centres. Buses also facilitate longer radial trips into London by feeding into railway stations and by enabling passengers to get to their final destinations in central London. An effective bus network also helps in reducing traffic volumes and overall CO₂ emissions.

³⁰⁴ These roles will remain essential as London develops. The bus network will need to respond to changing demands. Improvements in the quality of the experience offered to passengers will need to be consolidated and (where possible) enhanced to meet increasing expectations.

5.4.2 Bus network development

³⁰⁵ London's bus network is subject to a continuous development process, enabling it to respond to changing travel needs. This is passenger-led, based on research and consultation.

³⁰⁶ Compared to other major world cities, London's bus network performs either equally well, or better than average, on several key performance indicators, including accessibility. The cost efficiency of the bus network in

London is 20 per cent ahead of most major international cities. London currently has a comprehensive orbital bus network, enabling direct orbital journeys between neighbouring centres in Outer London, shown in Figure 39.

to change, including new homes, workplaces, shopping centres and leisure attractions.

307 Continued development of the network will be necessary so that it can carry on responding

308 Where major change or development is taking place in London, TfL will continue to work closely with the boroughs and developers to ensure the needs and demands on the bus network are fully understood, that plans for

Figure 37: London bus use since 1971

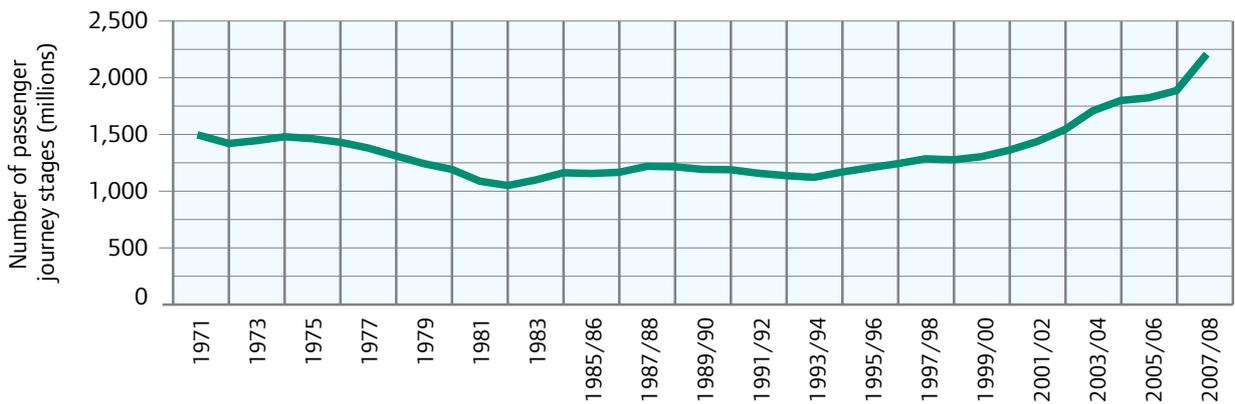


Figure 38: Improving bus journey experience

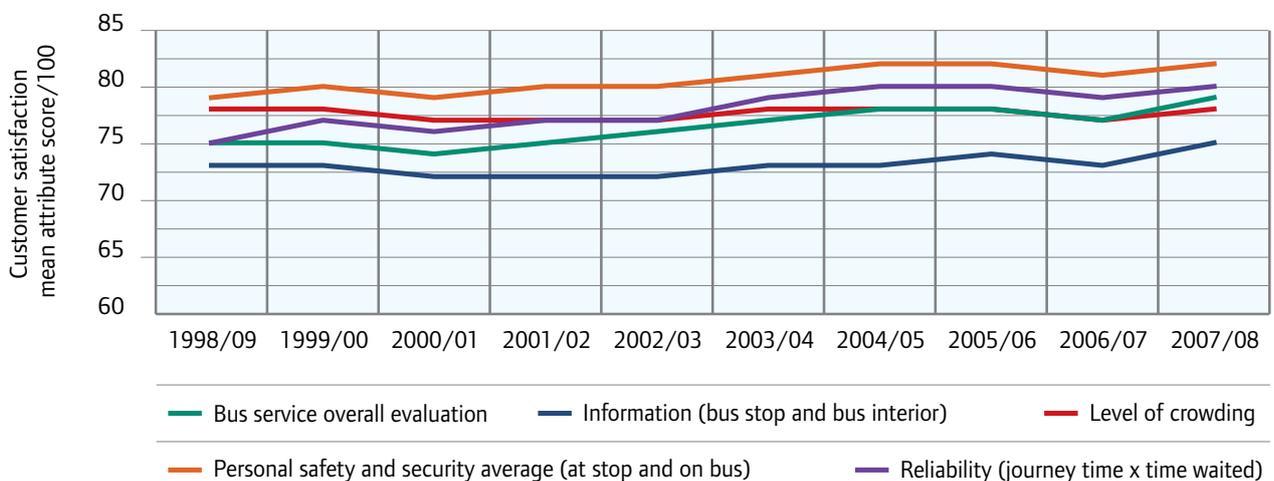
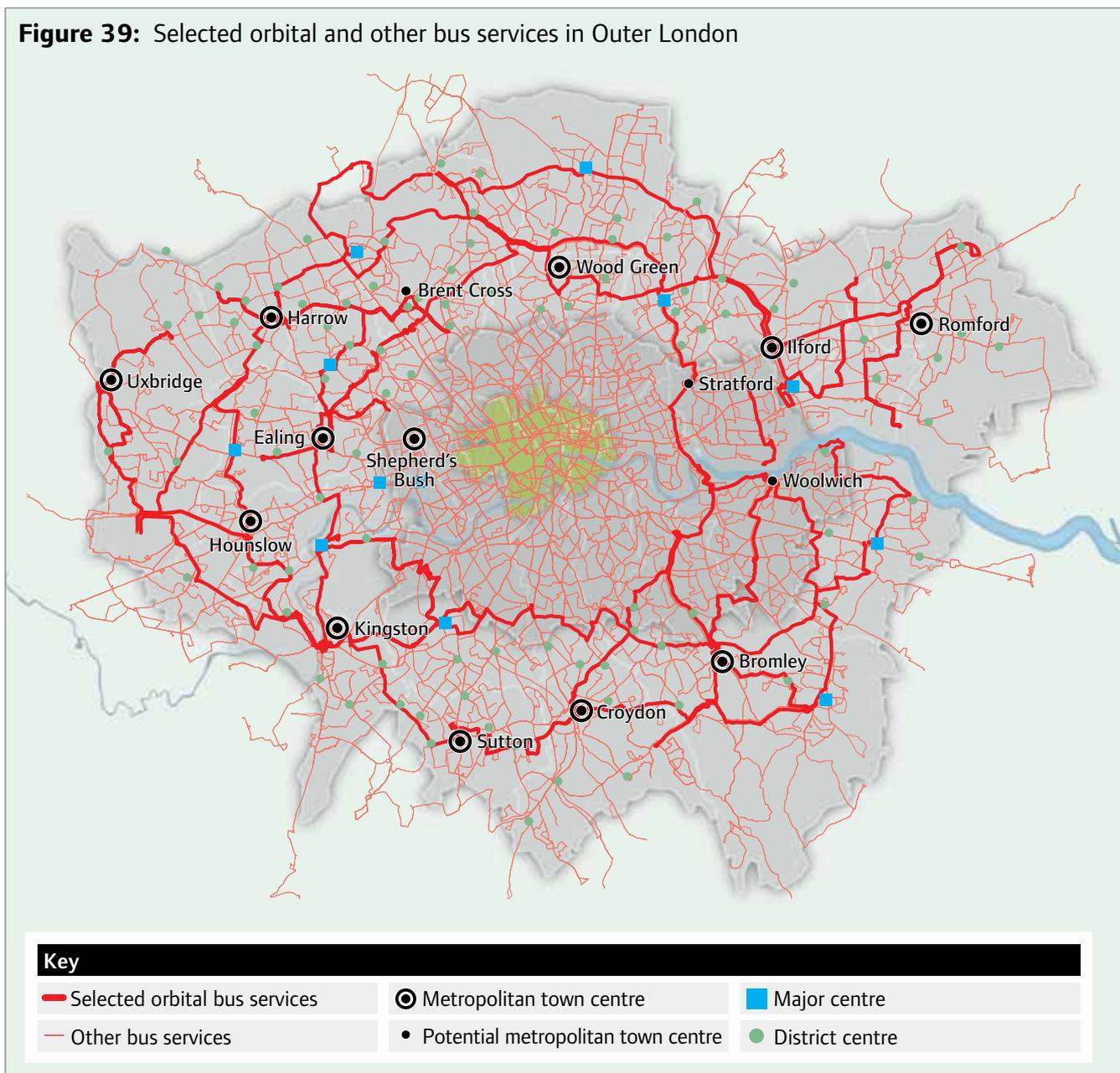


Figure 39: Selected orbital and other bus services in Outer London



any changes to the network are identified, and opportunities for funding are fully explored.

309 It is essential that the bus network continues to be developed in such a way to cater for the overall shape and scale of growth across London. TfL will undertake reviews of the strategic priorities underlying the process approximately every five years to ensure the bus network reflects the pace of development in London, responds to the challenges and opportunities of growth, and aligns with possible revisions of the London Plan.

310 The development of the bus network will need to support other transport investment, such as Crossrail and other railway improvements. In addition, there will be ongoing alterations to the nature and distribution of services and facilities provided by others, such as healthcare and education, which the bus network will need to reflect.

311 Keeping the bus network as accessible as it is today will also be essential as the fleet will continue to be the only city-wide accessible public



transport mode despite improved accessibility of the rail networks. Similarly, buses can operate 24-hours-a-day, supporting London's 24-hour economy, whereas rail services often cannot due to necessary maintenance constraints.

- 312 Network development will also consider the improvement and efficiencies that can be achieved at busy interchanges and major transport hubs, both existing and emerging.

Proposal 23

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will keep the development of the bus network under regular review, including reviews of the strategic priorities underlying the process approximately every five years, to ensure it caters for growth in population and employment, while maintaining ease of use, attractive frequencies and adequate capacity, reliable services, good coverage and good interchange with other modes. All proposals for change will be appraised to ensure that they deliver good value for money and that the funds available are being invested in optimum service improvements.

Spotlight

A New Bus for London

The competition to design a New Bus for London was launched in July 2008. This attracted a large number of entrants, and in December 2008, the Mayor announced the winners.

The aim of the competition was to harvest a range of creative ideas for a bus fit for the 21st century. These winning designs and concepts have been passed on to bus manufacturers, for development into final design proposals.

The New Bus for London will meet London Buses' requirements for vehicles in public service in London, including high standards of accessibility, safety and emissions abatement. In addition, it will be more durable, more fuel efficient and better ventilated. The bus will incorporate a double-deck and a platform at the rear near-side corner, so passengers will be able to board and alight easily.

The first prototype of the new bus will be on London's streets by 2011.



5.4.3 Bus service quality

- 313 As London's economy grows, pressures on road space will mean a continued requirement to ensure that appropriate measures are taken to maintain an attractive and reliable service for bus users.
- 314 Bus priority measures such as bus-only roads, bus lanes and selective vehicle detection at traffic signals are essential tools in ensuring that the limited people-carrying capacity of the road network is being used most effectively. These measures help reduce bus journey times, improve bus reliability and increase the efficiency of the bus network, especially when they are considered as part of a whole route approach. Bus priority measures are systematically identified, appraised and delivered at key locations, including town centres and their approaches, at new development sites, and links where bus passengers represent a significant proportion of all road users.
- 315 Quality incentive contracts have been very successful in incentivising operators to maintain a high level of reliability, and the iBus system improves operators' ability to control services effectively.
- 316 Bus information has been transformed over the last 10 years. Improved 'spider' maps and timetables are in place throughout the network. iBus has provided Next Stop announcements (audio and video) on all buses, and has improved information on Countdown signs at bus stops. Further development will include delivery of real time information through mobile phones and the internet, as well as an expanded number of signs at stops.

Proposal 24

The Mayor, through TfL, and working with the London boroughs and other stakeholders, including developers, will improve bus passengers' journeys by measures, including:

- a) Incentivising bus operating contracts and expanding staff training in order to consolidate reliability improvements
- b) Introducing measures such as bus priority at critical locations
- c) Ensuring that the appropriate enforcement of bus priority is carried out
- d) Implementing the Countdown 2 project to deliver expanded access to real time information and develop further integration with digital communications to provide real time bus information

5.4.4 Bus fleet development

- ³¹⁷ The bus fleet has been progressively developed with incremental enhancements to passenger comfort and security, including upgraded seat designs, CCTV throughout each bus, air-cooling systems and outward-opening doors to provide more space in the busiest part of the vehicle. Emissions standards are ahead of legal requirements. Diesel-electric hybrid buses are in service on a trial basis, and all new buses entering service from 2012 will use hybrid technology.
- ³¹⁸ TfL is also seeking to develop an iconic bus design with its New Bus for London project.

Proposal 25

The Mayor, through TfL, will upgrade its bus fleet to meet increased emissions standards and will appoint bus manufacturers as part of the New Bus for London project. It is intended that the first prototype will enter service during 2011.

5.5 Taxis, private hire, coaches and community transport

5.5.1 Taxis

- ³¹⁹ London's 22,000 licensed taxis and 25,000 licensed taxi drivers provide about 200,000 trips a day to London's visitors, residents and businesses, with the majority of activity concentrated in central London. In a 2007 survey for the London Chamber of Commerce and Industry, 93 per cent of business leaders regarded a good taxi service as being important or very important to the London economy.
- ³²⁰ Although licensed taxi drivers can use most of London's bus lanes, they face much the same challenges as other road users in terms of the impacts of congestion. Measures outlined elsewhere in the strategy to smooth traffic flow will therefore be of significant benefit to taxi drivers and their passengers. The essence of an effective taxi service is the point-to-point service offered, however, it is important that measures to smooth traffic flow also take account of the need for kerbside activity at the start and end of journeys.
- ³²¹ London's taxi service is widely recognised as the best in the world. The world-renowned Knowledge of London that must be demonstrated before a taxi driver is licensed to ply for hire, means that these drivers have an unparalleled understanding of London's streets and points of interest, as well as pride in their profession. The Conditions of Fitness licence requirement means that only vehicles which are

suitable for taxi work – wheelchair accessible and highly manoeuvrable – can be used as taxis in London.

- 322 Taxis are also recognised as a safe and quick way of making door-to-door journeys, and are particularly valuable for disabled people and at times when other public transport is scarce. TfL is working in partnership with the taxi associations to reduce taxi vehicle emissions and introduce a new low emission taxi. This will enable them to play a role in improving air quality in London and in tackling climate change.

Proposal 26

The Mayor, through TfL, and working with the London boroughs and other stakeholders will support improvements to the taxi service through a number of measures, including:

- a) Continued highway priority for taxi services, for example, access to bus lanes
- b) Reduced taxi vehicle emissions and development of low emission taxis
- c) Provision of parking and waiting facilities, including rest facilities
- d) Provision of ranks and facilities at interchanges
- e) Taxi marshalling
- f) Action against touting and illegal cabs
- g) Improved driving behaviour, to be encouraged through the licensing procedure of taxi drivers

- h) Ensuring regulated taxi fares changes allow drivers and owners to continue to recover the costs of providing the taxi service and provide a sufficient incentive for taxi provision to meet demand, in particular at night
- i) Continuous process improvements to provide a modern and cost effective licensing service

5.5.2 Private hire

- 323 There are about 50,000 PHVs in London, operated by about 2,400 businesses, and providing employment for about 54,000 people. PHVs offer a range of valuable services across the Capital, making a similar number of trips in total to taxis. The PHV trade is very diverse, covering all vehicles¹ for up to eight passengers offered for hire with the driver. As well as the familiar minicabs and people-carriers, this includes chauffeur and executive cars, some patient transport and school support services and a wide range of specialised operators. Private hire also encompasses a number of niche limousine and other bespoke services for which little or no alternatives exist. PHV services are spread more evenly across London than taxi activity. Like taxis, PHVs are particularly important at night when other public transport is limited. For those travelling with mobility impairments, heavy luggage or seeking to reach a remote location, PHVs are a good quality, value for money solution.

¹ Except taxis

324 All PHV trips must be booked through a licensed operator before the start of the journey. This means that the customer has an opportunity to ensure they get an appropriate service at a fair price. The licensing standards therefore allow a wider range of vehicles than can be accepted as taxis, and drivers take a less demanding topographical knowledge test. Like taxis, all vehicles must be safe and suitable for passenger carrying, and drivers must be healthy, of good character, with an enhanced criminal records check.

325 Licensing of private hire in London is relatively new, with operators licensed in 2001, drivers from 2003 and vehicles from 2004. PHVs cannot drive in bus lanes, although like taxis they are exempt from the Congestion Charge and are allowed to stop to pick up or set down passengers on red routes. The successful PHV licensing process has seen an improvement in standards across the industry, and along with the Safer Travel at Night initiative, licensing has reduced the levels of taxi touting and illegal cab activity. As the licensed industry matures, there may be opportunities to review the contribution such services play and reappraise the restrictions in force.

Proposal 27

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will support improvements to private hire services (especially minicabs) through the following:

a) Initiatives that deliver further the success of the Safer Travel at Night scheme

- b) Provision of facilities to pick up as well as drop off passengers where appropriate
- c) Action against plying for hire, touting, un-roadworthy vehicles and illegal cabs
- d) Continuous process improvements to provide a modern and cost effective licensing service
- e) Lower emissions from PHVs

5.5.3 Coaches

326 Coaches play an important part in London's overall transport system, operating broadly five types of service: UK short distance services, including commuter coaches; UK long-distance services; European services; private hire or charter services; and airport services. These services provide a range of benefits to London, including supporting the central London economy through commuter services, and charter services to theatres and other attractions. The majority of UK scheduled short and long distance services, including European scheduled coaches, serve Victoria Coach Station, which is directly managed by TfL. The organisation will work with coach operators to maximise the use of the existing facilities to increase capacity, given the anticipated growth in demand for coach travel.

327 The provision of a conveniently located coach terminal in London is important for both operators and passengers. In the longer term, the Mayor will work with all relevant partners to investigate the feasibility of developing a series of coach hubs or the potential for alternative

locations for coach station facilities to provide easier access to the coach network, while retaining good access to central London for coach operators.

- 328 Another challenge for coach operators, especially those who provide private hire or charter services, is the location and availability of pick-up and set down areas and, more importantly, parking where drivers can take

their legally required break from driving. Ensuring that adequate facilities are available is a key function of the London Coach Forum, which is coordinated by TfL, and provides a valuable engagement mechanism with the industry. TfL, working with the boroughs, will continue to develop facilities for coaches, balancing the needs of coaches with the needs of other road users. To support this, the Mayor will set out specific coach parking standards



to ensure parking at major visitor destinations such as hotels, stadia and exhibition venues is at appropriate levels to suit their individual demand, and help reduce congestion and improve visitor safety.

- 329 TfL also issues London Service Permits for local services within London that are not part of the London bus network. These include some local bus services, sight-seeing tours, and some commuter services. Such services can also provide useful links in Outer London with locations beyond the GLA boundary.

Proposal 28

The Mayor, through TfL, and working with the London boroughs, coach operators and other stakeholders, will seek to maximise the use of the existing facilities to increase capacity for coaches, given the anticipated growth in demand for their use and to develop parking standards for coaches. In the longer term, the Mayor will work with all relevant partners to investigate the feasibility of developing a series of coach hubs or the potential for alternative locations for coach station facilities to provide easier access to the coach network, while retaining good access to central London for coach operators.

5.5.4 Community transport

- 330 Community transport refers to a broad range of projects that provide an accessible transport service, often aimed at particular sectors, such as group travel and social car schemes.
- 331 The Mayor recognises the role that the community transport sector plays in London and will continue to engage with it through the Community Transport Association. TfL will continue to look at ways in which the transport facilities provided by the community transport sector can be closer coordinated with transport facilities provided by the organisation, for example, in terms of information provision.

Proposal 29

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will encourage and support the community transport sector's contribution to the development and provision of transport services in London.

5.6 Managing the road network

5.6.1 Introduction

³³² London's road network serves a variety of purposes. It is, most obviously, the means by which people travel from A to B – by foot, cycle, motorcycle, taxi, car, bus – and by which the vast majority of freight is moved, accounting for over 80 per cent of all trips in London. The Mayor's focus on smoothing traffic flow applies to all of these user groups. But the road network also constitutes a very large proportion of London's public realm, where people can relax, socialise and enjoy the atmosphere of this world city (this role is discussed in detail in the 'better streets' section). There are conflicts between and within these two roles, and the Mayor, through TfL, and the boroughs will continue to seek to resolve these where possible, taking into account the specific function and circumstances of the part of the road network involved. However, the overriding objective is to maximise the efficient use of this scarce resource, and this section outlines the principal ways in which the Mayor proposes to achieve this.

³³³ Responsibility for managing London's road network is shared between the Highways Agency, TfL and the London boroughs:

- The Highways Agency manages the M25, M1, M11 and M4 motorways
- TfL is responsible for the Transport for London Road Network (TLRN), the busiest and most economically important radial and orbital arterial routes crossing the Capital, accounting for around five per cent of total

road length, but carrying more than 30 per cent of London's traffic (see Figure 40).

- The London boroughs are highways and traffic authorities for the remaining strategic and local roads in their individual borough

³³⁴ TfL manages traffic signals and traffic control systems on all roads throughout London and, under the Traffic Management Act, has a Network Management Duty to coordinate traffic management and other interventions on the highway, and to facilitate the overall movement of people and goods across the Capital.

5.6.2 Road congestion

³³⁵ Road congestion – manifesting itself in delay, poor reliability and low network resilience – is a major issue for London's transport system. Congestion costs an estimated £2bn in lost economic productivity, adversely affects Londoners' quality of life, causes frustration to road users, contributes to a deterioration of air quality and leads to higher CO₂ emissions.

³³⁶ Levels of delay, reliability and resilience are determined principally by the relationship between the supply and demand for road space. The supply (also known as the 'effective road capacity') is determined by the amount of physical road space available, junction capacity, speed limits, the condition of highway infrastructure including traffic signals, the volume and duration of road maintenance works, utilities works and the incidence of vehicle collisions and breakdowns. The demand placed upon the network capacity comprises

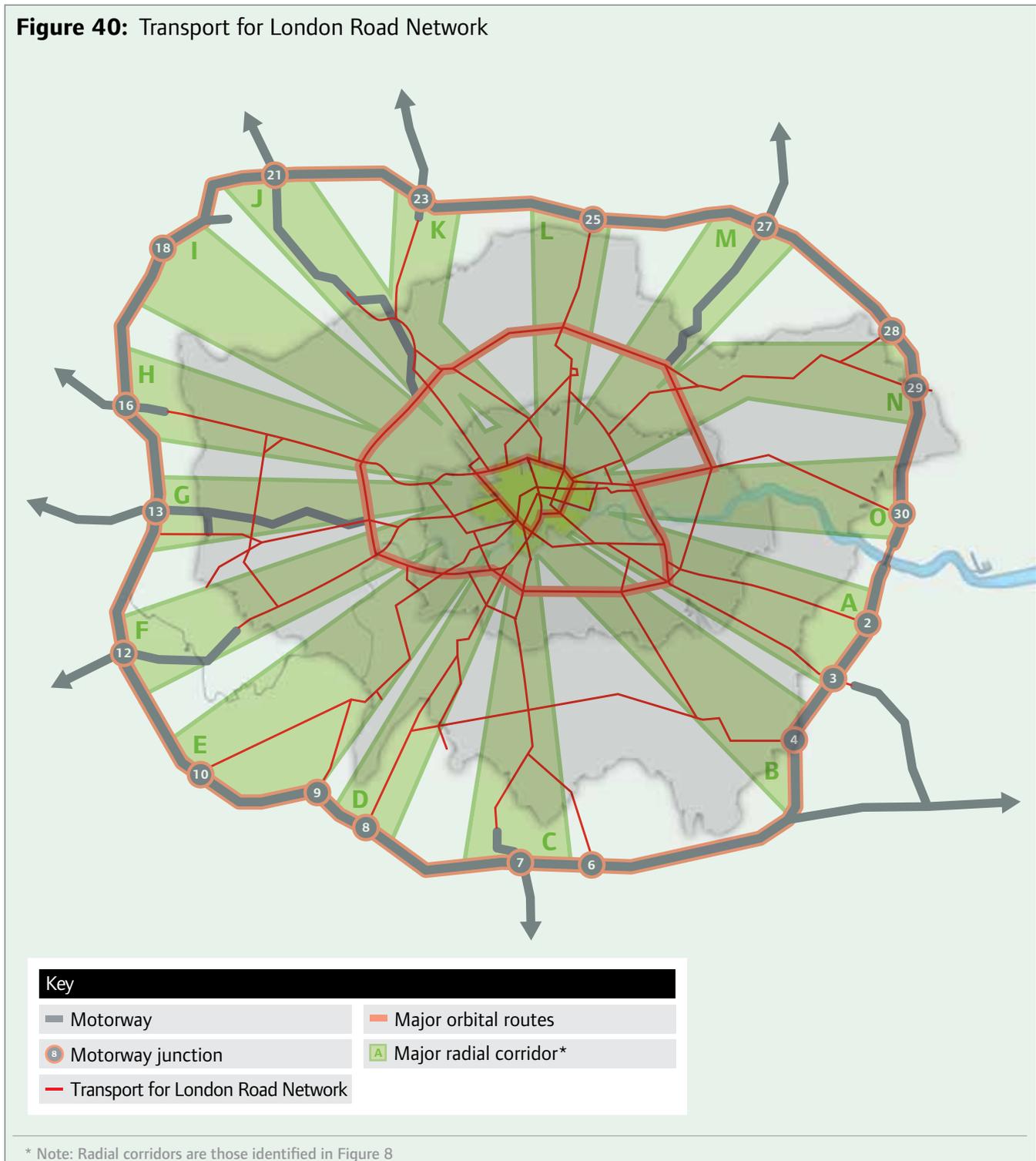
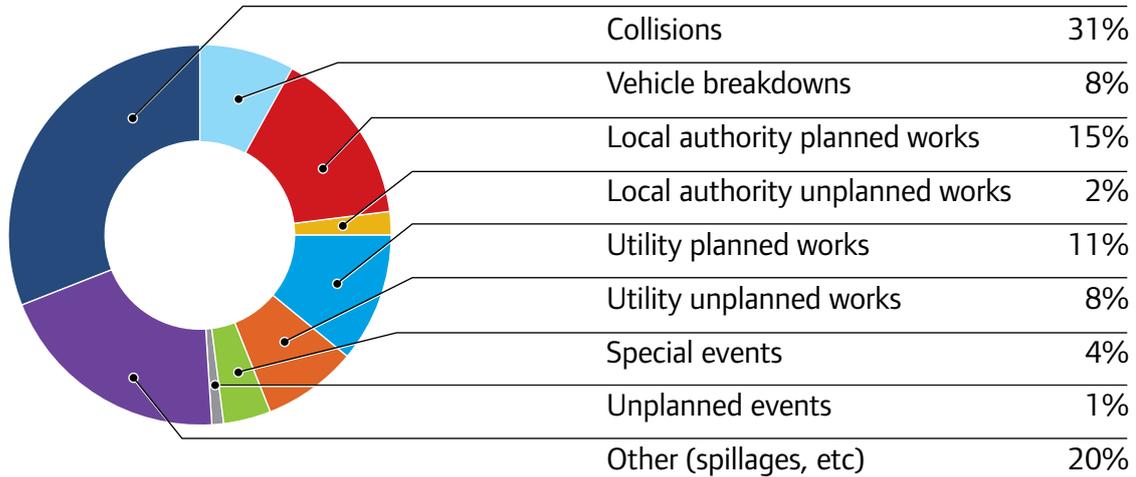
Figure 40: Transport for London Road Network

Figure 41: Causes of unusual congestion by proportion of duration

Note: Based on data gathered by the London Traffic Control Centre in 2008/09

moving vehicles, pedestrians, cyclists, parking and loading.

- 337 Generally speaking, on a largely saturated road network as in London, for a given capacity of road, as traffic volumes rise, speeds will reduce and congestion increases, leading to longer journey times, less reliable journeys and lower levels of customer satisfaction. In 2008, only 25 per cent of Londoners were satisfied with the levels of traffic congestion.
- 338 As population and economic activity increases, so will pressure on the road network, potentially leading to significantly more delay, less reliable journey times and reduced resilience of the network to planned or unplanned interventions. These congestion effects, in turn, are likely to reduce the productivity and competitiveness of the Capital as a whole, and particularly those areas where local economies depend on reliable road transport, for example, Outer London town centres.

- 339 Delay and journey time reliability vary according to route, direction and time of travel, seasonal factors, roadworks, traffic lights, planned and unplanned events, and traffic volume. Figure 41 shows the causes of 'unusual' severe congestion, which affect journey time reliability, by duration of delay, as recorded by the London Streets Traffic Control Centre. The chart shows that almost 40 per cent of 'unusual congestion' is caused by collisions and vehicle breakdowns, and over a third is caused by planned and unplanned road works.
- 340 Poor reliability and predictability of journey times means those who use the road network have to allow significantly longer for their journeys to ensure they reach their destination on time. Improving the reliability of journey times on the road network (even if average delays increase due to rising traffic volumes or other factors) is of significant benefit to motorists, freight operators and other users of the road network. It enables them to predict better how long a journey may take, allowing

for efficient and economic planning of social and commercial activities and to reduce the total amount of time they would otherwise need to allow to make their journey.

and smarter travel measures and the continued operation of the central London Congestion Charging scheme in the original area, provided for in chapter five)

5.6.3 Smoothing traffic flow

³⁴¹ 'Smoothing traffic flow' is the term used for the Mayor's broad approach to managing road congestion and, in particular, improving traffic journey time reliability and predictability. The aim of the smoothing traffic flow approach to managing the road network is to improve conditions for cyclists and pedestrians as well as vehicular traffic.

³⁴² Smoothing traffic flow has six components:

- Maximising the efficient and reliable operation of the existing road network
- Minimising the impact of planned interventions on the road network that have the potential to disrupt traffic flows
- Minimising the disruption caused by unplanned events (collisions, emergencies, etc) as they occur and returning the network to its planned steady state operation as soon as possible
- Maintaining road network assets in a good state of repair in the interests of safety and efficiency
- Where a net benefit under proposal 35 can be shown, developing the road network
- Achieving targeted modal shift from car journeys to more sustainable modes (supported by the improvements in public transport, walking and cycling conditions

³⁴³ As outlined in section 5.27, the Mayor proposes to remove the Western Extension of the Congestion Charging zone. The removal of the zone is part of the Mayor's broader transport strategy. This includes the proposals to better manage and smooth traffic flow, as set out below, to mitigate the potential effects of removal on congestion and emissions on the road network formerly covered by the charging zone.

5.6.4 Maximising the efficient and reliable operation of the road network

³⁴⁴ The poor reliability of journey times means those who need or wish to use the network have to plan for the 'worst case' scenario when predicting how long their journey may take. This makes for the inefficient and uneconomic use of time and energy in respect of ordinary day-to-day activities and can lead to journeys being predicted to last for longer than the actual average journey time. Increasing the reliability of journey times on the road network (even if average journey times are increased by increased traffic volume) can result in motorists having a better prediction of how long a journey may take that is closer to the actual average journey time.

³⁴⁵ The Mayor and TfL, working closely with the boroughs, will therefore manage, as far as is reasonably practical, the overall road network

and prioritise measures that improve the reliability of journey times.

Proposal 30

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will introduce measures to smooth traffic flow to manage congestion (delay, reliability and network resilience) for all people and freight movements on the road network, and maximise the efficiency of the network. These measures will include:

- a) Further investment in intelligent traffic control systems (such as the urban traffic control system, SCOOT) and the infrastructure to support them
- b) Allowing motorcycles and scooters to use TLRN bus lanes subject to a trial period and evaluating its impact
- c) Upgrading, rationalising or removing traffic management equipment and optimising timings at signal controlled junctions to keep traffic moving
- d) Working with the DfT to pilot and develop the concept of pedestrian countdown at traffic signals to optimise the amount of 'green time' for both pedestrians and road traffic
- e) Planning and implementing a targeted programme of improvements to the existing road network, including junction upgrades to improve traffic flow on the most congested sections of the network, and to improve conditions for all road users

³⁴⁶ A key component in the future management of the road network is to increase the knowledge of how the network operates and to employ the most effective solutions and technological developments to ensure its efficient operation. To do this, TfL will continue to develop its state-of-the-art dynamic traffic control system ensuring that the system grows in capability as the next generation of technological advances allow it to do so cost-effectively. This will bring together real time operational data, historic analysis and predictive modelling to more effectively respond to planned and unplanned disruption, and to proactively manage the available road capacity in real time; for example, through increased on-street control and by providing real time information to drivers in a way that supports their journey decisions. This capability will be deployed more widely across the Capital, to better manage the road traffic effects of expected economic and population growth and to support the development of Outer London.

³⁴⁷ In the period of the strategy, consideration will be given to the increased use of real time communications from vehicle to vehicle, and between vehicles and on-street infrastructure and a central traffic management control system. The development of intelligent transportation systems (ITS) technology will allow the upgrading of London's traffic signal network. The aim is to create a state-of-the-art traffic signal control system for the 21st century capable of maximising the efficient use of road capacity in London.

Proposal 31

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will utilise advances in ITS technology to better manage the road network, improve real time traffic management capability, lay the foundations for communication with in-vehicle systems and develop state-of-the-art traffic signal control systems.

5.6.5 Minimising the impact of planned interventions

³⁴⁸ Every year there are over half a million roadworks on London's road network that cause traffic disruption. Many of these are unplanned emergencies. A substantial proportion, however, are planned (for example, scheduled utility works, highway maintenance activities or special events). Customer surveys show a low level of satisfaction with how the works are managed and the time taken for their completion. Minimising disruption caused by these activities is a particular priority for the Mayor.

³⁴⁹ Under its Network Management Duty, TfL will facilitate cooperation between TfL, the boroughs and utility companies to minimise disruption to the existing road network for all road users in London. The Mayor's overall approach is twofold:

- To improve cooperation and communication between highways authorities and works promoters to improve the coordination of roadworks

- To develop incentives for works promoters to reduce (or eliminate) the time they spend digging up roads and disrupting traffic

³⁵⁰ As a first step towards more effective coordination, TfL has developed an information system known as 'LondonWorks' that shows the location of all works on its roads and the surrounding network. This will enable action to coordinate and effect the management by contractors of these roadworks thereby reducing their adverse impacts on traffic flows and journey times. In addition, the Mayor's Code of Conduct for Roadworks has brought together TfL and the main companies responsible for utility works on London's major roads, to improve cooperation and coordination. The Code of Conduct will be extended to other utility companies and boroughs with their agreement.

³⁵¹ A new roadworks permit scheme has been introduced that will ensure roadworks are planned in an efficient and integrated manner where possible, and are carried out quickly. The permit sets out when works can take place, the length of time allocated, days and times on which road space will be made available to contractors, as well as specifying penalties for not keeping within the agreed restrictions.

³⁵² The Mayor, through TfL, will work towards implementing a 'lane rental' scheme for works promoters wanting to dig up the most congested roads in the Capital. The rental charge would reflect the cost to the economy of taking temporary possession of road capacity. It would aim to incentivise works promoters to reduce the number and duration of roadworks, and quicken the development of

techniques to minimise disruption. The scheme would identify key junctions, times of the day and network links, where roadworks can cause significant traffic congestion. The lane rental scheme, together with penalties for delay, would help to ensure that any organisation wanting to dig up the city's roads would make every effort to cause as little disruption as possible.

Proposal 32

The Mayor, through TfL, and working with the London boroughs and utility companies, will seek to minimise the adverse impact of planned interventions on the road network on the movement of people and goods, by:

- a) Strengthening the Mayor's Code of Conduct for Roadworks to further improve coordination between different highway authorities and utilities across London
- b) Utilising 'LondonWorks' to improve roadworks planning, coordination and information availability
- c) Encouraging collaboration between utility companies and the use of innovative road engineering techniques such as minimum dig technology and temporary plating over roadworks
- d) Implementing the concept of 'lane rental' charges for utilities to reflect the value of their temporary possession of road capacity (in terms of cost of delay to the road user) and to incentivise reductions in the duration of roadworks

5.6.6 Minimising disruption from unplanned events

- 353 There will always be unplanned events and situations affecting the operation of the road network which cannot be planned for in advance, for example, emergencies, vehicle collisions, breakdowns and burst water mains.
- 354 The adverse impacts of these events can be minimised by highway authorities and other agencies involved in the management of the road network, by:
 - Developing physical capabilities and services to respond to events
 - Reducing and mitigating the impacts through effective real time traffic management
 - Taking appropriate remedial actions on the ground
 - Providing effective real time information
 - Developing pre-arranged plans to deal with events which can cause high risks to the safety of the public when they occur
- 355 How these unplanned interventions that adversely affect the normal operation of the road network are managed has a direct impact on the resulting levels of traffic disruption. Highway and traffic authorities, the police and utilities therefore have an important role in identifying the potential causes of unplanned events, minimising response and clear-up times, and effectively managing traffic around such incidents to minimise disruption.

³⁵⁶ Improving the accessibility and availability of customer information about when and how to travel, and how to avoid as far as practicable the impact of incidents and interventions on the network, can improve Londoners' ability to move around the city reliably. This can include better information about incidents before journeys begin (for example, through media available in homes, offices and shopping centres), once they are underway (for example, through improved radio announcements), and in the immediate vicinity of the event (for example, through the use of variable message signs).

Proposal 33

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will improve the real time management of unplanned interventions and incidents on the road network, and improve communications to minimise the disruption and raise levels of public satisfaction with road network management.

5.6.7 Maintaining road network assets for safety and efficiency

³⁵⁷ London's roads, pavements, bridges, tunnels and traffic control systems represent billions of pounds worth of public assets. Maintaining them in a state of good repair is vital for the safe and efficient operation of the network and to achieve a good quality of life and economic productivity.

³⁵⁸ Customer satisfaction with the physical condition of roads and pavements in London is generally higher than that for the management of traffic

and roadworks, and has remained stable at 50 per cent in recent years. However, roads are vital public spaces which all of us use every day. The condition of roads and pavements is therefore fundamental to the quality of the urban environment.

Proposal 34

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will work in collaboration to maintain cost-effectively London's road network assets in a good state of repair in order to maximise their operational safety and effectiveness, and to promote road user satisfaction. This will include:

- a) Conducting programmes for the maintenance of roads, pavements, bridges, tunnels and traffic systems so that the TLRN and borough road network is serviceable
- b) Ensuring highway structures are inspected regularly
- c) Developing a Tunnels Safety Enhancement Programme taking account of, among other matters, fire risks, lighting, communications and surveillance

5.6.8 Developing the road network

³⁵⁹ Due to limited space, the approach taken in London is generally 'to get more' from the existing road network rather than conducting a comprehensive road building or widening programme. However, the strategy recognises the potential need for local road capacity

enhancements in certain circumstances, such as river crossings (see section 5.8), where there can be demonstrated an overall net benefit against the criteria set out proposal 35, below. This approach is consistent with London Plan policy 6.12.

Proposal 35

The Mayor, through TfL, and working with the London boroughs and other stakeholders will give consideration to new road schemes where there is an overall net benefit when judged against the following criteria:

- a) The contribution to London's sustainable development/regeneration including improved connectivity
- b) The extent to which congestion (average vehicle delay, unreliable journey times and poor levels of network resilience) is reduced
- c) How net benefit to London's environment can be provided
- d) How conditions for pedestrians, cyclists, public transport users, freight transport and local residents can be improved
- e) How safety for all is improved

All proposals will demonstrate how any disbenefits will be mitigated.

5.6.9 Outcomes

³⁶⁰ The measures to smooth traffic flow described previously will directly tackle the causes of growth-induced congestion on London's road network. They are supported by measures elsewhere in the strategy to improve and

promote mode shift towards public transport, walking and cycling.

³⁶¹ However, the precise effectiveness of this complete package of measures over the 20 year period of the strategy is uncertain. The level and distribution of any such growth-induced delay and deterioration of journey time reliability by 2031 will be dependent upon future investment and travel patterns, neither of which are precisely known. In addition, during this period there is expected to be continuing technical and social change that will affect the pattern of demand for road space and the way in which the road network can be managed.

³⁶² Furthermore, people's behavioural responses and increased use of sustainable modes in the future may differ from their responses today. For example, as a result of reduced rate and/or free public transport fares, today's children and teenagers in London make greater use of public transport than their predecessors – and could continue this higher level of use into adulthood, inspired further by the behavioural legacy of the 2012 Games. As a result rates of car ownership and use may be lower than today's levels.

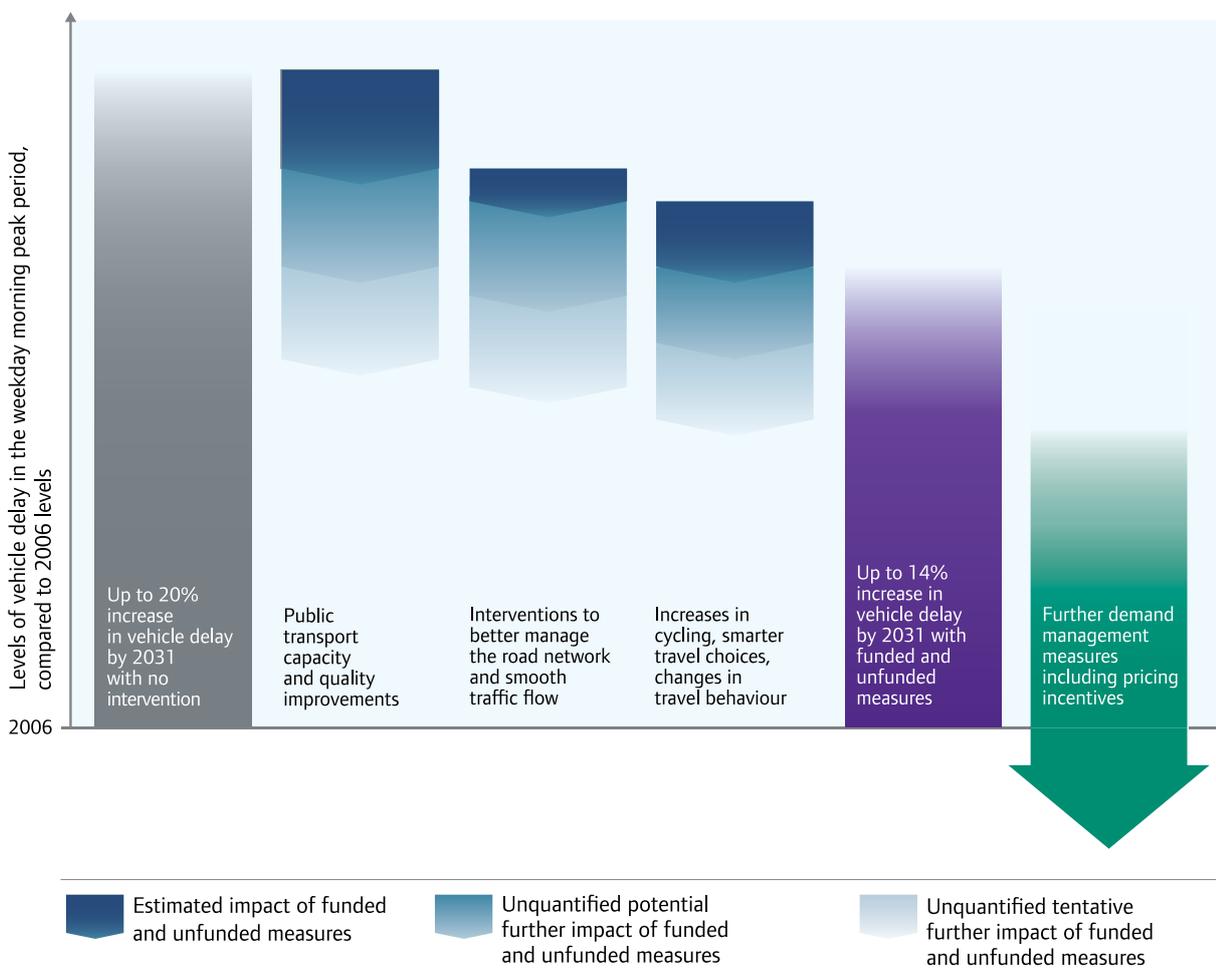
³⁶³ Because of these uncertainties, the effectiveness of the proposals in the strategy may be greater than can be quantified using conventional techniques.

³⁶⁴ Figure 42 illustrates the potential effectiveness of the transport strategy on reducing average vehicle delays on the road network, showing both the estimated level (in dark blue) and possible greater levels of effectiveness that might be achieved. Although a better

understanding of journey time reliability is being gained rapidly through TfL's traffic monitoring processes, still too little is known to usefully forecast levels of future reliability. Improvements to journey time reliability, while expected, are therefore not shown. If the

measures in the strategy achieve their maximum effectiveness then further interventions would not be required, however, with lower levels of effectiveness there would be a need for further interventions in the longer term.

Figure 42: Mitigation of increased road congestion (average vehicle delay)



The policy measures shown in this figure will also improve journey time reliability which is a priority for Londoners and is the strategic outcome measure for 'smoothing traffic flow'. The relative effectiveness of these interventions will also vary spatially, for example between the CAZ, Inner and Outer London

Spotlight

Managing roadworks

It is estimated there are around 500,000 holes dug in London's roads each year. Until recently there was limited ability to control the roadworks taking place in London. This imposed unacceptable costs in terms of congestion and damage to the road surface.

The London Permit Scheme began in January 2010, with the immediate support of TfL and 18 London boroughs, and expressions of interest from other boroughs have followed. The scheme aims to ensure that roadworks are undertaken in the least disruptive manner, are completed as quickly as possible, and are coordinated so all works required at a single location take place at the same time, wherever practical. In its first three months of operation, TfL approved around 12,000 applications to undertake works on the TLRN; 1,800 were refused. This alone will have reduced the overall number of roadworks occurring and

level of disruption being experienced on London's busiest main roads.

The Mayor wishes to introduce a targeted lane rental scheme. This scheme would apply charges to those undertaking roadworks at the busiest time of the day and on the most congested parts of the network. These charges could be avoided by works promoters if, for example, they undertook works at non traffic sensitive times or employed innovative working practices to allow the carriageway to return to traffic use at peak times.

The objective of the scheme would be to focus on the most congested roads in London and the most important pinch points on the TLRN and aim to reduce the volume and duration of roadworks. The scheme would incentivise works promoters by using charges that reflect the value of their temporary possession of road capacity (in terms of cost of delay to the road user).



5.7 The Blue Ribbon Network

5.7.1 Introduction

³⁶⁵ The Blue Ribbon Network encompasses the Thames, the canals, tributary rivers, streams, docks, reservoirs and lakes within London (as shown in Figure 43), a considerable proportion of which is navigable by passenger and freight vessels. Building on the policies in the London Plan, the strategy aims to maximise the network's potential for passenger and freight services, thereby relieving other congested and crowded modes.

5.7.2 Making better use of the Thames for passenger services

³⁶⁶ The Thames has been a strategic asset for London throughout its history, providing a vital link for people and goods. Currently, London's river traffic comprises a variety of freight and passenger services for commuters and tourists. At present, services operate from 22 piers between Putney and Woolwich, nine of which are under TfL management.

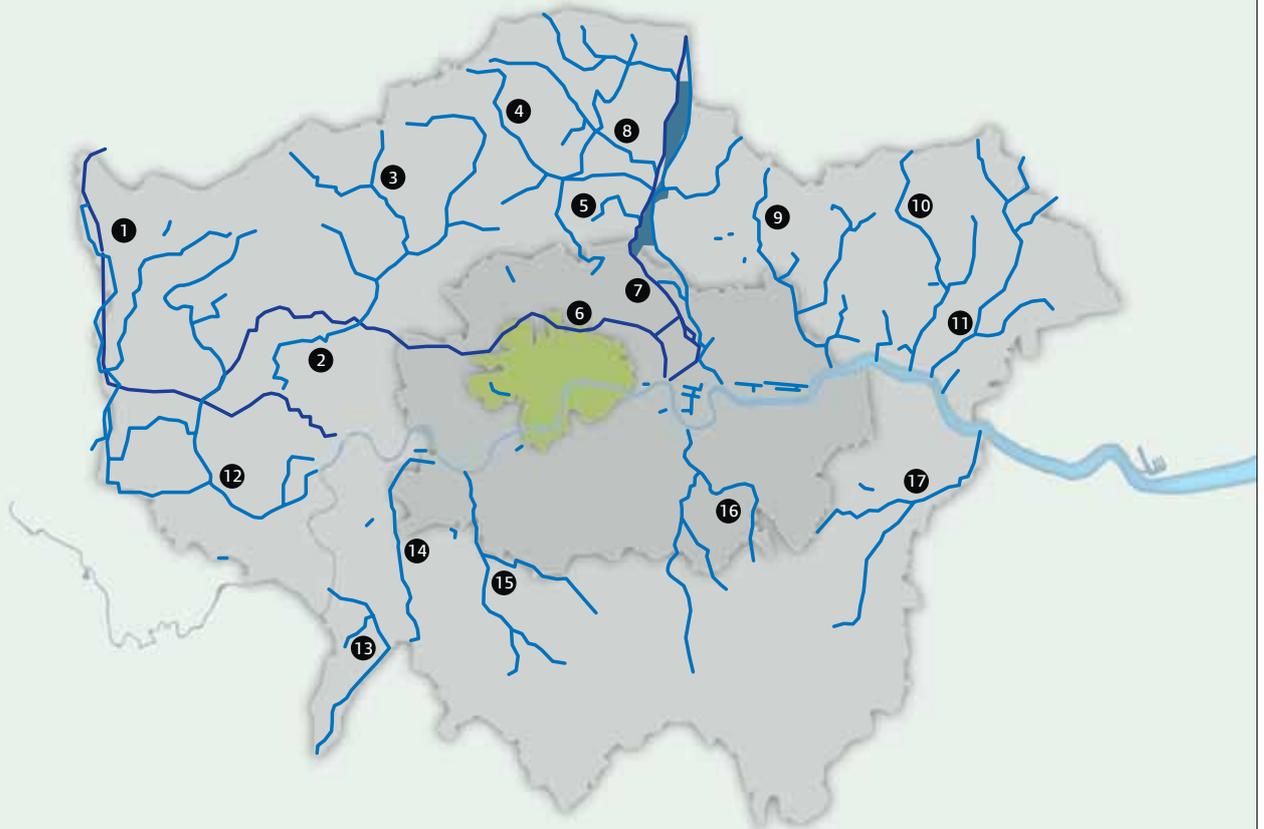
³⁶⁷ 'Riverbus' services provide a comfortable, accessible and occasionally faster alternative to other modes for those within the catchment zone of piers. In 2008/09 nearly 900,000 journeys were made by peak-time commuters on the river. Demand has increased by over 600,000 journeys since 2003/04, driven by riverside property development and commercial developments in the Docklands, as well as improvements to services part-funded by TfL, boroughs and developers. In comparison

with land-based public transport, scheduled commuter services may not be as cost-effective to provide, and can produce higher carbon emissions per passenger. However, if loadings increase, the per capita economic and environmental costs will fall. As further residential, commercial and leisure facilities develop in the Thames Gateway as well as west London, river services may become more popular, making better use of new and existing capacity. Including leisure trips, a total of five million passenger journeys are estimated to have been made on the Thames in London in 2009/10.

³⁶⁸ In order to maximise the potential of the river in the build-up to the 2012 Games and beyond, the Mayor has led the development of a 'River Concordat' between the Port of London Authority (PLA), British Waterways, ODA, boat operators, pier owners, riparian boroughs, TfL, the LDA and other organisations with an interest in improving passenger services on the Thames. The River Concordat Action Plan identifies six core workstreams:

- Providing an integrated and enhanced service for the 2012 Olympic Games
- Increasing pier provision
- Improving service quality
- Integrating ticketing with land transport
- Improving pier signage
- Improving passenger information

Figure 43: The London Blue Ribbon Network



Key	
	Larger tributary rivers
	Canals and river navigation
	Large lakes and docks
	River Thames

- | | | |
|-------------------------|-----------------------|-------------------------------------|
| 1. Grand Union Canal | 8. Salmon's Brook | 15. River Wandle |
| 2. River Brent | 9. River Roding | 16. Ravensbourne River |
| 3. Silk Stream | 10. River Rom | 17. River Cray |
| 4. Pymmes Brook | 11. Ingrebourne River | |
| 5. Moselle Brook | 12. River Crane | |
| 6. Regents Canal | 13. Hogsmill River | Note: Not all tributaries are shown |
| 7. River Lee Navigation | 14. Beverley Brook | |

369 The following supporting areas are also being given consideration:

- Boat yard provision
- Skills
- More reliable management information
- Reducing the environmental impact of services

370 Early outcomes of the concordat include a new direct service between Canary Wharf and London Bridge and the extension of Oyster pay as you go ticketing on Thames Clippers'

services. Work is ongoing to further integrate ticketing and passenger information with other modes of transport. Lack of customer awareness of services on the river has been cited as one of the key barriers to greater use. Better signage at public transport interchanges and inclusion within the Legible London wayfinding system may encourage more people to use river services. Improved branding will help customers choose the most appropriate service for their needs.

371 Feasibility work undertaken by TfL has identified scope for additional passenger

services in east London, to complement public transport networks. Potential exists to connect new developments on either side of the river with each other, the Docklands and central London. These would improve cross-river connectivity, capacity and boost the local economy. In the short-term, this could include new services between North Greenwich (The O2) and East India pier, as well as enhancements to the Woolwich Ferry. There may also be demand for a new vehicle ferry service serving Gallions Reach. Further consideration to river crossings in east London is given in section 5.8.

- 372 Options for increasing passenger use of the river will be explored over the period of this strategy through the sub-regional planning process, development planning, as well as through the on-going work of the concordat. Proposals for new services from developers, operators, local and central Government and other agencies, will be welcomed by the Mayor. Sustained commitment will be required from these partners to ensure services remain viable over the course of the MTS.

Proposal 36

The Mayor, through TfL, and working with the Port of London Authority, ODA, boat operators, pier owners, riparian boroughs and other interested parties, will continue by means of the River Concordat to work to enable the development of London's river services to reach their full potential and to better integrate river services into the land-based public transport network.

- 373 Additionally, there may be scope for a new passenger cruise terminal on the Thames where there is capacity to accommodate large vessels, which is supported by London Plan policy 7.26. A new terminal could also support London's tourism and aid local regeneration schemes, although the location would have to be considered in light of other proposals, such as new river crossings.

5.7.3 Pier capacity and supporting infrastructure

- 374 A Pier Plan, commissioned by the LDA, has reviewed the current status of piers from Putney to the Thames Gateway region and made recommendations for where additional pier capacity should be located.
- 375 The most pressing need for more pier capacity is in central London where demand is highest, and competition for space between leisure and commuter services is the greatest. TfL will extend Tower Millennium Pier and the concordat's pier capacity workstream is developing low-cost solutions to enable the expansion of other central London piers.
- 376 Outside central London, TfL will undertake feasibility work to identify if there is a need to build new piers at North Greenwich and Canary Wharf to relieve existing facilities. Further opportunities for new piers will be explored by the pier capacity workstream in line with the Pier Plan and in conjunction with developers, pier owners and other stakeholders; funding will be sought from a range of sources.

- 377 The concordat's pier capacity workstream is also developing pier amenity standards to help ensure more consistent levels of service across the network.
- 378 New river traffic management facilities may also help optimise pier use and reduce conflicts between different passenger services. However, this may entail alterations to the current regulatory framework and would require the full participation of partners in the River Concordat and Government.
- 379 The Mayor also recognises the need for sufficient supporting infrastructure for waterborne transport – both passenger and freight. In particular the need for boat yards to inspect, service and repair vessels. A report conducted by the GLA in 2007 identified the lack of suitable facilities in London and recommended that at least one additional facility be developed to cater for the larger vessels operating on the Thames.

Proposal 37

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will encourage the provision of more pier capacity, particularly in central London and will seek financial support for new piers when considering development proposals in the vicinity of the Thames. The Mayor, through TfL, will also work with the Port of London Authority, boroughs and operators to identify and promote suitable boat yard facilities in London.

5.7.4 Making better use of other rivers and canals for passenger services

- 380 Current infrastructure investment in the waterways surrounding the Olympic Park site, together with increased marketing and promotion is intended to leave a legacy of increased recreational use. Opportunities to provide leisure cruises around the park following the 2012 Games are currently being explored.
- 381 Concordat partners including British Waterways, the ODA and boroughs can help identify opportunities to increase use of other waterways in London such as the River Lee Navigation and Grand Union Canal. Where passenger services on these waterways are viable they will likely be for leisure use, as journey times are generally slow. New or expanded service provision will be dependent on potential demand and local environmental impacts.
- 382 There are also opportunities to improve pedestrian and cycle access to the Blue Ribbon Network and improve the quality of towpaths for a range of leisure and non-leisure trips.

5.7.5 Making better use of rivers and canals for waterborne freight

- 383 The Mayor recognises that transporting freight (including waste) by water is a less damaging option environmentally and can help ease the impacts of congestion on the road network. The shift from road freight to waterborne freight and increasing goods transported (by tonnage) from the current 1.84m tonnes per year is an important element in reducing

Case study

Improving passenger services on the Thames

The Thames is a great highway through central London but has been under-utilised for regular passenger travel for a number of decades. The Mayor has instigated, through 'By the river'¹, a concerted effort by TfL, the boroughs, operators and encourages third party investment to change this by: increasing the number of piers and improving them, operating new services at higher frequencies, introducing new, faster boats and providing better information. The two main operators, Thames Clippers and TEC, now run a number of regular services, from Woolwich in the east to Putney in the west.

As a result, more and more people are discovering the river as a viable, attractive alternative to often congested Tube services, buses and roads for travelling to work and for

leisure opportunities in central London, the Isle of Dogs and North Greenwich. Since 2003/04, river commuting has tripled from under 300,000 trips to nearly 900,000 in 2008/09.

Through participation in the River Concordat, Thames Clippers accepted Oyster pay as you go on its services in November 2009, allowing further integration with other public transport modes in London. The operator has recently launched new direct services to the Docklands from London Bridge pier and service patterns are designed around the needs of rail passengers interchanging from the mainline station. Therefore fast ferry services now provide a feasible alternative to the Jubilee line for Docklands workers, operating high frequency departures every 10 minutes in the peak.

¹ 'By the river', launched by the Mayor in 2009, introduces the River Concordat and other riparian initiatives



vehicle emissions and improving the quality of life in London. The Port of London within the Greater London boundary remains a significant port facility, handling a range of goods.

- 384 Water transport is particularly suited to bulk movements of relatively low value cargoes for which speed is less critical, aggregates and waste/recyclates are prime examples. Within London there are also other cargoes such as sugar, vehicle parts, metals, timber, foodstuffs, fuel, oil and other bulk liquids. Water transport is also well-suited to construction and demolition activities connected with building development. In the Olympic Park at Stratford, waterways have been upgraded so construction material can be transported by water rather than road. The new Three Mills Lock in Bromley by Bow can accommodate barges weighing up to 350 tonnes (equivalent to 17 average HGV loads).
- 385 Future potential for such movements include major construction projects such as Crossrail and the Thames Tideway Sewers. A range of Government grants are available to operators to offset both capital and operational costs.
- 386 Increasing waterborne freight will also depend on the availability of wharf facilities to transfer cargo between land and water. The Mayor has safeguarded 50 such wharves on the Thames and tidal tributaries and London Plan policy will ensure that these sites are maintained and used for waterborne freight (including waste) transport.

- 387 This strategy supports the retention of these wharves. Furthermore, the Mayor believes that there is potential for additional transfer from road to water, particularly for deliveries to central and west London. This will necessitate the reactivation of some of the safeguarded wharves that are not currently in use, and may require the addition of further wharves in appropriate locations to serve this demand. Road access will also be a consideration at these sites.
- 388 TfL has researched the opportunities for freight transport on London's canal network and, along with British Waterways will promote these opportunities further. This will involve the consideration of whether to safeguard a number of wharves on the canal network.

Proposal 38

The Mayor, through TfL, and working with the Port of London Authority, London boroughs and operators, will seek to ensure that existing safeguarded wharves are fully utilised for waterborne freight (including waste), and will examine the potential to increase the use of the Thames and London's canal network for waterborne freight transport.

5.8 River crossings

³⁸⁹ Historically, there have been fewer river crossings in east London than in the west, due to the width of the river, the types of existing land use and the extent of shipping activity east of Tower Bridge. This has resulted in limited interaction between the residential population and businesses on either side of the river, and is one of the factors contributing to lower land values.

³⁹⁰ As the economy of east London has changed, developments such as Canary Wharf, ExCel and The O2 have increased the demand for travel across the river significantly. Many of the large new economic drivers for London are located in east London, with the majority of these lying north of the river, such as the Olympic Park and adjacent Stratford City development, Canary Wharf, ExCel and City airport. Access to these growing destinations from southeast London can be difficult due to the barrier effect of the Thames.

³⁹¹ Over the last 20 years progress has been made on rail and passenger ferry crossings. The DLR extensions to Lewisham and Woolwich Arsenal and the Jubilee line extension have created new river crossings and proved very successful in improving cross-river connectivity. These will be followed by the upgraded East London line in 2010 and Crossrail in 2017.

³⁹² The Mayor supports improving the opportunities for pedestrians and cyclists to cross the Thames in east London, currently limited to the Greenwich and Woolwich foot tunnels and the Woolwich Ferry. In the shorter term, there is the potential

to make greater use of existing passenger ferries, but the potential for new fixed links will be explored whether for pedestrians and cycles only, or in conjunction with other modes. Schemes could include provision of new and enhanced passenger/cycle ferries, new fixed links, or innovative solutions such as cable cars, where these could be appropriate. These crossings would provide alternatives for local journeys on existing crossings and free-up capacity for longer distance travel on the Tube and DLR routes.

³⁹³ In addition, the Mayor is committed to ensuring that where new or improved cross-river pedestrian, cycle and public transport links exist, car drivers, who could switch their journeys to more sustainable modes, are encouraged to do so to reduce the number of car trips at congested crossings. Freight journeys can be timed to avoid peak hours through improved journey planning and supply chain interventions such as DSPs. Other measures, such as consolidation centres and modal shift to rail and water, proposed elsewhere in this strategy (see sections 5.2, 5.7 and 5.24) will also reduce freight traffic in peak hours.

³⁹⁴ However, there will continue to be a need for some journeys to be undertaken by vehicle, in particular commercial traffic and the movement of goods and the provision of services to support a growing economy in east London. Drivers are heavily dependent on the congested Blackwall and Rotherhithe tunnels, each of which have restrictions on the size of vehicle which can use them, and the Woolwich Ferry. Beyond London, the Dartford crossing, forming part of the M25 orbital motorway, also regularly operates at, or

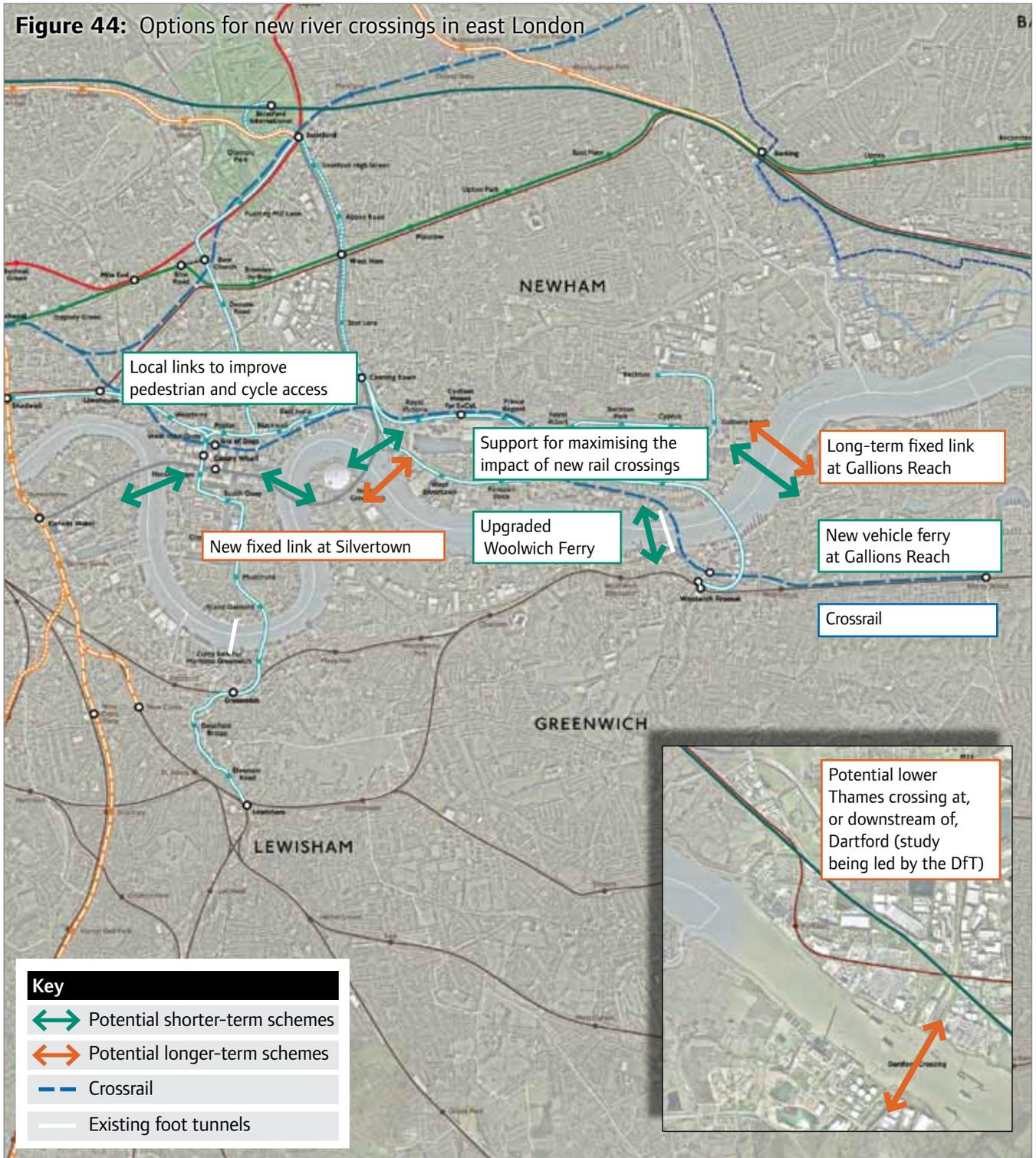
close to, capacity. There is little resilience in the event of an incident at one of these crossings, and local businesses, particularly in southeast London, suffer from this unreliability. The projected increases in jobs and population in the Thames Gateway will increase the problem of highway congestion and road network resilience at river crossings further. The Mayor is therefore supportive of additional road-based river crossings in east London as part of a package of transport improvements.

- 395 The Woolwich Ferry has a lower capacity than a fixed road crossing, but nevertheless provides an essential cross-river link for some road users, particularly HGVs and commercial traffic crossing the river due to vehicle restrictions at the Blackwall and Rotherhithe tunnels and at Tower Bridge. The vessels and landing stages are coming towards the end of their life, and there is an opportunity to replace the existing equipment with more efficient modern vessels.
- 396 The recent TfL review of potential river crossing sites and options identified several areas where more investigation and work is warranted. The package of river crossings will have regard to the needs of all potential users, including vehicles, freight, public transport, walking and cycling. The package of new river crossings in east London is shown in Figure 44.
- 397 A range of funding options are available for crossings. For example, tolling on highway crossings (section 5.27, see proposal 130 and chapter eight) could both help to finance the construction of schemes, as well as providing a means of managing traffic demand.

Proposal 39

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will take forward a package of river crossings in east London, including:

- a) A new fixed link at Silvertown to provide congestion relief to the Blackwall Tunnel and provide local links for vehicle traffic
- b) An upgraded Woolwich Ferry and consideration of a new vehicle ferry at Gallions Reach to improve connectivity
- c) Local links to improve connections for pedestrians and cyclists
- d) Consideration of a longer-term fixed link at Gallions Reach to improve connectivity for local traffic, buses, cyclists and to support economic development in this area
- e) The encouragement of modal shift from private cars to public transport, using new rail links including High Speed One domestic services, Crossrail and the DLR extension to Woolwich, reducing road demand, and so road congestion at river crossings, where possible
- f) Support for Government proposals to reduce congestion at the Dartford crossing



5.9 A more accessible transport system

5.9.1 Enhancing the physical accessibility of the transport system

- ³⁹⁸ This section, together with section 7.2 (Accessibility Implementation Plan), constitutes the Mayor's proposals for the provision of transport which is accessible to persons with mobility problems as required by the GLA Act 1999.
- ³⁹⁹ London's transport system is one of the oldest in the world. The legacy is a large, comprehensive system, but also, in places, notably the Tube and rail networks, one which does not fully meet the accessibility needs of Londoners, particularly mobility or sensory impaired people.
- ⁴⁰⁰ Much is being done to address this issue (see spotlight on transport accessibility). TfL's Business Plan sets out transport projects that are committed to be delivered before 2020, many of which will improve the physical accessibility of London's transport system. In particular, Crossrail will revolutionise the accessibility of central London with step-free interchanges at key stations such as Bond Street and Tottenham Court Road. In addition, accessibility improvements will be delivered as part of the Tube upgrades (for example, addressing platform-train interface and installing platform humps at key locations) as well as step-free access at key 2012 Games Underground stations and through major interchange schemes for example, Bank and Victoria – all building on the foundation of step-free stations already in place. Major redevelopment proposals such as Elephant & Castle and Brent Cross/Cricklewood will also provide an opportunity for further improvements in station accessibility.
- ⁴⁰¹ The DfT's Access for All programme, augmented by Crossrail and other committed investment, will increase coverage of step-free access (from street to platform) to 46 per cent of rail stations in London by 2017. This equates to 160 step-free stations in 2017, compared to 101 (31 per cent) in 2010. The process allows for TfL to influence the DfT's draft suggestions, which has successfully been done for each 'tranche' announced to date. The East London line extension and North London line enhancements will provide a number of new and upgraded step-free stations on the London Overground network.
- ⁴⁰² As the Tube network is renewed, it will be made more accessible. New trains to be introduced on most Underground lines will comply with Rail Vehicle Accessibility Regulations (RVAR), and Underground station refurbishments will provide or include, for example:
- Audible and visual information on all platforms and in all ticket halls
 - Improved handrails to ensure appropriate heights and designs and provide a visual contrast with the wall
 - Improved steps and stairs to provide a visual contrast at the leading edge of each riser and tread

Spotlight

Transport accessibility for all

Progress has been achieved in recent years in terms of the accessibility of transport services. Currently, all buses in London are low-floor, about 20 per cent of Tube stations and a third of National Rail/London Overground stations are step-free from street to platform, and all DLR and Tramlink stations and vehicles are fully accessible.

The DfT's Access for All programme, alongside Crossrail and enhancements to the London Overground network, will provide step-free access coverage at 46 per cent of rail stations in London, by 2017.

As the Tube network is renewed, it will be made more accessible: new trains will comply with RVAR and capacity enhancements at the busiest stations on the network will provide accessibility improvements. All Tube stations will be refurbished with tactile markings and colour-contrasted handrails.

However, there is even more to do to make London's transport system fully accessible for all. The strategy will deliver further improvements, to:

- Journey planning and information (for example, real time bus information via mobile phone or the internet)
- Streets and town centre areas (for example, balanced streets)
- Better bus stop accessibility (for example, removal of street clutter around bus stops)
- Public transport staff and passenger helpfulness, behaviour and attitude (for example, wider availability of staff to assist passengers)
- Further station and train accessibility improvement (for example, new trains, Crossrail)
- Door-to-door services (for example, new vehicles for Dial-a-Ride)



- Removing, modifying or highlighting obstructions
- Providing a visual contrast between Help and Information points and the surrounding walls
- Installing induction loops at every Help and Information point and providing 'listening points' for hearing aid users at some bigger stations
- Improving lighting and public address systems
- Improving signs and wayfinding to help people navigate around stations and trains, including expanding use of pictograms
- Installing tactile warning surfaces on every platform and on all staircases
- Increasing the amount of seating in ticket halls, on platforms and in long corridors and walkways
- Providing more priority seating on trains, at stations, in ticket halls and on platforms
- Further improving the safety and security of stations by increasing the coverage and quality of CCTV, providing safer waiting areas at specific stations with Help and Information points in every ticket hall and corridor and on every platform
- Providing accessible unisex toilets at all step-free stations where toilets already exist

403 In addition, trials of platform humps have been successfully completed, and are being rolled-out across the Tube system as new rolling stock is introduced, as well as using other infrastructure changes to provide level access on to trains.

- 404 Improvements to the accessibility of the street environment are important to complement station access enhancements and are crucial to the whole journey approach. With limited resources available, a joined-up approach will be required.
- 405 The increasing numbers of mobility scooters used by mobility impaired people for trips in London should continue to be supported through an accessible street environment and targeted enhancements with regard to the safety of all road and pavement users.

Proposal 40

The Mayor, through TfL, and working with the DfT, Network Rail, the London boroughs and others will improve the physical accessibility of the transport system by prioritising step-free access at strategic interchanges, improving street accessibility in town centres and around accessible stations and maximising the accessibility benefits of new transport schemes, such as Crossrail. In doing so, the Mayor will seek to maximise the benefits of investment by ensuring that resources are focused on improving accessibility for the maximum number of people, while ensuring an equitable balance across London.

- 406 In particular, it will be important to maximise the benefits of the accessible bus fleet as this is a relatively quick and cost effective way of enhancing physical accessibility to the transport system throughout London.
- 407 The Mayor recognises that the Blue Badge parking scheme has contributed significantly

to expanding travel opportunities for those with severe mobility difficulties. He supports the provision of priority parking places for Blue Badge holders, particularly in town centre locations, at public services and stations, and a 100 per cent discount from the Congestion Charge scheme.

- 408 Further details of the approach to improving the physical accessibility of London's transport network will be provided in TfL's Disability Equality Scheme (DES). This is a statutory document, updated every three years, which sets out in further detail what TfL is going to do to ensure that the services it offers are accessible to disabled people.

5.9.2 Enhancing information provision

- 409 Information is a critical enabler to making the right choice about travel options and needs to be timely and accessible. Disabled people identify improvements in this area as being a key factor in their ability to travel independently and with a feeling of confidence and personal safety. Enhancing pre-trip and in-trip journey information and improving the legibility of interchanges and facilities, will bring benefits to all Londoners, and will go some way to removing barriers to travel.

Proposal 41

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will improve the availability, quality, quantity and timeliness of information about the transport system to remove barriers to travel.

5.9.3 Improving staff service and the attitudes of customers

- 410 It is recognised that the approach of some staff and the attitude of some customers needs to reflect a more considerate approach to the needs of all users of public transport. This can be achieved through raising customer service standards, improved customer relations programmes and disability awareness campaigns, so that those passengers who require additional assistance receive it as a matter of course.

Proposal 42

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will improve attitudes of transport staff and travellers towards each other to ensure excellence in customer service and a courteous, safe and friendly travelling environment that does not present a barrier to travel.

- 411 Some people with mobility difficulties may need to build up confidence before using the public transport system independently. The Mayor will support travel-mentoring initiatives that help mobility impaired people to become accustomed to using the accessibility features on London's public transport system.
- 412 Staff that are available throughout service hours to provide assistance, information and reassurance to all customers are particularly valued by disabled people. All bus stations, Tube and London Overground stations will

continue to be staffed from first to last service. However, there remains the need for greater consistency in availability and the training of staff across the transport network.

Proposal 43

The Mayor, through TfL, will work to ensure a greater staff availability to provide direct assistance to customers and continue to improve customer experience, by enhancing staff training to ensure that the access needs of disabled passengers are understood by all frontline staff.

5.9.4 Door-to-door transport

- ⁴¹³ Door-to-door transport takes people all the way from the origin of their trip to their final destination. Unlike mainstream public transport, where people generally have to access the system at predetermined stops, door-to-door transport can, in most cases, pick up and drop off passengers anywhere. The general aim of schemes such as Dial-a-Ride, Capital Call and Taxicard is to provide transport options for people for whom the mainstream transport network remains inaccessible.
- ⁴¹⁴ Dial-a-Ride is a free door-to-door transport service for disabled people who can't use buses, trains or the Tube. It can be used for many types of journeys, making it easier for disabled people or people with lower levels of mobility to go shopping and visit friends. Eligibility for Dial-a-Ride membership includes those people who have a permanent or long-term disability which means they are unable, or virtually

unable, to use mainstream public transport services some or all of the time.

- ⁴¹⁵ Dial-a-Ride is a very successful and popular service, currently catering for around 1.3 million trips a year. Customer satisfaction rating is also running at more than 90 per cent.
- ⁴¹⁶ Funding of door-to-door services has significantly increased over the past few years, delivering a number of enhancements. Improvements to Dial-a-Ride have included extending eligibility, scrapping fares and making improvements to the call centre and booking system. TfL continues to jointly fund Taxicard with the London boroughs and fully fund Capital Call, both of which provide subsidised transport to people who have mobility impairment and difficulty using public transport. Demand continues to outstrip the supply for door-to-door services and discussions between TfL and London Councils are ongoing to explore the best use of resources in maintaining and improving these services.

Proposal 44

The Mayor, through TfL, will support door-to-door services for people with mobility problems who require this form of transport service.

5.9.5 Accessibility Implementation Plan

- ⁴¹⁷ An accessibility implementation plan, as required by the GLA Act, is set out in section 7.2 of this strategy.

5.10 Integrating London's transport system and services

5.10.1 Improving interchange

⁴¹⁸ Interchanges, whether local or major transport hubs, vastly expand the level of accessibility to opportunities and services offered by London's transport system by enabling multi-modal journeys, and those involving more than one public transport service. The convenience, comfort, information provision, safety and reliability experienced at interchanges are

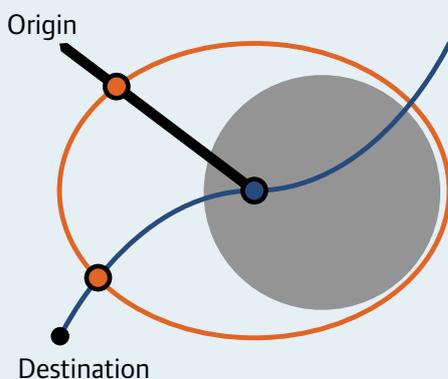
important determining factors in Londoners' perceptions of the quality and attractiveness of the transport system. Interchanges have a crucial role to play in improving the efficiency of London's transport system, as well as the relative attractiveness of public transport to the car and tackling car dependency.

⁴¹⁹ Interchanges not only enable travel choices, but also provide opportunities to create better places to live and work as well as support population and employment growth in highly accessible and sustainable locations. Improved

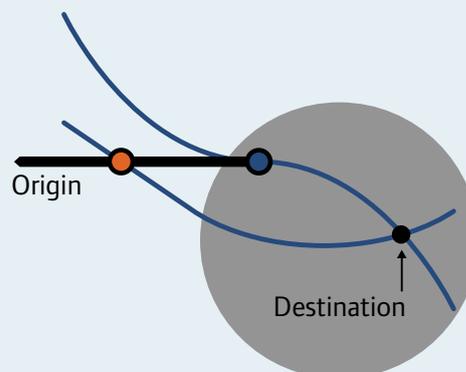
Figure 45: Strategic interchange concepts

Strategic interchanges will help to relieve passenger dispersal pressures at central London rail termini through two primary means:

1) Enable interchange to orbital public transport services to avoid the need to enter central London



2) Enable interchange between National Rail and Underground/bus services at a point prior to the rail termini, thereby reducing pressure at overcrowded rail termini interchanges

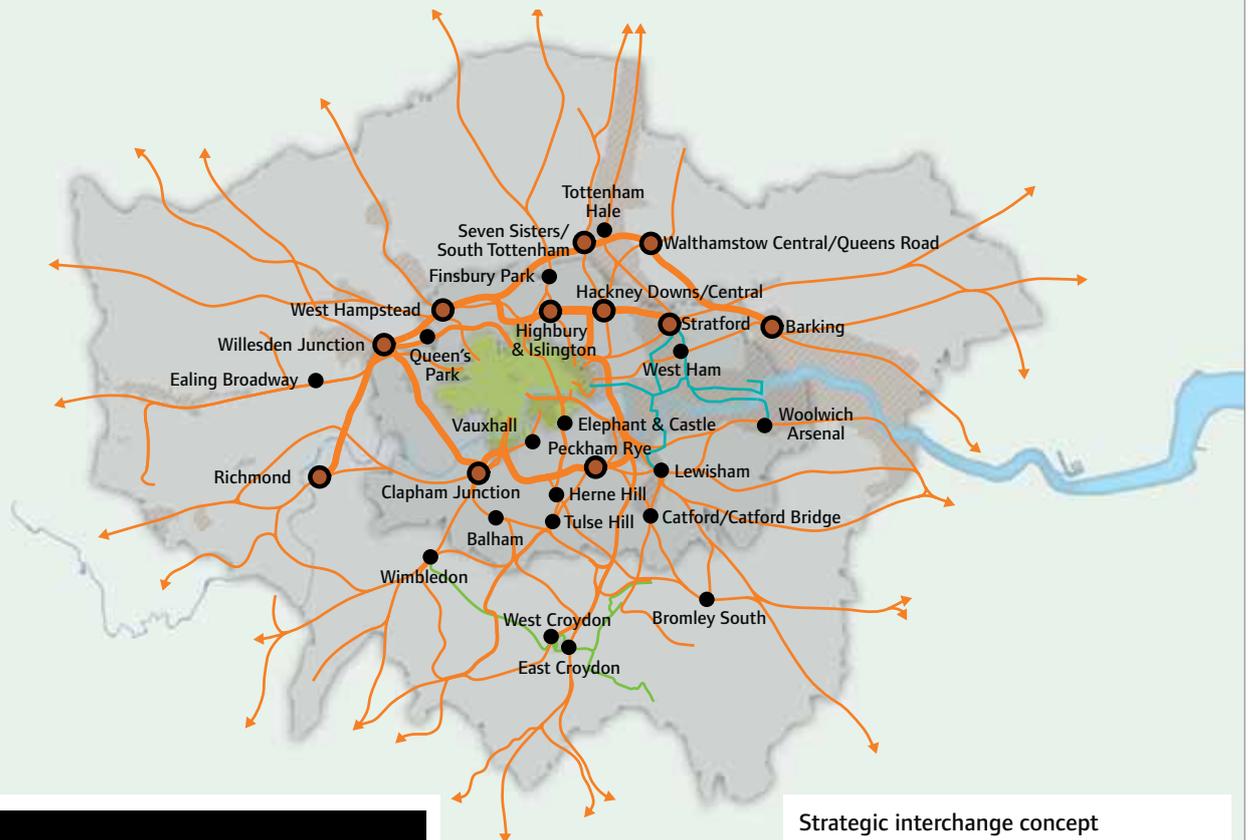


- | | | | |
|-----------------------------------|-----------------------|---------------|-----------------|
| Rail termini | Strategic interchange | National Rail | Underground/bus |
| Enhanced orbital trip opportunity | Central area | | |

interchanges can support the alleviation of crowding and congestion, maximise access to business and employment markets (on a London-wide, national and international scale), improve connectivity, improve passenger

journey experiences, and help address key environmental and quality of life concerns, such as air quality, health and noise pollution. In collaboration with partners and stakeholders, TfL has published Interchange Best Practice

Figure 46: Examples of strategic interchange locations outside central London

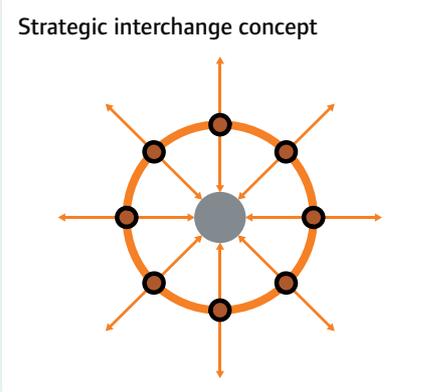


Key

- Radial rail routes
- London Overground orbital routes
- Docklands Light Railway
- Tramlink

Interchanges between radial rail routes and:

- London Overground orbital routes
- Other lines



Guidelines that provide advice and guidance to those involved in planning, improving and operating high quality effective interchanges.

Proposal 45

The Mayor, through TfL, and working with Network Rail, the train operating companies, London boroughs and other stakeholders, will improve the customer experience and physical accessibility at interchanges across London through the application of the principles set out by the TfL Interchange Best Practice Guidelines of 'efficiency', 'useability', 'understanding' and 'quality' to all interchange schemes in London. Such measures include:

- a) Provision of consistent and enhanced travel information
- b) Improved walking and cycling facilities at, and on routes to, public transport stations and stops
- c) Improved integration of public transport services in London, both in terms of service planning and physical location
- d) Improved efficiency, effectiveness and quality of interchanges across London to further integrate London's transport system
- e) Provision of consistent customer service delivery standards
- f) Assurance that interchange facilities have sufficient capacity to meet travel demand

5.10.2 Strategic interchanges

⁴²⁰ Strategic interchanges are primarily radial to orbital rail interchanges. They have the potential to reduce travel times and relieve crowding in central London, including interchange capacity pressures at London's rail termini. Connectivity and central London crowding relief benefits are offered by new and enhanced orbital public transport services, see Figure 45. Some also offer significant development potential, due to their enhanced public transport accessibility and connectivity. Figure 46 shows potential key strategic interchanges outside central London.

Proposal 46

The Mayor, through TfL, and working with Network Rail, the train operating companies, London boroughs and other stakeholders, will prioritise improvements to strategic interchanges, that will:

- a) Provide opportunities for orbital public transport services
- b) Provide interchange opportunities before arriving in central London, in order to reduce interchange capacity pressure at London's rail termini
- c) Provide opportunities to accommodate population and employment growth, with developer contributions towards the interchange improvements sought in appropriate circumstances

Spotlight

Woolwich Arsenal strategic interchange

The new DLR station at Woolwich Arsenal in Greenwich has created a strategic interchange in Outer London. The interchange enables passengers travelling on radial National Rail services into central London to interchange at Woolwich and make orbital journeys north, across the Thames, towards important destinations such as Stratford – home of the Olympic Park – London City airport and Canary Wharf.

The interchange is heavily used by passengers changing from orbital bus services travelling into Woolwich from areas such as Plumstead. More than 50 per cent of arrivals for DLR services from Woolwich have interchanged from bus or National Rail services. Cycle parking outside the station is also heavily used.

The Woolwich Arsenal strategic interchange will be further enhanced when the planned Crossrail station opens in 2017.

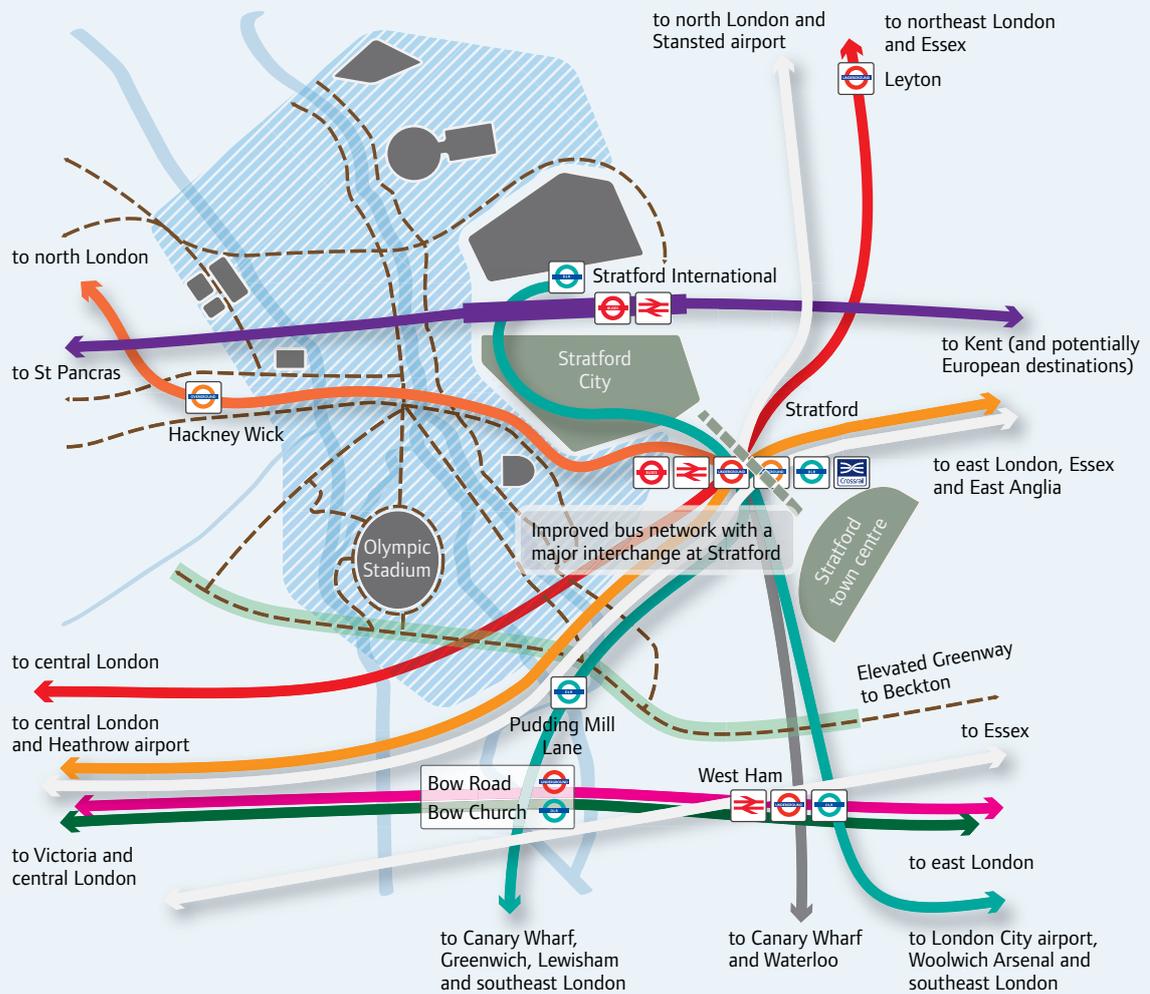


5.11 London 2012 Olympic and Paralympic Games

5.11.1 The 2012 Games legacy

- ⁴²¹ As highlighted in chapter four, the Games provides London with a unique opportunity to change people's behaviour and encourage a lower carbon, healthier life style by increasing the awareness and use of walking, cycling and public transport. This is particularly important in Stratford, where the Olympic Park will be fully accessible by public transport, as well as walking and cycling routes. The level of accessibility can be seen in Figure 47.
- ⁴²² Transport can support the wider legacy benefits of the 2012 Games in two key ways:
- Firstly, new transport infrastructure being delivered for the Games will improve accessibility to jobs and services for local people and offer a wider choice of travel modes, for example, walking and cycling routes and access to new DLR stations. This will also contribute towards reducing car dependency and road congestion, and reduce carbon and other emissions
 - Secondly, promotion of more active modes of travel following the Games, building on the inspiration of the athletic performances through targeted awareness programmes. These include smarter travel to support improvements in health and the local environment
- ⁴²³ The London 2012 'Active Travel Programme' will use the Games as a catalyst to encourage spectators and the public to walk and cycle more before, during and after the Games. The programme will help to raise awareness about the benefits of walking and cycling as a mode of transport nationwide, and help increase the number of such journeys across London and the UK.
- ⁴²⁴ To promote healthy and environmentally sustainable lifestyles beyond the Games, initiatives are being developed to encourage walking and cycling in the five Olympic boroughs of Tower Hamlets, Hackney, Greenwich, Newham and Waltham Forrest; and within the area of the Olympic Park.
- ⁴²⁵ TfL is also providing extra funding for boroughs in advance of the 2012 Games for public realm improvement schemes at sites that will attract significant visitor numbers during the Games. These will transform the quality of the environment and urban realm in line with the principles of 'better streets' and provide a lasting legacy in the local area. Further interventions may be appropriate.
- ⁴²⁶ Additional complementary transport infrastructure investments may also be required to realise the local benefits of the Olympic Park that will be transformed through the Olympic Legacy Masterplan.

Figure 47: Olympic Park legacy international, national, regional and local connections



Key

2012 Olympic Park area	Elevated Greenway	High-speed rail
2012 Olympic buildings	Crossrail	Central line
Pedestrian bridge	London Overground	District line
Off-highway cycling and walking routes	DLR	Hammersmith & City line
	National Rail	Jubilee line

Highway network not shown

Subject to potential review by the Olympic Legacy Transport Plan process

- 427 The 2012 Paralympic Games will also provide specific legacy benefits for Londoners that will need to be embedded with further initiatives after the Games. New infrastructure for the Games, such as the DLR extension to Stratford International, the upgrade of Stratford station and step-free access at key Underground stations such as Green Park, all contribute towards more accessible public transport services. The Paralympic Games will also do much to promote the awareness of disability among transport operators and the general public.
- 428 In order to better understand the additional interventions that may be required to ensure maximum synergy with other intervention programmes, to maximise benefits of transport investment and ensure transport fully supports the principle of convergence outlined in chapter four, the Mayor proposes to develop a Transport Legacy Action Plan with key partners. The plan will be embedded in the sub-regional transport plan process and delivered through the TfL Business Plan and the boroughs' LIPs.

Proposal 47

The Mayor in partnership with the London boroughs, TfL and Olympic Park Legacy Company, will develop a Transport Legacy Action Plan and monitoring programme to ensure the benefits of the legacy of the 2012 Games are maximised and that transport interventions support convergence as set out in the five Olympic Boroughs Strategic Regeneration Framework. The plan will be monitored for 10 years after the Games, and will define:

- Partners and their responsibilities
- The monitoring area within the five Olympic boroughs
- Key indicators and targets within the monitoring area and London-wide
- Actions and interventions required to meet the targets
- Annual review of targets

5.12 London's airports

⁴²⁹ This section focuses on airport capacity and surface access to airports. The Mayor's approach to broader aviation issues is outlined in section 4.2.2.1 'Supporting and developing London's international, national and inter-regional transport connectivity' and in draft replacement London Plan policy 6.6. Measures to improve the carbon efficiency of air transport are set out in section 5.22 'Reducing carbon dioxide emissions' of this strategy, including proposal 101.

5.12.1 Airport capacity

⁴³⁰ Demand for air travel will continue to pose a major challenge for London. The number of passengers travelling through London area airports amounted to almost 140 million in 2008, making this area the busiest in the world. Unconstrained, demand is expected to rise to 290 million passengers each year by 2031. Current airport capacity in the South East will, however, limit trips to 180 million passengers a year. This could have the effect of limiting London's economic growth and putting its competitive position at risk.

⁴³¹ Committed capacity enhancements, principally Crossrail and the Piccadilly line upgrade, are designed to accommodate demand based on projected growth to existing permitted levels of airport use.

⁴³² A third runway at Heathrow would increase capacity ultimately to 702,000 air traffic movements per year. This would significantly

increase passenger demand for surface rail and road access on already congested networks. However, the DfT has stated that a detailed surface access strategy is not a 'prerequisite for a policy decision' regarding a third runway. Current forecasts suggest that by 2030, with a third runway, non-transfer passenger numbers could more than double, to 91 million per year. This would reduce resilience and increase crowding, congestion and delays elsewhere along rail and road corridors serving Heathrow and across west London as a whole. Public transport would become less attractive for users, especially at peak times. Airport expansion would further threaten to reduce the quality of life of many London residents.

⁴³³ Noise pollution currently affects a large number of residents underneath the Heathrow flight paths. DfT modelling estimated that in 2008 over 250,000 people were within the Leq (used as the national airport noise exposure index) noise contour of 57 decibels or above. Measures to reduce noise pollution from aircraft are outlined in proposal 89.

⁴³⁴ Air quality is also a serious issue at Heathrow. The airport is at risk of failing to meet EU NO₂ maximum limit values in 2015. Surface access trips further compromise air quality: an extra three million car trips per year are forecast between 2010 and 2015. Measures to improve air quality are outlined in section 5.21 and policy 3 of the draft Mayor's Air Quality Strategy.

⁴³⁵ Nevertheless, the Mayor recognises that adequate airport capacity is critical to the

continued competitiveness of London's economy. For this reason, the Mayor will consider whether optimum use is being made of existing airport infrastructure (though mixed mode operation is not favoured at Heathrow).

- ⁴³⁶ Stansted, Gatwick and Luton airports have important roles serving London as well as the South East. The Mayor will continue to work with partners in neighbouring regions through the Advisory Forum on Regional Planning for London, the South East and East of England to ensure that existing aviation infrastructure is used to its fullest extent before other options are considered for providing further airport capacity (this is set out in the aviation section, chapter six, London Plan).
- ⁴³⁷ Solutions are, however, not limited to additional airport capacity. There is potential to increase transfer from short-haul domestic and European flights to rail journeys through existing and possible future high-speed rail services, thus freeing up take-off and landing 'slots' for long-haul capacity.

Proposal 48

The Mayor recognises that the provision of adequate airport capacity serving the South East is critical to the competitive position of London in a global economy, but will oppose any further increases in runway capacity at Heathrow.

5.12.2 Surface access to airports

- ⁴³⁸ London's four main airports will continue to be the gateway to the city for the majority of overseas visitors, so high quality, efficient surface access is vital to promote London and the UK as a place to visit and do business. Completion of Crossrail and the Thameslink upgrade will improve the public transport capacity and connectivity of Heathrow and Gatwick. The West Anglia National Rail upgrades (including the four-tracking project mentioned elsewhere in this section) will also enhance the capacity of rail services to Stansted. However, further improvements are required, in particular to access Heathrow.
- ⁴³⁹ The Mayor supports the principle of Airtrack (being promoted by BAA/Heathrow Airport Limited), subject to clarification of its impact on existing services to Waterloo, its impact on level crossings, and the scheme having a robust business case. If implemented, Airtrack would deliver a new rail link connecting the existing rail line from Waterloo to Reading with Heathrow Terminal 5. This project would cost around £650–£700m, and could be delivered by 2014. Airtrack has the potential to significantly improve connectivity to Heathrow by enhancing public transport access from southwest London, and support its role as a major transport and employment hub.
- ⁴⁴⁰ Government has approved expansion at Stansted, which will increase the airport's capacity from 25 to 35 million passengers per year. A package of measures has been developed to support this expansion. This

includes widening the M11 between junctions 6 and 8 (between the M25 and Stansted) and the provision of further rail capacity (including a new fleet of Stansted Express trains ordered in 2009).

- 441 BAA has submitted proposals to provide an additional runway at Stansted, which could see the number of passengers using the airport rise from 35 million to 68 million by 2030. The Mayor has concerns about the impact this expansion will have on public transport services into London and believes that essential improvements to Tottenham Hale Underground station and along the West Anglia main line need to be funded before planning permission is granted.

Proposal 49

The Mayor believes the aviation industry should meet its full environmental and external costs and supports the position of 'The Future of Air Transport' White Paper published in 2003. This states that airport operators should be responsible for paying the costs of upgrading or enhancing road, rail or other transport networks or services where these are needed to accommodate additional passengers travelling to, and from, expanded or growing airports.

- 442 London City airport was granted planning permission in 2009 to accommodate 120,000 flights per year. The opening of the DLR extension to the airport means that, at more than 50 per cent, it currently has the highest public transport surface access mode share of

any airport serving London. DLR infrastructure to support this growth is in place, though further rail vehicles are required to provide the required service capacity.

- 443 TfL has worked with airport operators through their airport transport forums to help improve surface access to airports. Continued close engagement with airport operators and local boroughs will be essential to serve the increasing numbers of air passengers and encourage a shift from private car to reduce congestion and improve surrounding air quality.

Proposal 50

The Mayor, through TfL, and working with the London boroughs, DfT, airport operators, Network Rail, train operating companies and other stakeholders, will seek to improve access to London's airports for passengers and staff by public transport, particularly from those parts of London which do not currently have good access by rail or bus; and for goods through better management of the road network, development of consolidation/break-bulk centres and encouragement of access by rail and waterway.



Proposals to encourage more cycling and walking

5.13 The cycling revolution

5.13.1 Introduction

⁴⁴⁴ Encouraging more people to cycle is a key Mayoral priority. There will be unprecedented levels of investment in cycling over the next 10 years to improve cycle infrastructure and information. This will help secure the health, environmental and congestion benefits of a cycle revolution. The strategy will support this revolution by providing better information and training to promote behavioural change. It also supports improvements to infrastructure to make it easier and safer to travel by bike, and ‘mainstreaming’ cycling as a transport mode making it more attractive to a wider range of people. The aim is to achieve a five per cent modal share for cycling (currently two per cent) by 2026, which equates to an approximate 400 per cent increase compared to 2000. The Mayor also aims to increase the number of cycle parking spaces by 66,000 by 2012.

5.13.2 Understanding London’s cycling potential

⁴⁴⁵ There is significant potential to increase rates of cycling across the whole of London to

meet the Mayor’s aim of a five per cent mode share for cycling by 2026. Cycling potential varies by region and reflects the diversity of London’s neighbourhoods and communities, its topography and density. Consequently, a tailored approach will be required to maximise the cycling potential in all areas of the Capital. The current cycling situation, future potential and policy recommendations for central, Inner and Outer London are outlined below.

Central London

⁴⁴⁶ Rates of cycling in central London are currently higher than in other parts of the city. This reflects the greater centralisation of employment and services in the centre, density (making short journeys by bike a more viable transport choice) and significant investment by TfL and the boroughs to increase the attractiveness of cycling options.

⁴⁴⁷ High demand for limited road space, meanwhile, makes car use increasingly unattractive and encourages the use of alternative transport modes. Measures such as Congestion Charging have reinforced this effect. For many trips in central London, cycling offers the fastest journey times and the most pleasant journey experience, and is

likely to remain an attractive choice in the future. That is why the Mayor is delivering major new schemes including the central London Cycle Hire scheme, which is expected to generate around 40,000 additional cycle trips each day, some of which will have transferred from other modes. The scheme will provide a greater number of people with the opportunity to cycle in central London. In addition, TfL has identified potential to increase the proportion of people who use a bicycle between a railway station, for example, a central London termini and their intended journey destination.

Inner London

⁴⁴⁸ Like central London, Inner London benefits from high density residential, employment and shopping regions; nevertheless, rates of cycling vary across the area. Currently, the highest rates of cycling are found where public transport is more limited (for example, in Hackney or Lambeth where there is comparatively less Tube provision), and where local boroughs have been most committed to promoting cycling by introducing local road layout improvements, providing training and raising awareness. Going forward, proximity to central London creates a major opportunity to increase rates of cycling, particularly for commuter travel, and measures such as the Cycle Superhighways should cater for this. Given the higher proportion of apartment-style residences in Inner London, the provision of secure cycle parking is a priority if the region's full potential is to be realised. Furthermore, an expansion of the Cycle Hire scheme in Inner London could also increase cycling trips.

Outer London

⁴⁴⁹ With a few exceptions, rates of cycling in Outer London are currently lower than central and Inner London. Lower development densities – resulting in longer travel distances – combined with less congestion and higher traffic speeds, makes the car an attractive travel choice. However, TfL analysis suggests that around two-thirds of the potential for increased levels of cycling in the Capital is in Outer London. About half of all car trips here are less than two kilometres and public transport provision is not as comprehensive as in central or Inner London.

⁴⁵⁰ TfL's existing smarter travel initiatives demonstrate that it is possible to increase rates of sustainable travel in Outer London by providing tailored advice and working with employers, schools and other partners. The Smarter Travel Sutton initiative delivered a 75 per cent increase in cycling by the end of its three-year programme.

⁴⁵¹ However, behavioural change is only part of the picture. There also needs to be improvements in cycling infrastructure, such as road layout and traffic management, bike priority measures, parking facilities and signage. Given Outer London's size and variability, larger-scale infrastructure measures may not be viable everywhere. Nevertheless, they may play an important role in certain locations with high potential, such as Croydon or Stratford. There are opportunities for Biking Borough¹ initiatives to improve access to town centres for cyclists.

¹ Biking Boroughs are those that prioritise cycling in their local transport strategies and LIPs (see glossary)

5.13.3 Bringing about the cycling revolution

⁴⁵² Improving cycling in London will require a broad package of measures responsive to local conditions. Some of these will be physical measures; but many will be supportive measures involving the provision of better information, incentives and the promotion of cultural change. Those initiatives already underway which have delivered significant improvements in the cycling experience over the past 10 years will be continued.

⁴⁵³ Further measures, outlined below, will also be required. These do not always need to be expensive: numerous improvements can be achieved inexpensively simply by being aware of cyclists' needs and integrating appropriate measures into existing projects, such as urban realm improvements. Where dedicated investment is required, these projects often represent excellent value for money.

Working in partnership

⁴⁵⁴ Delivering the cycling revolution requires a change in mindset. It is not enough for TfL and the boroughs to promote cycling and provide infrastructure and support. This must be a collective endeavour involving employers, property developers, schools, community groups and key partner organisations such as police services, housing associations, Primary Care Trusts and NHS London.

Proposal 51

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will provide support, including sharing best practice, to enable and empower employers, schools, community groups, other organisations and individuals to deliver the improvements necessary to create a cycling revolution in London.

Supporting the London boroughs

⁴⁵⁵ Boroughs have a central role to play in improving the cycling experience and increasing rates of cycling. The Mayor is committed to supporting boroughs in this work, with additional support and advice aimed at boroughs seeking to take the lead as a Biking Borough. Biking Boroughs will help to create a local culture of cycling, focusing on town centre locations or key trip destinations within a borough known as 'cycle hubs', where potential for mode shift to cycling will be greatest.

Proposal 52

The Mayor, through TfL, and working with the London boroughs that are keen to pilot the Biking Borough approach, will develop the Biking Borough scheme including measures such as cycle hubs and marketing initiatives to promote cycling.

⁴⁵⁶ There is also much that boroughs can do by working to prioritise cycling in their LIPs and to aspire to become Biking Boroughs where possible, with investment focused on the development of cycle hubs where appropriate.

⁴⁵⁷ While boroughs are the key delivery agent for the cycling revolution, many cycle trips cross borough boundaries. Therefore, it is imperative that, while providing space for creativity to respond to local circumstances, there is consistent guidance and set standards for cycling in London (for example, wayfinding). Given the pattern of potential for increased rates of cycling, the sub-regional approach offers one way in which boroughs and TfL can effectively work together to deliver wider cycling change.

5.13.4 Raising awareness and 'mainstreaming' cycling

⁴⁵⁸ 'Mainstreaming' cycling is vital if a broader cross-section of Londoners are to be persuaded to start and continue cycling. TfL's customer research suggests many people are put off because they consider it a 'sporty' activity requiring special equipment. Smarter travel initiatives, including school and workplace travel planning, campaigns, information provision and public events, all play a valuable role in raising the profile of cycling as an effective and practical means of transport. In particular, these initiatives can encourage greater numbers of people in under-represented groups (such as women, children, those with disabilities) to start cycling for leisure, health, convenience or environmental concern.

Proposal 53

The Mayor, through TfL, will work with the DfT, London boroughs and stakeholders to raise the profile of cycling, using information and behavioural change measures, including smarter travel initiatives and major events.

5.13.5 Improving cycle infrastructure, cycle training and safety

⁴⁵⁹ As noted above, rates of cycling in central London are currently higher than in other parts of the Capital. The Cycle Hire scheme and Cycle Superhighways will encourage further bike use here and the Mayor is keen for these benefits to be spread throughout the city.

⁴⁶⁰ In addition to targeted initiatives in high potential locations, a network of Cycle Superhighways running from Outer and Inner London to central London will be implemented to encourage more cycling and commuting by bike. Furthermore, specific measures will be introduced to complement each route, such as: bespoke signage and road markings, advance stop lines, traffic calming, cycle maintenance, tailored safety measures, workplace improvements, additional cycle parking throughout the route, urban realm improvements and cycle training. The attractiveness of Cycle Superhighways will be further enhanced by London-wide measures. For example, the Mayor is already committed to delivering an additional 66,000 public cycle parking spaces by 2012.

- ⁴⁶¹ Fears about personal safety and security are a significant barrier to starting or continuing cycling. The Mayor's Cycle Safety Action Plan, published in March 2010, sets out priorities and initiatives to improve cyclist safety in London. Attention to junctions and implementing site specific measures at high risk locations would help reduce these fears, as will ongoing work with the freight industry to address HGVs and cycling safety. Where possible, car access should be restricted in residential neighbourhoods to reduce speeds and create pleasant and safe spaces for cyclists. TfL in partnership with the police intends to publish a draft Cycle Security Action Plan to reduce the risk of cycle theft and the criminal damage of bicycles.
- ⁴⁶² Bikeability and the National Standards for Cycle Training ensure a comprehensive cycle training programme for school children, young people and adults, which will help address safety concerns and embed the right behaviours from a young age. For new cyclists of all ages, London's streets can be an intimidating place. Alongside the provision of training and infrastructure to provide reassurance and support, the Mayor will introduce measures to encourage novice cyclists to make the most of London's wealth of parks, open spaces, the river and canal network. This will include a network of Greenways and activity to promote cycling and walking for leisure purposes as a 'first step' for many. The Mayor will encourage park managers to facilitate cycling and welcome cyclists to their green spaces.

Proposal 54

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will deliver improvements to cycling infrastructure and training to support the cycling revolution, including:

- a) The launch of the central London Cycle Hire scheme in 2010
- b) Twelve Cycle Superhighways will be developed for commuters and others to cycle to central London, improving the capacity of the radial network
- c) Enhanced cycle links to the Olympic Park by 2012, and the development of a wider network of Greenways across London
- d) Further phases of the Cycle Hire scheme introduced in Inner and Outer London subject to sufficient demand and feasibility
- e) Increased provision of secure bicycle parking facilities, particularly at stations, workplaces, schools, retail and leisure sites
- f) Improving permeability for cycling by further integrating the road network and open spaces
- g) Delivering road enhancements to make cycling easier and safer, including managing car access to residential areas, through physical or design measures, to create pleasant and safer cycling environments
- h) Offering cycle training for people of all ages

Spotlight

Central London Cycle Hire scheme

A cycle hire scheme is coming to the Capital in summer 2010, offering public bicycle sharing for short journeys in, and around, central London. Users will be able to pick up a cycle for a small fee, use it, then drop it off ready for the next person. The cycles will be available 24 hours a day, all year round. The scheme will be self-service, and designed to be 'turn up and go'.

TfL is working with the boroughs of Camden, City of London, Westminster, Hackney, Islington, Lambeth, Kensington & Chelsea, Southwark, Tower Hamlets and the Royal Parks and private landowners to host the cycle docking stations.

There will be 400 docking stations located approximately every 300 metres, and with more spaces than cycles, making it easy to drop off your bike at any chosen docking station.

The Cycle Hire scheme will:

- Offer a sustainable and low emission form of transport
- Be convenient for local residents, business travellers, leisure users and visitors to London
- Encourage local trips within central London – many short journeys are faster by bicycle
- Be easy to use and available 24 hours a day, 365-days-a-year
- Alleviate congestion on the Tube and buses
- Provide an innovative addition to London's transport network
- Encourage a shift from car to cycling
- Mainstream cycling



5.13.6 Creating a considerate cycling culture

- ⁴⁶³ Cyclists are vulnerable road users and often find that vehicles block their cycle lanes and advanced stop lines, squeezing their available space. Pedestrians are also vulnerable road users and can feel intimidated by poor cyclist behaviour, particularly cycling on pavements or jumping red lights. Disregard for the Highway Code makes the road a more dangerous place for everyone. TfL is working with the police and cyclists to deter such behaviour.
- ⁴⁶⁴ It is important to create a culture of mutual respect, where all road users show consideration for each other. Through FORS and working with other partners, cyclist awareness is incorporated as part of driver training while considerate cyclist behaviour is a fundamental part of cycle training promoted by TfL. These initiatives should be complemented by changes to the Highway Code to improve conditions for cyclists. Furthermore, changes to traffic sign regulations have the potential to provide more convenient and better integrated cycling routes.

Proposal 55

The Mayor, through TfL, and working with the police, London boroughs and DfT, will encourage changes to be made to the Highway Code and road traffic regulations, where necessary, to make cycling more convenient and to encourage a culture of mutual respect between all road users.

5.13.7 Using bicycles for commercial purposes

- ⁴⁶⁵ Bicycles and bicycle-based vehicles are increasingly used for commercial purposes to carry goods and passengers. Many businesses in central London use cycle couriers. TfL is working with courier companies and is supporting the use of bikes for local freight deliveries.
- ⁴⁶⁶ Pedicabs are a popular mode of transport for tourists in some parts of the West End. However, pedicabs can cause congestion, reduce the effectiveness of bus lanes, and raise safety concerns over the road-worthiness of the vehicle, putting both passengers and drivers at risk. Regulation has been unable to keep pace with the rapid growth of this market. Pedicabs cannot be licensed like PHVs under current legislation, although the police can enforce vehicle regulations on pedicabs with electrical motors weighing more than 60 kilograms. A revision of the rules concerning pedicabs is clearly needed.

Proposal 56

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will press for specific primary legislation to establish an effective legal framework for pedicabs, including specific licensing powers for the boroughs.

5.13.8 Integrating cycle provision with development

- ⁴⁶⁷ Land use planning can be used to promote cycling in two principal ways. At a practical level, it can require that cycling is considered

in all developments, ensuring that the right facilities (parking, showers, storage, docking stations, etc) are available. Similar steps can be taken to retrofit existing developments, including public buildings (for example, hospitals) and major trip attractors, such as entertainment venues. These changes can help 'normalise' the use of the bicycle as a transport mode in all situations and at any time, from commuting for work to a night out. They will provide reassurance to cyclists that if they arrive at a venue, suitable facilities will be available and this will reduce the need to plan cycle journeys carefully. Cycle parking standards are given in the London Plan (Table 6.2), covering quantity and design of parking, and complementary facilities such as lockers.

⁴⁶⁸ Longer term, the planning system can support a realignment of land use within London to make active transport options more viable. For example, by reducing the distance between residential areas, employment opportunities and other significant trip attractors such as shopping centres and schools.

Proposal 57

The Mayor will seek to use his planning powers and work with the London boroughs to encourage cycling by supporting development that:

- a) Provides cycle parking to an appropriate standard
- b) Integrates the needs of cyclists into the design

- c) Promotes the co-location of key trip attractors to make cycling a more viable and attractive travel option
- d) Provides cycle hire docking stations dependent on sufficient demand and feasibility studies

5.13.9 Cycle parking at stations

⁴⁶⁹ Cycle parking at stations is necessary to support cycling as part of a longer trip. It expands the catchment areas of stations by encouraging combined cycle and rail trips.

⁴⁷⁰ There is evidence to show that provision at stations is often inadequate, in terms of quantity, location and security. TfL is working with Network Rail, the train operating companies and boroughs to increase cycle parking and improve facilities at, and adjacent to, existing London rail, Tube and bus stations.

Proposal 58

The Mayor, through TfL, and working with Network Rail, the train operating companies and London boroughs, will review cycle parking standards and aim to implement 'best-practice' levels of cycle parking provision at any new station or as part of any comprehensive station redevelopment works. Additional cycle parking provision will also be provided at other stations to meet demand, wherever possible.

Case study

Cycle parking on the DLR

In 2007, the DLR implemented a cycling strategy which aimed to encourage more passengers to cycle to its stations and continue their journey via the railway.

Shadwell station, in Tower Hamlets, was chosen as the first station to benefit from improved cycle parking in July 2008.

Shadwell fully incorporates TfL's five criteria for effective cycle parking at DLR stations, as follows:

- Demarcation of the cycle parking area
- A clearly visible, durable and transparent shelter to reduce fear of crime
- Consistent signage and information for cyclists
- Robust, secure and convenient bicycle stands that enable both the front and back wheels and frames to be locked to them
- A location near the station entrance (about 10 metres from the entrance and about 50 metres from a busy cycle lane that links the City and Canary Wharf), covered by CCTV, well-lit with good natural surveillance

Since the award-winning shelter has been installed, the practice of leaving bikes on railings has ceased and cycle use at the station has increased by more than 50 per cent.

Building on the success of Shadwell, eight further cycle shelters will be rolled out across the DLR network during 2010.



Spotlight

Cycle Superhighways

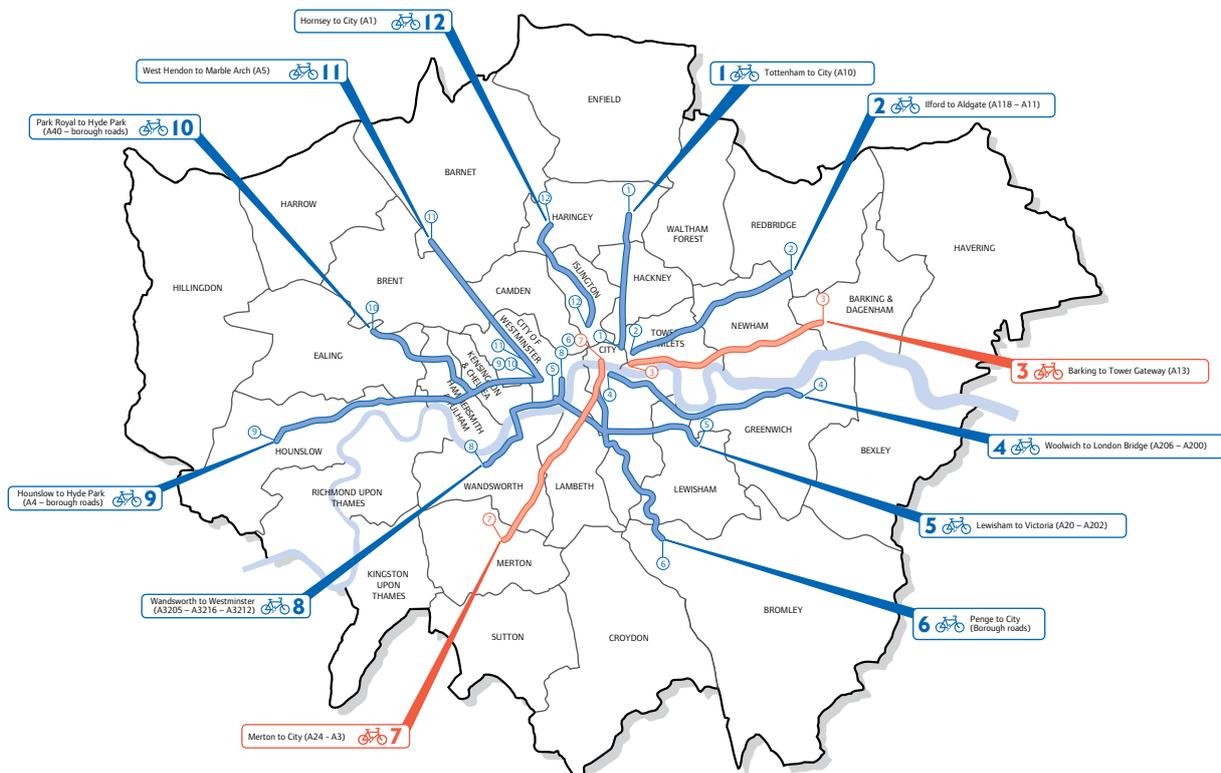
Cycle Superhighways will be safe, fast, direct routes from Outer London into the centre, linking residential areas across the Capital. TfL has engaged extensively with boroughs and businesses, and the first two routes open in summer 2010 from Merton to the City, and Barking to Tower Gateway. The remaining 10 proposed routes will be delivered as part of a rolling programme by 2015.

The routes will improve conditions for existing cycle commuters, attract those who do not currently cycle to work, and encourage others to start cycling.

The new routes will be clearly marked and easy to follow. There will be bespoke signs and road markings, as well as information about journey times and links to other cycle routes. The bold markings will increase awareness among other road users, and indicate that the route is used by a large number of cyclists.

TfL aims to provide comfortable road surfaces and measures to help cyclists feel confident when crossing junctions. Cycle Superhighways are a key part of London's cycling revolution, which also includes cycle parking, training, workplace improvements and Improving safety.

Cycle Superhighways Indicative routes subject to consultation*



*Red routes indicate first tranche, blue routes indicate later tranches

5.14 Making walking count

5.14.1 Introduction

⁴⁷¹ Almost a quarter of all trips in London are made entirely on foot. Walking is a free, functional and reliable method for moving around the city. In addition, it is widely enjoyed as a leisure activity and can, in both instances, offer a positive impact towards people's health.

⁴⁷² Walking can help reduce congestion on local road, bus, Tube and rail routes and contributes to creating a vibrant Capital with improved perceptions of safety. The Mayor is therefore keen to coordinate the activities of TfL, the boroughs and others to deliver significant investment to improve walking conditions across London, and achieve increased levels above the current 24 per cent mode share.

Proposal 59

The Mayor, through TfL, and working with the London boroughs, employers, schools, community groups, other organisations and individuals, will bring about a step change in the walking experience in London to make walking count.

5.14.2 Providing a safe, comfortable and attractive street environment

⁴⁷³ Sustaining increases in the number of people walking will require targeted programmes of urban realm improvements to ensure a safe and enjoyable experience. The strategy proposes initiatives to enhance conditions for pedestrians further, in particular in central London and

town centres. These initiatives are developed in conjunction with the founding principles of 'better streets' (section 5.18).

⁴⁷⁴ Land use planning policies can be used to support walking journeys by encouraging developments that ensure an improved and convenient urban realm for pedestrians. Fundamental principles to encourage a high quality, connected pedestrian environment are set out in the London Plan (policy 6.10). In addition, improving conditions for walking supports the 'lifetime neighbourhoods' approach of the London Plan (policy 7.1) which, in the context of a forecast increase in the number of both younger and older Londoners, aims to ensure that the needs of families with small children, older people and disabled people are better reflected in the design and development of public, open and green spaces.

Proposal 60

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will improve the walking experience by enhancing the urban realm and taking focused action to ensure safe, comfortable and attractive walking conditions, including:

- a) Development of the 'key walking route' approach, to encourage walking and improve corridors between local destinations where people want to travel, encapsulating squares and open spaces where appropriate (for example, London parks)

- b) Providing direct, convenient pedestrian access (for example, with surface crossings) where appropriate
- c) Street audits to identify pedestrian needs and guidance (such as pedestrian comfort levels)
- d) Delivery of the seven Strategic Walk Network routes, separate from, but alongside the development of, Greenways
- e) Training for those involved in the design and delivery of schemes that impact walking conditions
- f) Enhancing pavement space for pedestrians and removing guardrails and other obstacles
- g) Seeking to manage car access to residential areas, through physical or design measures, to create pleasant and safer walking environments
- h) Tackling the fear of crime and feeling unsafe on the streets
- i) Supporting major projects such as high street revitalisation through good quality public realm designed to support regeneration of small businesses and encourage local shopping and activity
- j) Improving access, safety and security between the station and surrounding areas for pedestrians (and cyclists) to encourage active and smarter travel
- k) Encouraging the extension of a network of linked green spaces (namely, the All London Green Grid)

- l) Supporting developments that emphasise the quality and permeability of the pedestrian environment (section 5.18 Better streets)

5.14.3 Making it easier to plan journeys by foot

⁴⁷⁵ Londoners need to know which journeys might be easier, quicker and more pleasant to walk (for example, across a square or park). The Tube map distorts the perception of distances between stations, resulting in many people taking the Tube for short distances. Improved signage, such as that provided by the Legible London initiative and new technologies can help people plan and undertake journeys on foot. The Legible London system piloted in both central and Outer London uses street maps of the immediate area to encourage short walking trips.

Proposal 61

The Mayor, through TfL, and working with the London boroughs, developers and other stakeholders, will improve the quality and provision of information and resources for walking, especially at stations, interchanges and in town centres by measures, including:

- a) Extending Legible London to other areas
- b) Creating an online one-stop walking resource to facilitate walking, linked to an enhanced Journey Planner with advanced walking options
- c) Developing consistent wayfinding formats and making use of new wayfinding technologies

5.14.4 Promoting the health and environmental benefits of walking

- ⁴⁷⁶ Walking is healthy. It can stimulate the cardiovascular system (heart, lungs and circulation), boost muscle endurance, help reduce obesity and contribute to mental health improvements. In addition, there are other recognisable benefits such as a decrease in CO₂ emissions as a result of people shifting modes to walking. An increase in town centre walking can also support the economy and have a positive impact for local businesses.
- ⁴⁷⁷ Walking in London can be a highly enjoyable experience, particularly when taking into account the wealth of green spaces and nature reserves. The completion of the Strategic Walk Network and improvements to the Blue Ribbon Network, among other incentives, will provide the stimulus to explore London's riversides, parks, woodlands and heaths at a leisurely pace.

- ⁴⁷⁸ Encouraging walking requires changes in the way people think about physically active travel and the transport choices they make. A key step is to provide better information about the benefits of walking. Travel planning and smarter travel initiatives can be used to promote the range of benefits, particularly in schools, workplaces and in deprived areas where the cost of public transport may be a barrier to travel.

Proposal 62

The Mayor, through TfL, working with the London boroughs, developers and other stakeholders, will promote walking and its benefits through information campaigns, events to raise the profile of walking, and smarter travel initiatives such as school and workplace travel plans.



Proposals to improve safety and security

5.15 Improving public transport safety

5.15.1 Introduction

⁴⁷⁹ Londoners desire safety and security for each and every stage of the door-to-door journey. They also depend on a public transport system that is well-maintained so that it gives them confidence that they can travel without fear of injury from crime, sabotage, negligence, equipment failure or terrorist attack. It is also important to ensure health and safety risks to passengers and staff are kept as low as reasonably practicable. A duty is placed upon TfL and other operators to ensure staff safety through the Health and Safety at Work Act.

5.15.2 Keeping transport networks safe and well-maintained

⁴⁸⁰ The application of a structured approach to health and safety across all public transport modes includes rigorous inspection, maintenance regimes and safety management systems. These are kept under regular review and improved as required, subject to agreement with the relevant authorities

such as the Railway Inspectorate. TfL ensures compliance with driver and vehicle safety standards across London's taxi and private hire fleet. It is the intention of the Mayor that health and safety remains embedded in the work culture of operational staff to ensure passenger and staff injury and fatality rates remain very low across all modes.

⁴⁸¹ Overall on LU and DLR, the rate of injury to customers and staff is low when compared against rising passenger numbers and the increased vehicle kilometres of services operated. London Buses' customer and staff fatalities, and major and minor injury rates, also remain low, especially when viewed against a backdrop of increased service provision. TfL continues to promote best practice initiatives for operators, improved risk assessments and improved driver training and recruitment procedures, but injury rates have fluctuated in recent years.

Proposal 63

The Mayor, through TfL and working with the London boroughs, Network Rail, train operating companies, the police and other stakeholders, will seek to reduce fatality and injury rates on London’s transport system further; and will aim to reduce London bus road user fatality, major and minor injury rates.

482 TfL will continue to plan and prepare for major incidents by drawing on industry best practice to prepare and rehearse contingency plans for major incidents on the transport network and to prepare recovery plans.

5.16 Improving road safety

5.16.1 Introduction

483 In recent years the number of casualties from road traffic collisions have fallen significantly (Figure 48), but despite the progress made London still has an unacceptable number of road casualties each year. The Mayor proposes to improve London’s record, a commitment demonstrated by signing the European Road Safety Charter in July 2009.

5.16.2 Progress and the scale of the challenge

484 Figure 49 shows the excellent progress achieved over the past decade by category of casualty. By 2004, London had achieved the national target – a 40 per cent reduction in

Figure 48: Trends in road casualties, 1991 to 2008

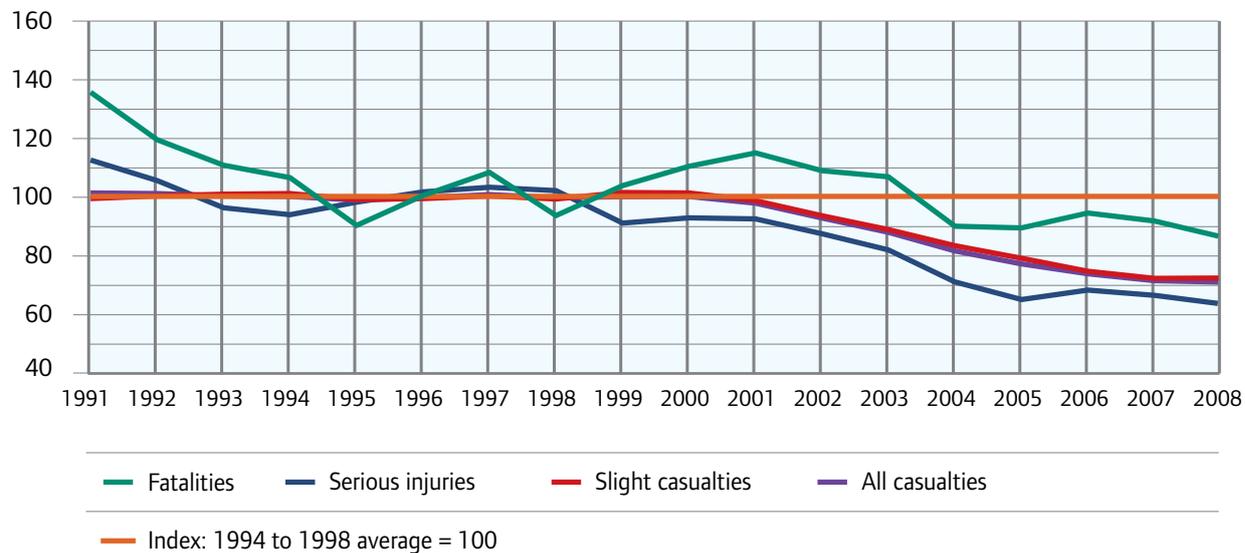
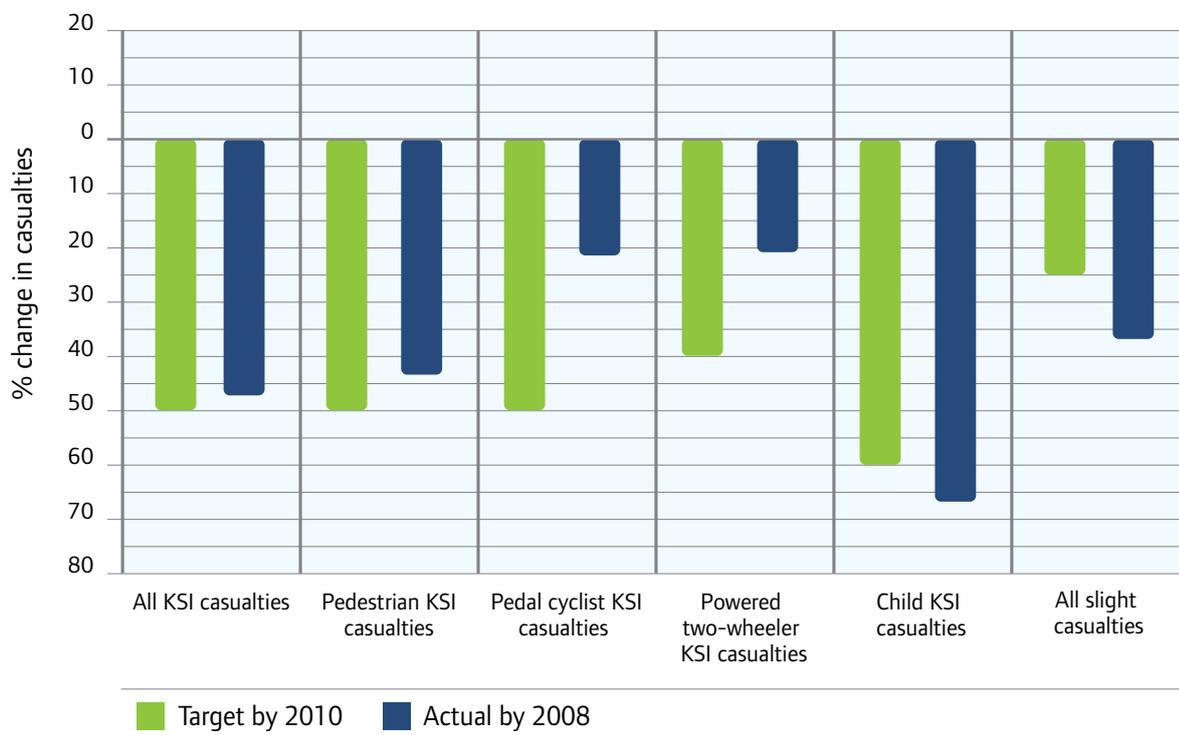


Figure 49: Road casualties by casualty category

the number of KSIs (killed or seriously injured) in road collisions, a 50 per cent reduction in the number of child KSIs and a 10 per cent reduction in slight casualties compared to the 1994 to 1998 average. Reaffirmed by the Mayor, more challenging targets were set in 2006 to be achieved by 2010. These included a 50 per cent reduction in total KSIs, 60 per cent reduction in child KSIs and for the slight injury rate to fall by 25 per cent by 2010. New targets were set for a reduction in pedestrian and cycle serious injuries and fatalities by 50 per cent.

⁴⁸⁵ By the end of 2008, pedestrian KSIs were down by 43 per cent, but cyclist and powered two-wheeler KSIs fell by only 21 per cent overall. However, there were still 204 fatalities, 3,322 serious injuries and a further 24,627 slight injuries. Figure 50 highlights the casualty break-down by mode of travel.

⁴⁸⁶ In 2008, collisions and casualties in London were estimated to cost society at least £1.3bn, excluding damage-only collisions. Research has found that around 30 per cent of road casualties were not reported by the police in

STATS19 data, so the road safety problem is under-estimated. Improving road safety will not only reduce direct costs and the burden on society, but will generate productivity savings and contribute to smoothing traffic as collisions are a major cause of disruption and will encourage more cycling.

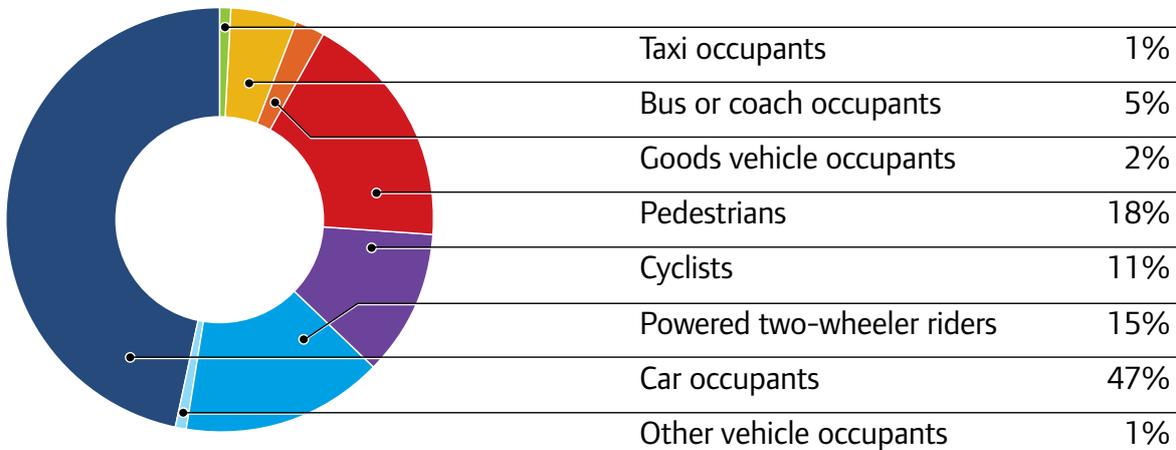
487 By 2017, TfL’s Business Plan commitments aim to achieve a 63 per cent fall in the total number of KSI casualties to approximately 2,470 KSIs per year, compared with the 1994 to 1998 average of 6,684 KSIs. Casualty reduction targets by 2020, compared to the 2004 to 2008 baseline are to be set for the UK by the DfT in 2010. Road user groups are likely to have individual targets and TfL will work towards achieving the new targets. If current

funding levels are retained, it is estimated that casualty reductions over the new 2004 to 2008 baseline may continue to 2031. At the level of funding identified in the TfL Business Plan 2010 to 2017/18, an overall reduction in the KSI casualties of 50 per cent compound to a baseline from 2004 to 2008, is anticipated across London.

Proposal 64

The Mayor, through TfL, and working with the London boroughs, police, Highways Agency, road safety partnerships, and other stakeholders, will seek to achieve any new national road safety targets and such further road safety targets as the Mayor may set from time to time.

Figure 50: Casualties by mode, 2008



Spotlight

Improving road safety for pedestrians, cyclists and powered two-wheeler riders

The Mayor seeks to continue the significant improvements in overall road safety of the past decade, particularly for pedestrians, cyclists and powered two-wheeler riders, who are at more risk of injury compared to other road users.

Pedestrian casualties have been reduced by over 40 per cent since the mid 1990s, but they remain the majority of vulnerable road user KSI casualties. Further improvements to pedestrian safety are, for example, urban realm enhancements, 20 mph zones and initiatives in schools.

Over the same period, cycling in London has increased by over 100 per cent, while KSI casualties have reduced by a fifth. Engineering solutions such as 'advanced stop lines' are complemented by events including ones where cyclists and HGV drivers see the road from each

others' perspective. The Cycle Safety Action Plan sets out over 50 actions to further improve cycling safety in London.

About 200,000 trips are made each day by powered two wheelers. In central London, usage has increased by about 40 per cent over the past decade while across London KSI casualties have been reduced by about a fifth. This has been achieved through targeted initiatives, such as the successful 'BikeSafe London' programme with active involvement from the police.

In addition to continuing to run innovative campaigns addressing the specific problems vulnerable road users face, TfL is looking at the interaction between these groups while supporting police enforcement of the rules of the road for all road users.



- 488 The Mayor, TfL and the boroughs will adopt national policy and set targets that are appropriate at a London-wide or borough level in a new Road Safety Plan for London. Additionally, the Mayor has re-affirmed his commitment to the European Road Safety Charter.

Proposal 65

The Mayor, through TfL, working with the police, Highways Agency, London boroughs, road safety partnerships and other stakeholders, will develop a new Road Safety Plan to reflect any new road safety targets to be set by the Government or the Mayor and review progress every five years.

- 489 A continued mixture of engineering, education and enforcement will help reduce the number of casualties on London's roads. New initiatives, such as intelligent speed adaptation (ISA) and average speed (time over distance) cameras, could also be used where they are demonstrated to be effective and value for money.

5.16.3 Injury inequalities

- 490 Some modes of transport, powered two-wheelers (motorcycles and scooters), cycling and walking in particular, suffer from disproportionately high casualty rates. By 2008, the number of KSIs for those using powered two-wheelers had fallen by only 21 per cent on the 1994 to 1998 average and is a cause of concern for the Mayor.
- 491 Reducing the rate of injury to cyclists is of paramount importance if the number of

cyclists is to grow. Busy roads and larger vehicles can pose significant safety hazards, especially for infrequent cyclists. Improving cyclist safety will help overcome a barrier to delivering the Mayor's cycling revolution. Pedestrians also currently suffer from a high injury rate per distance travelled, and have the highest number of KSI casualties; therefore, improving pedestrian safety will help encourage more people to walk.

- 492 Those who live in the most deprived areas of London and ethnic minority groups suffer a disproportionately high number of road casualties.
- 493 To ensure value for money, it is vital that safety initiatives are targeted, based on sound data and research evidence, especially using the London-wide body of collision and casualty data, analysis and research held by TfL. This provides a valuable resource for key stakeholders such as boroughs and the police. It is also important to monitor road safety schemes to ensure their success and inform future measures.

Proposal 66

The Mayor, through TfL, will continue to monitor road safety schemes and publish road safety casualty reports and research.

5.16.4 Educating road users

- 494 Communication with all road users is vital to improving road safety. It is particularly important that the messages reach children and other vulnerable groups who may not



Figure 51: An example of road safety campaign material

generally interact with transport authorities. For pedestrians and cyclists, it is essential to be aware of measures they can take to avoid injury on the road and conversely for other road users to be aware of their needs.

- ⁴⁹⁵ TfL road safety campaigns start with an early intervention with children aged three in the Children's Traffic Club and evolve as target groups age. The 'Don't die before you've lived' campaign targets teenage pedestrians while other campaigns (see Figure 51) aim to educate young drivers, cyclists, motorcycle and scooter riders.

- ⁴⁹⁶ Recent campaigns have used a variety of new and innovative methods to spread the road safety message. TfL works in partnership with key stakeholders including borough road safety officers, London Councils and organisations such as the Royal Society for the Prevention of Accidents (RoSPA). The aim is to provide suitable education materials and campaigns targeted to address issues highlighted by research. Training for cyclists is proposed as a means of improving the conditions for cycling under 'Continuing the cycling revolution'. Road safety education is also a key component of school travel plans.

Proposal 67

The Mayor, through TfL, and working with the London boroughs, police, DfT, and other stakeholders, will undertake public information and engagement to improve road user behaviours and reduce the risk of collisions.

5.16.5 Cyclist safety

- ⁴⁹⁷ One in three pedal cycle fatalities in London are from collisions with left-turning HGVs. In 2008, of the 15 pedal cyclist fatalities nine involved an HGV and five of these included a left-turning manoeuvre by the lorry. Research has shown that HGVs without sideguards are involved in a disproportionately large number of fatal collisions with cyclists considering the very small number of HGVs without sideguards. HGVs with sideguards can have additional mirrors or electronic warning devices fitted to improve safety.

- 498 In order to deliver the Mayor's cycling revolution, more needs to be done to resolve conflicts, both real and perceived, between HGVs and cyclists. This includes improved facilities for cyclists as well as better driver training and safety technology.
- 499 Advanced stop lines provide a safer location for cyclists at road junctions. They enable cyclists to pull away within view of other motorists, so they are less likely to be involved in a collision. It is important that cars and lorries do not encroach into advanced stop line areas.

Proposal 68

The Mayor, through TfL, the police and working with the DfT, London boroughs, road freight operators and other stakeholders, will improve safety for cyclists in the vicinity of HGVs and other vehicles, by:

- a) Encouraging the Government to amend legislation and remove the current exemption for HGVs being fitted with sideguard protection
- b) Working to increase the number of HGVs with sideguards or fitted with electronic warning devices that detect cyclists
- c) Raising awareness among drivers of the safety benefits of advance stop line areas

- 500 FORS has been well-received by those operators who have signed up so far. The scheme offers driver training and safety workshops, coupled with introductory offers for driver profiling to monitor driver behaviour.

In order to further improve safety standards, a subsidised driving licence check service is in place to help operators check for licence endorsements held by prospective drivers.

Proposal 69

The Mayor, through TfL and working with the DfT, London boroughs, road freight operators and other stakeholders, will seek enhanced vehicle and driver safety from organisations operating corporate fleets by working with the freight sector and other stakeholders, promoting increased membership of the Freight Operator Recognition Scheme, and encouraging operators to uptake and demonstrate freight best practice.

5.16.6 Work-related road safety

- 501 Recent research has shown that 28 per cent of KSI casualties are associated with vehicles driven in the course of work. Therefore the Mayor, TfL, Metropolitan Police (Met) and other partners will work with operators to improve vehicle quality and employee behaviour. For example, in 2008 TfL distributed 15,000 'Fresnel' lenses to HGV drivers to help improve their in-cab visibility of cyclists.
- 502 TfL has introduced a vocational BTEC qualification for new bus drivers and service controllers in London to improve safety and customer service through defensive driving training and health, safety and security. TfL offers driver training and safety workshops, and GLA staff members who drive for work will

undergo eco-driver training to reduce emissions and develop safer driving behaviour. Taxi and PHV drivers will also be eligible for this training.

- 503 Those working in road maintenance face some of the most hazardous working environments in the Capital. London-specific trends will be examined through the future Road Safety Plan for London.

Proposal 70

The Mayor, through TfL, and by working with the DfT, London boroughs and Health and Safety Executive, will seek to improve road safety by developing initiatives and working with employers to increase work-related road safety and to reduce casualties involving work-related vehicles and activities.

5.16.7 Road safety engineering

- 504 Improving facilities to make routes safer for pedestrians and cyclists remains a top priority in encouraging mode shift, as non-motorised users suffer disproportionately per kilometres travelled. Nevertheless, it remains necessary to address the needs of car occupants, who continue to form the majority of casualties, and all of the other main modes including motorcycles, scooters, goods vehicles and buses. Between 2001 and 2009, road safety engineering schemes on the TLRN had reduced collisions by an average of 30 per cent at 270 sites across the network. Any physical engineering measures implemented will be developed with due regard for emergency vehicle access.

Proposal 71

The Mayor, through TfL, and working with the London boroughs, Highways Agency and other stakeholders, will implement targeted physical engineering and other design considerations to improve road safety across London's road network.

- 505 Improving facilities for cyclists and pedestrians is also addressed by improvements to the quality of the urban realm for pedestrians, cyclists and all disabled users. Giving these groups more priority will reduce the collision rate as vehicle speeds are reduced and drivers are made more aware of the risk they pose to pedestrians and cyclists.

5.16.8 Road safety enforcement

- 506 It remains necessary to target those road user groups who are frequently the cause of the most serious collisions. Drivers breaking the law by drink or drug-driving and speeding contribute to a large number of serious collisions. In parts of London there are large numbers of uninsured drivers and unlicensed vehicles that contribute to high levels of 'fail to stop' collisions (also known as 'hit and run'). Excessive and inappropriate speed is a factor in many collisions and the enforcement of existing speed limits is key to reducing the likelihood and consequence of collisions. TfL has already committed funds to trials in its own fleet of time over distance speed camera technology and ISA technology which automatically limits the speed of the vehicle to the legal maximum. Current research suggests implementation of 'voluntary' ISA could ensure

compliance with the local speed limit in every vehicle, and could reduce the number of collisions resulting in injury by around 10 per cent and fatal collisions by around 20 per cent.

- 507 Over the course of this strategy it is hoped that such technology will become more widespread through TfL encouraging companies to fit the technology. The fitting of ISA to company cars and vans, following suitable trials and on the basis it can be shown to be value for money, would reduce the disproportionate number of those driving for work being injured and reduce their levels of occupational road risk. Depicted by the red zones in the ISA speed limit map (Figure 52), many London boroughs have introduced 20mph zones, particularly in residential areas with positive road safety effects which are enhanced when accompanied with enforcement.

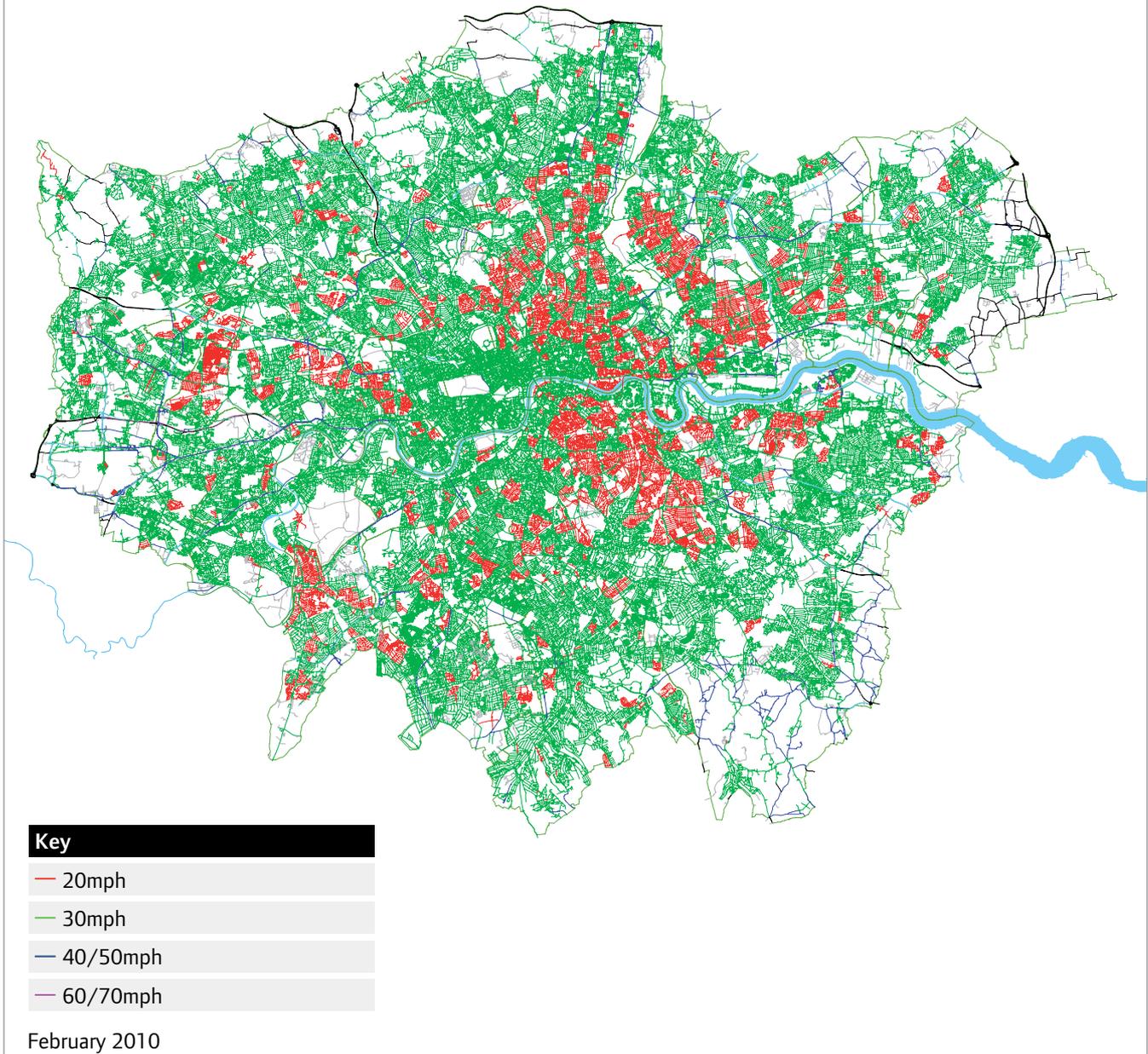
Proposal 72

The Mayor, through TfL, and working with the DfT, London boroughs, vehicle manufacturers and other stakeholders, will encourage the introduction of voluntary 'intelligent speed adaptation', subject to the outcome of trials in corporate fleets, including freight, passenger transport and company cars and vans.

5.16.9 Speed limits

- 508 The frequency and severity of road collisions and casualties are closely related to vehicle speeds. In residential areas, 20mph zones are generally popular with residents and make the streets safer for pedestrians and cyclists. This in turn encourages more use of these modes, with environmental and health benefits. Research has shown that 20mph zones have reduced



Figure 52: Speed limits on London's roads

casualties by over 40 per cent where they have been implemented in London.

- 509 Speed enforcement is currently delivered by more than 800 fixed ‘spot’ and mobile speed cameras operated by the London Safety Camera Partnership. Red light running is also enforced by cameras at more than 250 locations. Average speed cameras could help reduce the variability in speeds that can be caused by heavy braking at ‘spot’ camera sites and improve safety.

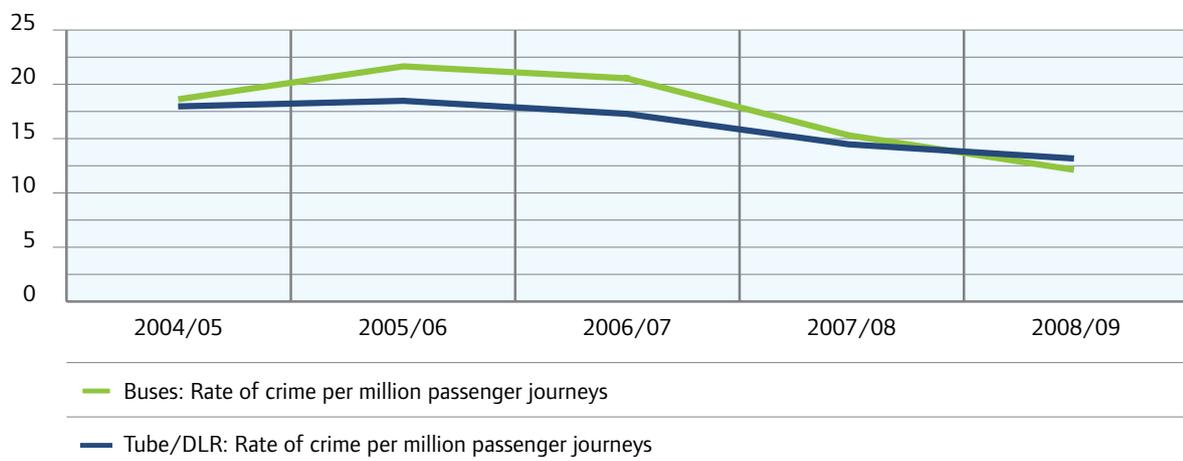
Proposal 73

The Mayor, through TfL, and working with the police, London boroughs and other partners will continue implementing effective enforcement measures, targeted at locations with poor collision records across London’s road network, including new average speed cameras which will be trialled subject to local consultation, for example, on main roads and for enforcing speed in 20mph zones.

5.17 Reducing crime, fear of crime and antisocial behaviour

5.17.1 Introduction

- 510 This section sets out proposals to reduce crime, antisocial behaviour and make every journey safer. The Mayor, TfL, local authorities, the police and other public bodies share a statutory duty to consider crime and disorder and community safety in the exercise of all their duties.
- 511 The rate of crime on the bus, Underground and DLR networks is falling (Figure 53). There were 12 crimes per million passenger journeys on London’s buses and 13 per million passenger journeys on the Underground and DLR in 2008/09.
- 512 As patterns of crime are likely to vary over the course of this strategy, the proposals are drafted to meet current priorities while offering flexibility to respond to future challenges. Activity in this area will be informed by robust evidence based on comprehensive intelligence and analysis. Progress will be rigorously assessed through performance management.
- 513 As well as combating crime and antisocial behaviour, these proposals aim to help people feel safer when walking, cycling, or using PHVs. Reducing crime and the fear of crime has direct economic and social benefits, can improve people’s quality of life, mental health and wellbeing and encourages walking, cycling and public transport use.

Figure 53: Crime rates on Tube/DLR and buses since 2004/05

5.17.2 Developing successful partnerships to deliver a safer transport system

⁵¹⁴ Partnership working is fundamental to achieving the vision of a transport system that is safe and feels safe, where people travel and staff work confidently without fear of crime or unwanted behaviour. The work of a number of agencies including local authorities, the Met, City of London Police, British Transport Police (BTP) and transport operators determine how safe travelling in London feels. Targeted initiatives, for example, on youth crime or violence against women, reflect the need to make travelling as safe as possible.

Proposal 74

The Mayor, through TfL, and working with the London boroughs, transport operators, police and local communities, will establish a statutory community safety partnership for transport and travelling in London. These partners will seek to ensure a strategic, effective, integrated and financially sustainable approach to improving safety and security across the transport system. The partnership will develop and implement a rolling three-year community safety strategy to tackle crime, fear of crime and antisocial behaviour. The strategy will set out shared priorities, objectives and targets based on a joint annual strategic assessment.

5.17.3 Prioritising resources

- ⁵¹⁵ Today, overall levels and rates of crime on the transport system are low. This has been achieved through a combination of investment in visible policing and enforcement; improving design; introducing new technologies; changing environments; and listening to, and informing, staff and the travelling public. However, perception of safety and security is not determined simply by the actual level of crime, but by factors such as the behaviour of other passengers and media reports. Because tackling crime and the fear of crime is complex, it is vital that the resources available to all agencies are used in a targeted and coordinated fashion, based on a common understanding developed from shared intelligence. Improved coordination will also help partners deliver improved value for money.
- ⁵¹⁶ Research confirms that people feel safer and reassured if shared public space, such as public transport, displays visible signs of being controlled. Uniformed staff, visible on the transport system, play a key role in helping to further reduce crime and antisocial behaviour and improve perceptions of personal security.

Proposal 75

The Mayor, through TfL, and working with the London boroughs, police and other stakeholders, will make best use of available resources, basing decisions on evidence and shared intelligence, to:

- a) Increase the visibility and accessibility of uniformed staff and officers, including special constables, at the right times and locations and provide them with the right powers to maximise their impact on crime, antisocial behaviour and public confidence in travelling in London
- b) Target enforcement activity on priority crimes, antisocial behaviour and behaviour that feeds the fear of crime using a problem-solving approach
- c) Create a small joint intelligence unit between TfL and policing agencies to improve intelligence sharing and the efficiency and effectiveness of resource deployment

5.17.4 Neighbourhood policing

- ⁵¹⁷ Responsibility for policing the transport system is shared between the Met, BTP and City of London Police. They are responsible for different transport networks, geographical areas and jurisdictions. The Mayor wants policing on the transport system to be seamless, delivered through a neighbourhood policing model focused on transport hubs and interchanges. Each police service – the Met, City of London Police and the three areas of the BTP that cover London – has implemented a neighbourhood policing structure but they are not coterminous. This can make local coordination challenging and sometimes be inefficient. There are some excellent examples of joint working and collaboration between the local transport policing teams, but there

is still room for improvement. Strengthening the current local policing model could be achieved through improved coordination and alignment of local policing areas, collaboration, joint tasking and deployment arrangements at specific locations.

Proposal 76

The Mayor, through TfL, and working with the London boroughs, police and other stakeholders will integrate local policing structures on the transport system; improve coordination and deploy resources collectively. Joint tasking of uniformed staff will help maximise their effectiveness.

5.17.5 Increasing public confidence in policing and transport safety

⁵¹⁸ Public confidence in the safety of travelling around London is enhanced not just by the visibility of policing and uniformed staff, but knowing how and where to report crime and antisocial behaviour, and knowing that reports will result in action. Currently a number of different channels for reporting exist. Improved coordination between these channels may increase the effectiveness of the response.

Proposal 77

The Mayor, through TfL, and working with the London boroughs, police and other stakeholders, will integrate reporting systems for antisocial behaviour, crime and disorder on the transport system.

5.17.6 Engagement and education

⁵¹⁹ Inconsiderate and antisocial behaviour can have a significant impact on people's perceptions of safety and on their journey experiences. Such behaviour can create a sense of unease for staff and other passengers and increase fear of crime. The Mayor is committed to improving behaviour on public transport and bringing about a shift in public opinion about what is acceptable behaviour and what people should expect of others when travelling. To achieve this will require a multi-pronged approach combining elements of enforcement with education and social marketing to persuade people to be more considerate of others when travelling. The current 'Together for London' campaign is an example of the type of initiative that can be pursued to promote positive and considerate behaviour on public transport and the Capital's roads.

⁵²⁰ Public perceptions of safety and security can be influenced positively by the provision of good quality travel information and an awareness of the safety and security initiatives on the network. Improving the quality and availability of information about travel options and services, such as wayfinding and real time travel information enables individuals to make informed decisions and increases their confidence to travel. Improving signage for pedestrian routes across London will not only encourage walking, but will help pedestrians to feel reassured when making these journeys. Proposals to improve the pedestrian environment are contained within sections 5.14 and 5.18.

Proposal 78

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will introduce a package of measures including marketing, education and engagement activities to help passengers make informed, safer travel choices, and raise awareness of the effect of inconsiderate and antisocial behaviour on others.

Proposal 79

The Mayor, through TfL, and working with the London boroughs, police, and other stakeholders, will seek to ensure that:

- a) Safety and security considerations are incorporated into the planning and design of transport facilities
- b) Existing transport infrastructure, including pedestrian routes and cycle parking facilities, are kept in a good state of repair and have adequate lighting, signage, clear lines of vision and CCTV coverage where appropriate

5.17.7 Designing out crime

⁵²¹ Ensuring that the transport system and the wider public realm is kept in a good state of repair and designed to minimise opportunities for crime and disorder is a key priority and statutory duty for the Mayor. TfL, local authorities, the police and transport operators will work with the community to implement affordable, high quality design and instigate environmental improvements that improve safety, security and the ambience on the transport system from door-to-door.

5.17.8 Using technology efficiently and effectively

⁵²² Technology has an important role to play in reducing opportunities for crime and antisocial behaviour and improving confidence to travel. Passenger surveys have identified that CCTV, improved lighting, Help points and availability of service information enhance safety and security on the transport system. TfL has made significant investments in CCTV across the network and there is now an extensive system on LU, DLR, London Overground and the bus and road networks. CCTV can reassure the public and act as a deterrent to criminals. It can be a valuable tool in apprehending perpetrators of crime on the network and providing evidence to secure convictions.

Proposal 80

The Mayor, through TfL, and working with the London boroughs, police, and other stakeholders, will exploit the opportunities provided by new technology to prevent crime and disorder.

5.17.9 Safer travel at night

⁵²³ London is a 24-hour city where people travel throughout the night. Research shows that fear of crime and antisocial behaviour is heightened when travelling after dark, particularly for women and older people. In some areas, travel choices late at night are limited, so people may be forced to choose more risky options, such

as walking unknown routes or using illegal cabs. Measures to improve the safety of taxis, PHVs and to combat illegal cabs are proposed in section 5.5 (Taxis, private hire, coaches and community transport).

Proposal 81

The Mayor, through TfL, and working with the London boroughs, police, and other stakeholders, will seek to:

- Improve the safety of night-time public transport services
- Improve the safety of cabs
- Provide better information about, and access to, safer travel options





5.17.10 Responding to the threat of terrorism

⁵²⁴ London's position as a world city makes it a high profile target for terrorist groups. Much work has been undertaken in response to the lessons learned from the July 2005 terror attacks with the aim of strengthening London's resilience to the threat of terrorism. A range of interventions have been made including long-term investment in infrastructure, improved operational procedures, staffing levels and policing initiatives that will help to safeguard the transport system from potential attacks. The interventions have been carefully balanced against the needs of passengers who use the system to go about their daily lives.

⁵²⁵ The preparedness and vigilance of the police, other emergency services and transport staff

are essential to reducing opportunities for terrorists to attack the transport system. The implementation of successful counter-terrorism plans will also contribute to London's successful hosting of the 2012 Games. Joint security arrangements and emergency response plans between TfL, the police and emergency services are in place to deter or respond to potential attacks. Plans are reviewed and tested regularly.

Proposal 82

The Mayor, through TfL, and working with the London boroughs, police and other emergency services and stakeholders, will seek to reduce the likelihood and impact of potential terrorist attacks on the transport system.

Proposals to improve London's environment

5.18 'Better streets'

5.18.1 Introduction

⁵²⁶ The Mayor has set out his ambition to revitalise London's public space in his manifesto 'London's Great Outdoors'. Public spaces help to define a city and a well designed built environment – encompassing the historic and new – can bring communities and people together. They can also encourage physical activity and recreation, restore a sense of pride in an area and attract businesses and jobs.

⁵²⁷ The transport system – in particular station buildings and forecourts, streets and other pedestrian thoroughfares including squares and piazzas – form a key element of London's urban realm and therefore play an important role in meeting the Mayor's ambition. Achieving bold improvements to such buildings and spaces is therefore one of his priorities.

⁵²⁸ London's Great Outdoors was accompanied by 'Better Streets', a practical guide intended to make the vision for great spaces a reality. It sets out how 'better streets' can be created and proposes a series of actions to deliver them. The underlying principles include finding a new

working balance between the different users of London's streets and spaces, distinguishing our streets with good quality sustainable materials with high levels of craftsmanship, and reflecting local character. This approach applies to all streets and spaces rather than just flagship schemes. Improving the streetscape effectively will require coordination and integration with other public bodies to create imaginative and liveable environments for everyone.

5.18.2 The principles and stages of creating 'better streets'

⁵²⁹ The enjoyment of the built environment and setting of the historic environment can be curtailed by unnecessary signs and guardrailing that restrict pedestrian movement. Consolidating remaining street features helps, while major rethinking of the function of streets can have dramatic effects. Figure 54 shows six principles for 'better streets' and Figure 55 the five stages to improve them.

⁵³⁰ Because 'better streets' must be sensitive to location and context, the key to their successful creation is found less in highway design manuals than in the imaginative application of certain principles to the design of the urban realm.

Figure 54: Six principles for 'better streets'

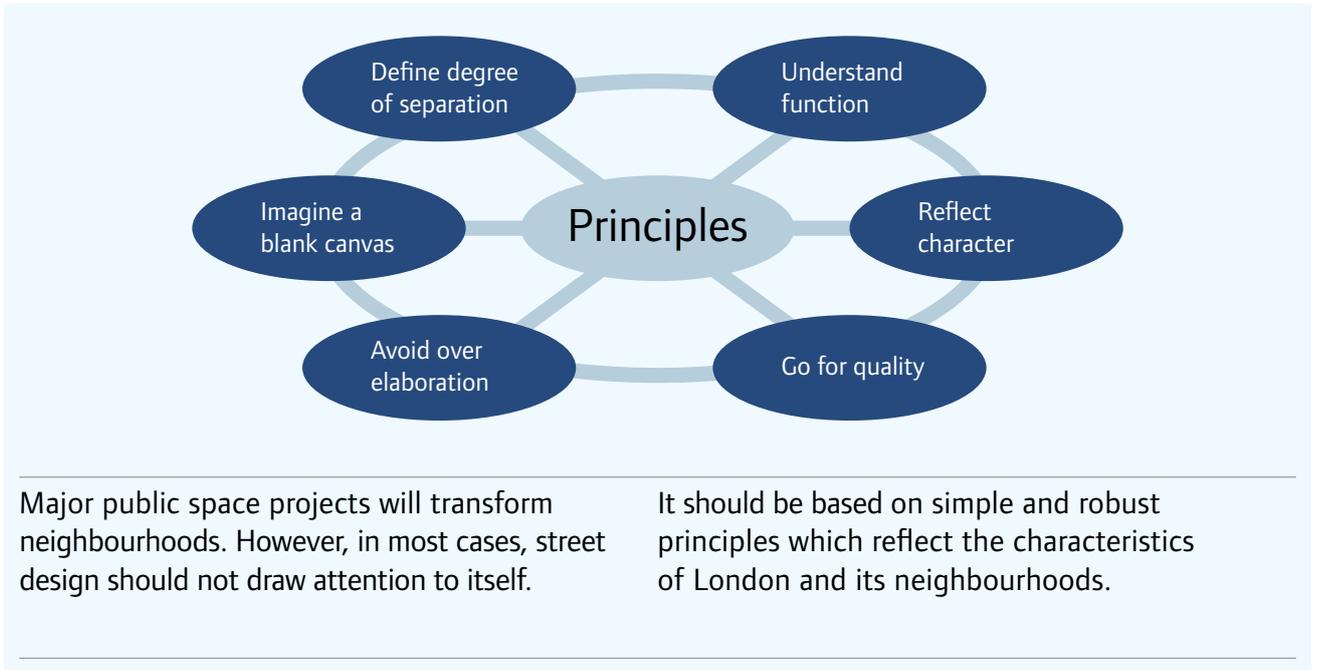
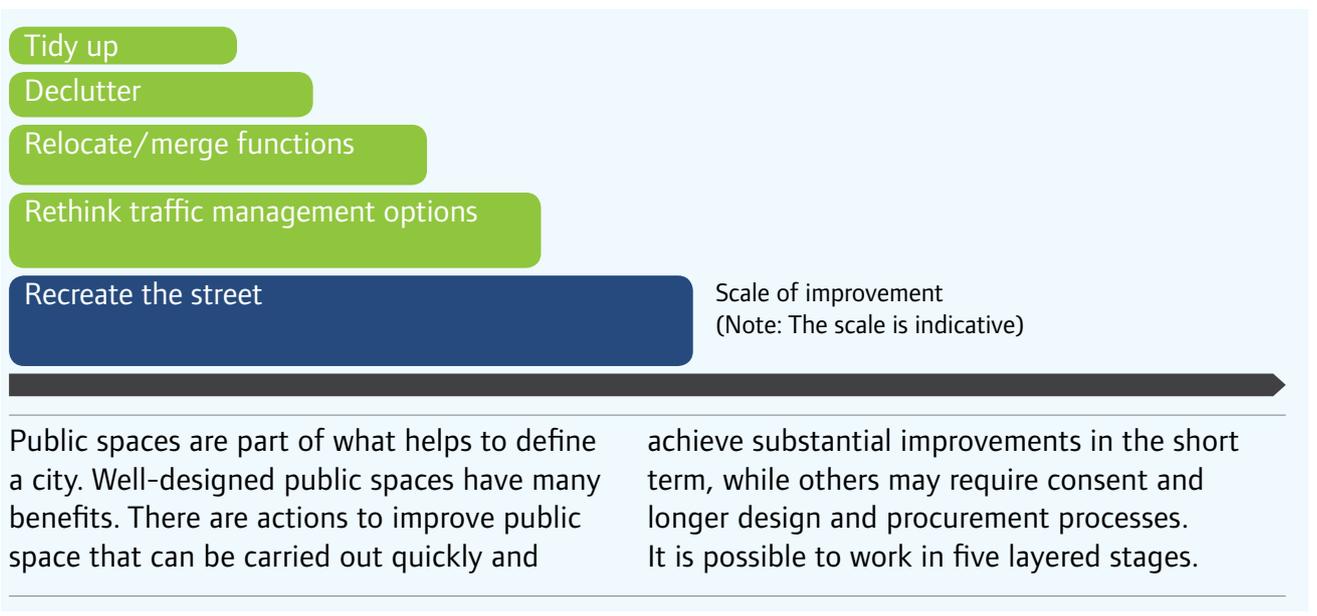


Figure 55: Five stages to improve streets



- 531 There is no one design or template of 'better streets' that can be applied to existing streets. Each location and context is unique; streets will fulfil different purposes, have different vehicle and pedestrian flows and will have their own character. Over-elaborate design is rarely impressive over the longer term. Simplicity of design, ensuring every feature is carefully justified and where care is taken to minimise the clutter of lighting, signage and materials, creates the best streets. The quality of materials is important and must allow for the street to reflect the character of the surrounding buildings and spaces.
- 532 There are several layers of intervention that can improve London's streets (see Figures 54 and 55). There are 'quick wins' that can achieve substantial improvements in the short term, while others may require longer design and implementation processes. Through incremental stages, streets can be improved to different extents. The simplest starting point is tidying up the existing streetscape and decluttering the street, for example, removing unnecessary road markings, signs, guardrailing and bollards. Further steps seek to merge functions, for example, moving a road sign to an existing lighting column rather than it having its own pole, and rethinking traffic management options such as reducing carriageway width and providing more generous pavements for pedestrians. The final stage is where the whole street is recreated, rethinking the road space and how road users interact in order to provide a 'balanced street'.

- 533 In designing such spaces across London, the needs of all users and, in particular, those with reduced mobility, visual impairment and deaf people should be taken into account. Equally, the creation of such spaces should give due consideration to the local historic and cultural context, being aware of the physical streetscape and environment within which such a space is created.

5.18.3 Application of 'better streets' principles to town centres

- 534 For town centres, the package of possible solutions could include improved facilities for pedestrians, cycling, essential deliveries and 'better streets'. Regeneration benefits may be realised too. Improvements need to be considered on a location by location basis and solutions that are appropriate to the local context.

Proposal 83

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will use the principles of 'better streets' to seek to improve town centres, in particular: removing clutter and improving the layout and design of streets; enhancing and protecting the built and historic environment; increasing the permeability of streets; and creating clear and easily understandable routes and spaces to make it easier for cyclists, pedestrians and disabled people to get about.

5.18.4 Application of the principles to create ‘better streets’

- ⁵³⁵ Designing streets primarily for motor vehicles has a detrimental effect on the ability of pedestrians to move, the setting of the historic environment and the enjoyment of the street scene. Making streets attractive for cycling and reorganising them by removing gyratories and one-way streets can improve the urban environment.
- ⁵³⁶ Schemes removing the dominance of motor vehicles in streets especially where there are heavy pedestrian flows are sometimes termed ‘shared space’ schemes and vary considerably. A common element is the changed way vehicles and pedestrians interact. A balanced street is one that has minimal clutter, uses good quality materials and encourages a degree of negotiation between road users. There are few if any traffic lights with formal crossings understated. Each improvement must be designed in the local context, be consulted on (including with blind and visually impaired groups) and be carefully monitored.

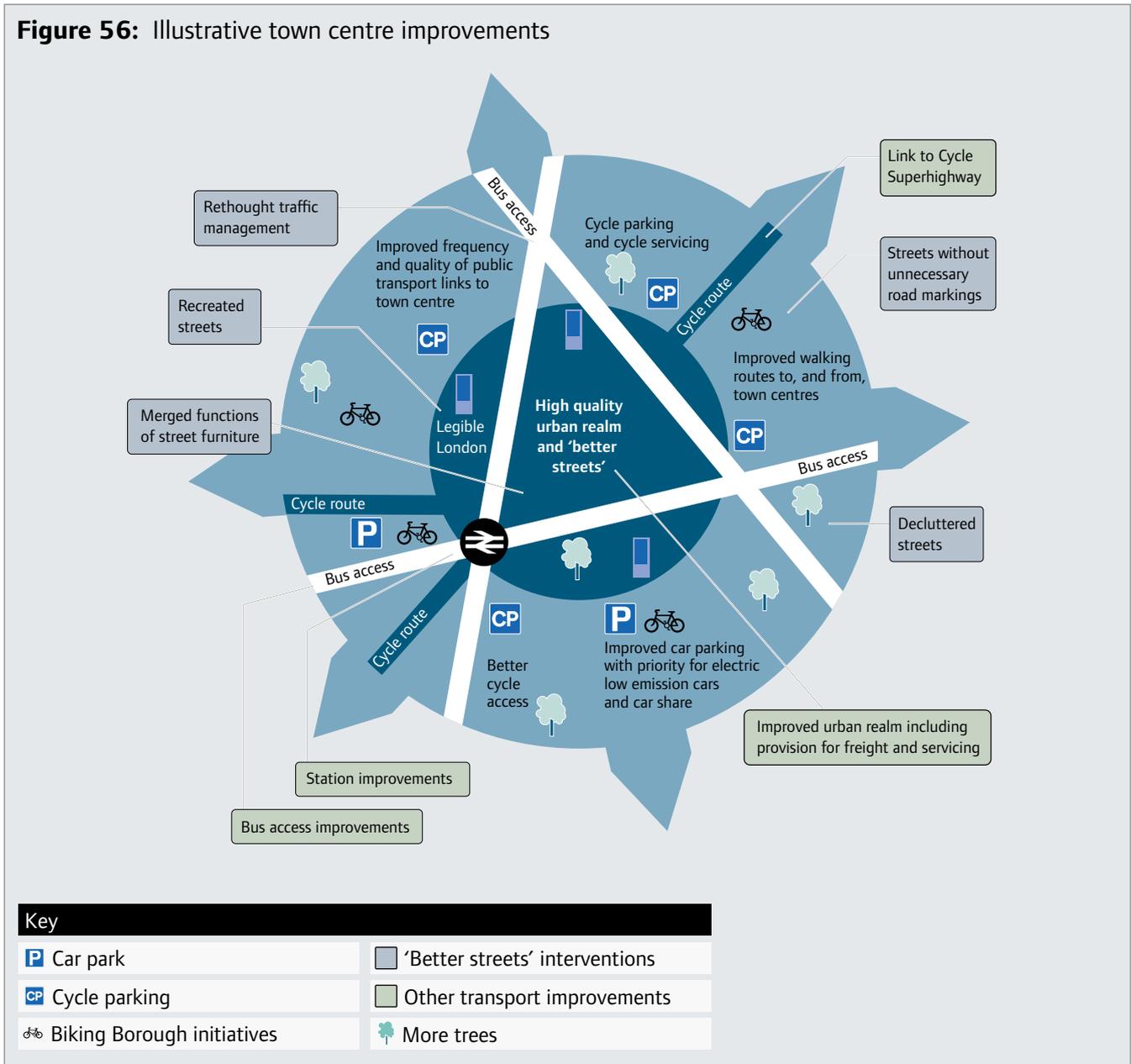
Proposal 84

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will introduce accessible for all, ‘better streets’ initiatives. Consideration will be given to trialling the removal of traffic signals where safe and appropriate.

5.18.5 Making the most of infrastructure investment to improve streets and town centres

- ⁵³⁷ With good design input and, where appropriate, local consultation, there are opportunities to improve the built environment when installing new transport infrastructure. This can range from small scale footway improvements when installing bus stops and street lighting, to comprehensive urban realm, pedestrian and cycle schemes associated with railway station schemes.
- ⁵³⁸ Each town centre is unique and each fulfils distinct commercial, educational, leisure and increasingly, residential functions for its catchment area which generate demand for passenger and freight transport. In addition to urban realm improvement, a package of further measures can reduce the environmental and social impacts of such demand and improve the amenity and quality of the town centre.
- ⁵³⁹ Pedestrians can benefit from improved walking routes to town centres, cyclists can take advantage of improved parking, cycle superhighways and local cycle hire schemes. Public transport access can be improved with new facilities or service enhancements. Parking arrangements for low or zero emission cars could also help encourage more environmentally friendly town centre access for those unable to travel by public transport, foot or bicycle. Park and ride schemes may also be suitable, in some circumstances, at some town centres to further reduce the number of vehicles entering the area. Figure 56 illustrates these improvements.

Figure 56: Illustrative town centre improvements



540 Proposals in smarter transport of freight and services (section 5.24.3) and parking and loading (5.26) will help ensure appropriate freight access arrangements are in place so local businesses are able to get the goods and services they need without adversely affecting other road users. DSPs could help ensure deliveries take place at the most appropriate time, with well-trained staff using environmentally friendly vehicles, optimising the use of loading facilities.

Proposal 85

The Mayor, through TfL and the LDA, and working with the London boroughs, Network Rail and other stakeholders, will seek to implement integrated and complementary improvements to town centres, streets and pedestrian and cycling routes directly adjacent to where major public transport investment projects are being delivered, using sustainable materials.

Case study

The Cut, Southbank

The Cut, spanning Southwark and Lambeth, is now a lively ‘better balanced’ street which includes housing, shops, restaurants, both the Old and Young Vic theatres and a college. Previously dominated by traffic, it has undergone a transformation. The project was a successful collaboration between the Cross River Partnership, TfL, the boroughs, the local community and business groups who have delivered a ‘better balanced’ shared space street. The Cut features:

- Improved pedestrian access by providing widened footways and raised tables, redesigned carriageway and junctions
- Improved quality of the shared urban realm, with quality materials (York stone), rationalised elegant street furniture, demarcated outdoor dining and new cycle stands
- Improved sense of wellbeing and personal safety of people using the street, with the introduction of better lighting levels and a strict time-restricted waste management system, new trees and solar-powered parking meters
- Improved trading environment for local businesses – pedestrian surveys show that evening and weekend footfall on The Cut has increased by more than 35 per cent which has greatly enlivened the area and benefited local businesses

The transformation has also encouraged the use of more sustainable means of transport, with average traffic speeds dropping from 29mph to 17.4mph and lower vehicles numbers, creating a more pleasant and safer environment for pedestrians and cyclists.



5.19 Improving noise impacts

5.19.1 Introduction

- ⁵⁴¹ London's transport system delivers significant economic, social and environmental benefits to the city. However, it can have negative impacts on the local environment. Ambient noise from transport in London is higher than elsewhere in the country and this can influence an individual's health and wellbeing.
- ⁵⁴² A fifth of Londoners are annoyed or disturbed in their homes by noise compared with one in 10 nationally, with buses and lorries creating the most disturbing noise. Noise can interfere with sleep, speech and concentration, and there is increasing concern at the potential physical health effects. Minimising transport ambient noise and improving perceptions of noise levels therefore has benefits for the quality of life of Londoners.
- ⁵⁴³ The strategy will assist in the management of noise in the context of sustainable development. The Mayor is committed to reducing ambient noise from transport. He controls the GLA Group's vehicles and transport system and wants to influence other transport sources of ambient noise, for example, aircraft.

5.19.2 Reducing the noise impacts of roads and public transport

- ⁵⁴⁴ Reducing ambient noise via engineering and design solutions is integral to transport operation. TfL monitors noise pollution by the number of noise-related complaints received, the proportion of the TLRN covered by lower noise road surfacing and by the proportion of buses in the fleet at least two decibels (2dB(A)) quieter than the legal limit. For the first time in three years, the number of complaints received increased by 16 per cent during 2007/08. This can be attributed to major construction work on the East London line and complaints associated with announcements from Tube PA systems. TfL is addressing these issues by using Best Practical Means in construction works, amending PA systems, the Tube's rail maintenance and track replacement works programme, and through considering the noise impact of transport projects.
- ⁵⁴⁵ There is further scope to take action where people are significantly exposed and affected by transport noise. Under the Environmental Noise (England) Regulations 2006 (as amended), noise 'hot spots' have been identified where the relevant highway and rail authorities are required to assess the scope and need for additional noise management in the context of sustainable development. For example, noise barriers, though expensive, may be a solution in some areas and regulations governing the provision of sound insulation may be reviewed.

Proposal 86

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will target the provision of noise reduction measures and noise mitigation measures in areas significantly affected by transport noise, to improve perceptions of noise and reduce the impacts of noise on dwellings and people, by:

- a) Timely and effective rail maintenance and replacement works
- b) Working to the TfL Health Safety and Environment policy
- c) Ensuring all new transport projects consider noise mitigation
- d) Introducing road maintenance programmes to replace road surfaces with low noise surfacing where possible
- e) Improving traffic management and signal control techniques
- f) Introducing speed enforcement measures which do not encourage noisy, rapid acceleration and deceleration
- g) Introducing quieter buses
- h) Procuring new, quieter public sector service vehicles, potentially through joint procurement to achieve efficiency

- 546 Many of the strategy's proposals to introduce lower carbon/lower air pollutant vehicles will have noise reduction benefits. The Mayor's Electric Vehicle Delivery Plan is one part of his strategy to decarbonise transport and improve

air quality in London. Another benefit of stimulating the market for EVs is the very low noise emission from these vehicles.

- 547 Although engineering and design solutions and regulation and enforcement can go a long way to reducing ambient noise, changing people's behaviour can also make a big difference.
- 548 Better freight management is being pursued by TfL, working with freight operators, in its London Freight Plan, for example, through DSPs. However, more can be achieved by introducing additional noise reduction measures through the supply chain. London Councils run the London Lorry Control Scheme which restricts the movements of HGVs in the city at night and weekends. It aims to limit noise impacts in residential areas. FORS members, for instance, could demonstrate quiet delivery practices using the 'silent approach' method, supported at selected sites by the Noise Abatement Society. Adoption of these practices may improve the efficiency of deliveries and the wider road network by enabling out-of-hours servicing.

Proposal 87

The Mayor, through TfL, and working with London Councils, London boroughs, freight operators, and other stakeholders, will explore opportunities to use the London Lorry Control Scheme to encourage companies to operate quieter vehicles as well as to promote improvements in air quality, and reduce CO₂ emissions.

549 Wider education initiatives can encourage people to employ driving styles that reduce emissions and reduce noise. TfL has carried out a campaign for eco-driving to reduce CO₂ emissions, and this will be extended to include noise.

Proposal 88

The Mayor, through TfL, and working with the London boroughs, motorist organisations, freight operators and other stakeholders will encourage quieter driving through publicity campaigns aimed at private drivers and motorcyclists, and training programmes for professional drivers.

5.19.3 Aircraft noise

550 Aircraft noise is a particularly difficult issue for London as Heathrow is located on its western boundary. With prevailing winds, most flights approach over the city. An independent study of public attitudes to aircraft noise for the DfT concluded the public is more annoyed by aircraft noise now than in 1985 when the last major study was carried out. As highlighted elsewhere in the strategy, and the draft replacement London Plan policy 6.6b, the Mayor is opposed to further expansion at Heathrow due to its adverse noise and air quality impacts.

551 The Mayor is also keen to explore with the Government and aviation stakeholders, such as the national air traffic control service, ways of varying flight paths to reduce aircraft noise impacts, such as the preferred direction of approach for night landings. There is European Commission legislation concerning the noise performance of aircraft.

Proposal 89

The Mayor, through TfL, and working with the DfT, the national air traffic control service and the European Commission, will:

- a) Encourage the development and use of quieter aircraft
- b) Seek to coordinate flight paths so they minimise their impact on London

5.20 Enhancing transport's contribution to the natural environment

- ⁵⁵² London's rail, road, cycling, walking, river and canal networks provide essential habitats for wildlife across the city. Approximately two-thirds of London's land area is occupied by green spaces and water. LU alone manages about 10 per cent of the wildlife habitats in the city – more than 4,000 hectares across London and parts of the surrounding counties.
- ⁵⁵³ Due to its linear nature, the transport system provides a multitude of green corridors along which plants and animals can thrive and, as much of this property is inaccessible to the public, it provides a safe and undisturbed refuge for wildlife. Transport buildings can also play a role, for example, with green station roofs.
- ⁵⁵⁴ To illustrate the importance of transport land in supporting biodiversity, around 550 plant, 42 bird, 14 mammalian, 538 invertebrate, three reptile and three amphibian species have been recorded on TfL's land. This includes

deer, water voles, pipistrelle bats and great crested newts.

- ⁵⁵⁵ London's transport operators have a duty to promote biodiversity and support the UK and Mayor's biodiversity strategies. LU, Network Rail and the Highways Agency all have Biodiversity Action Plans and the boroughs have local biodiversity protection and enhancement policies in their Local Development Frameworks. Proposal 113 in this strategy describes how there will be an additional 10,000 street trees by 2012, with the aim of additional two million trees by 2025.

Proposal 90

The Mayor, through TfL, and working with the DfT, Highways Agency, London boroughs, Network Rail, and other stakeholders, will make the most of open spaces across the transport system (for example, green spaces alongside railway lines, roads, rivers, canals, cycling and walking routes, green grids and on roof tops) to improve the quality and diversity of London's natural environment.



5.21 Improving air quality

5.21.1 Introduction

⁵⁵⁶ Despite improvements in recent years, transport in London remains a significant source of air pollutant emissions contributing to the overall concentrations of pollutants in the air and adversely affecting the health of Londoners.

⁵⁵⁷ There are two main air pollutant emissions from ground-based transport:

- Oxides of nitrogen (NO_x) – consisting of both NO and NO₂
- Particulate matter (PM) of varying size fractions, notably PM₁₀ and PM_{2.5}

⁵⁵⁸ The extent to which transport affects air quality can clearly be seen from Figure 57 and 58 which show measured NO₂ and PM₁₀ concentrations. The highest levels are found around busy roads and diesel-operated rail lines, with a clear concentration around Heathrow.

5.21.2 European Union and national air quality objectives

⁵⁵⁹ The Mayor has a legal obligation to put forward policies and proposals for the implementation of the national air quality strategy and to achieve in Greater London the air quality standards and objectives prescribed in regulations made under the Environment Act 1995. These regulations transpose into UK law the European Union directive on air quality establishing limit values for PM₁₀ and NO₂.

⁵⁶⁰ For PM₁₀ a small number of locations focused in central London are currently exceeding the PM₁₀ daily limit value (which was supposed to be met by 2005). For NO₂ wider areas of Greater London are exceeding the annual mean limit value, which was supposed to be met by 2010. The Government is in the process of applying for an extension to the deadlines for meeting these limit values to 2011 for PM₁₀ and 2015 for NO₂. The directive has also established limit values for PM_{2.5} and these limits are currently being transposed into UK law.

⁵⁶¹ Modelling suggests that without further action London will be at risk of exceeding the PM₁₀ daily limit value in a small number of central London locations near major roads in 2011. In 2015, the NO₂ limit values will be exceeded across Greater London, particularly around Heathrow, in central London and near major roads. Road traffic is a significant source of air pollutant emissions in London.

⁵⁶² Air pollutant emissions do not respect London's administrative boundaries. Around 40 per cent of London's PM₁₀ and 20 per cent of its NO₂ concentrations are caused by emissions outside London. Consequently, some of the most effective policies to address air quality need to be implemented on a national basis, for example: changes to vehicle excise duty, further national scrappage schemes, certification of NO_x abatement equipment and establishing a framework for promoting ultra low emission vehicles.

⁵⁶³ Nevertheless, London must play its part in helping the UK meet the EU limit values

Figure 57: NO₂ annual mean concentrations (µg/m³), 2008

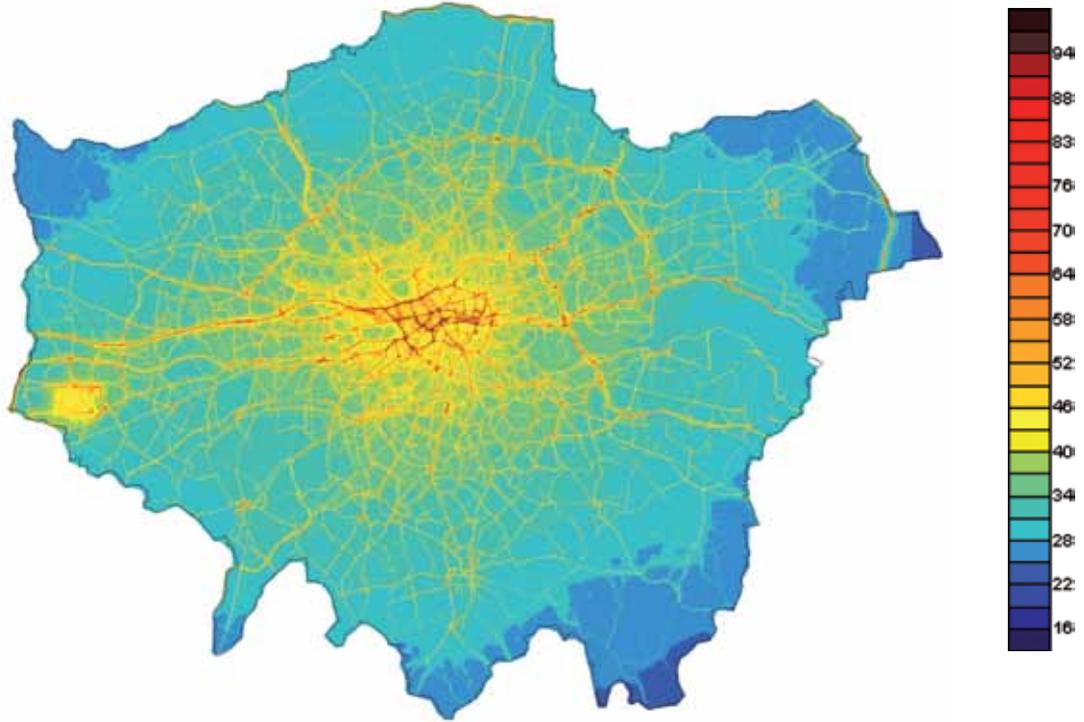
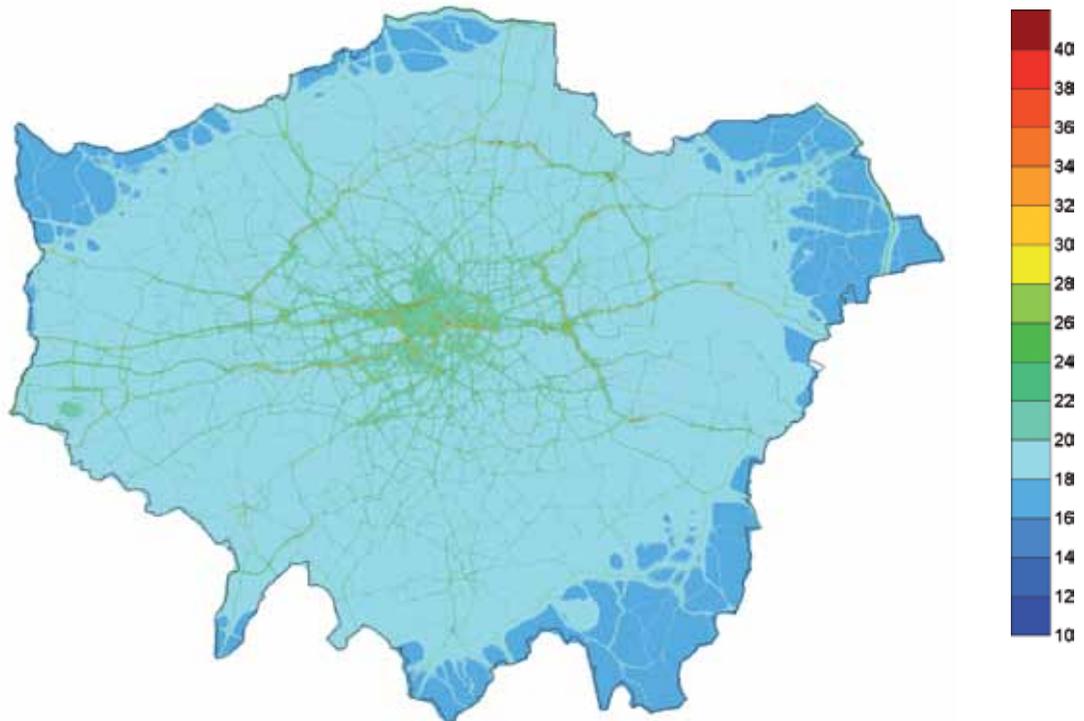


Figure 58: PM₁₀ annual mean concentrations (µg/m³), 2008



and securing improvements in public health. Consequently, the air quality proposals in this chapter have been developed to help achieve the biggest improvement in air quality possible. In doing this, the Mayor is committed to demonstrating value for money for London's taxpayers and avoiding any undue burdens on London's economy, particularly its small businesses. Going forward, it will be necessary to adopt a proportionate approach which will secure improvements using incentives first. Where disincentives are required these will be targeted and cost-effective.

⁵⁶⁴ While developing the policies in the strategy, particular attention has been paid to maximising co-benefits to help achieve other Mayoral objectives including those for climate change and noise. Improving air quality also requires capturing the benefits of other proposals found elsewhere in this strategy, for example, modal shift.

5.21.3 Behavioural changes

⁵⁶⁵ Promoting behavioural change is an effective and relatively quick way of reducing vehicle emissions by providing Londoners with the necessary information to make smarter choices. Namely, more walking and cycling for short journeys and greater use of public transport where possible. When cars are needed, Londoners should be encouraged to adopt the most sustainable patterns of car ownership (for example, through membership of car clubs, car sharing, purchase of fuel efficient vehicles and use of smarter driving techniques).

Proposal 91

The Mayor, through TfL and working with London boroughs, transport operators and other stakeholders, will encourage behavioural changes to reduce vehicle emissions, by:

- a) Promoting walking and cycling, the use of car clubs, car sharing, the use of fuel efficient vehicles and smarter driving techniques and raising awareness about air quality
- b) Implementing eco-driving training for all GLA/functional body, taxi and bus drivers
- c) The Mayor will also reduce emissions from the wider fleet by supporting eco-driving training for members of the public and freight drivers (through the existing FORS scheme) and tackling emissions caused by unnecessary idling
- d) Providing better information about emissions from private vehicles and the public transport fleet

5.21.4 Reducing emissions from public transport and the public sector fleet

⁵⁶⁶ By reducing emissions from rail, buses, taxis, PHVs, the GLA and boroughs' own fleets, overall levels of emissions, particularly of PM and NOx in central London, can be reduced. To do this it will be necessary to electrify London's remaining diesel railways, introduce new requirements for buses, taxis, PHVs and passenger boats and to promote new technologies such as low emission taxis which will help achieve long-term improvements in air quality.

Proposal 92

The Mayor, through TfL, and working with the London boroughs, DfT, Network Rail, train operating companies and other stakeholders, will introduce measures to reduce emissions, including:

- a) Cleaner buses
- b) Cleaner taxis and PHVs
- c) Further rail electrification, including the recently announced Great Western Main Line electrification scheme and the Barking to Gospel Oak line
- d) Cleaner passenger boats and other river vessels, which use more environmentally friendly fuels
- e) Encouraging the introduction and use of cleaner public service and local authority vehicles

Proposal 93

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will take further action to reduce private vehicle emissions, by:

- a) Supporting the uptake of low emission vehicles, such as electric cars and vans
- b) Incentivising of low emission vehicles through pressing for changes to vehicle excise duty and parking regulations
- c) Working with the European Commission, the Government and vehicle manufacturers, the Mayor will encourage the development of new technologies which reduce vehicles emissions, such as better tyres which wear less, more sophisticated abatement technology and automatic hybrid-switching

5.21.5 Reducing emissions from private vehicles

⁵⁶⁷ Tackling emissions from the London transport system and public sector fleets will not be enough by itself to meet the EU limit values, so further action to improve private vehicle emissions will be needed.

5.21.6 Tackling poor air quality at priority locations¹

⁵⁶⁸ Some locations have specific air quality problems as a result of the make-up of the vehicle fleet using them, traffic speed and other factors. The situation at these priority locations can be improved by tailored local action. This may include power washing roads and applying dust suppressants, focusing more hybrid buses on routes going through these locations and better enforcement of existing no-idling and no-stopping rules. Further improvements can be achieved by incorporating

¹ TfL has enhanced its understanding of local air quality. Rather than as individual sites (or 'hot spots') these need to be understood in their broader context as part of the road network. For this reason action will be targeted at larger connected corridors which will be known as 'priority locations' – see the Mayor's Air Quality Strategy for more detail

improved air quality measures into planned urban realm improvements and using scheduled refurbishment of the road surface to trial new surfaces. Where possible these measures should also deliver improvements for noise and CO₂ emissions as well as for air quality.

- 569 Any measures undertaken by TfL to improve air quality hot spots would be developed in close partnership with the relevant London boroughs, as these retain their own responsibilities for local air quality as part of the Local Air Quality Management process.

Proposal 94

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will introduce targeted local measures at poor air quality priority locations to reduce emissions and improve local air quality.

5.21.7 London Low Emission Zone

Continuing the London Low Emission Zone

- 570 The Mayor will continue to operate the current LEZ scheme. The implementation of the next phase of the scheme in 2012, introducing a tightening of emission standards (to Euro IV PM) for HGVs, buses and coaches, will deliver further benefits for air quality.

London Low Emission Zone extension deferral

- 571 The Mayor has announced his intention to defer the extension of the London LEZ to LGVs and minibuses (previously known as Phase 3), which was due to be introduced in October 2010.

- 572 In the current economic downturn, the potential business costs and impacts for LGV and minibus operators associated with meeting the proposed emission standard (Euro 3 for PM) from 2010 are now more significant than when the LGV and minibuses phase of LEZ was confirmed in 2007. Having regard to the additional pressures facing business at this point in time, and to allow operators more time to comply and thus mitigate some of the potential impacts, the Mayor is proposing to defer the extension of the LEZ to LGVs and minibuses to an appropriate date in 2012. He will ask TfL to make the necessary variation to the Low Emission Zone Scheme Order.

- 573 TfL estimates that extending the LEZ to LGVs and minibuses in 2012 will reduce emissions of PM₁₀ by around eight tonnes and emissions of NO_x by around 100 tonnes in 2011 through pre-compliance benefits. These are important in the context of meeting the 2011 EU daily limit value for PM₁₀. While delaying the extension of LEZ to LGVs and minibuses will reduce its benefits to some extent, it will allow time for the economic situation to improve for smaller operators to take the necessary action. The Mayor considers that this approach strikes an appropriate balance for London between environmental and economic objectives.

- 574 A range of other measures is being proposed to reduce emissions, but extending the LEZ to LGVs and minibuses is considered an important element of the overall package. It is important that action is taken to ensure the achievement of the EU targets and deliver health benefits

for Londoners. There is a need to reduce road transport emissions from different sources, such as buses, taxis, HGVs, coaches, cars – and also LGVs. The Mayor's Air Quality Strategy sets out the proposed approach in more detail. The Mayor will work with central Government, who need to play a key role in supporting action in London.

Developing the London Low Emission Zone

575 This combination of reduced emissions from the public and private fleets, behavioural measures and targeted local measures may still not sufficiently reduce emissions in the Capital, particularly NO_x emissions, which is a London-wide problem. Therefore, the Mayor will consider – if needed to meet outstanding issues – the tightening of standards beyond 2015, additional zones and/or the inclusion of other vehicles.

Introducing a NO_x standard

576 The Mayor proposes introducing a London-wide standard (Euro IV) for NO_x emissions from 2015 for HGVs, buses and coaches in order to reduce these emissions and deliver benefits across London. This will include areas where emissions are particularly high in central, Inner and parts of Outer London such as around Heathrow. However, this will be subject to central Government delivering a national certification and testing scheme for NO_x abatement equipment. The LEZ currently does not require operators to purchase newer vehicles to become compliant. An option is to fit a certified particulate trap to the vehicle. Similar compliance options must be available

for the LEZ to be amended to include an emissions standard for NO_x.

Consulting on changes

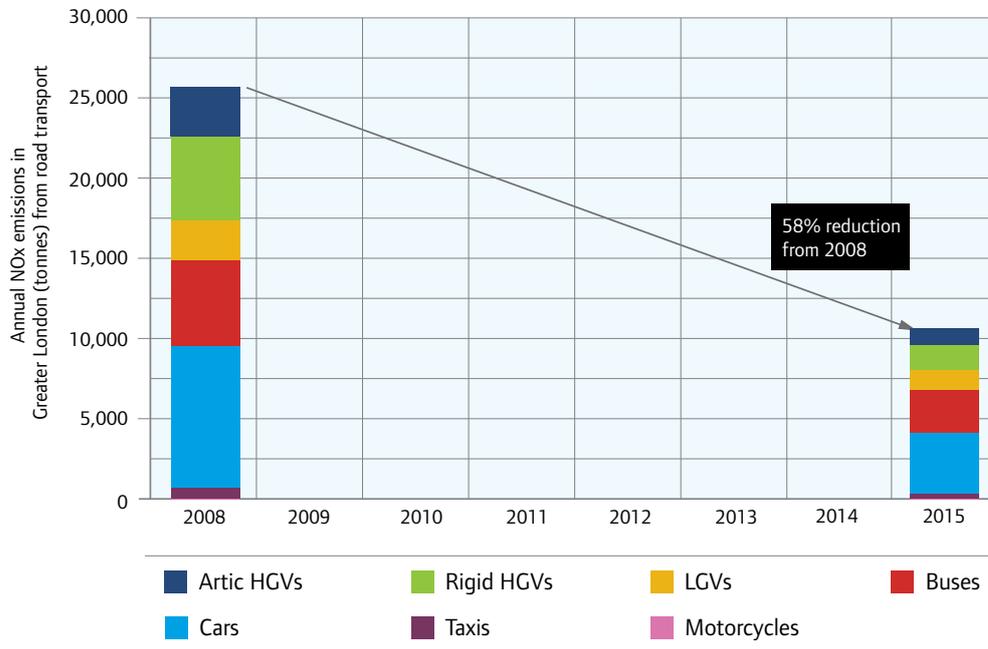
577 TfL will need to consult on a Variation Order to defer extending the LEZ to LGVs and minibuses to 2012. A Variation Order and public consultation will also be needed to include a standard for NO_x emissions in the LEZ for HGVs, buses and coaches.

578 TfL would also need to consult widely on other proposals to introduce further changes to the current LEZ. To minimise costs to business, the Mayor would announce any further proposed alterations to the existing LEZ as early as possible, to maximise compliance time.

Local low emission zones

579 Given the localised nature of some aspects of the air quality challenge, it may also be appropriate for London boroughs to explore establishing their own LEZs in response to local circumstances. Where appropriate and in conformity with the MTS and consistent with other relevant Mayoral strategies, the Mayor may consider supporting these through the LIP process and other measures. Such schemes may also deliver benefits in relation to reduced CO₂ emissions and noise.

580 To ensure London-wide inter-operability and to minimise compliance costs the Mayor would work with the boroughs to establish guidelines for introducing a local LEZ should there be interest in doing so.

Figure 59: London NO_x emissions 2008 to 2015

Proposal 95

The Mayor, through TfL, will continue to operate the existing London Low Emission Zone. The Mayor will consider further tightening of the standards of the current LEZ, as well as the introduction of further emissions control schemes to encourage the use of cleaner vehicles in London:

- The current LEZ scheme will continue to operate to reduce emissions from the heaviest vehicles, and tighter standards will be introduced in 2012 as planned
- The Mayor will defer extending the LEZ to LGVs and minibuses (which was due to commence in 2010) to 2012
- In 2015, the Mayor will, subject to technical feasibility, introduce an emissions standard for NO_x (Euro IV) into the LEZ for HGVs, buses and coaches
- If necessary, the Mayor will consider introducing minimum requirements for other vehicles or tighter standards in particular locations within London

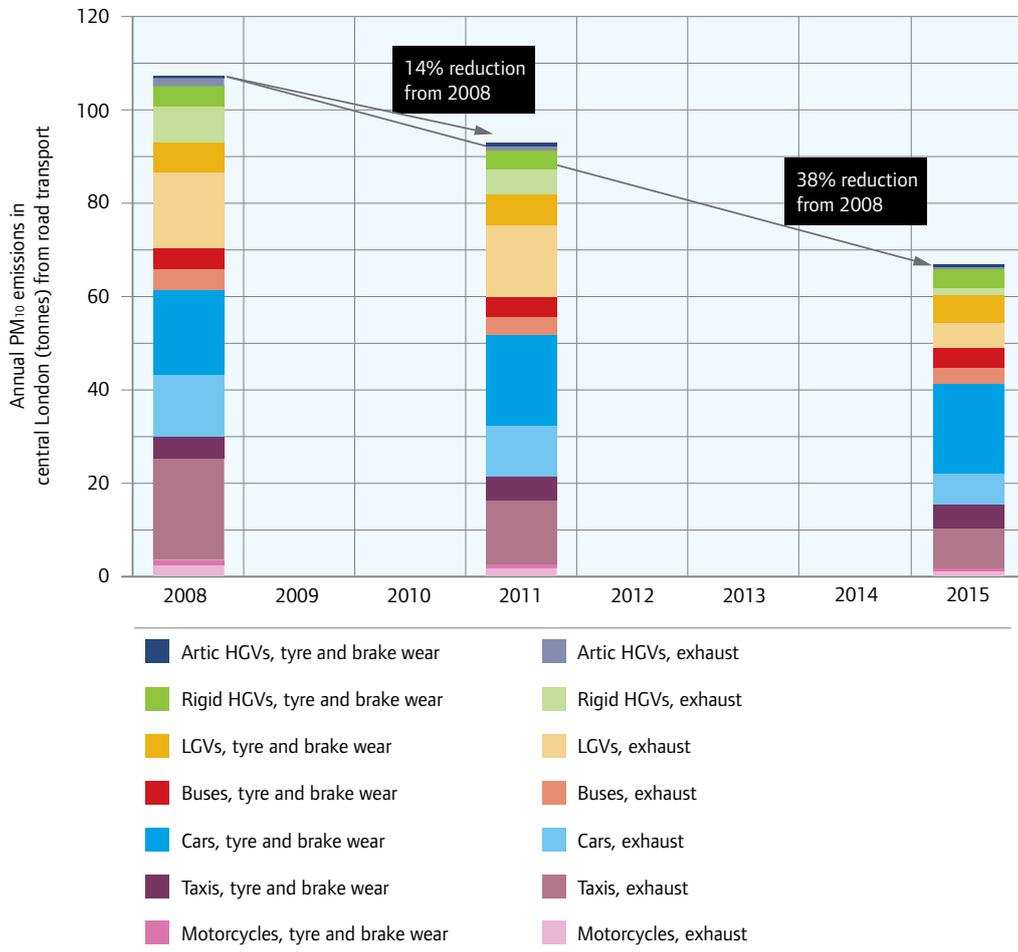
- The Mayor will work with boroughs that propose to take local action to address air quality through local low emission zones or similar measures

581 Further steps will also be required to reduce emissions from other sources, such as commercial, industrial, construction and domestic sources. The Mayor's Air Quality Strategy considers air pollutant emissions from transport as part of the broader London context. More detailed proposals to address emissions and improve air quality will be included in this strategy.

5.21.8 Contribution to improved air quality

582 The Mayor's Transport and Air Quality Strategies will achieve significant reductions in emissions of air pollutants, especially from road transport. Overall, TfL estimates that, along with natural fleet turnover and existing measures, the proposed air quality measures in this and the Air Quality Strategy will deliver

Figure 60: Central London PM₁₀ emissions in 2008, 2011 and 2015



around a 14 per cent reduction in central London road transport PM₁₀ emissions in 2011, and a 58 per cent reduction in Greater London road transport NO_x emissions by 2015 (Figures 59 and 60).

(and, where necessary, special measures) should help to ensure that these areas meet the EU limit values.

Particulate matter

583 The measures laid out in this strategy increase the confidence that London will meet the EU limit values for PM₁₀ in 2011.

584 While there remain a small number of areas in central London which have been identified as being at risk of exceeding the EU limit values, it is anticipated that targeted local measures

NO₂

585 NO₂ is a national issue requiring further action from central Government. The Mayor's Air Quality Strategy includes policies for encouragement to be given to central Government and other organisations in developing a package of measure which together with the measures in this strategy will meet NO₂ limit values in London by 2015.



Proposals to reduce transport's contribution to climate change and improve its resilience

5.22 Reducing carbon dioxide emissions

5.22.1 Introduction

⁵⁸⁶ The Mayor proposes to structure his approach to reducing CO₂ emissions from ground-based transport around three core themes:

- Improved operational efficiency – to minimise unnecessary CO₂ emissions
- Supporting and enabling the development and use of low carbon vehicles, technology and energy – has significant potential to deliver CO₂ reductions. This will require close joint working with stakeholders and appropriate incentivisation
- Carbon efficient mode choice – massive investment is underway in London to improve the attractiveness of low carbon modes such as walking, cycling and public transport and to enable the movement of freight by water and rail

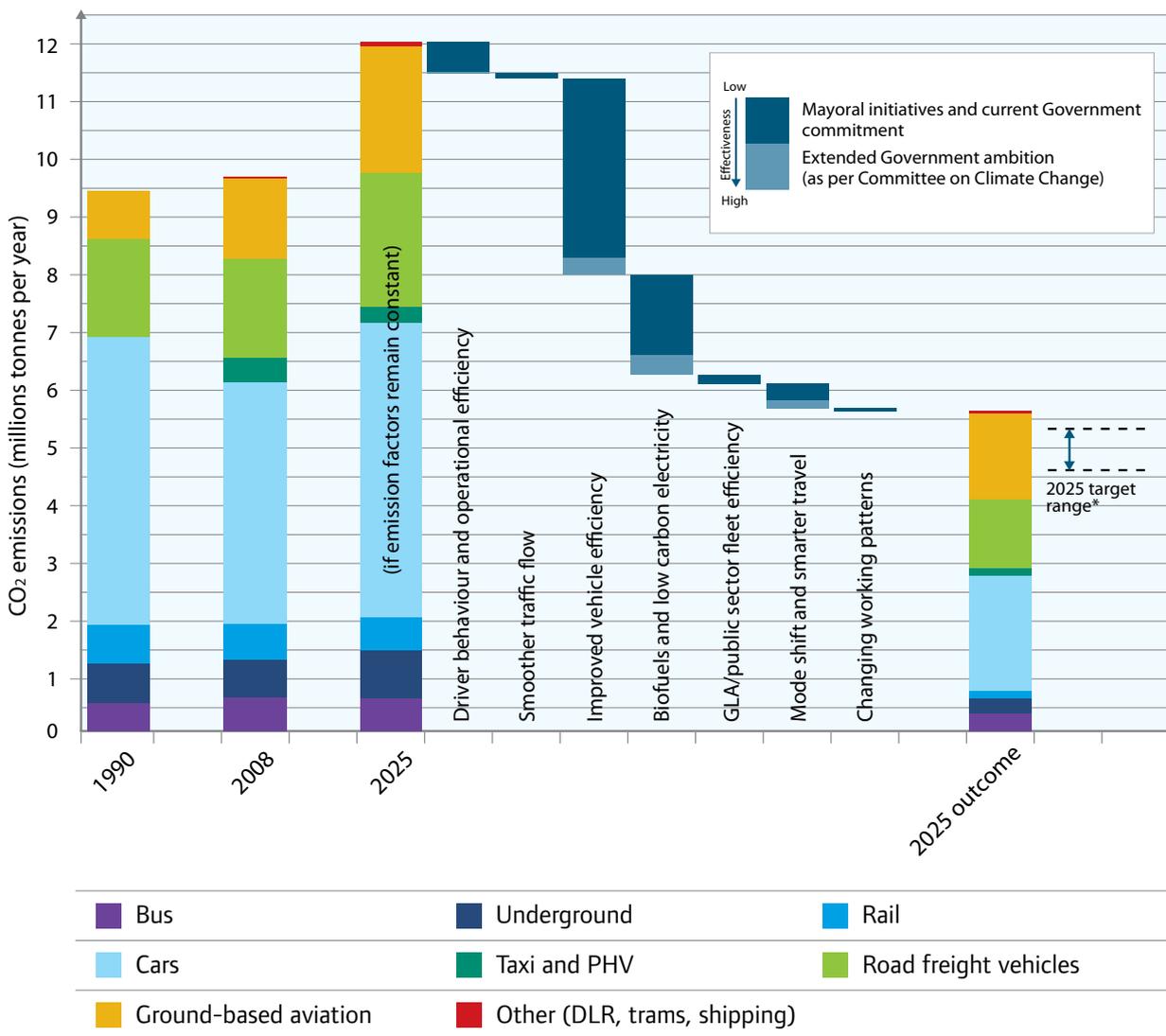
⁵⁸⁷ Significant CO₂ savings are required from all three themes for transport to meet its required contribution to the Mayor's target of a 60 per

cent reduction in London's CO₂ by 2025, from a 1990 base. Meeting this target will require significant investment and effort from the Mayor and a number of stakeholders. However, the Mayor recognises that the long-term costs of inaction are far greater than the shorter-term costs of action.

⁵⁸⁸ Figure 61 illustrates the potential range of contributions from identified policy areas in reducing transport-related CO₂ emissions. The Mayoral initiatives outlined in this document and the Mayor's CCMES together with the current level of Government ambition are anticipated to result in annual transport-related CO₂ emissions in London in 2025 of around 6.4m tonnes.

⁵⁸⁹ If the Government were to adopt the more ambitious approach as called for by the Committee on Climate Change, it is anticipated that annual transport-related CO₂ emissions in London in 2025 would be around 5.6m tonnes. It is anticipated that this higher level of Government ambition, if it were applied across all CO₂ emissions sectors in London, would result in a 57 per cent reduction in London's CO₂ emissions by 2025, compared to a 1990 base.

Figure 61: Mid-range estimate of CO₂ reduction impacts of transport policy areas by 2025



* The contribution required from the transport sector to meet the Mayor's CO₂ emissions target for 2025 is linked to the CO₂ emissions reductions from other sectors. It is anticipated that transport sector CO₂ emissions, in the range indicated on the chart, will be required to meet the Mayor's target of a 60 per cent reduction in London's CO₂ emissions by 2025 compared to 1990

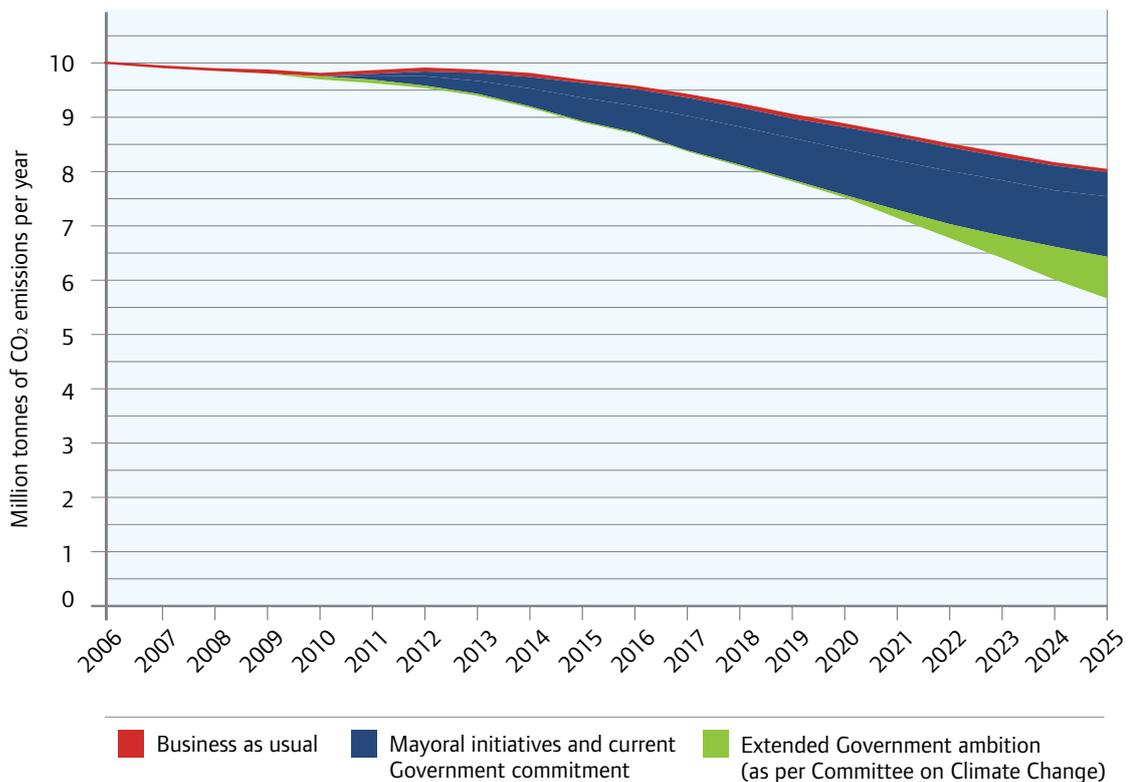
- 590 As illustrated in Figure 61 it is anticipated that transport sector CO₂ emissions in the range of 5.3 to 4.6m tonnes will be required in 2025 to meet the Mayor’s target. A range is given to reflect the level of uncertainty as to the distribution of CO₂ emission reductions across the CCMES emissions sectors of homes, workplaces and transport.
- 591 Figure 62 sets out projected CO₂ emissions reductions that could be achieved through Mayoral and Government transport programmes in London to 2025. The level of

further Government and/or Mayoral action required to meet CO₂ emissions targets will be kept under review as the effectiveness of policies to reduce CO₂ emissions are monitored over the period of the strategy.

5.22.2 Carbon efficient travel behaviour

- 592 Awareness of the environmental impact of travel choices, driving style and vehicle maintenance is growing. Levels of awareness and action must increase in order to minimise the transport carbon footprint within the constraints of available technology and infrastructure.

Figure 62: Projected transport sector CO₂ emissions to 2025



593 TfL has pioneered the use of smarter travel initiatives to achieve improved CO₂ travel efficiency, including the widespread successful uptake of school and workplace travel plans. School travel plans cover nearly all of London's schools resulting in the proportion of trips to school by car reducing by around six per cent. More than 10 per cent of London's workforce work in locations with travel plans, thereby achieving a 13 per cent reduction in the proportion of car journeys to work at these sites. Smarter travel provides the opportunity to further explore flexible working patterns and remote working to support measures to reduce the need to travel, especially during peak hours. TfL has also run a two-year smarter driving campaign which has been complemented by the nationwide 'Act on CO₂' campaign, to communicate clear, practical methods to improve fuel efficiency.

Proposal 96

The Mayor, through TfL, and working with the London boroughs, transport operators and other stakeholders, will promote behavioural change and smarter travel measures aimed at encouraging more use of lower carbon modes, eco-driving practices, better vehicle maintenance and flexible working patterns to reduce CO₂ emissions.

594 Since 2000, the mode share of public transport and cycling has increased significantly. However, the potential exists to achieve more; the programme of committed investment in public transport, cycling and walking in London, and proposals for further schemes

contained within this strategy are anticipated to lead to a continued increase in the use of low carbon modes, with the joint mode share of public transport, cycling and walking expected to increase by six per cent in the period 2006 to 2031.

595 Figure 63 illustrates typical CO₂ emissions associated with the use of different modes of transport. To complement investment in London's transport system, an integrated approach to transport and land use planning will focus London's growth in locations with good public transport accessibility, walk and cycle accessibility and reduce the need to travel.

Proposal 97

The Mayor, through TfL, and working with the London boroughs, transport operators, and other stakeholders, will support, promote and improve sustainable, low CO₂-emitting transport (including public transport, cycling, walking, and rail and water for freight), and reduce the need to travel through integration of transport and land use planning.

- ⁵⁹⁶ London is a national leader in the development of car clubs with a rapidly growing membership of around 100,000. The Mayor will support car club expansion and the introduction of ultra low carbon vehicles to their fleets.

Proposal 98

The Mayor, through TfL, and working with the London boroughs, car club operators, and other stakeholders, will support expansion of car clubs and encourage their use of ultra low carbon vehicles.

5.22.3 Reducing CO₂ emissions from freight delivery

- ⁵⁹⁷ Existing freight-related initiatives such as DSPs, CLPs, and the FORS as defined in the London Freight Plan encourage improved efficiency and provide a framework for incentivisation and regulation. The Mayor will continue to develop these tools over time to ensure continuing and increasing contributions to improved freight movement efficiency.

Proposal 99

The Mayor, through TfL, and working with the London boroughs, road freight operators and other stakeholders, will:

- a) Adopt planning conditions that specify Delivery Service Plans for major developments (by spring 2011)
- b) Aim for 50 per cent of HGVs and vans serving London to be members of FORS by 2016

- c) Encourage, and where appropriate specify, improved freight movement efficiency through, for example, greater consolidation, more off-peak freight movement and greater use of water and rail-based transport
- d) Support freight industry land requirements for locally focused consolidation and/or break-bulk facilities and access to waterways and railways

5.22.4 Improving driving techniques on public transport

- ⁵⁹⁸ It has been demonstrated that driving style can have a significant impact on energy consumption and therefore CO₂ emissions. The Mayor is keen to demonstrate the positive impact driving style can have on reducing CO₂ emissions associated with the public transport fleet.

Proposal 100

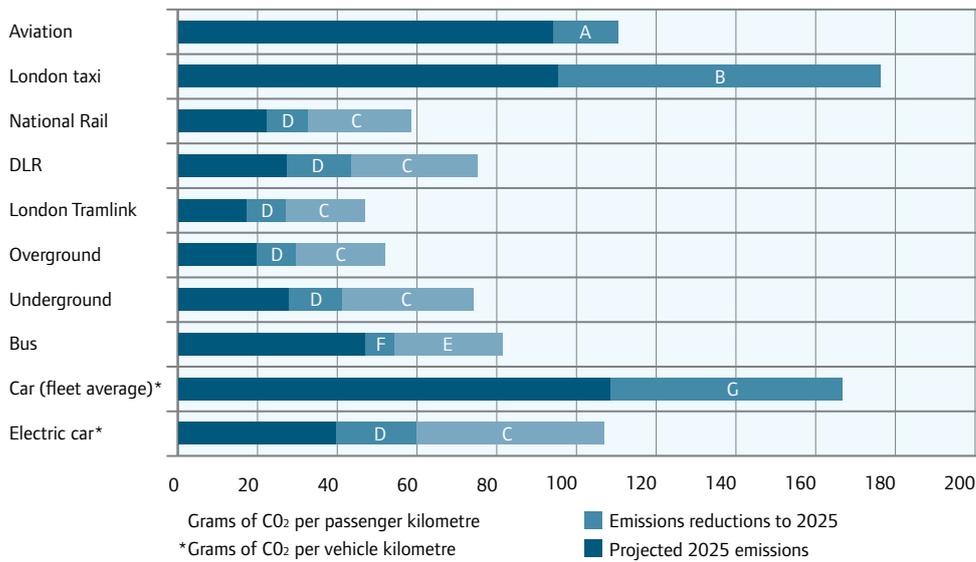
The Mayor, through TfL, will introduce automatic train control (a tool that can optimise energy efficiency through driving style) across the Tube network. Drivers of non-automatic railways, such as London Overground, will be given training on energy efficient driving style, as will London's bus drivers.

5.22.5 Reducing CO₂ emissions from aviation

599 Over 60 per cent growth in passenger numbers is anticipated at London's airports in the period to 2031. Therefore, efforts must be redoubled to tackle the environmental impacts of aviation if demand growth is to be met in a sustainable manner. The Mayor's powers to influence CO₂ emissions from aviation are limited, however, Government has a target to reduce aviation CO₂ emissions to below 2005 levels by 2050. Inclusion of aviation within the EU Emissions Trading Scheme provides a legal

framework through which to meet the target. The international connectivity that aviation provides is crucial to the competitiveness of London's economy in this era of globalisation. Therefore, strict limits on aviation growth in the London area are not tenable, nor would they be effective with demand shifting to competing aviation hubs. Meeting both the Government target for aviation CO₂ emissions and the Mayor's target for London CO₂ emissions will require either a breakthrough in aviation carbon efficiency or significantly lower than forecast growth. The Mayor supports the expansion of competitive rail-based alternatives to aviation,

Figure 63: CO₂ emissions by mode: 2008/09 emissions and 2025 projections



- Carbon reduction initiatives**
- A: Technological and operational improvements to 2025
 - B: Low carbon taxis
 - C: Low carbon electricity supply (300g CO₂ per kWh)
 - D: Extended Government ambition low carbon electricity (200g CO₂ per kWh)
 - E: Diesel-electric hybrids
 - F: 2025 further CO₂ reduction potential (eg biofuels, electric power, hydrogen, etc)
 - G: EU 2020 average new car CO₂ emissions target met

Case study

Electric road vehicles

Electric power has been identified as a particularly promising way to reduce emissions of CO₂, air pollutants and noise from road vehicles and reduce dependence on fossil fuels.

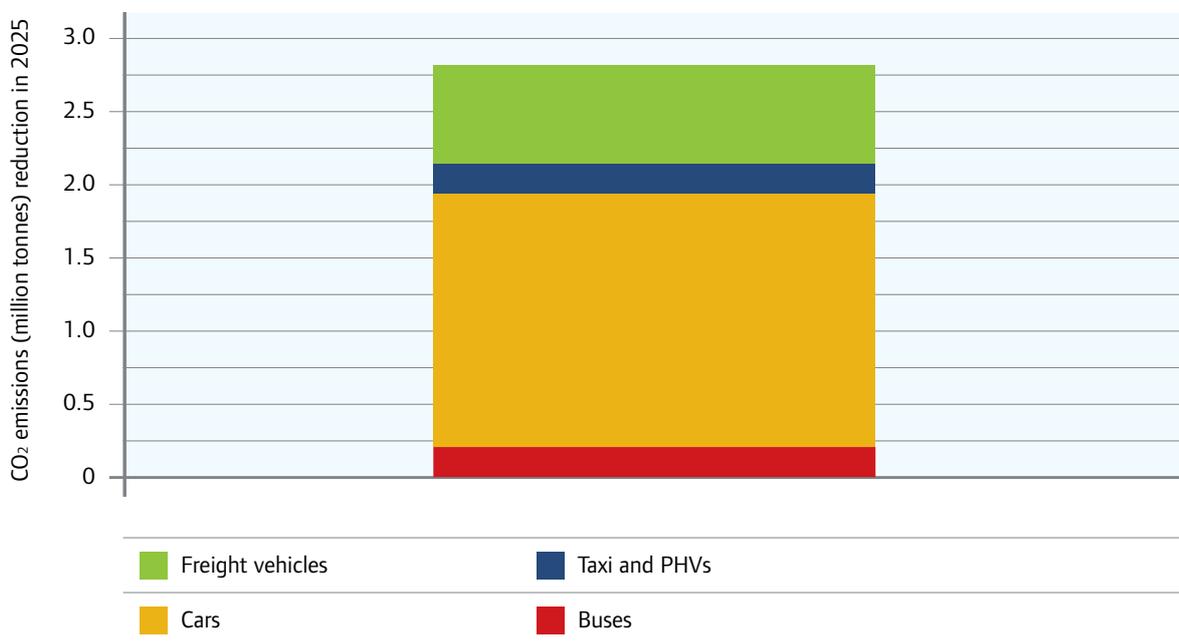
The inherent advantage of an electric motor is that typically around 90 per cent energy conversion efficiency is achieved, as opposed to around 20 per cent with internal combustion engines. CO₂ emissions associated with EVs are ultimately determined by electricity generation. Currently EVs account for around 40 per cent less CO₂ per kilometre than the average London car. As electricity generation becomes

more efficient, the carbon efficiency of EVs will improve further.

Plug-in hybrid, extended range electric and fully electric vehicles that offer the performance of conventional vehicles will be available on the mass market in the coming years. Plug-in hybrid and extended range EVs will generally have a range sufficient for a typical household's routine daily use, with the ability to use hydrocarbon-power on longer journeys. The uptake of EVs in London is a Mayoral priority, not only for environmental reasons, but also for the associated economic and job creation opportunities.



Figure 64: Annual road transport CO₂ emissions reductions by 2025, compared to 2007, due to improved vehicle efficiency



such as high-speed rail (for more details on high-speed rail, see the rail section 5.2).

- 600 The Mayor's target for CO₂ emission reductions includes emissions from ground-based aviation at Heathrow and London City airports (including take-off and landing cycles to an altitude of 1,000 metres).

Proposal 101

The Mayor, through TfL, or otherwise, will work with the DfT and other stakeholders to promote research, investment and regulation to achieve improved aviation carbon efficiency.

5.22.6 Smoothing traffic flow

- 601 Stop-start traffic conditions and congestion leads to increased CO₂ emissions. Improved management of London's road network (including rephasing of traffic signals and introduction of a state-of-the-art traffic control centre) and driver information will enable a smoother flow of traffic and ultimately reduce CO₂ emissions given a constant volume of road traffic (further detail of smoothing traffic flow is given in section 5.6, Managing the road network).

Proposal 102

The Mayor, through TfL, and working with the London boroughs, Highways Agency, and other stakeholders, will implement a package of measures (including signal timing reviews and the coordination of traffic signals) to reduce road traffic emissions by smoothing the flow of traffic and optimising the efficiency of London's road network.

5.22.7 Development and use of low carbon vehicles, energy and design principles

- ⁶⁰² Substantial reductions in transport-related CO₂ emissions are achievable through the use of low carbon vehicle technologies and fuels, particularly for road and rail-based transport. Technological hurdles to the decarbonisation of aviation and water-based transport remain more challenging. Strong incentivisation must be in place to catalyse the mass market uptake of low carbon vehicles and discourage use of higher CO₂-emitting vehicles. Implementation of distribution infrastructure networks for alternative fuel sources, such as electric charging points, biofuels and hydrogen refuelling facilities, will play a crucial enabling role. The MTS recognises other low carbon technologies may be forthcoming.
- ⁶⁰³ Figure 64 illustrates the anticipated annual CO₂ emission reductions in London in 2025 as a result of improved vehicle efficiency, compared to 2007 vehicle efficiencies.

- ⁶⁰⁴ While much can be done at a local level to accelerate the uptake of low carbon technology (for example, parking and Congestion Charging incentives and provision of support infrastructure such as electric charging points), national and international incentives in the areas of industry support and vehicle purchase and scrappage will be crucial to realising the full potential rate of change and scale of impact.

Proposal 103

The Mayor, through TfL, and by working with the London boroughs, will encourage a switch from conventional to low CO₂-emitting road vehicles and low carbon fuel sources where feasible. The Mayor will lobby Government and other stakeholders to follow suit in order to establish a package of integrated incentives across national, regional and local government to ensure low carbon road vehicles are price competitive with conventional technology.

- ⁶⁰⁵ Road vehicles currently account for around 72 per cent of ground-based transport CO₂ emissions in London. Reducing emissions from road vehicles will be achieved through a number of means, for example, improved internal combustion engine efficiency, hybridisation, biofuels, hydrogen and electric power¹. In the long run, the combination of electric power and decarbonisation of electricity generation has the potential to go a long way to the decarbonisation of car use. This would meet environmental needs, while maintaining the societal and economic benefits

¹ The Mayor launched 'An Electric Vehicle Delivery Plan for London' in May 2009

realised through the advent of affordable private motorised travel. Regulation and incentivisation will play key roles in determining the rate of change.

606 Given the international nature of the climate change challenge, the large automobile and aircraft manufacturing companies and regulations and agreements at an international level have the potential to be particularly effective. EU regulations will enforce average emissions from new cars in Europe of 130g CO₂/km from 2015 (compared to around 150g CO₂/km today), with a target of 95g CO₂/km by 2020. A similar EU directive is being negotiated for vans. The Mayor supports further development of the Copenhagen Accord to deliver a binding international agreement to tackle emissions from aviation and shipping.

607 The Mayor supports the use of sustainable biofuels. The European Renewable Energy and Fuel Quality Directives require that 10 per cent of transport energy comes from renewable sources by 2020. It is intended that the national Renewable Transport Fuel Obligation be updated to reflect the EU target.

Proposal 104

The Mayor, through TfL, or otherwise, will continue to examine the feasibility of increasing the use of sustainable biofuels in vehicle fleets controlled or regulated by Mayoral bodies, and will encourage the boroughs and other vehicle fleet operators to do likewise.

608 The Mayor aims to secure a London EV fleet of 100,000 vehicles as soon as possible, including GLA and functional body vehicles. To support the uptake of electric-powered road vehicles the Mayor is committed to supporting the delivery of a network of electric recharging points in London.

Proposal 105

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will enable and support the development and mass market uptake of low carbon road vehicles (including EVs) through, for example, the delivery of infrastructure required for the distribution of alternative transport fuel sources, including EV recharging points.

609 The Mayor recognises that the provision of charging points will play a crucial enabling role in the conversion to electric powered road vehicles and fully supports initiatives to streamline the planning process to enable implementation of EV charging points. However, he also recognises that EV charging infrastructure must be integrated sympathetically with the urban realm and on building exteriors. In particular, opportunities to integrate EV charging infrastructure with other street furniture should be sought to minimise street clutter in support of the 'better streets' initiative.

610 London's Electric Vehicle Infrastructure Strategy¹ provides further detail on plans for EV recharging infrastructure in London. The Mayor

¹ Launched by the Mayor for consultation in December 2009

is aware that mass-market introduction of EVs is dependent on joint working across a number of stakeholders. The Mayor will therefore continue to develop the London Electric Vehicle Centre of Excellence and Electric Vehicle Partnership as well as being an active member of the nationwide Low Carbon Vehicle Partnership.

- 611 The majority of London's rail-based public transport networks are electrified. The Mayor will lobby for further investment to complete electrification of London's rail network, including the Gospel Oak to Barking line. Regenerative braking (which typically provides around 15 per cent CO₂ savings) is a feature on a number of recently introduced rail fleets and is now standard on all new electric-powered rail rolling stock. Rolling stock on the Central,

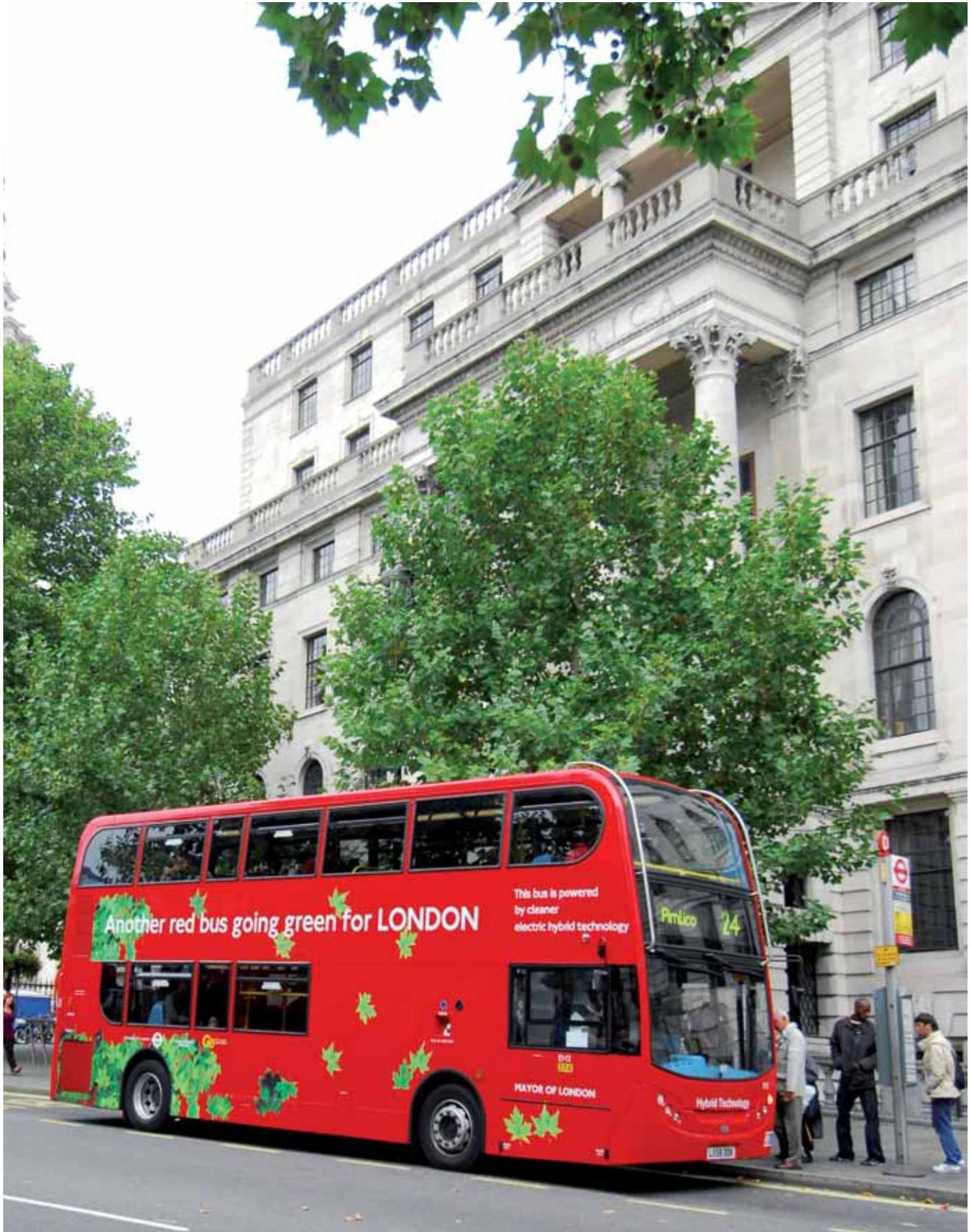
Jubilee and Northern lines, the DLR and some of the more modern National Rail fleet in London are capable of transferring electricity produced while braking to the power supply network for other trains to use.

Proposal 106

The Mayor, through TfL, and working with Network Rail, and the DfT, will endeavour to:

- a) Provide low loss electricity supply infrastructure on London's rail networks
- b) Implement regenerative braking where feasible on London's rail networks
- c) Develop, trial and seek to implement measures that minimise the loss through electricity distribution on the Underground





5.22.8 Energy supply

⁶¹² Electricity is anticipated to supply a growing proportion of transport energy requirement. Therefore, the CO₂ efficiency of transport and electricity generation will become ever more closely linked. The Mayor's support for decentralised energy production in London will lead to CO₂ savings and improve security of supply as will Government ambitions for decarbonisation of the National Grid supply. Uptake of electric powered road vehicles will increase demand for electricity. However, it is anticipated that the majority of the additional demand could be met without substantial additional generating capacity if incentives to ensure the vast majority of recharging occurs at night are provided.

Proposal 107

The Mayor, through TfL, and working with the DfT, energy companies, and other stakeholders, will deliver additional low/zero carbon electricity-generating capacity and investigate the potential for micro-generation at sites on the transport system.

5.22.9 Mayoral innovation and leadership

⁶¹³ The strategy builds on a track record of Mayoral innovation and leadership in addressing the challenge to achieve carbon efficiency. In 2007/08, TfL established a three-year £25m Climate Change Fund to support schemes to reduce CO₂ emissions and trial low carbon technologies.

⁶¹⁴ The Mayor intends to continue to lead by example to demonstrate what is achievable through low carbon best practice. A trial of light emitting diode (LED) traffic signals that reduce power consumption by around 60 per cent has been successful and funding is available to install LED signals at around 300 junctions across London. The Mayor supports the further trialling and roll-out of LED low energy lighting technology at signals, street lights, stations and other locations across London.

Proposal 108

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will promote CO₂ standards for vehicles and infrastructure controlled, procured or regulated by the Mayor, GLA Group and/or other public sector bodies (for example, public transport vehicles, taxis, street and station lighting and infrastructure embodied carbon) to reduce emissions from existing and new vehicles and infrastructure, including the following specific measures:

- a) The Mayor, through his functional bodies, will increase the proportion of his vehicle fleet powered by electricity
- b) All new buses entering fleets operated on behalf of the Mayor from 2011/12 will be lower carbon
- c) Work with vehicle manufacturers and the taxi trade to develop a new low carbon and low air pollutant version of the London taxi

- d) A trial of at least five hydrogen powered buses from 2010
- e) Trialling of low energy station lighting and automatic meter reading
- f) LED traffic signals preferred to conventional technology when replacing life-expired signal sets and further development of LED lighting leading to a preference for LED technology when replacing life-expired lighting, if proved to be feasible
- g) Major infrastructure schemes will conduct a carbon footprint assessment
- h) Where relevant, encourage the GLA group, boroughs, other public sector bodies and their suppliers to procure freight services from FORS members or freight operators able to demonstrate equivalent competencies

⁶¹⁵ The Mayor recognises that in many cases improving energy efficiency not only brings environmental benefits but can save money. TfL will participate in the Carbon Reduction Commitment, covering the use of energy for non-motive purposes (for example, lighting and offices) which provides a financial incentive to secure greater CO₂ reductions than peer organisations. TfL engagement with the

Mayor's Building Energy Efficiency Programme is anticipated to continue to reduce energy consumption in office buildings and save TfL money. The Mayor is also keen to create stronger links between efficiency requirements and procurement processes, a combination that has already demonstrated an ability to reduce environmental impacts and save money.

⁶¹⁶ It is anticipated that the previously outlined measures will be insufficient to achieve the Mayor's target for reductions in London's CO₂ emissions by 2025. Accordingly, further action from Government, the Mayor and/or London boroughs will be required. The Mayor's CCMES contains further details.

Proposal 109

The Mayor, through TfL, and working with the London boroughs, DfT, Highways Agency, and other stakeholders, will keep under review the option of road user charging and/or regulatory demand management measures to influence a shift to more CO₂-efficient private and commercial road vehicles, and to lower carbon travel options such as walking, cycling and public transport.

5.23 Adapting to climate change

5.23.1 Introduction

- ⁶¹⁷ There is substantive scientific evidence that our climate is changing. Despite efforts to mitigate emissions of greenhouse gases, deviations from long-term climatic trends experienced over past years are projected to intensify. Changes in London's climate as a result of increasing concentrations of greenhouse gases (most notably CO₂) in the earth's atmosphere are anticipated to be milder, wetter winters and hotter, drier summers. An increased frequency of 'extreme' weather conditions such as heatwaves, droughts, tidal surges, storms and heavy rainfall is also predicted.
- ⁶¹⁸ The result would bring an increased risk of flooding, storm damage, droughts and uncomfortably hot weather, together with secondary consequences such as increased incidence of ground instability/movement and periods of poor air quality in the summer. Furthermore, sea levels are forecast to rise, adding to the risk of flooding. Climate change is anticipated to have health impacts on Londoners, ranging from heat-related illnesses to injuries, stress and anxiety caused by extreme weather events. In addition, heatwaves can exacerbate the health impacts of air pollution.
- ⁶¹⁹ The Mayor's Climate Change Adaptation Strategy sets out the priorities for climate change related risk assessment, including for transport infrastructure and services.
- ⁶²⁰ The London transport system comprises infrastructure that has been built over a number of centuries to varying standards and specifications. Long-lived infrastructure such as embankments, cuttings and bridges will be vulnerable to climate change as a result of increased incidence of intense rainfall and greater inter-seasonal temperature and soil moisture variation. Additionally, the London Regional Flood Risk Appraisal finds that around a quarter of Underground (including DLR) stations, 15 per cent of rail stations, 30 per cent of bus depots and London City airport are in locations identified as being at risk from tidal or fluvial flooding. A programme of risk assessment must be completed to gain a better understanding of the vulnerability of the transport system to the threats posed by climate change.

Proposal 110

The Mayor, through TfL, and by working with the London boroughs, Network Rail, Highways Agency, airport operators and other stakeholders, will determine the vulnerability of transport assets to the impacts of climate change and maintain existing infrastructure (including remedial works where effective and affordable) to improve resilience to climate change.

- ⁶²¹ Effective and affordable solutions must be sought to reduce potential risk to passengers from the threats posed by climate change, and improve the operational resilience of the transport system. In some instances alteration of maintenance regimes may achieve improved resilience to the threats of climate change. For

example, poorly maintained storm drains have been identified as the source of some past Tube flooding incidences.

- 622 Measures to adapt to future climate change will make London's transport system more resilient to extreme weather conditions that currently occur, often with significant impacts. For example, the rainstorm of 7 August 2002 forced five main line London rail termini to shut for a number of hours over the rush hour.

Proposal 111

The Mayor, through TfL, and working with the London boroughs, Network Rail, and other stakeholders, will prepare adaptation strategies to improve safety and network resilience to threats posed by climate change, and ensure that new transport infrastructure is appropriately resilient. The adaptation strategy should include:

- a) Climate change impacts risk assessment of infrastructure and operations to identify key risks and mitigation opportunities
- b) The prioritisation of identified risks and proposals for appropriate management and/or mitigation action plans, including emergency planning and investment plans
- c) Guidelines for major procurement contracts (including design, construction and maintenance) to demonstrate a climate risk assessment for the lifetime of the investment

- 623 To ensure long-term value for money is achieved through transport investment

programmes, new transport infrastructure must also be designed and built with climate change in mind. The existing system will be adapted where possible in a cost effective manner.

Proposal 112

The Mayor, through TfL, and working with the London boroughs, Network Rail and other transport infrastructure owners, will ensure the transport system is developed with climate change in mind, by:

- a) Designing, locating and constructing new infrastructure to withstand climatic conditions anticipated over its design life
- b) Introducing energy efficient air-conditioned rolling stock where feasible, for example, on London Overground services and sub-surface Tube lines
- c) Continuing to investigate the feasibility of innovative methods of cooling the deep tunnelled sections of the Tube network
- d) Ensuring that all new buses entering the London fleet will feature specific climate change adaptation measures

- 624 Increasing the number of trees and vegetation in London (urban greening) will contribute climate change adaptation and mitigation by providing shade and absorbing rain water. This will also enhance the built environment by improving the urban realm and increasing biodiversity.

Proposal 113

The Mayor, through TfL, and working with London boroughs, Network Rail and other transport infrastructure owners, will plant an additional 10,000 street trees by 2012, with the ambition of an additional two million trees in London's parks, gardens and green spaces by 2025.

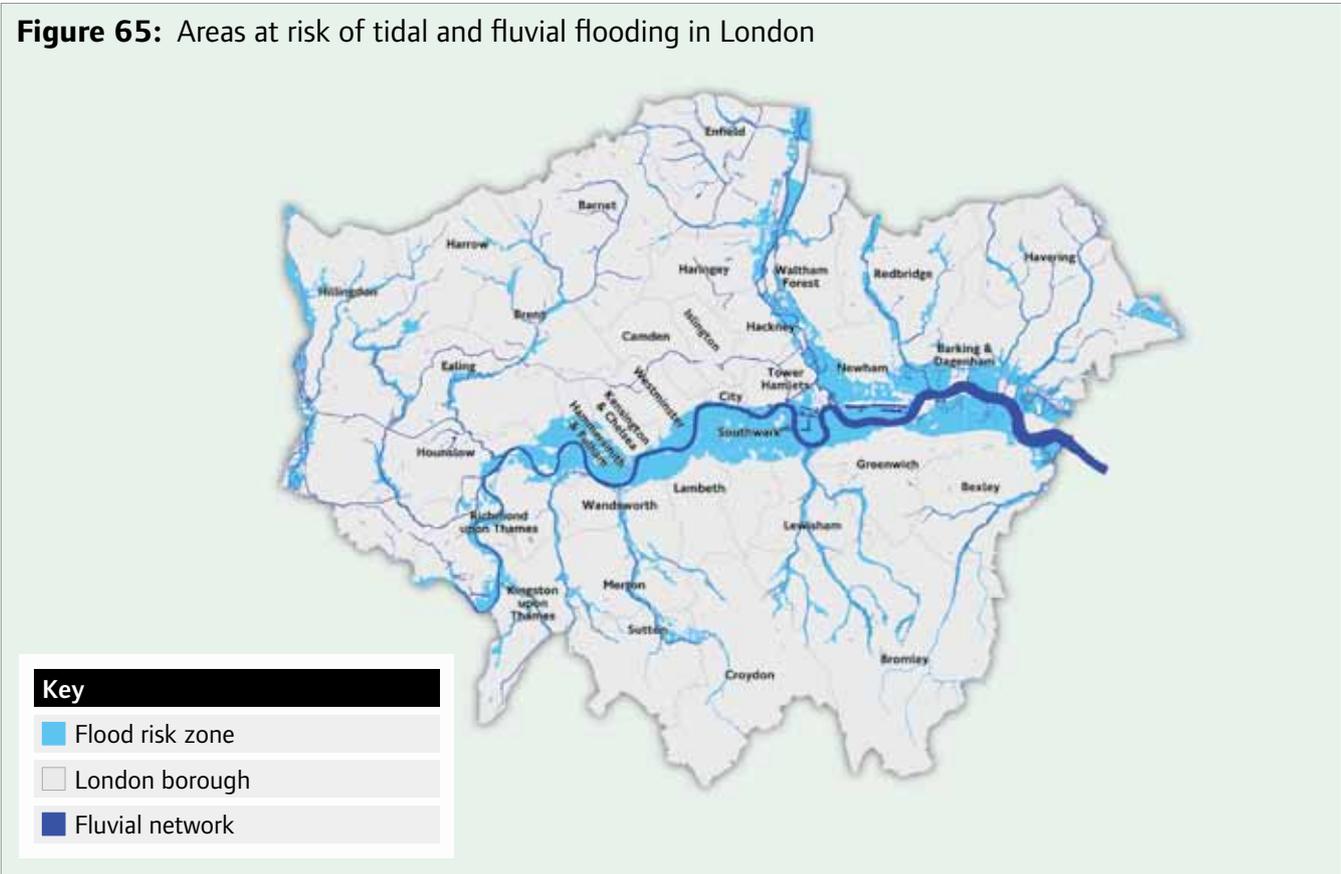
625 Despite best efforts to assess, manage and mitigate risks, it will be impractical and unaffordable to eliminate all risks posed by climate change to London's transport system. However, as the occurrence of severe weather

events increase in future years, contingency planning for these conditions will become ever more important in maintaining a safe and reliable transport system. Figure 65 shows areas of London at tidal and fluvial flood risk.

Proposal 114

The Mayor, through TfL, and working with the London boroughs, Network Rail, and other stakeholders, will develop and test plans and procedures to minimise risk to person and property, manage disruption and ensure rapid transport system recovery from the impact of climate change related events.

Figure 65: Areas at risk of tidal and fluvial flooding in London





Proposals to manage the demand for travel

5.24 Better journey planning and smarter travel for people and goods

5.24.1 Public transport and road user information

⁶²⁶ Good quality information will improve passenger flow, with associated wellbeing benefits of convenience and ease which can improve the journey experience, especially if disruptions occur. Current satisfaction for road traffic information is less than 60 per cent, so there is clearly more to do. For public transport, customer satisfaction on information is rising. There is the opportunity to build on TfL's extensive work in this area, such as its award-winning website, Journey Planner and iBus, by allowing wider access to service information anywhere in London using mobile phone and internet technology, resulting in better journey planning. This benefits regular users, tourists and other visitors to London who may be unfamiliar with the Capital's complex transport system.

Proposal 115

The Mayor, through TfL, and working with the London boroughs, DfT, Network Rail, train operating companies, and other stakeholders, will enhance the provision of information to improve customers' knowledge and understanding of service availability, delays and other information to improve customer satisfaction, and the way Londoners use public transport and make travel decisions, by:

- a) Improving the provision of real time and other journey planning information, including upgrading the TfL web-based journey planner, allowing further improvements to its real time performance, accuracy and personalisation
- b) Providing customers with a range of paper-based information (Tube, cycle and bus 'spider' maps, timetables, fares and service changes)
- c) Raising public awareness and knowledge of existing public transport provision, particularly, orbital public transport services

- d) Further development of journey planning, including web-based information, for local trips to town centres
- e) Developing town centre journey planning tools consistent with other information resources proposed in the strategy

5.24.2 Smarter travel initiatives

⁶²⁷ Smarter travel aims to reduce congestion, improve health and reduce transport's contribution to climate change by helping people to make the most effective use of London's transport network and encouraging greater use of public transport, cycling and walking. This involves a range of initiatives such as: raising awareness of available travel options through targeted promotions; supporting sustainable travel through small scale infrastructure projects such as cycle racks; building an understanding of factors motivating travel behaviour; and engaging directly with schools, workplaces and local communities. In addition, smarter travel provides the opportunity to explore flexible working patterns and support measures that limit the need to travel.

⁶²⁸ The objectives of smarter travel initiatives are to:

- Deliver more sustainable patterns of vehicle ownership and use
- Change people's travel patterns to avoid congested times and places
- Deliver a mode shift to public transport, cycling or walking instead of car use

- Deliver a mode shift to walking and cycling instead of public transport use
- Promote healthy travel options

⁶²⁹ The main smarter travel activities being undertaken by TfL, the boroughs and others are:

- School travel planning: More than 90 per cent of London schools now have a travel plan in place, with an average 6.5 per cent reduction in the number of car journeys to schools that have undertaken post-implementation monitoring. The Mayor's school cycle parking initiative provides for needs identified in the school travel plans and has achieved a 43 per cent increase in cycling in the 22 per cent of London schools that have received modern cycle parking facilities through the scheme
- Workplace travel planning: More than 400 organisations collectively employing in excess of 450,000 staff now have TfL-supported travel plans in place. An average 13 per cent reduction in the number of car journeys for trips to work has been recorded from those that have undertaken post-implementation monitoring
- Car clubs: More than 1,600 car club vehicles are used by 100,000 people in London, with vehicles including plug-in hybrids and the latest low emission diesels. Each car club vehicle typically results in eight privately owned vehicles being sold, and members reducing their annual car mileage by more than 25 per cent. A further 380 vehicles will be added to London's car club fleet in 2010/11 which will include the trial of EVs

Case study

Transport and schools – New City Primary School

New City Primary School runs its own cycling club for students in Years 4, 5 and 6. To encourage cycling to school in the winter, the school introduced an early morning cycle club in the playground. The children now run the club every day of the week (including some evenings) all year round. Membership rose to 150 pupils and many more children now cycle to school. The school has two areas for bike storage on site and provides cycle training to pupils, parents and staff. The school also offers cycling as part of the PE lesson activity for all year groups. Bike maintenance workshops take place regularly, as well as cycle instructor training for interested staff and parents.

As a result, cycling levels among staff have doubled. In addition, 84 per cent of children now walk to school, 12 per cent cycle and in 2009, none reported being driven regularly to school – an inspiring outcome for the school travel plan.



- Travel awareness: This focuses on changing behaviour by promoting 'better ways to travel' for residents across London. A personal travel plan programme, designed to help individuals get the best from the travel network and to make better choices is being made available to all boroughs
- Integrated Towns Programme: Smarter Travel Richmond (STR), which was launched in March 2009 will continue through to the end of 2011. The programme showcases the use of integrated smarter travel techniques alongside infrastructure

improvements, such as new cycle routes and pedestrian and public realm improvements. The overall target for the STR programme is to achieve an increase of five per cent in the combined modal share for walking, cycling and public transport in the borough. The Richmond programme follows Smarter Travel Sutton, which achieved a six per cent reduction in the mode share of the car (driver or passenger) and the delivery of school travel planning to 100 per cent of schools at the end of its programme (2006 to 2009)

- Public transport crowding relief: Recent projects, such as the Wimbledon schools walking initiative, have demonstrated that smarter travel measures can successfully help tackle core issues such as crowding on buses during term time
- Keeping London moving and working during the 2012 Games: Smarter travel delivery measures are being developed in partnership with the ODA and will contribute to the legacy of more walking and cycling in London
- Integrated delivery: Programmes such as the Cycle Superhighways will include complementary smarter travel initiatives along the corridors to raise awareness and use, and help break down barriers to cycling by working with communities, schools and workplaces along the routes

⁶³⁰ As smarter travel offers a cost-effective way of encouraging greater use of public transport, cycling and walking, with associated benefits that tackle congestion, reduce CO₂ and improve health, these initiatives will continue and be widened to include new areas of engagement. For example, piloting travel planning for higher education and further education institutions.

⁶³¹ In addition, the Mayor also proposes that more localised smarter travel interventions should be targeted to reduce or manage traffic flows in particularly sensitive locations, for example, along key road links or at bottlenecks on the network to control traffic volumes and improve reliability.

Proposal 116

The Mayor, through TfL, and working with the London boroughs and other stakeholders, will use smarter travel initiatives across London to facilitate more efficient use of the transport system, achieve mode shift to cycling, walking and public transport and encourage the take-up of healthier travel options.

5.24.3 Smarter transport of freight and services

⁶³² The London Freight Plan identifies four key projects to deliver freight in London more efficiently and sustainably. Given freight's role as a major road network user, improving freight operations will help reduce conflicts with other modes of transport, pedestrians and cyclists.

⁶³³ FORS helps organisations who join the scheme to increase operational efficiency, reduce CO₂ emissions, lower the risk of potential collisions, reduce costs and contribute to lower congestion. The scheme also provides driver and management training programmes and, therefore, promotes safer and more fuel-efficient operations through better driver behaviour.

- 634 DSPs are designed to increase the operational efficiency of buildings by providing a framework to better manage the transport impacts of supply chains including the timing and location of delivery activity.
- 635 CLPs have similar overall objectives to DSPs, but are focused on the design and construction phases of premises, supporting and improving the efficiency and sustainability of construction supply chains. They are seen as key to encouraging modal shift for large-scale developments.
- 636 Freight Quality Partnerships (FQP) provide a mechanism for TfL, boroughs, freight operators and other stakeholders to liaise with each other and work together to conduct research and develop solutions for sub-regional freight issues. Hauliers and other businesses in the supply chain are able to raise issues they face with organisations responsible for highway and transport planning to help them work more efficiently. Local authorities can gain a greater understanding of these issues and are able to encourage more environmentally and socially-responsible practices from operators, through such partnerships.

Proposal 117

The Mayor, through TfL, and working with the London boroughs, and other stakeholders in the public and private sectors, will improve the efficiency and effectiveness of freight operations through the promotion of ‘delivery and servicing plans’, ‘construction logistics plans’, the Freight Operator Recognition Scheme, Freight Quality Partnerships and other efficiency measures across London.

- 637 The London freight information portal will help London’s public authorities (the GLA and boroughs, for example) and freight operators exchange information about:
- Improving operational efficiency of freight and servicing in London
 - Encouraging better driver behaviour, the use of alternative fuels and the uptake of low carbon vehicles
 - Reducing freight operators’ administrative costs
 - Enhancing freight journey planning

Proposal 118

The Mayor, through TfL, and working with the London boroughs, freight industry, and other stakeholders, will develop the London freight information portal to exchange information and share knowledge to ultimately improve the performance of freight operators, boroughs and TfL.

Spotlight

Freight in London

Freight transport uses a number of modes, from international and national freight by air, rail, sea, pipeline and road, through to local distribution and servicing, predominantly undertaken by road vehicles. Total freight lifted in London in 2007 was 139m tonnes, with a split by mode that amounted to 88 per cent by road, six per cent by water, five per cent by rail, and 1.2 per cent by air (2005 figures). Fifty six million tonnes of that total freight tonnage were moved wholly within London. Heathrow handles 56 per cent of all UK airfreight and generates around two million road-related freight trips each year.

The movement of waste is another important part of London's freight transport. Freight requires road space, warehousing facilities, rail freight yards, depots and terminals, river wharves and kerb space for deliveries. In this way, freight must also be closely integrated with land use planning to ensure it has adequate

space for facilities. On London's streets, freight not only contributes to congestion, but also significantly suffers the consequences of it. As a result, freight transport impacts on all the goals contained in this strategy.

Freight makes up about 17 per cent of all road traffic. Forecasting suggests that this traffic will grow by 25 per cent between now and 2031 as London's economy and population grow, increasing congestion and servicing costs. Road freight currently accounts for 23 per cent of London's CO₂ emissions from transport. Without measures to encourage more sustainable distribution, the growth in freight will lead to more CO₂ emissions and more noise.

To improve freight and servicing for London, the roll-out of measures outlined in the London Freight Plan is essential, and includes the FORS, DSPs, CLPs and freight information portal.



The impacts of freight growth may be further mitigated by measures to facilitate mode shift or allow deliveries and servicing by road to be undertaken in more sustainable ways. For example, expanding the use of break-bulk facilities and freight consolidation centres as well as making use of more fuel efficient vehicles, including expanding the use of EVs will be important.

Providing additional rail freight terminals to serve London, including opportunities to take advantage of the potential for high-speed rail freight, will also need to be further explored. The continued expansion of port facilities such as the new London Gateway port in Essex (with 60 per cent in container growth forecast between 2004 and 2016) will further increase freight transport to/from and via London. However, there remains a need to find alternative routes for rail freight to/from such ports (currently 10 per cent of

National Rail freight moves via London, yet only three per cent has London as its destination, and only one per cent has London as its origin), to avoid conflicts with passenger rail services in London.

There is also potential to make further use of the Blue Ribbon Network for some freight movements which may require new or upgraded infrastructure, as seen at the Three Mills Lock in east London, built to accommodate barges carrying construction material to the Olympic Park.

In Outer London, improving freight and servicing, for major industrial and business parks and in town centres is especially important. For example, servicing retail outlets and town centres is often a particularly challenging issue given the space and loading/unloading constraints, causing supply chain risks for retailers and freight operators.



- 638 These proposals are complemented by proposals for rail and water freight facilities which are set out in later sections of this strategy. Additional investment will enable an increasing share of freight movement to be borne by these modes.
- 639 For freight which cannot be transferred from road to rail or water, there may be additional opportunities to consider more sustainable movement by road, using low or zero emission vehicles.

Proposal 119

The Mayor, through TfL, working with the London boroughs, freight operators and other stakeholders, will support the introduction of consolidation centres and break-bulk facilities where appropriate, especially at Strategic Industrial Locations, to allow distributed goods to be transferred from lorries using the trunk road network to more environmentally friendly vehicles for servicing urban centres.

- 640 For the densest urban areas, local delivery and collection points with good cycle and pedestrian accessibility also have potential to limit the growth in freight movement by road.
- 641 As these proposals are developed and rolled-out the full extent of their likely impact will become apparent. Using these approach options for increased incentivisation or regulation may need to be considered.

5.25 Fares and ticketing

5.25.1 Fares levels

- 642 Fare income is the life blood of any transport operator. Fares have to be set at levels which allow TfL to sustain the operational delivery of public transport while maintaining affordability to the maximum possible extent. Focus by operators on achieving value for money in their operations is essential if this is to be achieved.
- 643 Fares policy involves striking a balance between the fare levels charged for public transport, the amount of subsidy provided for eligible groups of users, and the quantity and quality of public transport provided by operators. Under the GLA Act 1999, fares setting is the responsibility of the Mayor.

Proposal 120

The Mayor will ensure that fares provide an appropriate and necessary level of financial contribution towards the cost of providing public transport services to ensure that public transport continues to play a central role in London's transport system and overall economic development.

5.25.2 Concessionary fares

- 644 TfL currently offers a number of fare concessions to those least able to pay. The bulk of the cost of providing free travel for those above 60 and disabled people is borne by the boroughs. All other concessions are funded internally by TfL. This is a significant cost: for example, people in receipt of free or reduced fares on buses make up almost 40 per cent of all bus passengers.

- 645 Given the constraints on external funding available to TfL, the likely impact of the current economic recession on revenue from fares and the need to maintain capital investment, it is essential that the scale and scope of concessions offered is both affordable and sustainable. At the same time they should be appropriately targeted to maximise the social benefits that they enable.

Proposal 121

The Mayor will keep the range of concessions for which he is responsible under review to ensure that they are focused on where they will be most effective at helping those in most need of them. Concessions for schoolchildren are also conditional on good behaviour. If removed for poor behaviour, concessions can be earned back through programmes of community activity and good behaviour.

5.25.3 Fares collection

- 646 Historically, it has been overly complicated and time-consuming for customers to identify the right ticket for their public transport needs and to pay for it. This has been inefficient for users and operators of public transport: users have to invest their valuable time in figuring out and navigating the range of tickets available, and operators have to bear the cost of running complex ticketing systems. Simplification of London's fare collection system is therefore desirable from both perspectives.
- 647 TfL's Oyster smartcard has been a great success in this respect by reducing the need to queue for tickets through the use of the 'pay as you go' product and through the introduction of online sales options. Now, more than 80 per cent of journeys on TfL services are made using Oyster smartcards.
- 648 Oyster has also enabled further integration of fare collection between different modes of public transport, building on the success of the range of Travelcard tickets offered by TfL and National Rail. Integration encompasses the use of common ticket types and the standardisation of fares for journeys that can be completed on more than one mode of transport. Integration of fare payment across modes speeds up public transport journeys where more than one mode is required by eliminating the need for intermediate ticket purchases, and so encourages greater use of public transport. Oyster has also led to reduced opportunities for fare evasion.
- 649 Much progress has been made on integration within London, notably including the extension of Oyster pay as you go acceptance to the National Rail network from January 2010.

Proposal 122

The Mayor, through TfL, will seek to conclude the creation of a fully integrated fare collection system for London that covers both TfL and National Rail services with a common set of travel products simplified to the maximum extent possible, in cooperation with the Association of Train Operating Companies and the DfT.

⁶⁵⁰ Fare collection systems are expensive. Operators of public transport in cities typically bear the full cost of running the ticketing system and this can exceed 10 per cent of the revenue collected. Fortunately, new contactless-capable devices are being introduced by the financial services industry (and may soon be introduced by the mobile telecommunications and consumer electronics industries) that could provide opportunities to reduce these costs by using contactless credit and debit cards, mobile phones or other devices to pay directly on entry and exit. These technologies could be applied across all of London's transport modes, including river services, at National Rail stations, on trains, and, potentially, in taxis too.

Proposal 123

The Mayor, through TfL, and working with the London boroughs, train operating companies, other transport operators and stakeholders, will explore ways to reduce the cost of revenue collection and to make fare payment quicker and more convenient for passengers through the use of new technology and other initiatives.

5.26 Parking and loading

5.26.1 The role of parking and loading

⁶⁵¹ The Mayor recognises the essential role of parking and provision for loading in supporting economic development and to allow journeys where there is no viable alternative. This is particularly the case in Outer London where car use is higher. However, parking regulation is also an effective method in encouraging the use of public transport, walking and cycling which in turn can mitigate the negative impacts of road traffic and car dependency. Loading regulation can be an effective way of influencing the time of delivery and its effect on congestion.

5.26.2 Parking and loading regulations and enforcement

⁶⁵² Parking provision standards at developments are detailed in the London Plan.

⁶⁵³ Over a number of years, TfL and the boroughs have improved levels of compliance with parking regulations. However, there is growing concern from drivers and stakeholders in London that enforcement can be unfair and unreasonable and that regulations across the Capital are inconsistent and confusing. On average, councils receive some form of challenge on nearly 20 per cent of Penalty Charge Notices issued. Whether unfairness is perceived or actual, these complaints may be compounded by the complex array of parking rules in place. More consistent regulations and enforcement practises, combined

with more advance information regarding local parking restrictions, should result in lower levels of unintended parking contraventions and fewer stressed drivers.

- 654 Taxis are also dependent on the ability to pull over to collect or deposit passengers. This has associated impacts on road network capacity and smoothing traffic flow.
- 655 To improve drivers' journey experience on the road network, TfL has developed a Driver Charter. Its four central themes are:
- Common sense approach towards enforcement, to help drivers avoid receiving penalties
 - Simplifying loading bay regulations
 - Simplifying the penalty payment and representation processes
 - Apologising and automatically cancelling the penalty if any mistake is made

Proposal 124

The Mayor, through TfL, and working with the London boroughs, London Councils, and other stakeholders, will seek to ensure fair and consistent enforcement of parking and loading regulations across London, together with more consistent regulations, clearer signage, and more advance information regarding parking availability. Pan-London parking provision and regulations information will be published on the internet in an easy-to-access format.

5.26.3 Motorcycle and scooter parking

- 656 The Mayor recognises that provision and regulations for motorcycle and scooter parking is best addressed at a local level to meet local needs and objectives.

5.26.4 Parking charges

- 657 Parking charges enable demand for parking to be better matched with parking space supply.
- 658 Parking controls have been identified as one of the key measures that can be implemented at a local level to encourage the purchase and use of road vehicles with low CO₂ and air pollutant emissions. The Mayor therefore wishes to develop and promote the concept that parking charges vary not only by location and duration of stay, but also by the environmental impact of the vehicle.

Proposal 125

The Mayor, through TfL, and working with the London boroughs, car park operators, and other stakeholders, will encourage implementation of pricing differentials based on vehicle emissions, including banded resident parking permits and other on and off-street parking charges, including incentives for EVs.

5.26.5 Controlled parking zones

- 659 Controlled parking zones (CPZs) are intended to manage competing pressures for limited parking supply in areas of high parking demand. The Mayor will offer continued support to the introduction of CPZs where

boroughs consider they would be beneficial. The Mayor would also support boroughs to explore the possibility of integrating CPZ enforcement with other community enhancement activities.

5.26.6 Commercial vehicle loading and waiting

- ⁶⁶⁰ Road freight dominates the collection and delivery of goods and waste and is essential to keep London functioning. Industries such as manufacturing, construction and retail are particularly dependent on the physical movement of goods.
- ⁶⁶¹ Waiting and loading arrangements for freight are important factors in ensuring fair allocation of limited road space, enabling efficient freight operations and smoothing traffic flow. It is in the interest of all parties to minimise the potential negative environmental and congestion impacts of freight distribution. With a constrained supply and high demand for on-street loading/waiting facilities, new developments should assess required commercial vehicle parking/waiting facilities and ensure adequate provision is made off-street.

Proposal 126

The Mayor, through TfL, the LDA, and working with the London boroughs and other stakeholders, will seek to ensure that new developments generating significant volumes of freight activity provide adequate off-street lorry parking and waiting facilities.

5.26.7 Park and ride

- ⁶⁶² Park and ride is widely promoted in many regional towns and cities as an alternative to city centre parking, primarily to reduce congestion. Many of London's rail and Tube stations, especially in Outer London, have station car parks, and so 'park and ride' at stations is widespread in London. The Mayor is supportive of further park and ride schemes, including those serving Outer London town centres, where they bring net benefits to the road network as set out in the TfL Park and Ride Assessment Framework (see glossary).

Proposal 127

The Mayor, through TfL, the LDA, and working with the London boroughs and other stakeholders, will support those park and ride schemes in Outer London that lead to an overall reduction in congestion, journey times and road vehicle kilometres.

5.27 Road user charging for economic and environmental aims

5.27.1 Introduction

⁶⁶³ Road user charging can be effective in altering travel patterns and can be tailored to support sustainable transport objectives. Yet it is clearly a contentious policy as the rejection of proposed schemes in Edinburgh and Manchester show. The response to the Mayor's informal consultation on the Western Extension and the response to the consultation on the draft of this strategy makes this clear. Therefore any potential schemes must be carefully designed to fit local conditions if they are to be effective and regarded as reasonable. London has already implemented two sizeable road user charges in the form of the central London Congestion Charging scheme (which is focused on reducing the impact of congestion on the economy; as set out in section 5.27.2) and the London LEZ (which seeks to discourage the most individually polluting vehicles from travelling in the Capital to improve air quality; see section 5.21).

5.27.2 Background to Congestion Charging in central London

⁶⁶⁴ In central London, with diverse and competing demands on the road network, effective management of scarce road capacity is a key priority. To assist with this, the central London Congestion Charging scheme was introduced in February 2003, delivering significant congestion reduction benefits. The Western

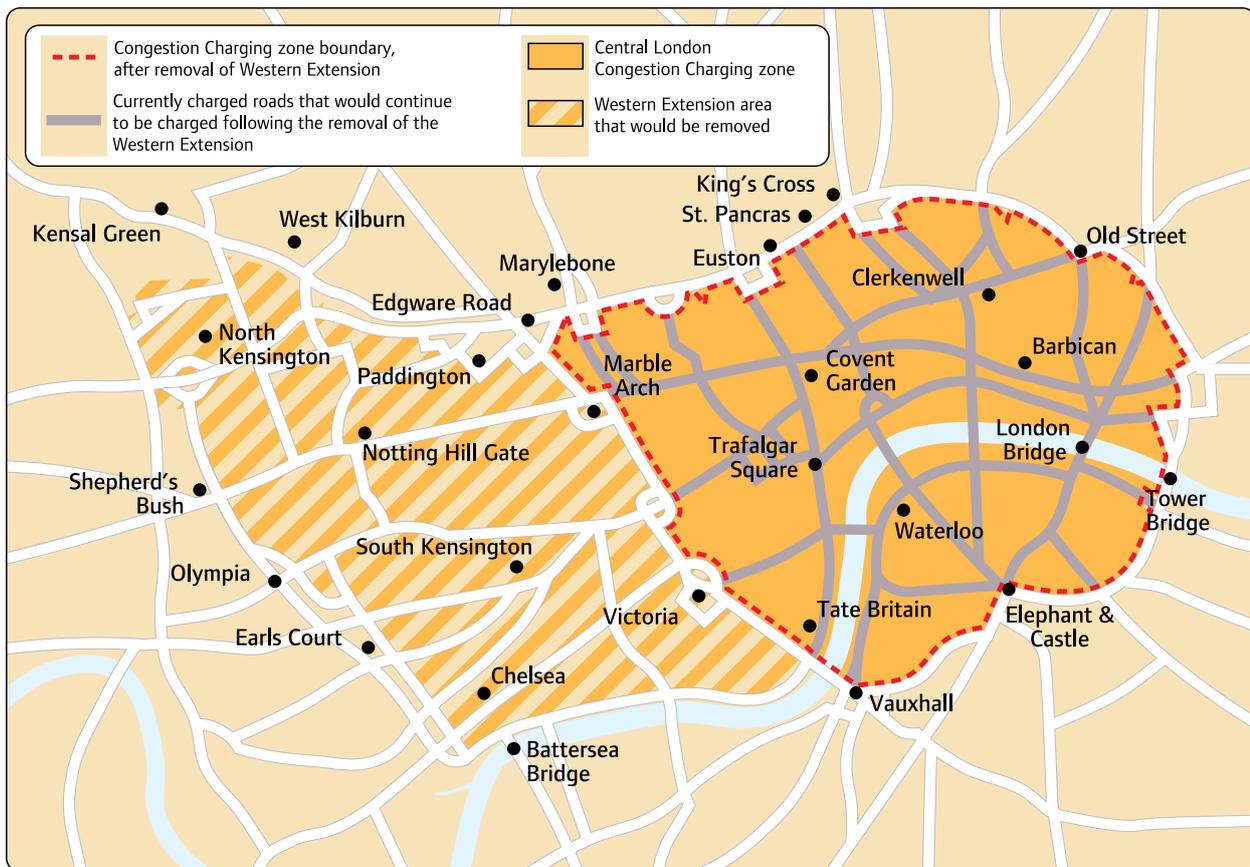
Extension of the scheme was introduced in February 2007.

⁶⁶⁵ The Congestion Charging scheme has substantially reduced traffic volumes, and achieved relative reductions in congestion, though actual congestion intensities have returned to nearer pre-charging levels as a consequence of road space being reduced by street works and re-allocated to assist pedestrians, cyclists and buses. The lower levels of weekday traffic have also meant some reductions in road collisions and vehicular emissions of CO₂ and atmospheric pollutants, though the predominance of other factors means that there has been no measurable impact on local air quality. By reducing the road space required for road vehicles, the scheme has also facilitated other measures, such as public realm enhancements. It has also generated substantial net revenues which have been reinvested in transport in London.

5.27.3 Concerns over the impacts of Congestion Charging in the Western Extension

⁶⁶⁶ Concerns have regularly been raised about the impact of the Western Extension on the local economy. Business owners and employers have described weaker sales and reduced profitability in the year following the introduction of charging in the Western Extension. By comparison, no such falls were reported elsewhere in comparator non-charging locations¹. Emerging analysis also suggests that the charge may have contributed to a

¹ Central London Congestion Charging Impacts Monitoring: Sixth Annual Report, July 2008, TfL

Figure 66: Extent of the Western Extension to the Congestion Charging zone

small decline in the rate of formation of small enterprises, while similar analysis in the original central London zone showed no discernible effect on the enterprise population in the area¹.

⁶⁶⁷ Traffic and congestion patterns in the Western Extension are somewhat different from those in the original central zone. For example, there is a higher proportion of vehicles driven by local residents, average speeds are higher and the intensity of congestion is somewhat lower. Meanwhile, there is slightly lower provision

of public transport than in the original zone – albeit still very good – which makes alternative journeys a little more awkward for those, both residents of the zone and non-residents, who would prefer to switch to alternative modes to avoid the charge.

⁶⁶⁸ The effects of the Western Extension have been lower than the original zone, with a decrease in traffic entering the Western Extension of around 10 to 15 per cent compared with a reduction of around 15 to 20 per cent in traffic entering the

¹ The Impact of the Congestion Charge on the Dynamics of the Enterprise Population, 2008, Beta Model Ltd

original zone. In round terms, the daily charge has resulted in a 10-minute saving on a round trip into and out of the original central London zone. The same charge delivers savings of around five minutes on a round trip into and out of the Western Extension – half the benefit for the same charge.

5.27.4 The future of the Western Extension of the central London Congestion Charging zone

- ⁶⁶⁹ In 2008 the Mayor held an informal consultation on the future of the Western Extension. This set out options of removing the zone, keeping it as it is, or changing it, for example, by charging only at peak times. Overwhelmingly, respondents to this informal consultation favoured the removal of the Western Extension. The public consultation on the draft of this MTS confirmed the strong public support to remove the Western Extension, though stakeholder views were more divided.
- ⁶⁷⁰ Those responding to these consultations who argued in favour of removing the Western Extension highlighted a range of concerns. Stakeholders, businesses and members of the public raised concerns about the impact of the charging on the local economy.
- ⁶⁷¹ Concerns have also been raised over social impacts from charging, such as community severance at the northern boundary of the Western Extension.
- ⁶⁷² In light of the concerns raised in consultation and in other forums, and because of the relatively lower benefits of the Western Extension, the Mayor proposes that TfL should make a Variation Order to remove the Western Extension and to focus Congestion Charging in the original central London zone where the benefits of the scheme and local conditions make a charge throughout the day more economically justifiable.
- ⁶⁷³ Those currently paying the charge to access the Western Extension would gain by not paying the charge, although there would be a reduction in income for TfL. An alternative package of measures would be used in pursuit of the outcomes that the Western Extension had been intended to achieve and to mitigate the impact of its withdrawal.
- ⁶⁷⁴ The return of the currently deterred traffic to the Western Extension area would tend to increase congestion there. The measures that the Mayor is proposing that should act to mitigate increases, include:
- The accelerated introduction of computer optimised traffic light timings in the area to reduce delays and improve management of traffic flows
 - Improved management of streetworks through the LondonWorks permit scheme and the use of steel plating to cover excavations when work is not in progress
 - Reviews of traffic signal locations and timings

- Increased CCTV coverage of roads in the Western Extension area to allow remote observation by the London Traffic Control Centre and facilitate intervention when incidents occur
 - Improving information to help people make informed journey plans and make the most efficient use of the road network
 - Ongoing improvement to the TLRN, and to the local road network in the Western Extension area through Local Implementation Plans
 - Other measures in the Mayor's smoothing traffic flow programme, and measures to improve freight efficiency, such as FORS
- ⁶⁷⁵ Action will be taken to encourage the use of sustainable modes such as the Mayor's Cycle Hire Scheme and Cycle Superhighways, travel planning for schools and businesses, and funding car club bays in the Western Extension area to allow for expansion of these schemes which reduce car ownership and use.
- ⁶⁷⁶ Possible increases in air quality pollutant emissions arising from additional traffic (which are very small in the context of London as whole) would be mitigated by a number of other measures set out in this strategy and the Mayor's Air Quality Strategy, in particular, extensions to the LEZ. Related increases in emissions of CO₂ would be tackled on a London-wide basis.

⁶⁷⁷ While it is unlikely that these measures would fully offset the impacts of returning traffic on congestion, complete mitigation would require road capacity to be allocated away from other worthwhile schemes such as improvements that have been made to the urban realm, priority for sustainable modes, and space that is available for the Mayor's Cycle Hire Scheme.

⁶⁷⁸ However, the removal of the Western Extension would be likely to reduce by a few per cent traffic and congestion in the original central London zone because some traffic which currently passes through the original zone on the way to, or from, the Western Extension would revert to driving around it to avoid paying a charge.

5.27.5 Removal of the Western Extension and continued operation of the remaining central London Congestion Charging zone

⁶⁷⁹ The GLA Act provides that the Western Extension of the central London Congestion Charging zone may only be revoked if it appears desirable or expedient for the purpose of directly, or indirectly, facilitating the achievement of any policies or proposals set out in the MTS. The revocation must be contained in an order.

⁶⁸⁰ In accordance with proposal 128, TfL will consult the public and stakeholders on a variation order for the revocation of the Western Extension of the central London Congestion Charging zone, providing an opportunity for interested parties to make

representations on the proposed change including its conformity with the MTS.

- 681 In deciding whether to confirm the order the Mayor will have regard to the requirements of the GLA Act and any representations and objections received in response to consultation.
- 682 Regardless of the proposed removal of the Western Extension zone, the Mayor will continue to operate the Congestion Charging scheme in the remaining central London zone. He will consider opportunities to improve the scheme as they arise, for instance, through the development of new technologies, feedback from scheme users or stakeholders, or the emergence of new examples of best practise, to ensure it continues to provide the best possible means of achieving the desired outcomes of the MTS.

Proposal 128

The Mayor, through TfL, subject to consultation, will remove the Western Extension of the central London Congestion Charging zone after putting in place such measures in mitigation of negative impacts as are both desirable and practicable.

Proposal 129

The Mayor, through TfL, will operate and monitor Congestion Charging in the original Central London Congestion Charging zone. The Mayor will keep the scheme under review, making variations to ensure the continued effectiveness of the policy reflects best practice, improves the operation of the scheme, or helps it to deliver the desired outcomes of the MTS.

5.27.6 Wider application of road user charging to manage demand

- 683 The TfL Business Plan for 2009/10–2017/18 does not include any extension to the remaining congestion charging arrangements or the introduction of any new area based congestion charging as a Mayoral initiative. As set out in Figure 42 (in section 5.6, Managing the road network), some form of demand management in areas beyond the central London Congestion Charging zone may be required in the longer term if congestion becomes an increasing problem or if other objectives (for example, environmental aims or the need for additional investment in transport) cannot otherwise be met. The application of road user charging may be explored in the longer term in other circumstances where it can be appropriately tailored to local conditions and suitably implemented.

- 684 Charging in local areas would only be considered with the Mayor working in partnership with local authorities to evaluate the potential for local schemes to support the delivery of the desired outcomes set out in this strategy. Charges or tolls to support specific infrastructure improvements, such as river crossings, might also be examined.
- 685 Investment in public transport, better management of the road network, smarter travel initiatives and support for a shift to walking and cycling, as illustrated in Figure 42, will help to mitigate the congestion impacts of forecast population and economic growth. This approach will ensure more reliable journey times on the road network than would otherwise be the case. Along with measures to promote cleaner vehicles, this will also help to reduce emissions of both CO₂ and air pollutants.
- 686 Beyond this, in the longer term, additional levers such as road user charging may be considered, if needed, to help achieve the Mayor's desired outcomes for London. The Mayor is currently considering further phases of the Low Emission Zone. In the future, potential funding options for the package of river crossings may also be considered. Decisions on the mix of demand management measures that might be deployed across London, the relative priority accorded to such interventions and their potential timing, will depend on the effectiveness of the policy levers in achieving the goals and outcomes of the strategy, the final shape of the London Plan and other considerations. Any proposals in the longer term for road user charging would, by

law, be subject to full public and stakeholder consultation, allowing the Mayor to consider public attitudes alongside other salient factors before making a decision.

Proposal 130

The Mayor, through TfL, and working with the London boroughs and other stakeholders, if other measures are deemed insufficient to meet the strategy's goals, may consider managing the demand for travel through pricing incentives (such as parking charges or road user charging schemes). This would depend upon there being a reasonable balance between the objectives of any scheme and its costs and other impacts. Any scheme would need to take account of local conditions, as well as the impact on surrounding regions, and to be fair and flexible relating charges to the external costs of travel with sensitivity to time of day, and with scope for discounts or exemptions for specific user groups. The Mayor will also consider imposing charges or tolls to support specific infrastructure improvements, such as river crossings.

Chapter six – Expected outcomes of the transport strategy

6.1 Analytical approach

⁶⁸⁷ In assessing the challenges facing London's transport system, the strategy considers the current situation in the Capital and also looks forward to the London of 2031. There has been a considerable amount of analysis underpinning the new MTS, which includes:

- A detailed assessment of past and current patterns and trends in travel and the performance of the transport system set out by the Travel in London reports, published by TfL in April 2009 and March 2010
- A projection of outcomes in 2031 on the basis of a committed, funded transport investment programme in the TfL Business Plan (up to the end of financial year 2017/18) and GLA projections of employment and population. After 2018, only the completion of Underground line upgrades – and the continuation of existing services – is assumed in this projection. This is called the reference case
- Sensitivity analysis. All projections have some uncertainty, so development of the strategy has not simply considered one projection of the future. Sensitivity analysis tests have therefore been run, which vary key assumptions in the reference case, such as with different levels or patterns of population and employment growth
- Scenarios. There have been a number of scenarios tested, for example, different transport investment scenarios and the impact of other transport policies, including cycling. One scenario is the reference case; the others are compared either to the reference case or the base year (2006)

- The joint Economic Evidence Base, produced by GLA Economics, to underpin the London Plan, MTS and EDS
- The Integrated Impact Assessment (IIA)

⁶⁸⁸ The reference case, sensitivities and scenarios are essentially aimed at estimating what would happen in the future under different circumstances – and the consequences of different investments, policies or other assumptions. The Travel in London report, which analyses what has happened to travel and transport in the Capital in the past, has also informed the forward-looking analysis carried out for the MTS.

⁶⁸⁹ Most of the scenarios compare the outcomes for 2031 with current levels and the reference case, which includes already committed schemes.

⁶⁹⁰ As well as transport scenarios, the MTS analysis also looked at scenarios involving changes to land use. This reflected the integration of land use and transport planning: the production of the MTS, London Plan and the EDS has gone well beyond the minimum requirement of the MTS having regard to the London Plan and other Mayoral strategies. Considerable effort has gone into making sure they were produced together and aligned. The scenarios tested looked at varying both land use and transport.

⁶⁹¹ Employment and population projections have been supplied by the GLA and model inputs have been informed by discussions with the authority, including the London Plan team, Data Management and Analysis Group (DMAG) for population projections, and GLA Economics

in order to achieve a common approach. The range of sensitivities is aimed at producing a picture of the scale of uncertainty based likewise on common information.

⁶⁹² Projections of ground-based, transport-related CO₂ emissions in the MTS are derived from the same analytical tool as transport sector CO₂ projections in the Mayor's CCMES.

6.2 Anticipated outputs and outcomes

⁶⁹³ The outputs and outcomes of implementing the full transport strategy can be compared to:

- London as it is now
- London as it would be in 2031 with no further investment at all (beyond 2010)
- London as it would be in 2031 with the committed TfL Business Plan and HLOS only (the MTS reference case)

⁶⁹⁴ The outcomes for London with no further investment beyond 2010 would be truly dire: crowding on the Tube and National Rail would get significantly worse, road congestion would escalate, asset condition would deteriorate making journeys far less reliable and increasing journey times, and transport's impact on the environment would increase. London's economy would be unable to grow and its viability would be threatened. Government has recognised this and has committed, through the 10-year TfL funding settlement and the HLOS process, to one of the largest

programmes of infrastructure investment the Capital has ever seen. This programme of investment has started and will run to 2020.

⁶⁹⁵ Analysis for the MTS has therefore focused on the outcomes of this committed investment programme and identifying what more is needed to support London's growth beyond that period and to meet the Mayor's desired outcomes. Analysis shows that significant benefits are delivered by the currently funded investment and that they will contribute to address the challenges identified in chapter four. However, because of the greater demand placed on the transport system by continuing economic and population growth, these investments will not be sufficient to meet London's needs and the Mayor's desired outcomes for 2031.

⁶⁹⁶ The rest of this section therefore focuses on the anticipated benefits of the whole transport strategy compared to 2006 levels unless stated otherwise. Figures 67 to 85 summarise the anticipated outcomes of the MTS for each of the challenge areas identified in chapter four. They include the effects of the measures in the implementation plan in chapter seven – the impacts are therefore different from those in chapters three and four which are based on the reference case.

Figure 67: How the strategy would support population and employment growth

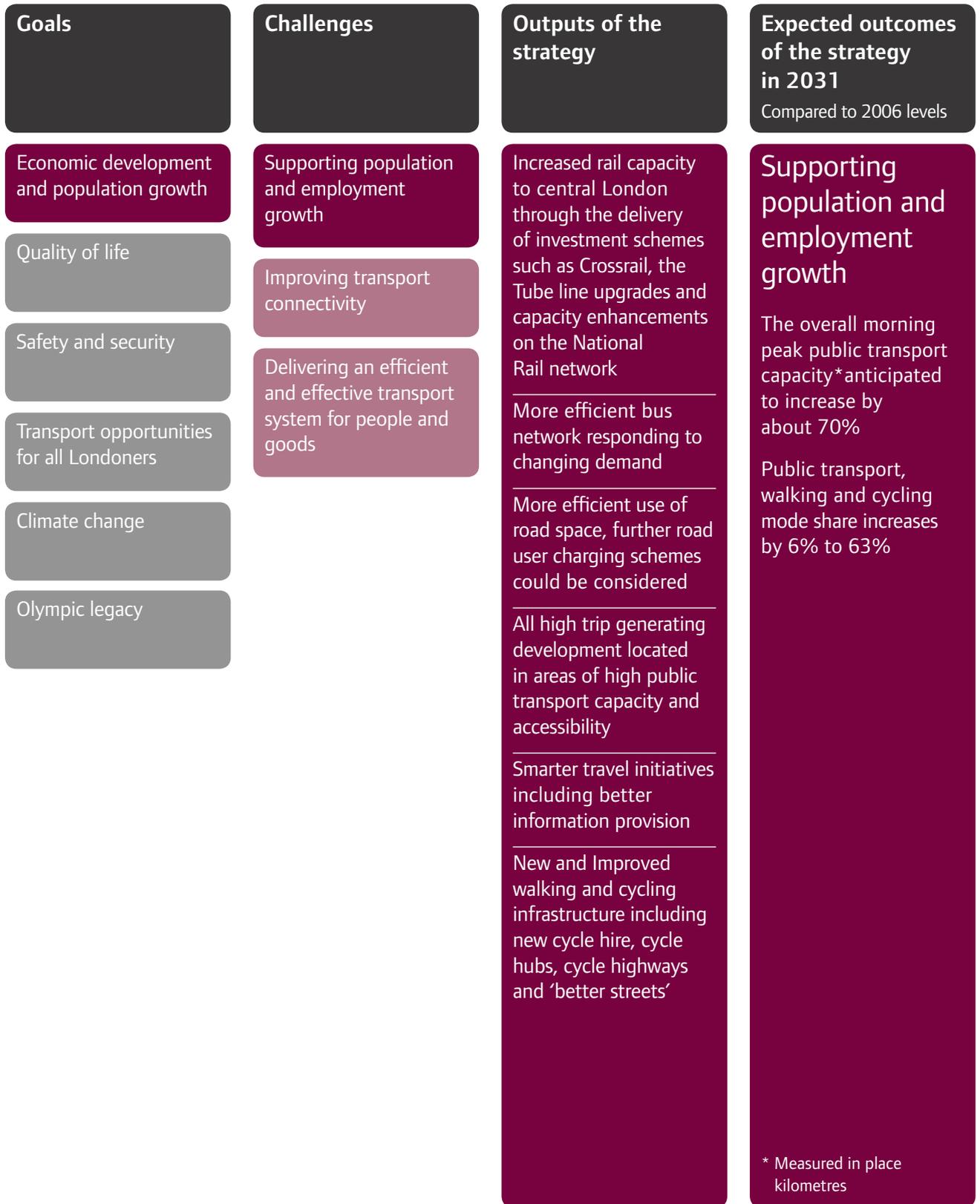


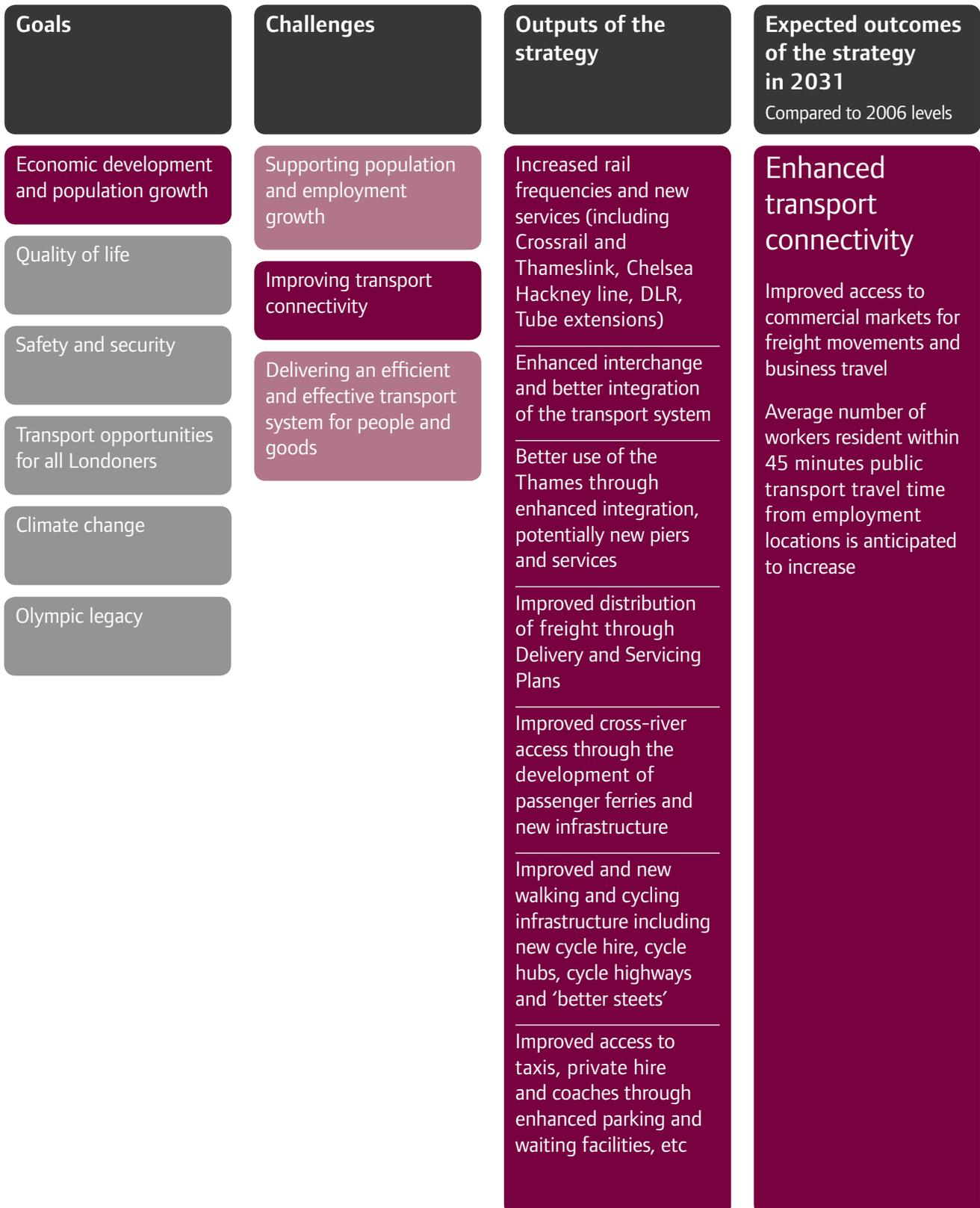
Figure 68: How the strategy would enhance transport connectivity

Figure 69: How the strategy will deliver an efficient and effective transport system for people and goods

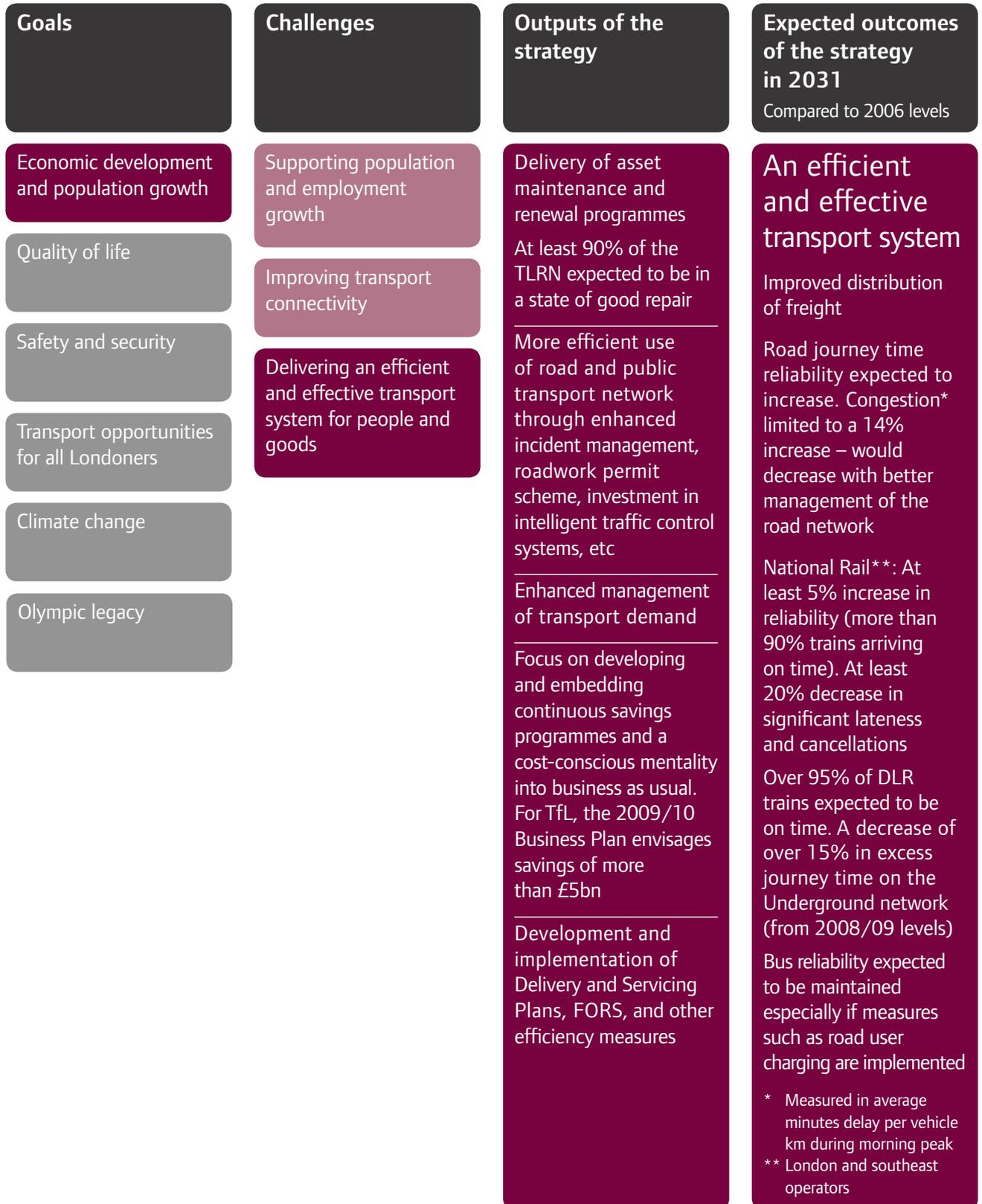


Figure 70: Anticipated change in crowding levels on the National Rail network by 2031 with the strategy

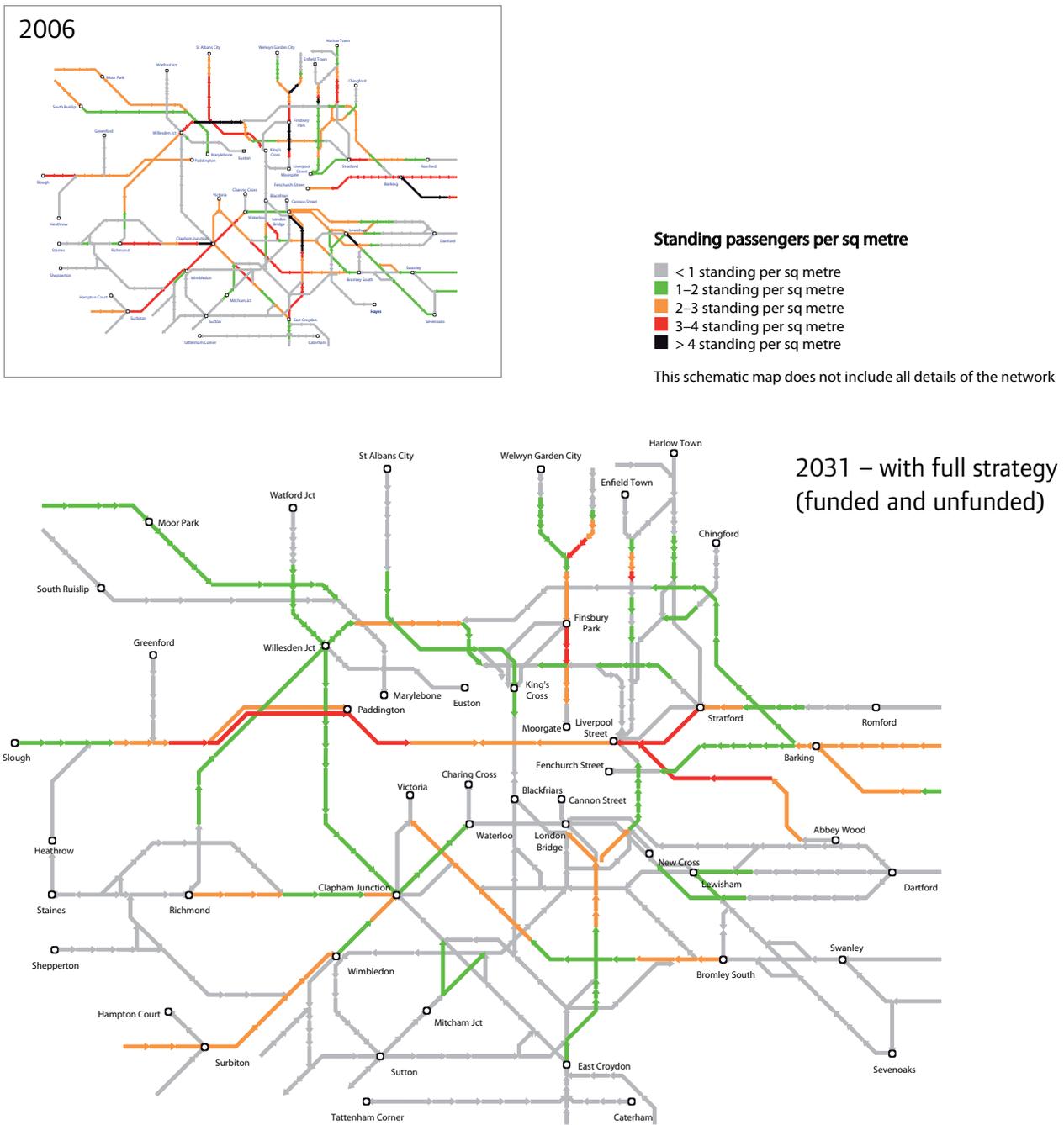


Figure 71: Anticipated change in crowding levels on the Tube and DLR network by 2031 with the strategy

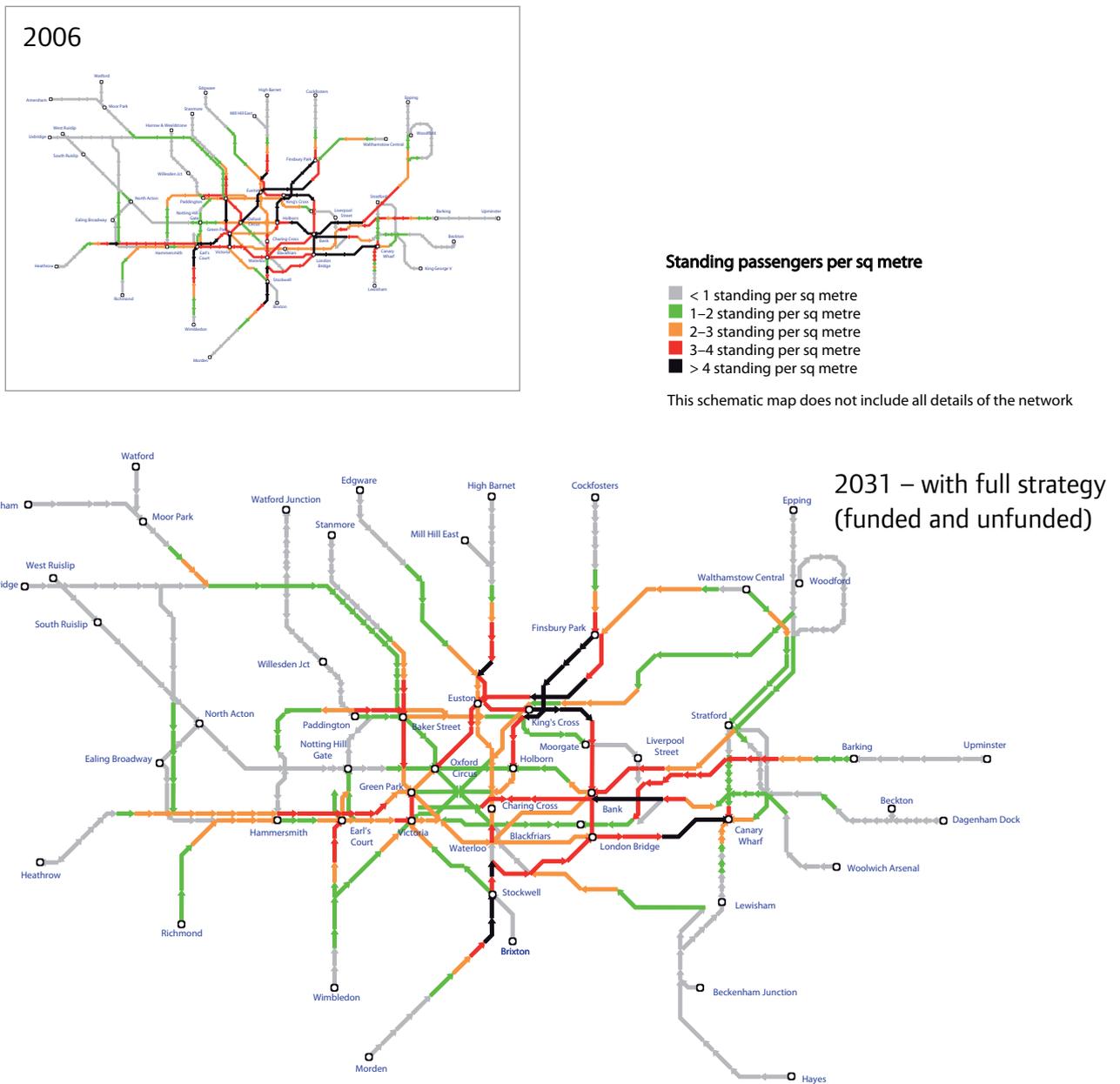


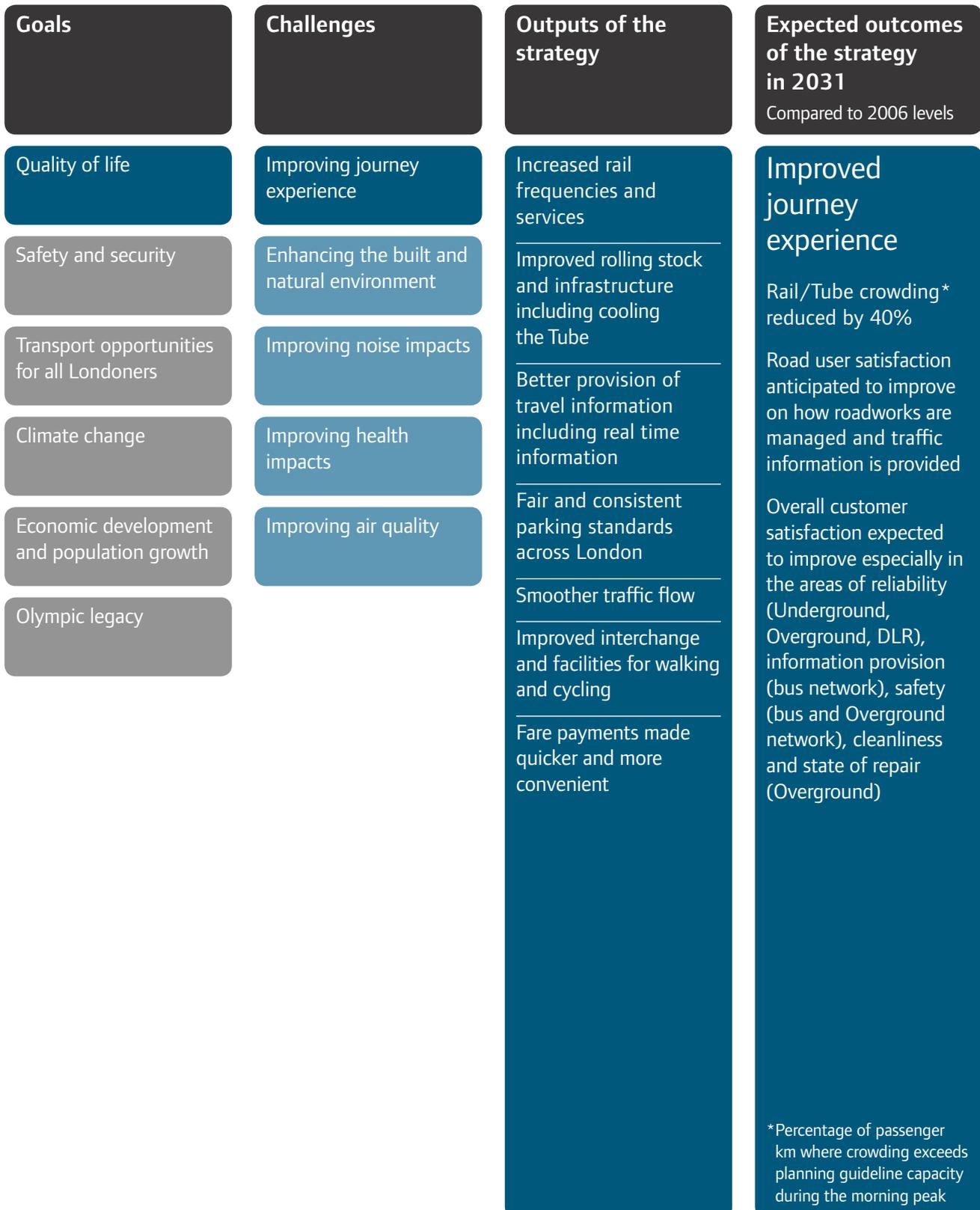
Figure 72: How the strategy will improve journey experience

Figure 73: How the strategy will enhance the built and natural environment

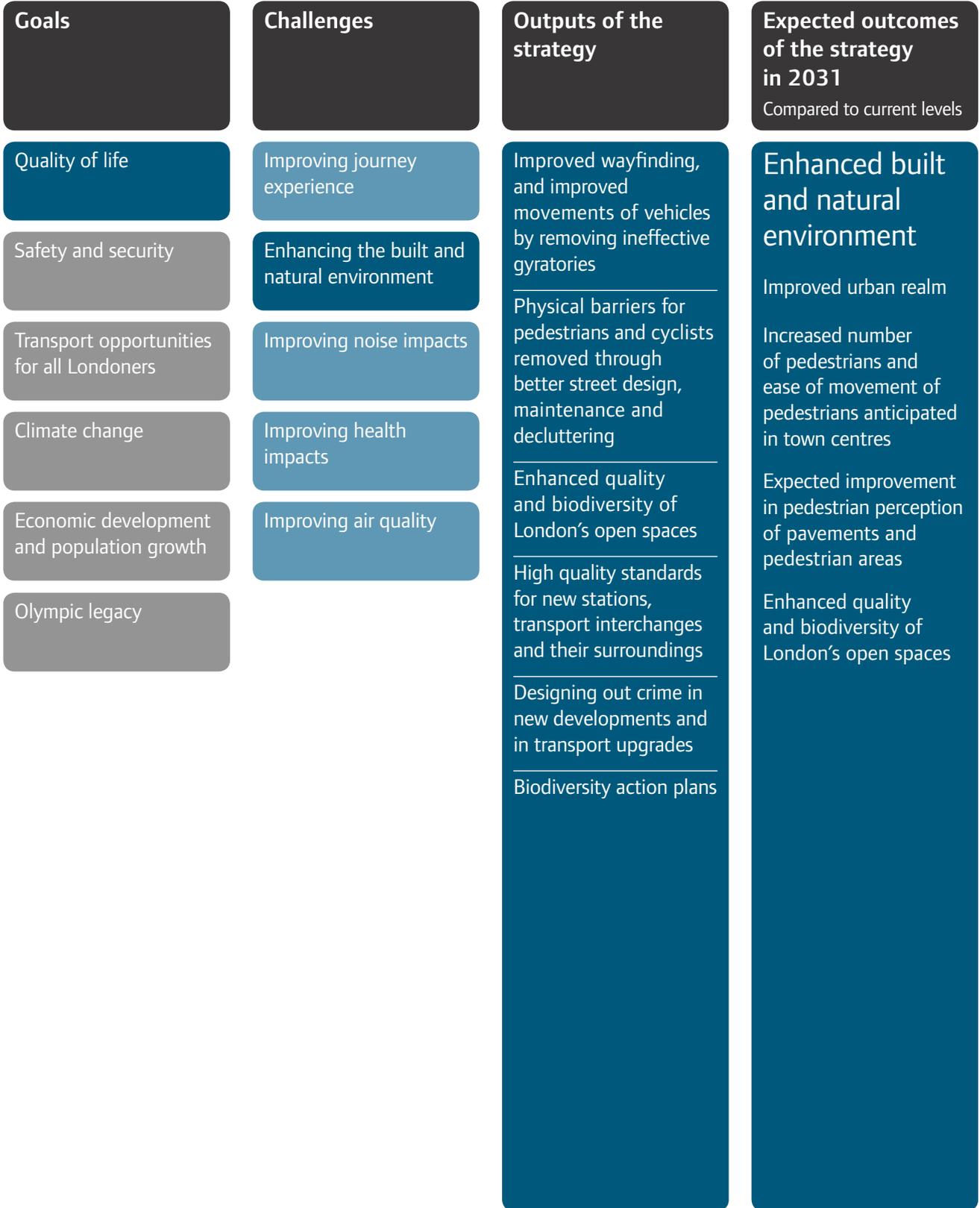


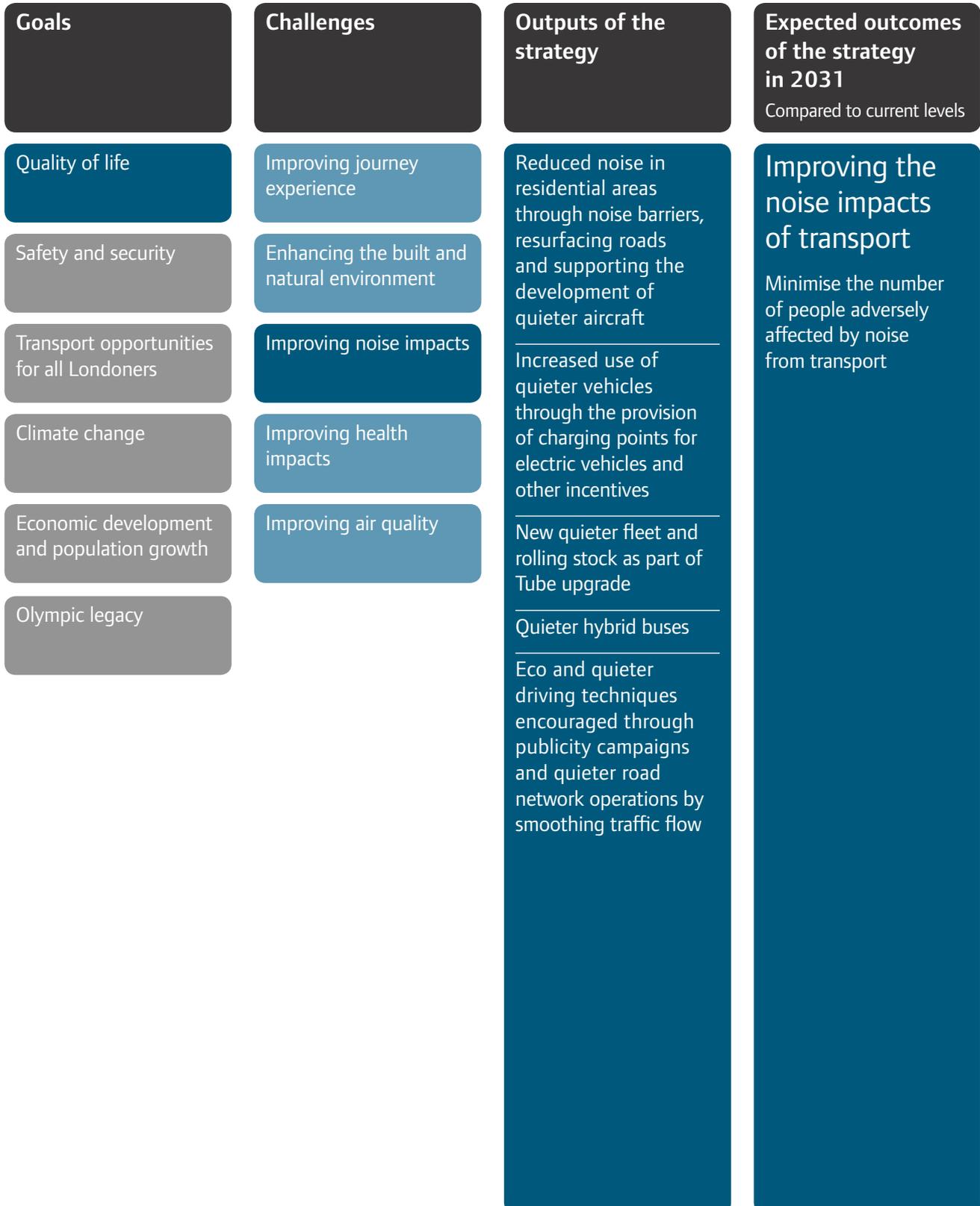
Figure 74: How the strategy will improve noise impacts

Figure 75: How the strategy will improve health impacts

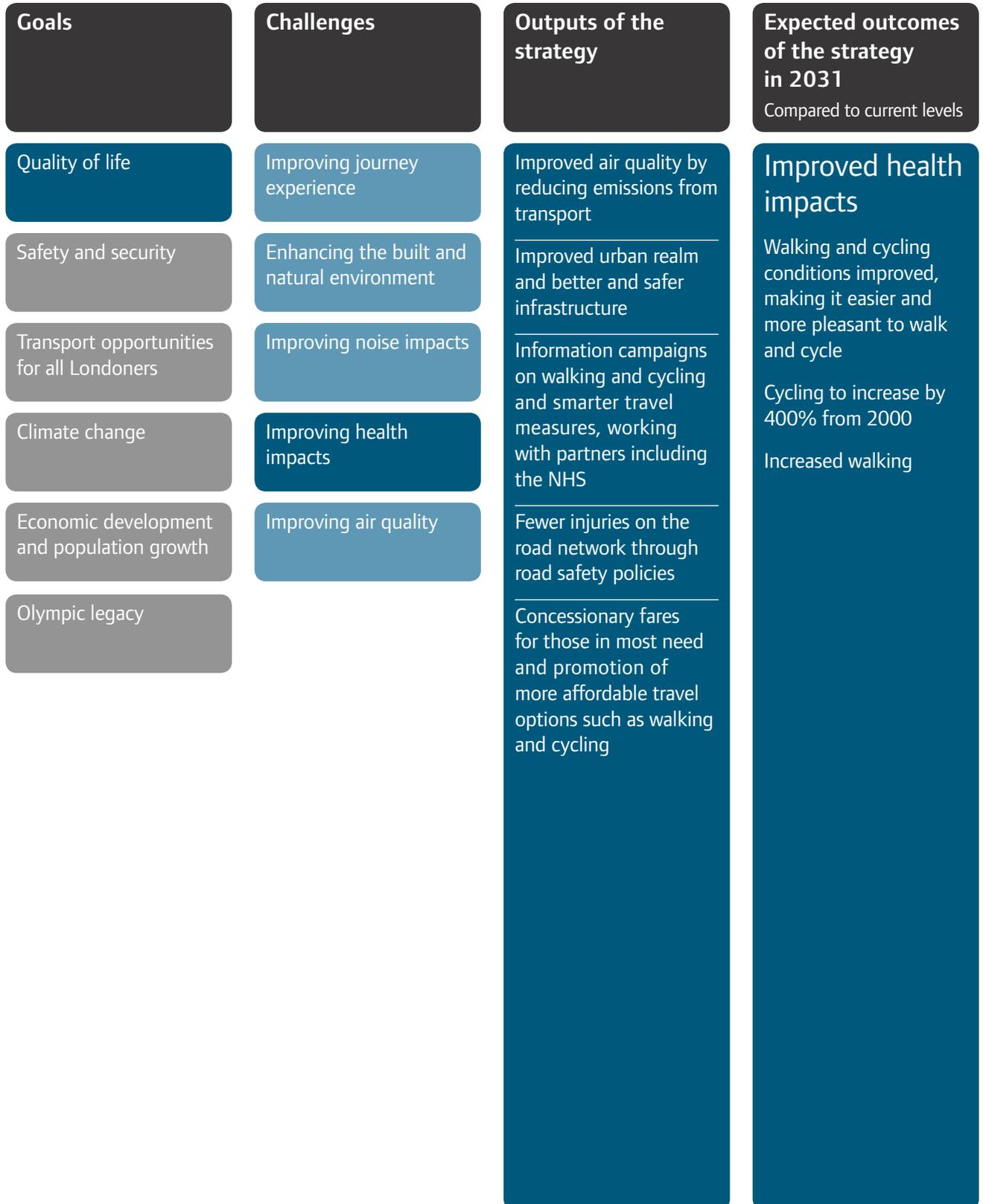


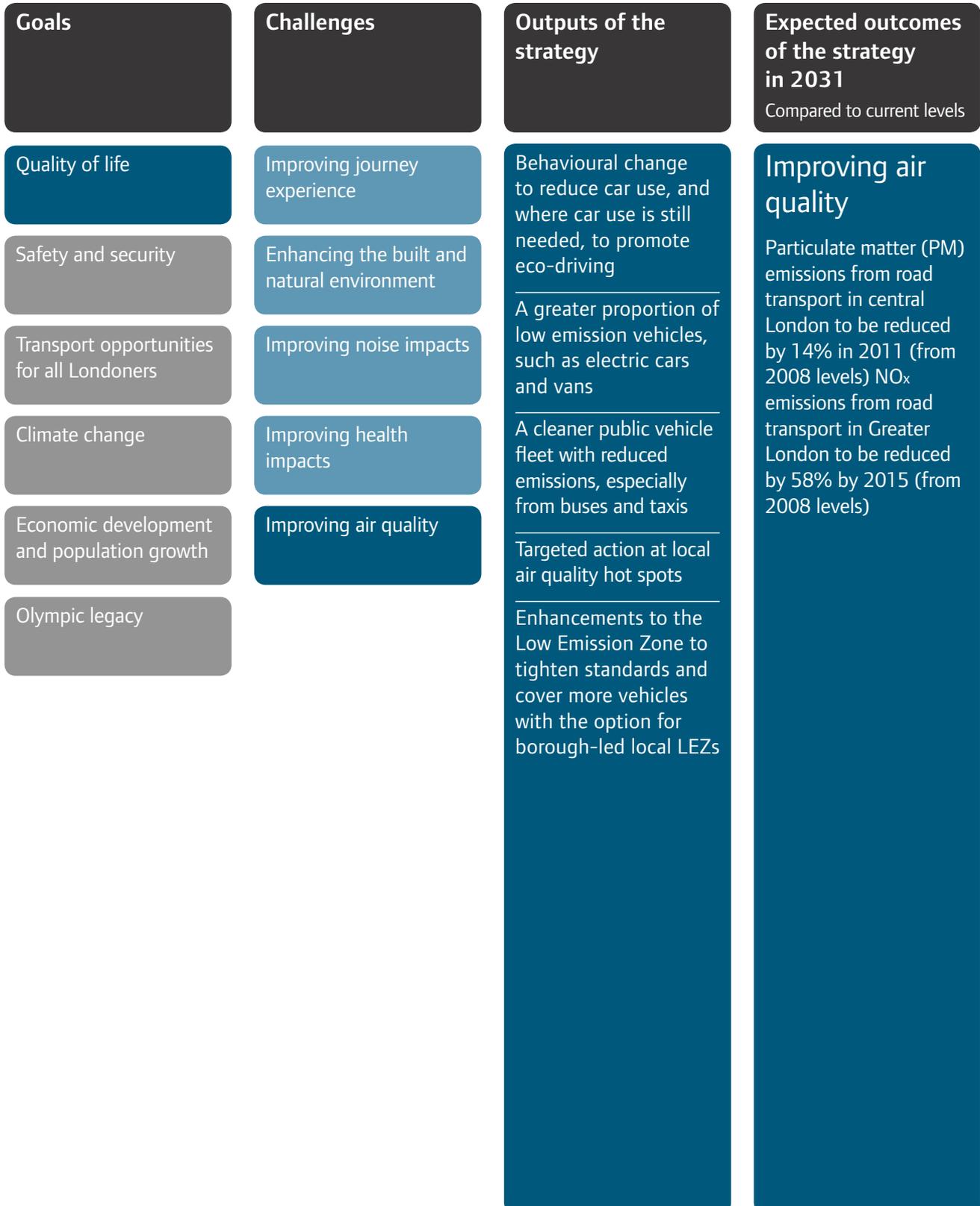
Figure 76: How the strategy will improve air quality

Figure 77: How the strategy will reduce crime, fear of crime and antisocial behaviour

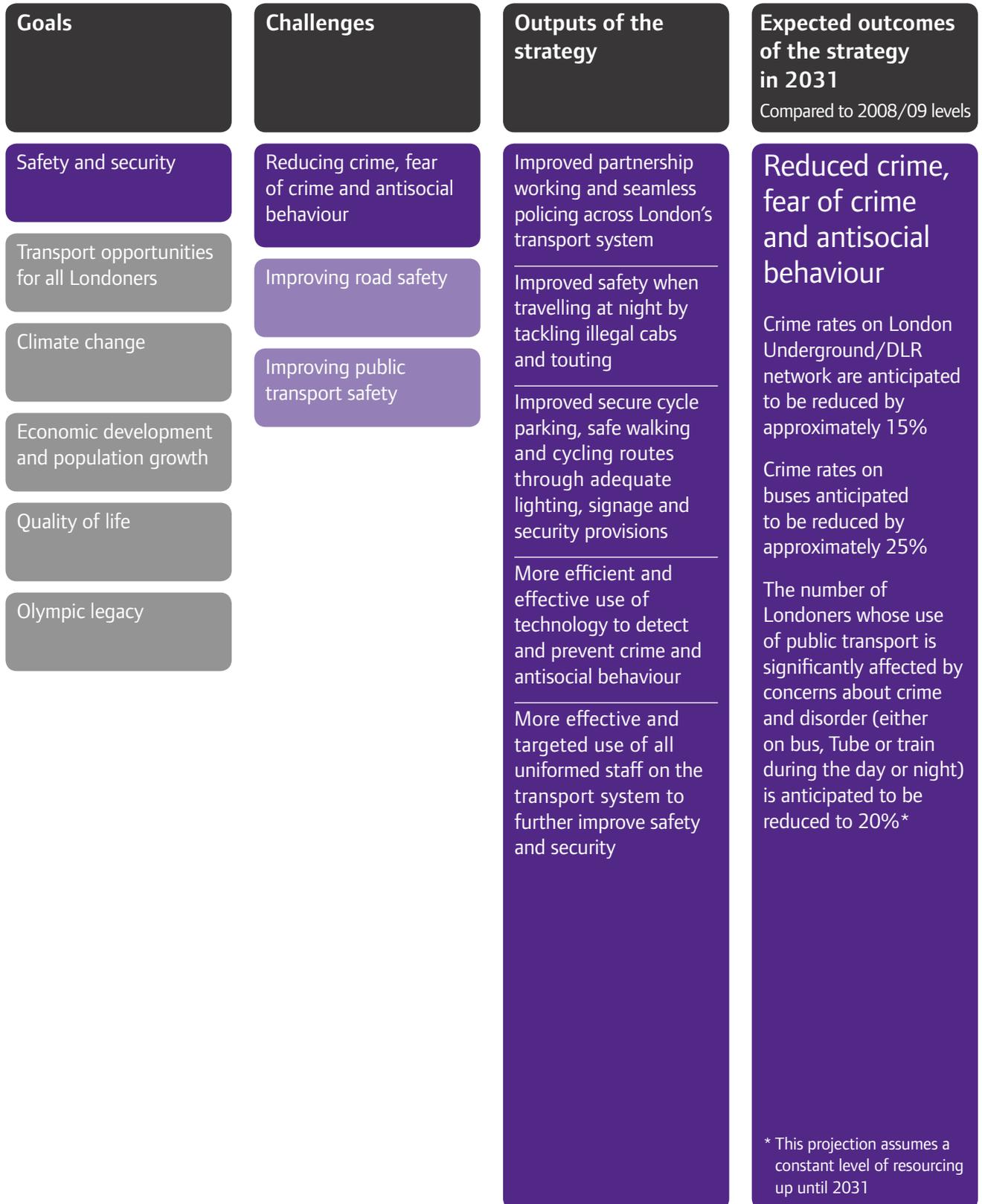


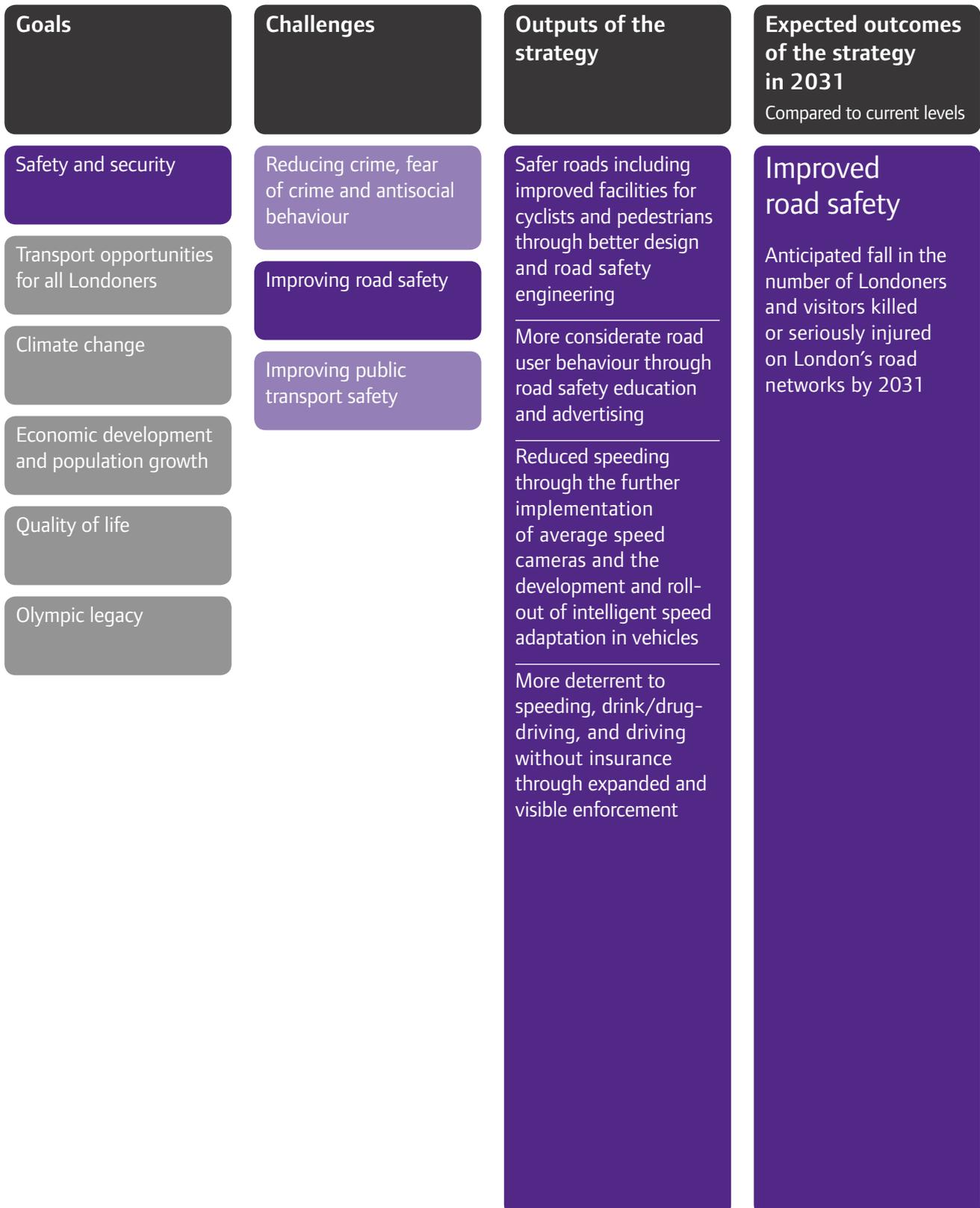
Figure 78: How the strategy will improve road safety

Figure 79: How the strategy will improve public transport safety

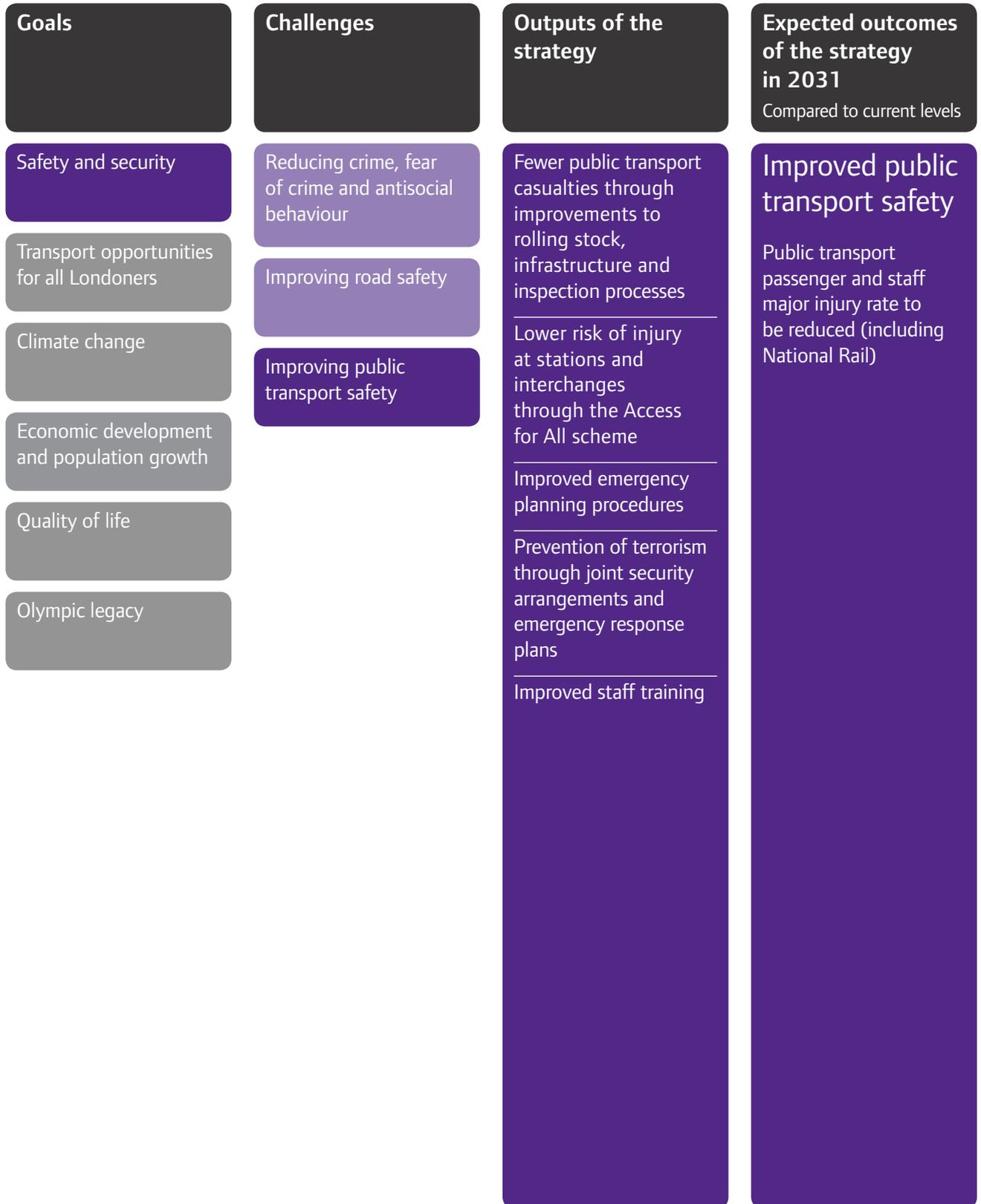


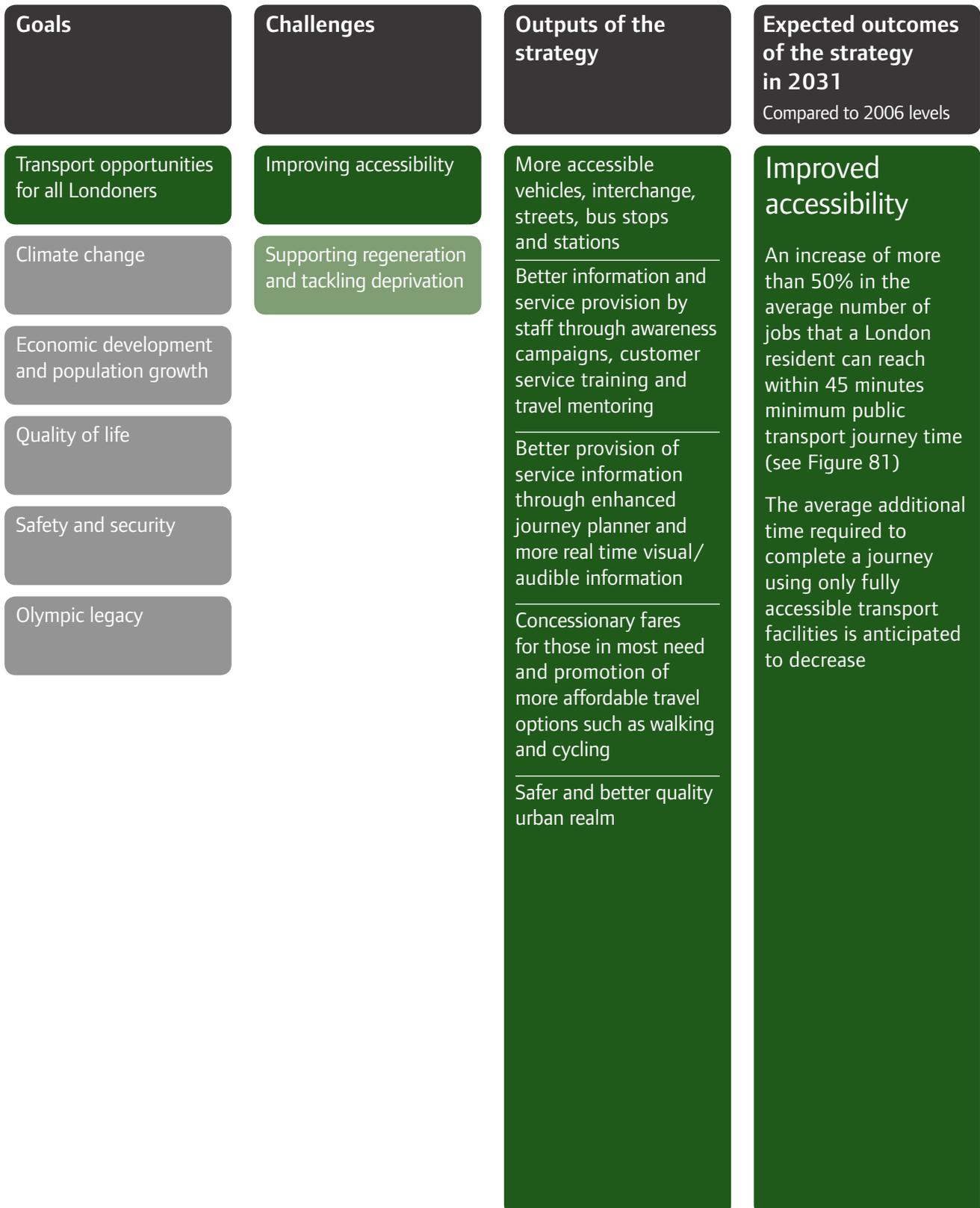
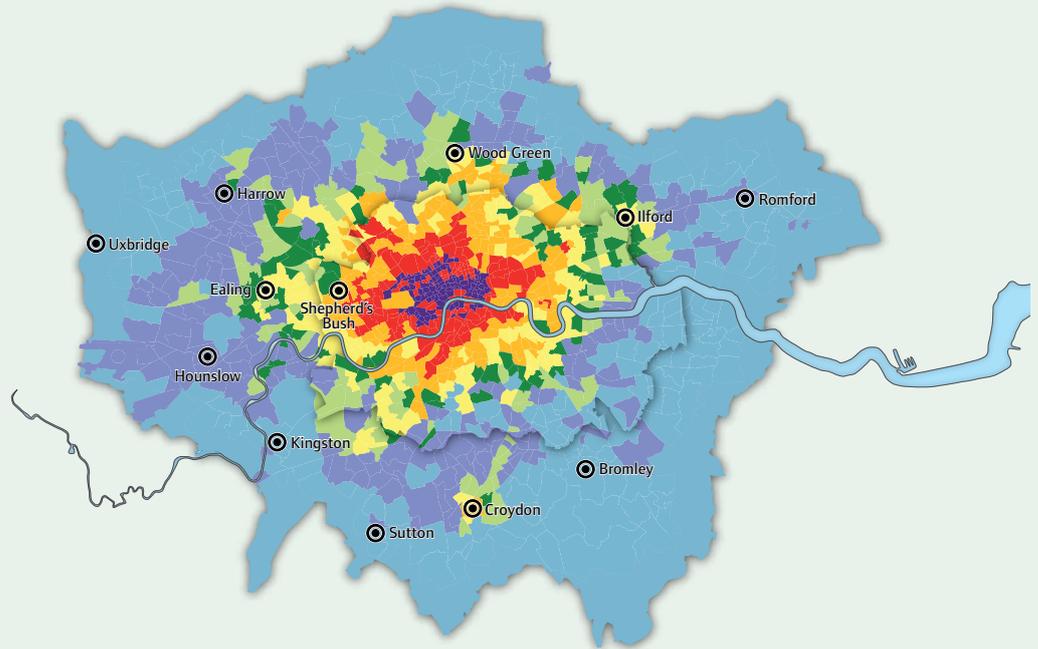
Figure 80: How the strategy will improve accessibility

Figure 81: Anticipated difference in access to jobs between 2006 and 2031

The strategy will support London’s economic development by increasing the number of jobs accessible by transport within 45 minutes. This

will increase the pool of potential employees available to London’s businesses and improve the employment opportunities available to Londoners

2006



2031

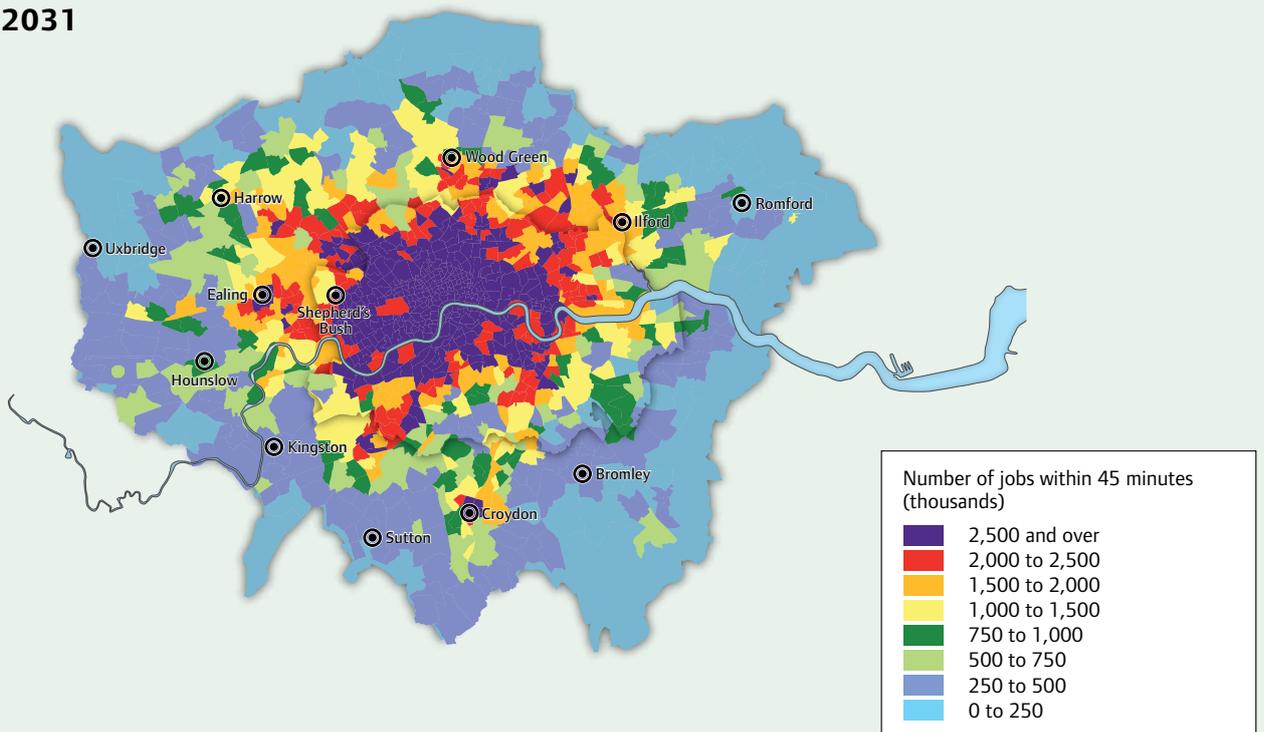


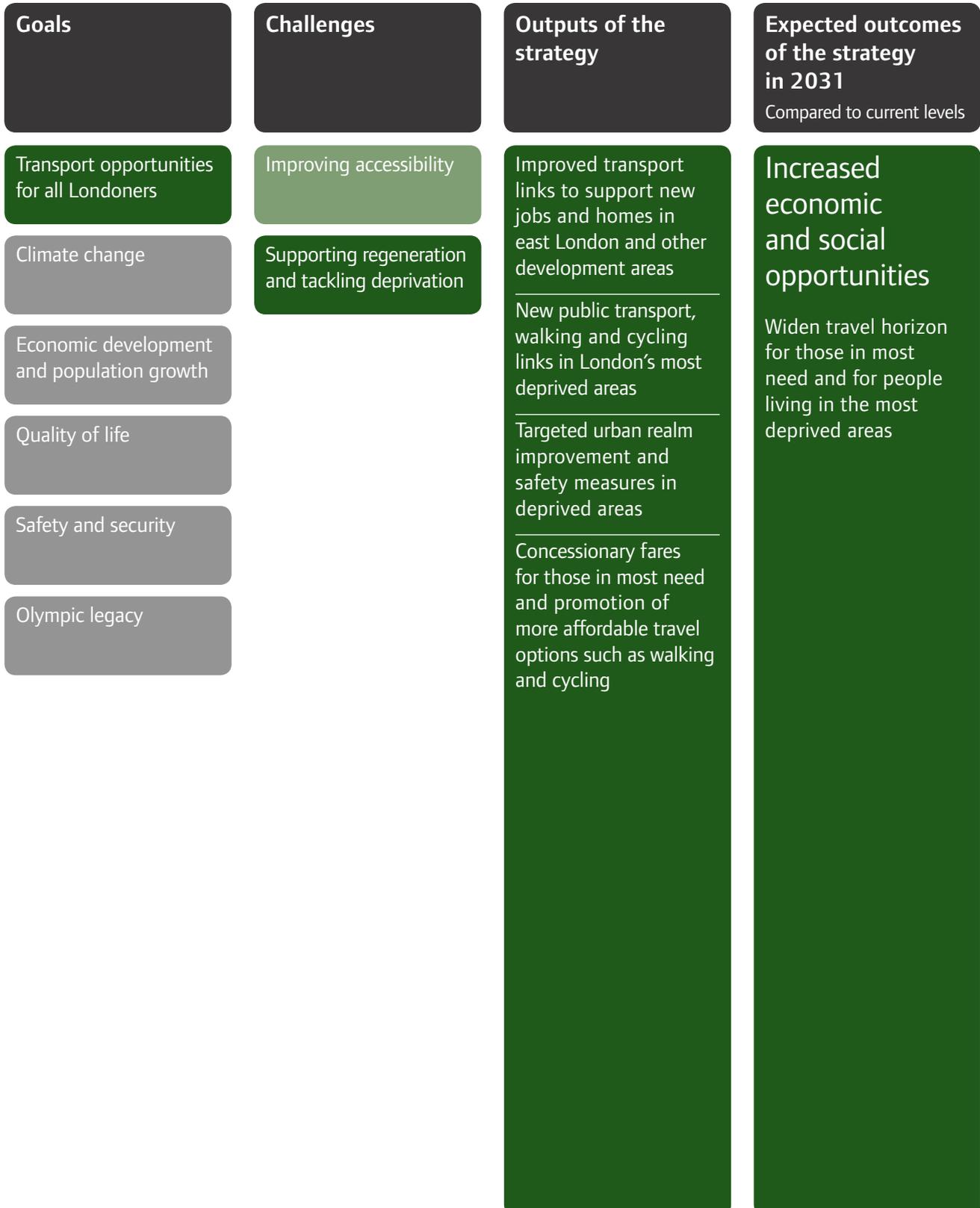
Figure 82: How the strategy will support regeneration and tackle deprivation

Figure 83: How the strategy will reduce ground-based transport CO₂ emissions

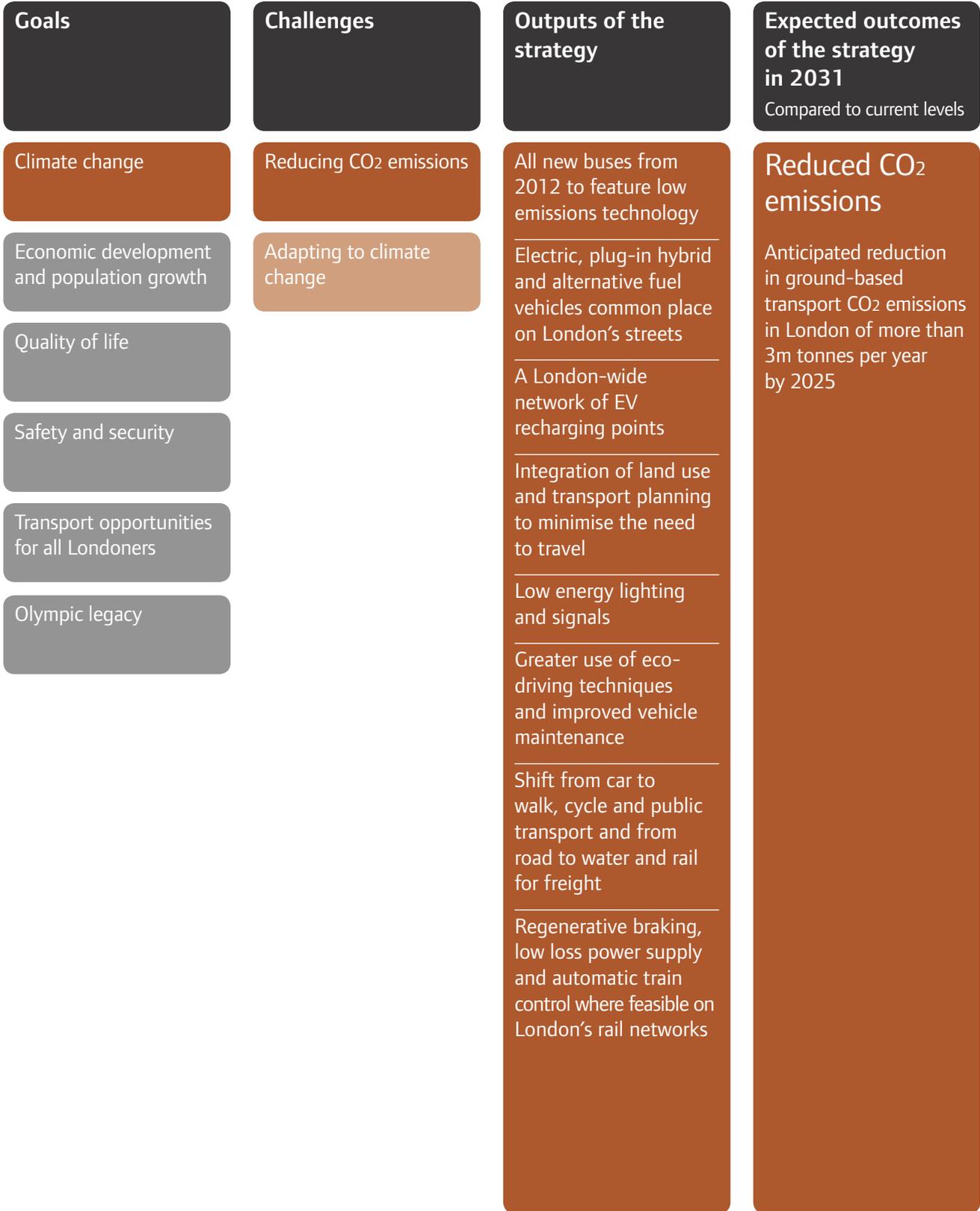


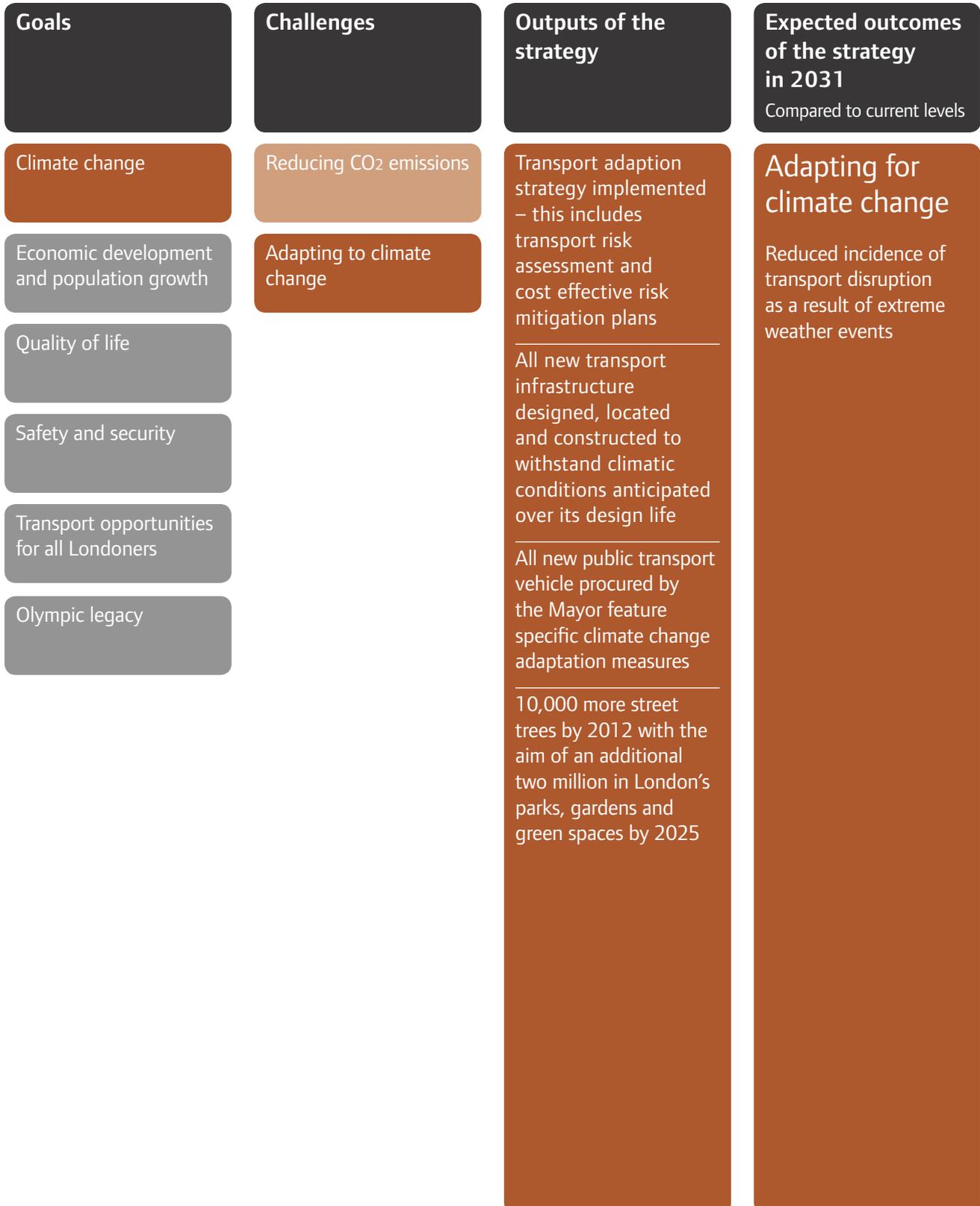
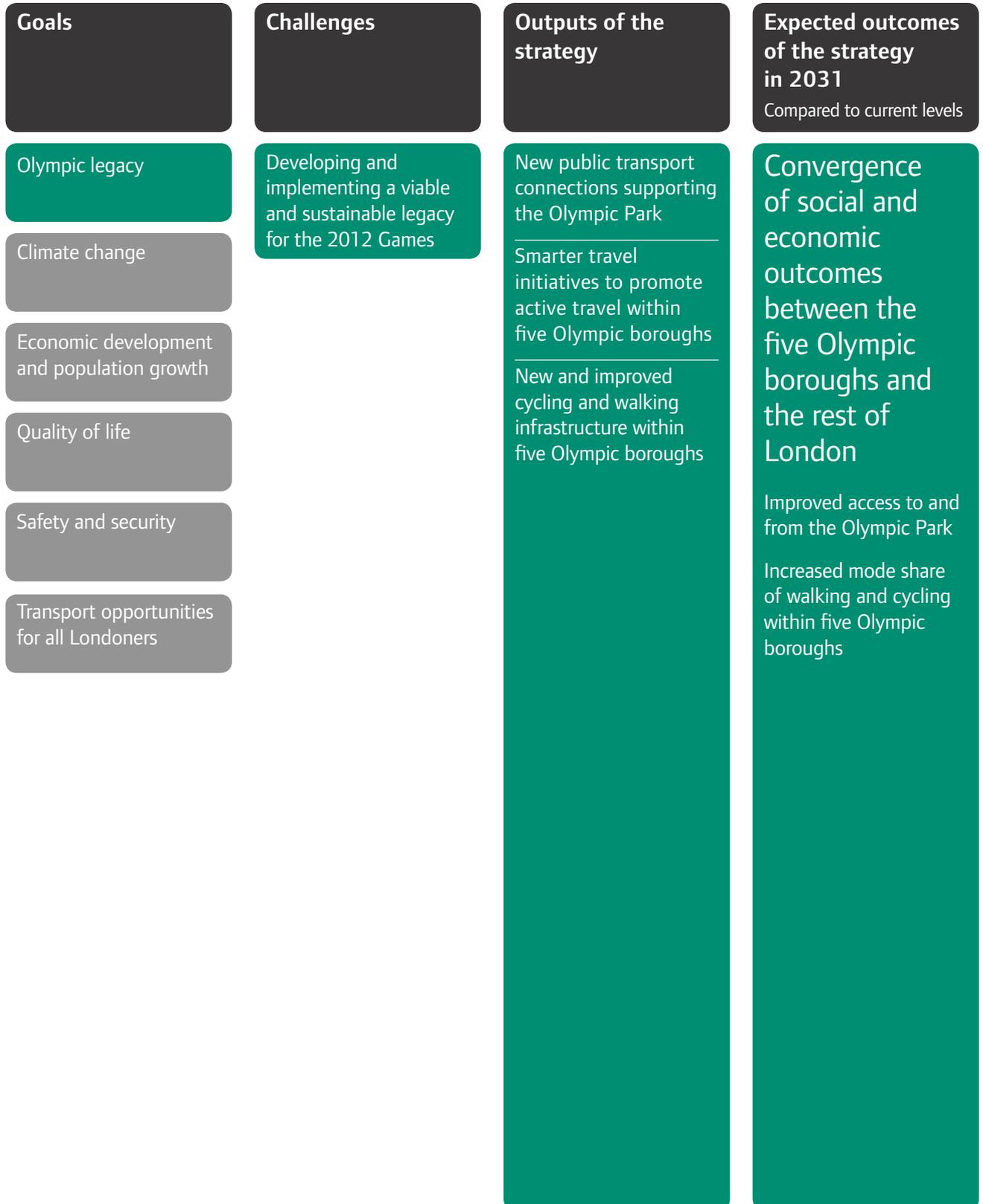
Figure 84: How the strategy will support adaptation to climate change

Figure 85: How the strategy will support the Olympic legacy



Mayor's Transport Strategy – Part three

Delivery



Chapter seven – Implementation plan

7.1 Short, medium and long-term plan

⁶⁹⁷ Implementation of the schemes identified in the MTS can be grouped into three time periods:

- Short term: The period up to and including 2012
- Medium term: From 2013 up to and including 2020
- Long term: From 2021 up to and including 2031

⁶⁹⁸ Figure 86 below sets out the phasing for the implementation of an indicative list of schemes for the implementation of the strategy¹. It describes the scheme itself, the phasing and whether funding has already been

or is yet to be secured. Some schemes are labelled as unfunded as they require further funding to be made available before they could be taken forward, or because they fall outside the timeframe of TfL's current Business Plan.

⁶⁹⁹ The implementation plan reflects the current delivery priorities. The plan will be regularly reviewed through the TfL Business Plan, the GLA Corporate Plan and the DfT's Network Rail and Highways Agency investment programmes to ensure ongoing alignment with priorities. Longer-term unfunded schemes are at varying stages of development. Scheme development will be regularly reviewed to ensure alignment with policy priorities, value for money, deliverability and to take account of opportunities for funding that may become available.

Figure 86: Transport Strategy Implementation Plan (indicative list)

Scheme	Description	Scheme cost	Anticipated completion			Proposal
			2010–2012*	2013–2020†	Post 2020	
Rail						
High Speed 1	International services stopping at Stratford	L				1
High Speed 1	Enhanced domestic services	L				4
High Speed 1	Direct services to a wider range of European destinations (making use of new European infrastructure)	L				4
High Speed 2	London to the west Midlands and beyond	H				4
Improved rail freight terminals to serve London	New and/or expanded rail freight terminals to serve London	L				2

¹ TfL schemes will be reviewed by the TfL Board as part of the business planning process

Scheme	Description	Scheme cost	Anticipated completion			Proposal
			2010–2012*	2013–2020†	Post 2020	
Improved rail freight routes	Rail link from Barking to Gospel Oak line to West Coast Main Line	M				3
Improved rail freight routes	Further capacity enhancement for the Felixstowe to Nuneaton route	M				3
Crossrail 1	Core scheme: Maidenhead and Heathrow in the west to Shenfield and Abbey Wood in the east	H				5
Crossrail 1	Westerly extension(s) and/or increased frequency west of Paddington	M				6
Crossrail 1	Easterly extension	M				6
Chelsea Hackney line (Crossrail 2)	Enhanced southwest – northeast London capacity and connectivity	H				9
London Overground	Programme of expansion and enhancement of services, including new orbital services through Inner London and new, longer trains by 2012	M				14
London Overground	Further train lengthening	L				8 and 14
London Overground	Diversion of Watford Junction services to Stratford (instead of Euston) to release capacity for High Speed 2 at Euston	M				4
London Overground	Barking to Gospel Oak line – electrification and train lengthening	L				8 and 92
West Anglia	Twelve-car capability to Stansted and Cambridge. Additional capacity also on inner services (HLOS CP4)	L				7
West Anglia	Lea Valley four-tracking and improved access to Stratford	H				8
Thameside south Essex	Twelve-car capability on all routes (HLOS CP4)	M				7
Thameside south Essex	Further capacity increases	M				8
Chiltern	Enhanced inner suburban service (HLOS CP4)	L				7
South central London	Ten-car capability on inner suburban (HLOS CP4)	M				7
South central London	Twelve-car capability and additional fast services (HLOS CP4)	L				7
South central London	Further capacity increases	M				8

Scheme	Description	Scheme cost	Anticipated completion			Proposal
			2010–2012*	2013–2020†	Post 2020	
Southeast London	Train lengthening on services to Cannon Street/Charing Cross (HLOS CP4)	M				7
Southeast London	Further capacity increases	M				8
Southwest London	Ten-car capability on inner suburban and Windsor lines (HLOS CP4)	M				7
Southwest London	Further capacity increases	M				8
Great Western	Train lengthening (HLOS CP4)	L				7
Great Western	Electrification	H				92
Great Northern	Train lengthening (HLOS CP4)	L				7
Great Northern	Further capacity increases	L				8
Great Eastern	Additional and longer outer services (HLOS CP4)	L				7
Great Eastern	Additional inner services (HLOS CP4)	L				7
Great Eastern	Further capacity increases	L				8
West Coast	Train lengthening and frequency improvements (HLOS CP4)	L				7
West Coast	Further capacity increases	L				8
Thameslink	Phase 1: 12-car capability on most of mainline and 16 trains per hour through core	H				7
Thameslink	Phase 2: 24 trains per hour through core, expanded network	H				8
Thameslink	Make greater use of 12-car capability coverage	M				7
Rail termini enhancement	Passenger congestion relief/onward movement capacity enhancement works. Schemes under development	M				11
Strategic interchanges	Programme of schemes under development	M				46
Improved rail	For example, enhanced bus services and interchange at selected Crossrail and/or Thameslink stations	L				45
Airtrack	Link south west London railway network to Heathrow (part-funded)	M				50
Tube						
Jubilee line	Jubilee line upgrade to provide additional capacity and improve journey times	M				17

Scheme	Description	Scheme cost	Anticipated completion			Proposal
			2010–2012*	2013–2020†	Post 2020	
Northern line	Phase 1: Northern line upgrade to provide additional capacity and improve journey times by the end of 2012	M				17
Northern line	Phase 2: Northern line Upgrade 2 to deliver a further 20 per cent increase in capacity through the simplification and recasting of service patterns	M				17
Northern line	Developer-led extension: Kennington to Battersea to support the regeneration of the Vauxhall/Nine Elms/Battersea area	M				22
Victoria line	Victoria line upgrade including new rolling stock and signalling to provide additional capacity and improve journey times	M				17
Piccadilly line	Piccadilly line upgrade to provide additional capacity and improve journey times	M				17
Sub-Surface Railway (SSR)	Circle, District, Hammersmith & City and Metropolitan lines upgrade (including new air-conditioned rolling stock and new signalling) to provide additional capacity and improve journey times	H				17
Croxley rail link	Metropolitan line link to Watford Junction	M				22
Bakerloo line	Bakerloo line upgrade: Including new energy efficient and high capacity rolling stock and signalling	M				17
Bakerloo line	Potential Bakerloo line southern extension	H				22
Station refurbishment/modernisation programme	Continuing programme of refurbishment/modernisation of stations	H				18
Cooling the Tube programme	Enabling operation of services post line upgrades and improved passenger comfort	M				20
Core asset renewal	Programme of core asset renewal to lock-in benefits from the upgrades and maintain assets in a state of good repair	H				17
Tube station congestion relief schemes	Congestion relief schemes at Victoria, Tottenham Court Road, Bond Street, Bank (part-funded) and Paddington (Hammersmith & City line)	H				19

Scheme	Description	Scheme cost	Anticipated completion			Proposal
			2010–2012*	2013–2020†	Post 2020	
Further Tube station congestion relief schemes	Targeted station capacity expansion programme	H				19
Energy-saving initiatives	Initially, a programme of trials to include low energy lighting, smart electricity metering at stations and low loss conductor rails	L				106
Regenerative braking and automatic train control	To be implemented as an integral part of the Tube upgrade programme	M				106
DLR						
Network-wide capacity upgrade to three-car services	Infrastructure enhancement to enable a 50 per cent increase in capacity	M				15
Extension: Stratford International to Canning Town	Extension to be completed in summer 2010	M				15
Further DLR network enhancements	Potential extensions and/or capacity increases	M				15
Tramlink						
Tramlink further enhancements	Potential extensions and/or capacity increases	L/M				16
Buses and bus transit						
East London Transit	Phase 1b (Barking to Dagenham Dock via Barking Riverside), services starting in 2013	L				23
Bus network development	Regular review of bus network, including reviews of the strategic priorities underlying the process approximately every five years, to cater for population and employment growth, maintain ease of use, attractive frequencies and adequate capacity, reliable services, good coverage and good interchange with other modes	M				23
Development of a New Bus for London	Pilot to create a new iconic bus for London	L				25
Phasing out of 'bendy' buses	Anticipated by the end of 2011	L				25

Scheme	Description	Scheme cost	Anticipated completion			Proposal
			2010–2012*	2013–2020†	Post 2020	
Low emission buses	Intention that all new buses entering London's fleet post 2012 be low emission (initially diesel hybrid)	M				92
Enhanced real time service information	Delivery of Countdown 2; enhanced real time information at stops, on internet and mobiles	L				24
Bus priority	Implementation of bus priority measures to maintain service reliability	M				24
Cycling						
Central London Cycle Hire scheme	Around 6,000 bikes for hire in central London, scheme opening in 2010	M				54
London Cycle Hire scheme enhancement	Expansion of area covered and/or additional bikes in London Cycle Hire scheme	L				54
Additional cycle parking	Around 66,000 additional cycle parking spaces in London	L				54
Cycle Superhighways	Two initial trial radial routes to central London, followed by further routes	L				54
Cycling initiatives	Biking borough initiatives	L/M				52
Walking and urban realm enhancements						
Enhanced urban realm and pedestrian environment	London-wide 'better streets' initiatives to improve pedestrian connectivity and urban realm	M				60
Access to stations and surroundings	Targeted programme of works to improve accessibility and personal security on walk and cycle routes to stations and bus stops	M				60
Walking information and campaigns	Walking campaigns, including the '2011 year of walking', that will focus on walking routes, wayfinding, events and activities	L				62
Improved wayfinding	Targeted introduction of on-street wayfinding specifically designed for pedestrians, for example, Legible London	L				61
Increased tree and vegetation coverage	Additional 10,000 street trees by 2012 (funded), with a target of an additional two million trees in London's parks, gardens and green spaces by 2025	L				113

Scheme	Description	Scheme cost	Anticipated completion			Proposal
			2010–2012*	2013–2020†	Post 2020	
Roads						
Improved road management to smooth the flow of traffic	Measures to smooth traffic flows, manage congestion and improve journey time reliability for all people and freight movements, and maximise the efficiency of the road system from a business and individual perspective	M				30
Permit scheme for roadworks	Introduction and development of a permit scheme and lane rental system aimed at utility companies undertaking roadworks	L				32
Bounds Green (A406)	Safety and environmental improvements	L				35
Henlys Corner junction works	Safety improvements, consents yet to be obtained	L				35
Removal of Tottenham Hale gyratory	Existing one-way system to be converted to two-way, improved pedestrian crossing and cycling facilities	L				35
Blackwall Tunnel (northbound)	Refurbishment of tunnel	L				34
Further gyratory, one-way system and bottleneck improvement works	Works to improve facilities and conditions for pedestrians and cyclists, and to smooth traffic flow	M				35
Achievement of state of good repair of road infrastructure	Ongoing programme of maintenance	M				34
Support development of intelligent speed adaptation	Continue trials of intelligent speed adaptation technologies	L				72
Average speed camera technology	Encourage further implementation of average speed camera technology	L				73
Car club support	Support expansion of car clubs	L				91
LEZ	Further LEZ enhancements and vehicle coverage	L				95
Provision of infrastructure to support low emission road vehicles	Introduction of electric vehicle recharging points by 2015 (funded) and support distribution networks for other alternative fuels such as hydrogen and biofuels (unfunded)	L				105

Scheme	Description	Scheme cost	Anticipated completion			Proposal
			2010–2012*	2013–2020†	Post 2020	
Light emitting diode (LED) traffic signals	LED traffic signals at 300 junctions across London (funded) and ongoing programme to replace life-expired conventional signals with LED signals (unfunded)	L				108
Continue to work with DfT on road pricing feasibility programme	Review the option of road user charging and/or regulatory demand management measures to influence a shift to more CO ₂ -efficient road vehicles and lower carbon travel options, such as walking, cycling and public transport	L				109
Promote emission-based parking charges	Boroughs and car park operators to be encouraged to expand coverage of parking charges to vary by duration of stay and vehicle emissions	L				125
Congestion Charge Western Extension	Remove the Western Extension of the central London Congestion Charge (subject to consultation on a variation order)	L				128
Core central London Congestion Charging zone	Ongoing reviews to enable variations to ensure the continued effectiveness reflect best practice, improve operation, or help deliver desired outcomes of the strategy	L				129
London river services and river crossings						
Encourage improved passenger Thames services	Consistent service standards, examine opportunities for enhanced pier facilities (including at North Greenwich and Isle of Dogs) and development of the River Concordat	L				37
New vehicle ferry between Gallions Reach and Thamesmead	To be implemented in advance of a potential fixed link	L				39
Promote the use of Thames and other waterways for freight movement	Enable freight access to waterways	L				38
New walk/cycle Thames crossings	Including schemes in central London and walk/cycle links to access Isle of Dogs from east and west	M				39

Scheme	Description	Scheme cost	Anticipated completion			Proposal
			2010–2012*	2013–2020†	Post 2020	
New and enhanced road vehicle river crossing(s) in east London (package of measures)	Programme of works under development to improve cross-Thames links in east London	M				39
Other						
Integrated fares and ticketing	Integrated fares collection system and ticketing across all London public transport services, including Oyster zonal fares on all suburban rail services and Oyster on river services	M				122
Enhanced travel planning tools	Ongoing programme of enhancements to information availability, including TfL Journey Planner	L				115
Richmond 2009 to 2012 Smarter Travel Programme	Complete the three-year programme of smarter travel initiatives in Richmond	L				116
Targeted smarter travel initiatives	Smarter travel initiatives to reduce the environmental impact of travel, make more efficient use of limited transport capacity and/or encourage active travel such as walking and cycling	L				116
Increased use of travel plans	Increased use and power of travel plans for workplaces, schools and individuals	L				116
Continued development and roll-out of TfL Freight Plan initiatives	Town centre and area-based DSPs, CLPs and promotion of collaborative approaches such as consolidation centres and/or break-bulk	L				117
Promotion of freight best practice	Development and incentivisation of membership of the FORS and develop functionality of the freight information portal	L				117
Integrated transport policing	Establish joint transport policing intelligence unit and reporting systems to enable integrated working between the agencies policing London's transport system	L				74

Scheme	Description	Scheme cost	Anticipated completion			Proposal
			2010–2012*	2013–2020†	Post 2020	
Tackling antisocial behaviour	Programme of initiatives to tackle antisocial behaviour, including preventative and enforcement measures	L				75
Enhanced CCTV capability and Help points	Including introduction of two-way audio-visual communication at Help points and further expansion of CCTV coverage and enhanced 'smart' monitoring capability	L				74
Transport system climate change adaptation	Risk assess the transport system and prioritise actions to improve resilience and safety to the impacts of climate change	L				110

Costs: L: £0 – £100m M: £100m – £1bn H: More than £1bn

 Funded

 Unfunded

DfT: Department for Transport

TfL: Transport for London

NR: Network Rail/DfT

HLOS CP4: High Level Output Statement for control period 4 – the Government's railway investment programme for the period 2009 to 2014

TOC: Train operating company

TWA: Transport and Works Act

BAA: British Airports Authority

*2012 for TfL schemes and 2014 for Network Rail schemes (as per HLOS CP4)

† 2013 for TfL schemes and 2015 for Network Rail schemes (post HLOS CP4)

7.2 Accessibility Implementation Plan

⁷⁰⁰ This section, together with section 5.9 (A more accessible transport system), constitutes the Mayor's proposals for the provision of transport which is accessible to people with mobility impairments as required by the GLA Act 1999.

⁷⁰¹ Figure 87 represents the phasing for the implementation of the accessibility element of the strategy, as detailed in section 5.9. Figure 87 also includes proposals that will deliver accessibility benefits from other chapters in the MTS.

Figure 87: Accessibility Implementation Plan (indicative list)

Scheme	Description	Scheme cost	Anticipated completion			Proposal
			2010 - 2012*	2013- 2020†	Post 2020	
Rail						
Crossrail	All stations through central London and the majority of stations in Outer London to offer step-free access	H				5
National Rail step-free access station programme	DfT's Access for All, augmented by Crossrail and other committed investment, will increase the number of step-free rail stations in London to 160 (46 per cent) by 2017, from 101 in 2010	M				40
Common service standards on London's railways	Including staff presence at stations over the entire traffic day who can provide assistance if required	L				13 and 43
Chelsea Hackney line (Crossrail 2)	All new infrastructure will be fully accessible	H				9
Tube						
New Tube and rail rolling stock	New rolling stock will be compliant with rail vehicle accessibility regulation (RVAR)	M				17
Continuing roll-out of step-free access schemes on the Underground	Continuing programme of station step-free access schemes	M				18 and 19
Tube platform to train level access	Platform humps rolled-out across the Tube system as new rolling stock is introduced to provide level access from platform to train	L				40

Scheme	Description	Scheme cost	Anticipated completion			Proposal
			2010 - 2012*	2013- 2020†	Post 2020	
Tube station upgrade programme	To include some of the following features at upgraded stations: <ul style="list-style-type: none"> - Audible and visual information at all platforms and ticket halls - Improved handrail colour contrast and design - Improved visual contrast at leading edge of each riser and tread on steps - Removing, modifying or highlighting obstructions - Induction loops at Help and Information points - Listening points at some larger stations - Improved lighting and public address systems - Improved signs and wayfinding - Tactile warning surfaces on every platform and staircase - Increased amounts of seating - Accessible unisex toilets at all step-free stations where toilets already exist 	L				18
Tube wide-aisle ticket gates	Explore opportunities for further implementation of wide-aisle ticket gates	L				40
Tube travel information	Accessible Tube map showing step-free and mostly step-free routes	L				21
DLR						
DLR fully accessible extension	Canning Town to Stratford International	M				15
Buses and bus transit						
Bus network development	Regular review of bus network, including reviews of the strategic priorities underlying the process approximately every five years, to cater for population and employment growth, maintain ease of use, attractive frequencies and adequate capacity, reliable services, good coverage and good interchange with other modes	M				23
Bus stop accessibility	Improved accessibility of bus stops, for example, through removal of street clutter	L				83
Development of a New Bus for London	New Bus will include enhanced accessibility design features	L				25

Scheme	Description	Scheme cost	Anticipated completion			Proposal
			2010 - 2012*	2013- 2020†	Post 2020	
Walking and urban realm enhancements						
Accessible crossings programme and urban realm improvements	Improve the physical accessibility of the streetscape, particularly in town centres and on routes to stations and bus stops, taking account of the whole journey approach	L				83
Staffing measures						
Staff availability	To ensure staff are available to provide assistance, information and reassurance throughout service hours	L				43
Staff training	To ensure the needs of disabled passengers are understood by all frontline staff	L				43
Other accessibility specific measures						
Attitudes of staff and Londoners	Stakeholder, staff and public initiatives to improve staff and public attitudes and raise awareness of peoples accessibility needs	L				42
Travel information	Improve the availability, quality, quantity and timeliness of accessibility-related travel information	L				41
Enhanced Dial-a-Ride service	New Dial-a-Ride fleet and review of operations	L				44
TfL's Disability Equality Scheme (DES)	A statutory document, updated every three years, which sets out in further detail what TfL is going to do to ensure that the services it offers are accessible to disabled people	L				-
Further extensions to the public transport system	All extensions to the public transport system will meet the requirements of the Disability Discrimination Act	H				-
Blue Badge discounts	Discounts on Congestion Charging schemes	L				129

Costs: L: £0 - £100m M: £100m - £1bn H: More than £1bn

 Funded

 Unfunded

DfT: Department for Transport

TfL: Transport for London

HLOS CP4: High Level Output Statement for control period 4 – the Government's railway investment programme for the period 2009 to 2014

*2012 for TfL schemes and 2014 for Network Rail schemes (as per HLOS CP4)

† 2013 for TfL schemes and 2015 for Network Rail schemes (post HLOS CP4)



7.3 Delivery processes

7.3.1 Overall approach to delivery

- ⁷⁰² Detailed delivery planning and budgeting for TfL-delivered services and schemes will be developed in TfL's Business Plan. Schemes delivered by TfL will encompass sustainability principles governing design, procurement, construction and operation. TfL will adhere to any statutory procedures and consents such as Planning Policy Statement 5: Planning for the Historic Environment, Strategic Environmental Assessment and Environmental Impact Assessment and also to best practice assessment for equalities, health, etc. This is particularly the case with respect to protection of the integrity of Natura 2000 sites within, and in close proximity to, the Greater London boundary, with updated or amended S159 funding guidance issued periodically thereafter.
- ⁷⁰³ A significant element of the MTS will be delivered by the London boroughs, with each borough setting out its contribution in its LIP. Guidance on LIPs is being published simultaneously with this strategy.
- ⁷⁰⁴ National Rail, the Highways Agency and other delivery agencies also play a key role in delivering transport solutions in London, and the revised strategy sets the framework for TfL to work in partnership with all relevant agencies.
- ⁷⁰⁵ The overall delivery of this strategy depends on action and support from a variety of agencies, including national Government (via funding

settlements and overall policy guidance), London boroughs, the Met and emergency services, the LDA and other areas of the public sector such as NHS London, Primary Care Trusts, local education authorities and private business, as shown in Figure 88. The need for joint action with the boroughs is recognised by the London City Charter, launched in July 2009 by the Mayor and London Councils.

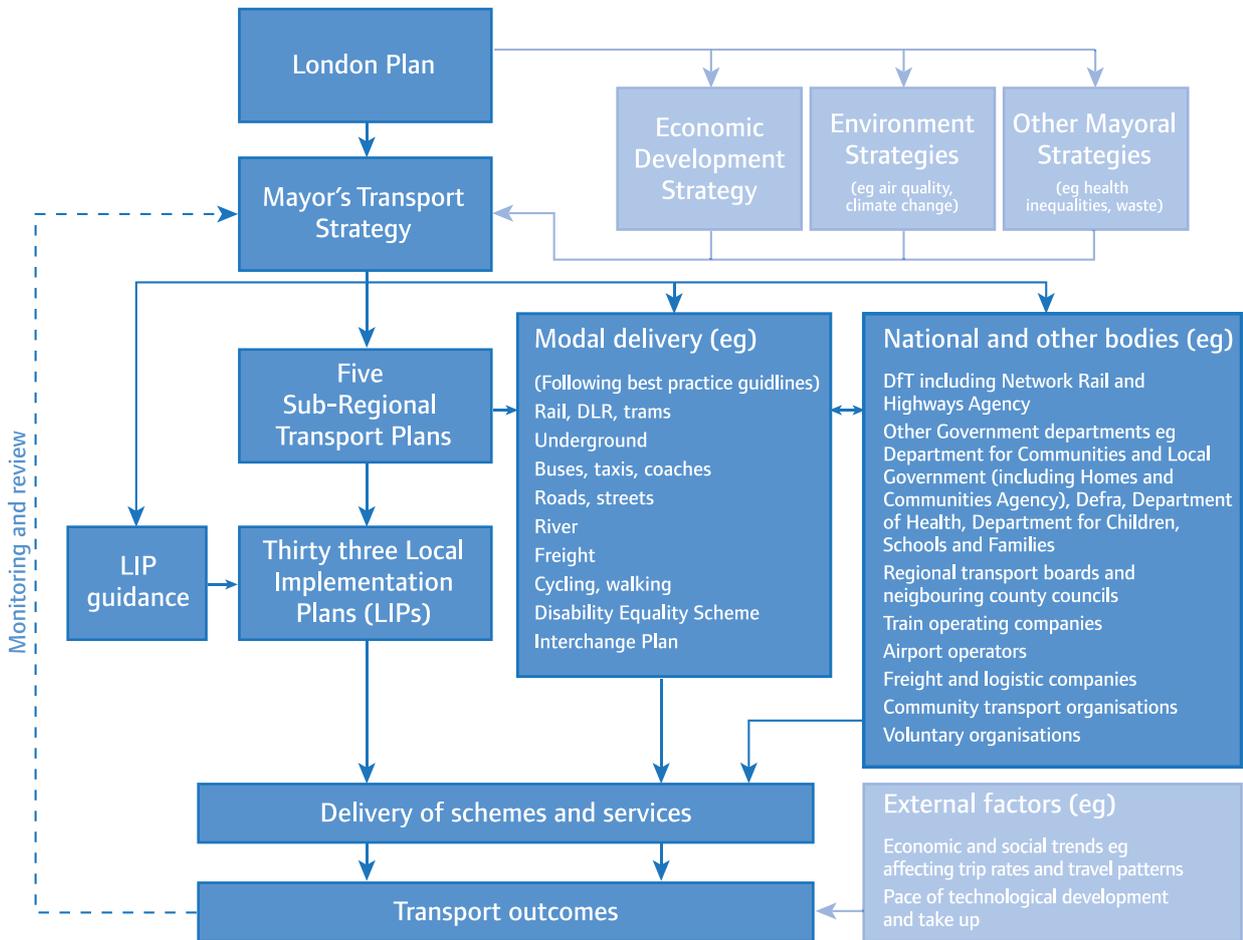
Policy 27

The Mayor and all parties involved in the delivery of this transport strategy will follow the spirit of the London City Charter and the principles (originally set out in 'Way to Go!') which underpin the strategy. These are: to provide value for money, work in partnership, ensure appropriate integration and phasing of programmes, a fair allocation of available resources across modes and delivery agents, London's regions and boroughs, and a fair funding regime for taxpayers and fare and chargepayers.

- ⁷⁰⁶ The Accessibility Implementation Plan which is required under the GLA Act is also supported by TfL's DES¹, which is a statutory document setting out in detail what TfL will do to ensure that the services it provides are accessible to disabled people. TfL is required to produce a DES every three years, and it contains an outcome-based action plan, which sets out what will be achieved during that timescale.

¹ GLA Act 1999, section 142

Figure 88: Delivery process



7.3.2 Sub-regional strategy development

⁷⁰⁷ TfL is working closely with the boroughs and London regional partnerships to develop more detailed sub-regional transport plans – referred to as London sub-regional transport plans. These address the specific challenges facing each region and the options for addressing them based on analysis of current and future demand, travel patterns, etc. TfL will also take steps to ensure the involvement of county and unitary strategic transport authorities immediately outside the Greater London area. These plans will provide more detail about the priorities for the regions, and how the policies and proposals set out in the MTS may apply. They will provide a framework for local and modal delivery through the development of borough LIPs and TfL implementation plans, the development of specific schemes or broader business planning processes.

⁷⁰⁸ In parallel with the development of the London sub-regional transport plans, TfL will update its Interchange Plan. This plan will complement the MTS, London Plan and EDS and help TfL and the boroughs to prioritise how available resources should be put into the development and implementation of particular interchange proposals. It will build on the analysis at a regional level, identifying strategically and regionally important interchanges and provide a common benchmark for quality across all categories of interchange. It will provide a framework to enable consideration of arising opportunities to leverage funding as well as consideration of area and system-wide

initiatives, including facilities for walking and cycling, adjacent to the interchanges.

Policy 28

The Mayor, through TfL, and in consultation with the London boroughs and other stakeholders, will develop a London sub-regional transport plan for each of the five sub-regions of London.

7.3.3 Local Implementation Plans

⁷⁰⁹ At the borough level the implementation of the MTS is delivered by the LIP, prepared by each London borough council (including the City). The MTS and non-statutory London sub-regional transport plans will provide the overarching framework for their development. The new LIPs must be prepared as soon as reasonably practicable after this new MTS is published in 2010, and when approved by the Mayor, will supersede any previous version.

⁷¹⁰ The GLA Act states that a LIP must contain each particular borough's proposals for the implementation in its area of the policies and proposals contained in the MTS. The LIP must also contain a timetable for implementing the borough's proposals, and a date by which all those proposals in the plan will be implemented. It is important that LIPs also link-up with other documents and mechanisms, for example, Local Area Agreements, Local Development Frameworks and Local Strategic Partnerships, to ensure delivery of wider community and economic development priorities.

- 711 It is for each borough to seek the financial resources it requires to implement its LIP proposals. For these, and for any other borough transport proposals that are conducive to the provision of safe, integrated, efficient and economic transport facilities, or services, to, from, or within Greater London, a borough may apply for such financial assistance as may from time to time be available from TfL. This assistance is provided by TfL under section 159 of the GLA Act 1999. Assistance may be made by way of grant, loan or payment, and be given subject to such conditions as TfL considers appropriate. The Second London LIPs Guidance (referred to below) sets out further information on funding.
- 712 In preparing its new LIP, the borough must consult the Metropolitan Police Commissioner (or City of London Police Commissioner in the case of the City's LIP), TfL and such organisations representative of disabled people as the borough considers appropriate. The borough must also consult other London boroughs whose area is, in the opinion of the borough preparing the LIP, likely to be affected by the plan, and any other person that the Mayor has directed should be consulted.
- 713 Each new LIP must be submitted to the Mayor for his approval and the GLA Act 1999 sets out the criteria that must be met before Mayoral approval can be given. Section 146 states that the Mayor shall not approve a LIP unless he considers:
- That the LIP is consistent with the MTS
 - That the proposals it contains are adequate for the purposes of the implementation of the MTS in its area
 - That the timetable for implementing those proposals, and the date by which those proposals are to be implemented, are adequate for those purposes
- 714 The Mayor may issue statutory guidance as to the implementation of the MTS to which boroughs must have regard. He also has reserve powers to issue general or specific statutory directions as to the manner in which a borough is to exercise its functions of preparing and implementing its LIP, with which they must comply.
- 715 Detailed guidance to boroughs on how to prepare and submit their LIPs is contained in the Second London LIP Guidance following consultation with the boroughs and key partners. The Mayor has recognised the autonomy of the boroughs as reflected in the City Charter and that they should be given greater flexibility to determine their own transport priorities consistent with the goals and outcomes of the MTS. Boroughs are expected to develop their own delivery and performance monitoring plans. The Mayor shares London Councils' desire to minimise the amount of work associated with the preparation, submission and monitoring of LIPs.

⁷¹⁶ To this end the guidance indicates how LIPs should best be structured, and the level of information they should contain, including monitoring, to assist the Mayor by providing him with a reasonable level of information so as to determine the LIP's consistency with the MTS, and with the other statutory approval criteria set out in section 146 of the Act.

Policy 29

The Mayor, consistent with the approach of the London City Charter, will work with TfL and London Councils to seek to ensure the requirements for a LIP demonstrate consistency with the policies and proposals set out in this MTS, and that other legal requirements are kept to a minimum.

The boroughs will develop LIPs which set out their transport objectives, a delivery plan and a performance monitoring plan. The goals that are required to be addressed by the London boroughs in their LIPs, are:

1. Supporting economic development and population growth
2. Enhancing the quality of life for all Londoners
3. Improving the safety and security of all Londoners
4. Improving transport opportunities for all Londoners
5. Reducing transport's contribution to climate change and improving its resilience

⁷¹⁷ Delivering the London 2012 Olympic and Paralympic Games and its legacy is also a goal that boroughs may wish to include in their LIP submission. This will depend on the impact of the Games in each borough and whether significant Games-related transport projects need to be implemented in each borough after the next round of LIPs are effective in 2011.

⁷¹⁸ The Mayor also expects the boroughs to work towards achieving a number of specific outputs. More detail on these outputs is supplied in the Second London LIP Guidance.



Chapter eight – Cost, resources and funding the strategy

8.1 Cost of the strategy

8.1.1 Introduction

⁷¹⁹ Meeting London's transport needs and successfully achieving all the strategy's objectives will require sustained investment beyond the 10-year funding settlement. The strategy sets out a significant and necessary investment in infrastructure and expansion of transport services through to 2031. Cost estimates assume a continuation of the policy and that levels of operational expenditure for the day-to-day provision of services, subject to the efficiencies programme set out in the TfL Business Plan, are funded by sources of recurring income, including grant.

8.1.2 Capital investment costs

⁷²⁰ Committed investment in London's transport infrastructure, including the completion of Crossrail, over the years to 2018 is approximately £4.8bn per year. The proposed package of capital works beyond this will require continuing annual investment of around £3.5bn to £4.5bn (further analysis is underway to determine more precisely the scale of investment required) in the period to 2031. Careful phasing of investment in the period following the current committed programme will be required to ensure construction industry capacity to deliver the works and a balanced investment profile over time.

8.2 Funding the strategy

8.2.1 Funding sources

⁷²¹ Transport in London is funded through a combination of sources, including:

- Government grant direct to TfL
- Revenue from fares and other sources (for example, Congestion Charge)
- Secondary income (for example, advertising)
- TfL 'prudential borrowing' against future revenue, which is capped until 2018 under TfL's 'spending review 2007' funding settlement with Government
- Asset financing and property disposal receipts (although this is unlikely to be a significant source of further funds post 2018)
- Other forms of Government grant to parts of the transport network not controlled by TfL, for example, Network Rail, the DfT HLOS process, borough highway maintenance
- Contributions from the private sector, for example, developer funding for associated transport investments
- Direct borough funding
- Other Government funding sources including specific allocations to support regeneration, health, education, and the London 2012 Olympic and Paralympic Games Transport Plan

8.2.2 Approach

- ⁷²² The policies and proposals in this strategy provide the necessary minimum levels of investment to enable London to continue growing and contribute to the UK economy. Further investment is required to meet London's population and employment growth and to address the challenges of climate change. It is essential that TfL continues to secure a fair allocation of funding from Government, reflecting the contribution that transport makes to London's prosperity and success as a world city.
- ⁷²³ The current funding settlement from Government provides for £39.2bn of funding through to 2017/18. This, along with funding generated through revenue including fares, borrowing and contributions secured through the private sector, will deliver the short-term policies and proposals of this strategy. In addition to this, funding through Network Rail will also provide major benefits for Londoners through increased capacity on the rail network.
- ⁷²⁴ The strategy underpins the importance of funding the current round of investments such as Crossrail and the Tube upgrades, and the value for money these schemes offer. It is essential that TfL continues to provide levels of service that passengers expect in a way that delivers greater value for money. The strategy covers the period to 2031, and this will require similar levels of funding to continue beyond 2018 to 2031. In a time of potential funding shortfalls, it is essential that TfL maximises the benefit of schemes and investments that are

already funded and secures the best possible return on future levels of investment.

Policy 30

The Mayor, and TfL, will make the case to Government for long-term investment in the transport network to secure the outcomes set out in this strategy.

Policy 31

The Mayor, and TfL, will maximise any available efficiencies, subsidise services at appropriate levels and ensure that value for money is otherwise achieved from the existing and planned transport network, while reviewing fares levels to provide, if required, a residual means of achieving the goals of this transport strategy. Innovative ways of financing investment and services, including making the most of the value of transport infrastructure, will be explored.

8.2.3 Bus funding

- ⁷²⁵ There are large and broad benefits of the bus service in London – directly to users by enabling access to jobs and services, and through wider social benefits, such as increasing social inclusion and addressing deprivation. It is therefore appropriate that the cost of bus operations is partly met through the Transport Grant from the DfT, and not entirely paid for by users through fares and by reimbursements for concessionary travel.
- ⁷²⁶ London is not unusual in requiring subsidy for its bus operations; indeed, many cities around

the world receive subsidies. Before TfL was set up in 2000 the level of operating subsidy – the difference between fares income and the cost of providing bus services was £41m in 1999/00 and has increased significantly to £560m in 2008/09 as the quantity and quality of bus services have been expanded and improved considerably, and extra free and concessionary travel has been introduced. Over, broadly, the same time period the number of bus kilometres operated in London have increased by over 30 per cent and bus ridership has increased by around 40 per cent.

- 727 The average bus fare revenue in 2008/09 was 47.8p per journey, while the average cost was 72.8p per journey – meaning that one third of the average bus journey is subsidised. Bus fares compare favourably with the cost of using other modes of transport in London and with bus fares in other UK cities.
- 728 In order to maximise the level of funding available for essential investment in capacity and other key priorities, it is essential to ensure that the long-term subsidy for operations is both affordable and sustainable.

Policy 32

The Mayor, through TfL, will keep the level of subsidy for bus operations under constant review to ensure the correct balance between fares income, bus service levels and quality, social benefits and affordability, in the context of the overall level of funding available for transport.

8.2.4 Tube funding

- 729 The cost of operating and maintaining the London Underground system is met by its farepayer revenue and other taxpayer funding. Significant taxpayer funding is committed to cover the costs of the essential investment that is underway to bring Tube assets to a state of good repair and to increase the network's capacity to support London's future economic and population growth.
- 730 The investment in the Underground line upgrades has a very strong business case, and the new capacity will generate additional revenue, create benefits for users and generate wider economic benefits which over time will cover their cost many times over.
- 731 It is vital for the future of London and the national economy that this taxpayer-funded investment is maintained throughout the period of this transport strategy.

Policy 33

The Mayor, through TfL, will work to secure the investment necessary to remove the backlog of life-expired assets and to deliver the transformation of the Tube.

8.2.5 Rail funding

⁷³² Many of the priorities set out in this strategy are not directly controlled by TfL but by other agencies such as Network Rail. Seventy per cent of all National Rail journeys across the UK start or finish in London and 50 per cent of all National Rail journeys across the UK are made by Londoners. Given this, it is not only fair but essential that a significant proportion of investment in the National Rail network is focused on London.

⁷³³ The quality of National Rail infrastructure in the Capital, while greatly improving, still requires major investment. For example, the quality of National Rail stations in London is poor compared to those directly controlled and managed by TfL and extra funding is needed to secure comparable improvements. It is essential that investment continues to be made in London's National Rail network either directly by National Rail or through new franchises which offer more for Londoners in terms of level and quality of service.

⁷³⁴ Rail refranchising also offers an opportunity to secure investment from the private sector train operating companies. Refranchising of rail services during the life of this strategy includes:

- Essex Thameside (c2c) – 2011
- Greater Anglia (National Express East Anglia) – 2011
- Integrated Kent Franchise (Southeastern) – 2014

- Greater Western (First Great Western) – 2016
- London Region (London Overground) – 2014
- South Central (Southern) – 2015
- West Midlands (London Midland) – 2015
- Thameslink/Great Northern (First Capital Connect) – 2016
- South Western (South West Trains) – 2017
- Chiltern (Chiltern Railways) – 2021

Policy 34

The Mayor, through TfL, will work with the DfT, Network Rail, the train operating companies and other stakeholders to secure the necessary investment in London's rail network, including new stations where feasible, through additional capital funding and enhancements to rail services through rail franchises.

⁷³⁵ Looking to the future, in a period with constrained funding, TfL will continue to be innovative about how transport investments are funded and financed. At the same time, strategic choices will have to be made about the overall subsidy of services, that is, between fare levels, the amount of free and discounted travel and the volume and quality of services provided, to maximise the funding available for necessary investments in the network. TfL has a strong track record of both delivering projects on time and to budget, as well as using a variety of innovative financing models, including private finance initiatives (PFI).

8.2.6 Developer contributions to transport

⁷³⁶ Developments such as new offices, retail and housing often places significant demands on London’s transport system. This needs to be addressed in order to ensure the development is viable and sustainable. TfL will continue to work with the LDA and boroughs to secure developer contributions for the necessary transport improvements through existing planning obligations to facilitate the success of the development and mitigate its impacts on the current transport network, in accordance with relevant legislation and policy guidance.

8.2.7 Developer contributions to Crossrail

⁷³⁷ In view of the strategic regional importance of Crossrail to London’s sustainable development and continued economic success, developments which contribute to the transport needs that the project will wholly or partly address will be required to contribute towards its funding through the use of planning obligations. Where it is appropriate to seek a Crossrail contribution, this should generally be given higher priority than other public transport improvements.

⁷³⁸ Overall, £300m needs to be secured for Crossrail through planning obligations (with a further £300m to be raised through a Community Infrastructure Levy). While this is a relatively small proportion of the total cost of Crossrail, it is a vital element of the overall funding package for the scheme.

⁷³⁹ TfL will work with boroughs and other stakeholders to put in place practical arrangements for administering the policy and assessing viability. A protocol to ensure efficient collection of the monies will also be developed.

Policy 35

The Mayor, and TfL, will work with the London boroughs to secure developer contributions to transport through planning obligations in order to secure the success of each development and to mitigate any negative impacts on the existing transport system in accordance with relevant legislation and policy guidance. As set out in the proposed London Plan policy, where it is appropriate to seek a Crossrail contribution, this should generally be given higher priority than other public transport improvements. TfL will work with the GLA and boroughs to develop a protocol to implement the policy.

8.2.8 Other funding sources

⁷⁴⁰ There are other sources of funding which the Mayor may pursue in order to assist with the implementation of this strategy. For example, to better integrate transport and other investment in Regeneration Areas, improve the urban realm, or to promote walking and cycling, including:

- London Boroughs
- Government's Community Infrastructure Fund
- NHS London/Primary Care Trust funding to support active travel initiatives
- European Union funds

Policy 36

The Mayor, and TfL, will work with the London boroughs and other stakeholders, to seek to secure further investment from a variety of sources that help improve the quality and range of transport services available to Londoners.



Chapter nine – Monitoring and reporting

9.1 Monitoring and review

9.1.1 Introduction

⁷⁴¹ This strategy outlines a series of challenges for the improvement and delivery of transport in London. The outcomes of this strategy are primarily monitored through the collection and publication of strategic outcome indicators. The strategic indicators quantify progress in the delivery of the strategy in order to facilitate a broad understanding of the ‘totality of effects’ of the strategy’s interventions on transport and wider quality of life in London. These indicators provide a straightforward way of monitoring and reporting progress in delivering the MTS. However, in order to fully understand and interpret developments, a wider range of information is also needed.

⁷⁴² The strategic outcome indicators are therefore related to, and interpreted alongside, appropriate supporting and contextual information about specific trends and developments in transport in London. This includes background factors such as economic and demographic change, and the specific actions taken by TfL and delivery partners as part of the implementation of the MTS. This allows changes and the relative contribution of specific policies, to be interpreted. Where appropriate and possible, findings are divided on a spatial (borough, network, region), modal or temporal basis.

9.1.2 Mayoral targets

⁷⁴³ The anticipated outcomes described in chapter six are not statutory targets, however, the Mayor may set, from time to time, statutory targets with respect to the implementation of the strategy, for example, with regard to:

- Mode share
- CO₂
- Road safety
- Cycling
- Use of the Thames
- Better streets
- Air quality

9.1.3 Framework of indicators

⁷⁴⁴ The MTS strategic outcome indicators (SOIs) are, deliberately, based on outcomes, rather than outputs (such as particular projects or policies) or inputs (for example, amount of money spent). Likewise, they are multi-modal.

⁷⁴⁵ The SOIs for the MTS will sit at the head of a framework of indicators and support information designed to measure delivery against the strategy’s goals by TfL, local authorities and other delivery partners in London, and measure the outcomes of that delivery. This framework, set out in Figure 89, can be envisaged in two dimensions:

- First, a ‘reporting’ framework, whereby the strategic indicators are aligned with the KPIs for the TfL Business Plan, which are in turn connected with performance indicators for

boroughs through the revised arrangements for LIPs. The former has a longer timescale than the latter two; but the KPIs are consistent, once timescales are taken into account. The framework and reporting process also include the transport KPIs and targets in chapter eight of the draft London Plan. There are also envisaged to be shorter term (up to one year) delivery indicators, which consider the short-term outputs that have been achieved, and provide a basis to assess their contribution to change in the strategic 'outcome' indicators

- Second, an 'analysis' framework, where SOIs can be broken down – by mode, borough, time of day, etc, according to specific policy analysis requirements to understand how these outcomes are being achieved

9.2 Reporting processes

⁷⁴⁶ The SOIs set out in Figure 90 are published in TfL's annual Travel in London report. This report describes key trends and developments affecting how people travel around London. It provides an understanding of what has been achieved to date and interprets the direction of movement of the strategic performance indicators within the context of wider travel, economic and societal conditions. Many of the strategic outcome indicators are published annually, some less frequently; findings are separated out to as local a level as possible. Where the data exist and permit, the report shows a time series and the latest data.

Figure 89: Framework of indicators

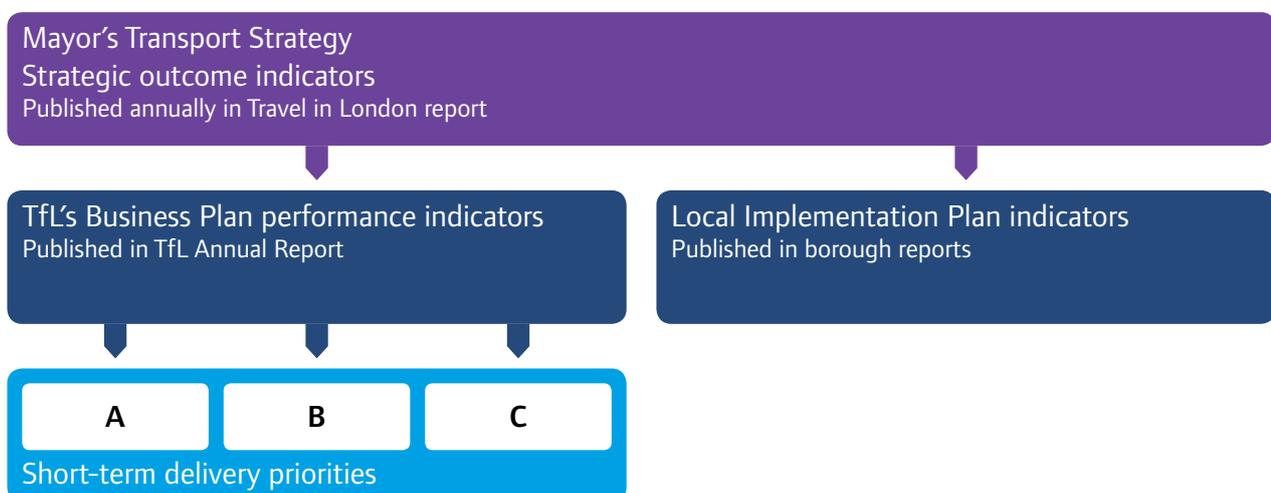


Figure 90: Indicators proposed to monitor the outcomes of the MTS

Goal	Strategic outcome indicator	Brief definition
Contextual indicators	Travel demand	The number of trips (or journey stages) made to, from, or within London per calendar year
	Mode share	Proportion of trips (or trip stages) undertaken by each mode to, from, or within London per calendar year
Supporting economic development and population growth	People's access to jobs	Employment accessibility maps – number of jobs within 45 minutes travel time (three-yearly)
	Smoothing traffic flow – journey time reliability	For a selection of key road corridors, percentage of journeys completed within five minutes of a specified typical journey time
	Public transport reliability	Existing reliability indicators for each principal public transport mode will be presented separately
	Public transport capacity	Calculated using planning capacities for the various modes multiplied by kilometres operated
	Operating costs per passenger kilometre	Operating cost per passenger kilometre, by principal public transport mode
	Asset condition	Composite multi-modal indicator measuring the percentage of in-scope asset that is deemed to be in good condition
Enhancing the quality of life for all Londoners	NO _x emissions	Emissions from all identifiable ground-based transport sources in London per year, expressed as tonnes of NO _x
	PM ₁₀ emissions	Emissions from all identifiable ground-based transport sources in London per year, expressed as tonnes of PM ₁₀
	Public transport customer satisfaction	Overall satisfaction of those travelling on the network with the operation of principal public transport modes
	Road user customer satisfaction	Satisfaction of private road users with the maintenance and operation of the road network
	Public transport crowding	Satisfaction of those travelling on the network with the level of crowding inside the vehicle, on the principal public transport modes
	Perception of journey experience	Perception of London residents of their overall journey experience when travelling in the city
	Perception of noise	Perception of London residents of noise levels in their local area
	Perception of the urban realm	Perception of London residents of the quality of the urban realm in their local area

Goal	Strategic outcome indicator	Brief definition
Improving the safety and security of all Londoners	Volume of road traffic casualties	Number of people killed or seriously injured in road traffic collisions in London per year
	Crime rates on public transport	Crimes per million passenger journeys by principal public transport modes
	Perception of crime/safety	Perception of London residents of their sense of safety and fear of crime when travelling in the city
Improving transport opportunities for all Londoners	Access to services	Local area score of average journey time by public transport, walking and cycling to work, education, health services, quality food shopping and open spaces
	Physical accessibility to the transport system	Level of step-free access across the public transport and streets network
	Real fares levels	Cost for a selected, representative 'basket' of trips
Reducing transport's contribution to climate change and improving its resilience	CO ₂ emissions	Emissions from all identifiable ground-based transport sources in London per year, expressed as tonnes of CO ₂
Supporting delivery of the London 2012 Olympic and Paralympic Games and its legacy	Convergence of social and economic outcomes between the five Olympic boroughs and the rest of London	The measure of convergence is to be determined through the Transport Legacy Action Plan

- Figure 1: Enhancements to London’s transport infrastructure**
Source: TfL
- Figure 2: Mode share**
Source: From 2006 daily trips estimate in TfL Travel in London, report number 1; 2031 based on trip growth from London Transport Studies (LTS) transport model, with estimate to reflect growth in cycle trips. The LTS is a four-stage model used in London for trip generation, trip distribution, mode split and assignment
- Figure 3: Proposed outcomes**
Source: TfL
- Figure 4: Travel demand and levels of transport networks serving London**
Source: Journey purpose and mode share data from TfL
- Figure 5: London’s transport geography at the international, national and inter-regional level**
Source: TfL
- Figure 6: London’s economic inter-relationship with the Greater South East**
Source: TfL
- Figure 7: Places which are dominant in the London economy**
Source: TfL derived from the London Plan
- Figure 8: London-wide transport geography**
Source: TfL
- Figure 9: London-wide transport connectivity**
Source: TfL
- Figure 10: Town centres in the CAZ, Inner and Outer London**
Source: TfL derived from the London Plan
- Figure 11: Spatial pattern of travel across London, with mode shares**
Source: TfL, Travel in London, report number 1. Percentages are daily 2005 to 2008 average proportion of all trips made from, or within, London. Figures include trips by London and non-London residents and excludes freight. For more information, go to tfl.gov.uk
- Figure 12: Daily average number of trips (millions) in London, 2007**
Source: TfL Travel in London, report number 1. Daily average number of trips in London (including trips to/from London). For more information, go to tfl.gov.uk
- Figure 13: Population and employment distribution and forecast growth**
Source: TfL derived from the London Plan. Figures supplied by the GLA and represent the best view at the time of writing. The CAZ encompasses parts of 10 London boroughs (Kensington & Chelsea, Wandsworth, the City of Westminster, Lambeth, Camden, Islington, City of London, Southwark, Hackney, Tower Hamlets). The boundary of the CAZ is not contiguous with either boroughs or wards – the only areas for which there are employment statistics for

the years between Censuses (every 10 years). An estimate of 2007 and 2031 employment was based on a 'backcast' of CAZ employment using the growth rate of aggregate employment in three boroughs partially or wholly included in the CAZ (Camden, City of Westminster, City of London). Employment in the zone was then projected to 2031, using trend-based forecast growth rates for aggregate employment in the same three boroughs

Inner London comprises the following boroughs, and rest of Inner excludes the area defined as CAZ: Camden, Kensington & Chelsea, City of Westminster, City of London, Greenwich, Hackney, Hammersmith & Fulham, Islington, Lambeth, Lewisham, Newham, Southwark, Tower Hamlets, Wandsworth

Outer London comprises: Barking & Dagenham, Barnet, Bexley, Brent, Bromley, Croydon, Ealing, Enfield, Haringey, Harrow, Havering, Hillingdon, Hounslow, Kingston upon Thames, Merton, Redbridge, Richmond upon Thames, Sutton, Waltham Forest

Figure 14: Spatial distribution of population growth, 2007 to 2031

Source: Based on population projections for 2031 supplied by the GLA. These were used to estimate 2006 to 2031 growth factors which were applied to 2006 population and employment figures allocated to the London Transport Studies (LTS) transport model zones. (The LTS is a four-stage model used in London for trip generation, trip distribution, mode split and assignment)

Figure 15: Spatial distribution of employment growth, 2007 to 2031

Source: Based on employment projections for 2031 supplied by the GLA. These were used to estimate 2006 to 2031 growth factors which were applied to 2006 population and employment figures allocated to the London Transport Studies (LTS) transport model zones. (The LTS is a four-stage model used in London for trip generation, trip distribution, mode split and assignment)

Figure 16: Growth areas in the Greater South East

Source: TfL, derived from the London Plan, South East England Development Agency (SEEDA) and East of England Regional Assembly (EERA)

Figure 17: London trends and forecast in population, employment and trip making, index from 1993

Source: TfL. Trend from midweek daily trips reported in TfL Travel in London report. Projected daily trips based on London Transport Studies (LTS) transport model. GLA population and employment projections and TfL Freight Unit data are also used. (The LTS is a four-stage model used in London for trip generation, trip distribution, mode split and assignment)

Figure 18: Public transport accessibility levels (PTALs), 2006

Source: TfL PTAL model – data combining walk and service wait time calculated for a grid of points at 100-metre intervals

Figure 19: Tube and DLR crowding, 2006

Source: TfL. Morning peak period crowding from TfL Railplan public transport assignment model, using travel demand matrices from the London Transport Studies (LTS) transport model. Diagram shows categories representing the number of passengers standing per square metre

Figure 20: Tube and DLR crowding, 2031 (with committed funding/reference case)

Source: TfL. Morning peak period crowding from TfL Railplan public transport assignment model, using travel demand matrices from the London Transport Studies (LTS) transport model. Diagram shows categories representing the number of passengers standing per square metre

Figure 21: Rail crowding, 2006

Source: TfL. Morning peak period crowding from TfL Railplan public transport assignment model, using travel demand matrices from the London Transport Studies (LTS) transport model. Diagram shows categories representing the number of passengers standing per square metre (on train)

Figure 22: Rail crowding, 2031 (with committed funding/reference case)

Source: TfL. Morning peak period crowding from TfL Railplan public transport assignment model, using travel demand matrices from the London Transport Studies (LTS) transport model. Diagram shows categories representing the number of passengers standing per square metre (on train)

Figure 23: Local trips to metropolitan town centres

Source: TfL – London Transport Studies trips by zone to each Outer London metropolitan centre – displayed as a series of dots proportional to the number of trips within each zone

Figure 24: Enhanced links to, and between, metropolitan town centres

Source: TfL

Figure 25: Highway congestion, average vehicle delay, 2006

Source: TfL. Output from the London Transport Studies (LTS) transport model, showing average vehicle delay in minutes per vehicle kilometre in each LTS model zone (in the morning peak). This is based on comparison with free flow travel times

Figure 26: Highway congestion, average vehicle delay, 2031 (with committed funding/reference case)

Source: TfL. Output from the London Transport Studies (LTS) transport model, showing average vehicle delay in minutes per vehicle kilometre in each LTS model zone (in the morning peak). This is based on comparison with free flow travel times

Figure 27: Public transport journey relative time differential to/from Bank by physically accessible route in comparison to quickest route

Source: TfL – comparison of generalised travel times for a 2006 constrained and unconstrained network – reflecting travel times for disabled people requiring step-free access

- Figure 28: Transport's contribution to London's CO₂ emissions**
Source: TfL Environment Report. An estimate from the London Greenhouse Gas Emissions Inventory. For more information, go to tfl.gov.uk
- Figure 29: Layout of the expanded Tottenham Court Road station**
Source: TfL, go to www.crossrail.co.uk
- Figure 30: Crossrail route connections and regional maps**
Source: TfL, go to www.crossrail.co.uk
- Figure 31: Committed enhancements to London's rail network**
Source: TfL, derived from DfT Rail White Paper, July 2007
- Figure 32: National Rail and Tube 'stress' on radial corridors into central London**
Source: TfL. The crowding value for each corridor has been calculated by estimating the flow on each link due to trips between the corridor in question and central London (during the three hour morning peak from 07:00–10:00) and using this data to estimate a weighted average of the crowding measure (passengers per sq metre). The grading is:
Highly stressed (red) – crowding more than 2.25 passengers per sq metre
Stressed (amber) – crowding 1.70–2.24 passengers per sq metre
Moderately stressed (green) – crowding under 1.69 passengers per sq metre
Note that the definition of the corridor and CAZ relates only to the origin and destination of the trips, thus the links that are used in the calculation are not bound by the geographic definition of the areas
- Figure 33: Further rail capacity needed in London**
Source: TfL
- Figure 34: The potential benefits from implementing measures beyond those in the TfL Business Plan and HLOS to reduce crowding on London's rail and Tube network**
Source: TfL, analysis, including modelling using London Transport Studies (LTS) and Railplan. Crowding at morning peak
- Figure 35: National Rail punctuality (London and southeast operators total, including peak services)**
Source: TfL, derived from the Office of Rail Regulation punctuality of all train services
- Figure 36: London Overground route map (2012)**
Source: TfL
- Figure 37: London bus use since 1971**
Source: TfL, Travel in London report, number 1, using service performance data of total passenger journey stages per year (a passenger journey stage is a component part of a trip using a single mode of transport between interchanges. Walking is counted as a separate mode)

- Figure 38: Improving bus journey experience**
Source: TfL, Travel in London report, number 1, customer satisfaction survey
- Figure 39: Selected orbital and other bus services in Outer London**
Source: TfL. For more information, go to tfl.gov.uk
- Figure 40: Transport for London Road Network**
Source: TfL
- Figure 41: Causes of unusual congestion by proportion of duration**
Source: London Traffic Control Centre 2008/09
- Figure 42: Mitigation of increased road congestion (average vehicle delay)**
Source: TfL. Congestion in 2006, 2031 with the reference case, and 2031 with the strategy based on TfL LTS modelling. 2031 with no interventions based on LTS modelling of effect of funded public transport investment, and including one per cent estimated effect of funded measures to support increases in cycling, travel choices and changes in travel behaviour. Impact of strategy measures for road network management and cycling, including smarter choices and changes in travel behaviour, estimated at one per cent reduction each
- Figure 43: The London Blue Ribbon Network**
Source: TfL
- Figure 44: Options for new river crossings in east London**
Source: GLA, the London Plan
- Figure 45: Strategic interchange concepts**
Source: TfL
- Figure 46: Examples of key strategic interchange locations outside central London**
Source: TfL
- Figure 47: Olympic Park legacy international, national, regional and local connections**
Source: TfL, based on planning submissions by the ODA (non-exhaustive)
- Figure 48: Trends in road casualties, 1991 to 2008**
Source: TfL, derived from Stats 19 casualty data collected by the Metropolitan and City Police
- Figure 49: Road casualties by casualty category**
Source: TfL, derived from Stats 19 casualty data collected by the Metropolitan and City Police
- Figure 50: Casualties by mode, 2008**
Source: TfL, derived from Stats 19 casualty data collected by the Metropolitan and City Police
- Figure 51: An example of road safety campaign material**
Source: TfL
- Figure 52: Speed limits on London's roads**
Source: TfL

- Figure 53:** Crime rates on Tube/DLR and buses since 2004/05
Source: TfL. All reported crimes per million passenger journeys
- Figure 54:** Six principles for 'better streets'
Source: TfL
- Figure 55:** Five stages to improve streets
Source: TfL
- Figure 56:** Illustrative town centre improvements
Source: TfL
- Figure 57:** NO₂ annual mean concentrations ($\mu\text{g}/\text{m}^3$), 2008
Source: TfL, derived from GLA, London Atmospheric Emissions Inventory. Concentration of NO₂ by mean concentration of micrograms per cubic metre. Analysis undertaken for TfL by ERG Kings College
- Figure 58:** PM₁₀ annual mean concentrations ($\mu\text{g}/\text{m}^3$), 2008
Source: TfL
- Figure 59:** London NO_x emissions 2009 to 2015
Source: TfL
- Figure 60:** Central London PM₁₀ emissions in 2008, 2011 and 2015
Source: TfL
- Figure 61:** Mid-range estimates of CO₂ reduction impacts of transport policy areas by 2025
Source: TfL, derived from the GLA, London Atmospheric Emissions Inventory. Concentration of NO₂ by mean concentration of micrograms per cubic metre. Analysis undertaken for TfL by ERG Kings College
- Figure 62:** Projected transport sector CO₂ emissions to 2025
Source: TfL, modelling of vehicle kilometres and emissions assumptions
- Figure 63:** CO₂ emissions by mode: 2008/09 emissions and 2025 projections
Source: TfL, modelling of vehicle kilometres and emissions assumptions
- Figure 64:** Annual road transport CO₂ emissions reductions by 2025, compared to 2007, due to improved vehicle efficiency
Source: TfL, modelling of vehicle kilometres and emissions assumptions
- Figure 65:** Areas at risk of tidal and fluvial flooding in London
Source: Environment Agency
- Figure 66:** Extent of the Western Extension to the Congestion Charging zone
Source: TfL
- Figure 67:** How the strategy would support population and employment growth
Source: TfL

- Figure 68:** How the strategy would enhance transport connectivity
Source: TfL
- Figure 69:** How the strategy will deliver an efficient and effective transport system for people and goods
Source: TfL
- Figure 70:** Anticipated change in crowding levels on the National Rail network by 2031 with the strategy
Source: TfL, morning peak period crowding from TfL Railplan public transport assignment model using travel demand matrices from the London Transport Studies (LTS) transport model. Diagram shows categories representing number of passengers standing per square metre
- Figure 71:** Anticipated change in crowding levels on the Tube and DLR network by 2031 with the strategy
Source: TfL, morning peak period crowding from TfL Railplan public transport assignment model, using travel demand matrices from the London Transport Studies (LTS) transport model. Diagram shows categories representing number of passengers standing per square metre
- Figure 72:** How the strategy will improve journey experience
Source: TfL
- Figure 73:** How the strategy will enhance the built and natural environment
Source: TfL
- Figure 74:** How the strategy will improve noise impacts
Source: TfL
- Figure 75:** How the strategy will improve health impacts
Source: TfL
- Figure 76:** How the strategy will improve air quality
Source: TfL
- Figure 77:** How the strategy will reduce crime, fear of crime and antisocial behaviour
Source: TfL
- Figure 78:** How the strategy will improve road safety
Source: TfL
- Figure 79:** How the strategy will improve public transport safety
Source: TfL
- Figure 80:** How the strategy will improve accessibility
Source: TfL

- Figure 81:** Anticipated difference in access to jobs between 2006 and 2031
Source: TfL – calculations combining journey times estimated from Railplan model coding (RP54 – coding as of September 2009) and population and employment forecasts produced by the GLA
- Figure 82:** How the strategy will support regeneration and tackle deprivation
Source: TfL
- Figure 83:** How the strategy will reduce ground-based transport CO₂ emissions
Source: TfL Planning
- Figure 84:** How the strategy will support adaptation to climate change
Source: TfL
- Figure 85:** How the strategy will support the Olympic legacy
Source: TfL
- Figure 86:** Transport Strategy Implementation Plan (indicative list)
Source: TfL
- Figure 87:** Accessibility Implementation Plan (indicative list)
Source: TfL
- Figure 88:** Delivery process
Source: TfL
- Figure 89:** Framework of indicators
Source: TfL
- Figure 90:** Indicators proposed to monitor the outcomes of the MTS
Source: TfL



Annex B – Cross-reference of policies, proposals and London Plan policies

Policy No.	Policy	Reference	Page No.	Reference to policies in the draft replacement London Plan
1	The Mayor, through TfL, and working with the DfT, Defra and other government agencies, regional development agencies, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to develop London's transport system in order to accommodate sustainable population and employment growth.	This policy is taken forward by proposals throughout chapter five.	67	1.1
2	The Mayor, through TfL, and working with the DfT, government agencies, Network Rail, train operating companies, London boroughs, coach operators and other transport stakeholders, will support sustainable capacity enhancements to inter-regional, national and international rail and coach services, high-speed rail hubs and the strategic road network serving London.	This policy is taken forward by proposals: 1, 2, 3, 4, 5, 6, 7, 8, 11, 28, 48, 49 and 50.	68	6.4, 6.6
3	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to improve public transport accessibility and conditions for cycling and walking in areas of lower PTAL, where there is an identified need for improving accessibility; and to improve access to economic and social opportunities and services for all Londoners.	This policy is taken forward by proposals: 9, 15, 16, 22, 23, 36, 45, 46, 51, 52, 54, 57, 58, 59, 60, 83, 84 and 85.	70	6.2, 6.4, 6.7, 6.9, 6.10
4	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to improve people's access to jobs, business' access to employment markets, business to business access, and freight access by seeking to ensure appropriate transport capacity and connectivity is provided on radial corridors into central London. In particular, the Mayor will seek to maximise public transport connectivity and capacity benefits on the two main east-west and north-south corridors (incorporating the Crossrail and Thameslink projects respectively). The Mayor will also explore opportunities to make greater use of the Thames for east-west passenger and freight transport across the city.	This policy is taken forward by proposals: 5, 6, 7, 8, 9, 11, 15, 17, 19, 22, 23, 36, 37, 38, 54 and 128.	71	2.17, 6.1, 6.2, 6.4, 6.7, 7.24, 7.25, 7.26

Policy No.	Policy	Reference	Page No.	Reference to policies in the draft replacement London Plan
5	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to ensure efficient and effective access for people and goods within central London through providing improved central London connectivity and appropriate capacity. This will include improving access to major public transport interchanges for pedestrians, cyclists and by public transport.	This policy is taken forward by proposals: 5, 7, 9, 11, 15, 17, 19, 22, 23, 26, 30, 31, 32, 33, 36, 37, 45, 54, 56, 60, 124, 126 and 129.	77	6.1, 6.2, 6.4, 6.7
6	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other transport stakeholders, will seek to provide appropriate connectivity and capacity on radial transport corridors into current and potential metropolitan town centres and to Strategic Outer London Development Centres.	This policy is taken forward by proposals: 16, 23, 30, 31, 34, 45, 52, 54 and 127.	78	2.15, 2.16, 6.2, 6.4, 6.7
7	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other transport stakeholders, will seek to increase public awareness of existing and planned orbital public transport connectivity in Inner London; and seek to improve orbital connectivity in Outer London, particularly between adjacent metropolitan town centres, where shown to be value for money.	This policy is taken forward by proposals: 14, 15, 16, 23, 34, 39, 45 and 46.	80	2.6, 2.7, 2.8, 6.2
8	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other transport stakeholders, will support a range of transport improvements within metropolitan town centres for people and freight that help improve connectivity and promote the vitality and viability of town centres, and that provide enhanced travel facilities for pedestrians and cyclists.	This policy is taken forward by proposals: 24, 26, 27, 30, 40, 45, 54, 57, 60, 61, 79, 80, 84, 85, 115, 119, 124 and 126.	82	2.15, 6.7, 6.9, 6.10

Policy No.	Policy	Reference	Page No.	Reference to policies in the draft replacement London Plan
9	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other transport stakeholders, will use the local and strategic development control processes to seek to ensure that: <ul style="list-style-type: none"> a) All high trip generating developments are located in areas of high public transport accessibility, connectivity and capacity (either currently or where new transport schemes are committed) b) The design and layout of development sites maximise access on foot, cycle and to public transport facilities, for example, via safe walking and cycling routes and provision of secure cycle parking c) Access for deliveries and servicing, maximise the opportunities for sustainable freight distribution where possible d) Land for transport use is safeguarded in line with London Plan policy and Supplementary Planning Guidance e) Planning contributions are sought for transport improvements where appropriate 	This policy is taken forward by proposals: 2, 9, 15, 22, 36, 37, 38, 39, 45, 48, 49, 50, 51, 54, 57, 58, 60, 97, 99, 119 and 126.	83	6.1, 6.2, 6.3, 6.5, 6.9, 6.10, 8.2, 8.3
10	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders including the private sector, will seek to improve the efficiency and effectiveness of the operation of the transport system, bring transport assets to a good state of repair, and then maintain them in that condition.	This policy is taken forward by proposals: 10, 11, 12, 13, 17, 18, 19, 21, 23, 24, 30–39, 45, 46, 115, 116, 117, 118, 119, 121, 122, 123, 129 and 130.	86	6.1, 6.2
11	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to reduce the need to travel, encourage the use of more sustainable, less congesting modes of transport (public transport, cycling, walking and the Blue Ribbon Network), set appropriate parking standards, and through investment in infrastructure, service improvements, promotion of smarter travel initiatives and further demand management measures as appropriate, aim to increase public transport, walking and cycling mode share.	This policy is taken forward by proposals: 51, 52, 53, 54, 57, 59, 61, 83, 115, 116, 120, 125, 127, 129 and 130.	87	6.1, 6.2, 6.3, 6.7, 6.9, 6.10, 6.13

Policy No.	Policy	Reference	Page No.	Reference to policies in the draft replacement London Plan
12	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders including business and the freight industry, will seek to improve the distribution of freight through the provision of better access to/from Strategic Industrial Locations, delivery and servicing plans, and other efficiency measures across London.	This policy is taken forward by proposals: 3, 2, 30, 31, 32, 33, 38, 39, 50, 117, 118, 119, 124, 129 and 130.	88	2.17, 6.11, 6.12, 6.14
13	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will expand the capacity and quality of public transport services, improve passenger comfort and customer satisfaction, reduce crowding, and improve road user satisfaction.	This policy is taken forward by proposals in sections: 5.2, 5.3, 5.4, 5.5, 5.6, 5.9, 5.10, 5.13, 5.14, 5.15, 5.16, 5.17, 5.18, 5.19, 5.24, 5.25, 5.26 and 5.27.	89	6.3, 6.11
14	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to improve transport's contribution to the built and natural environment.	This policy is taken forward by proposals: 83, 84, 85, 90 and 113.	90	7.5, 7.6, 7.19
15	The Mayor, through TfL, and working with Defra, the DfT, Network Rail, train operating companies, freight operators, London boroughs and other stakeholders, will seek to reduce emissions of air pollutants from transport.	This policy is taken forward by proposals: 25, 91–100, 103, 105, 108, 109, 113, 129 and 130.	91	7.14
16	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, freight operators, London boroughs and other stakeholders, will seek to reduce noise impacts from transport.	This policy is taken forward by proposals: 48, 86, 87, 88, 89 and 113.	93	7.15
17	The Mayor, through TfL, and working with the DfT and other government agencies, the London boroughs, health authorities and other stakeholders, will promote healthy travel options such as walking and cycling.	This policy is taken forward by proposals: 51, 52, 53, 54, 55, 57, 58, 59, 60, 61, 62, 68, 115 and 116.	94	3.2, 6.9, 6.10
18	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to reduce the rate of crime, the fear of crime and antisocial behaviour on London's transport system.	This policy is taken forward by proposals: 13, 18, 21, 26, 27, 41, 42, 60, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83 and 84.	95	6.2, 7.3, 7.13

Policy No.	Policy	Reference	Page No.	Reference to policies in the draft replacement London Plan
19	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders including the police and road safety partnerships, will seek to improve road safety for all communities in London and implement measures that contribute to any targets that may be set by the Mayor from time to time.	This policy is taken forward by proposals: 54, 60, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 83, 84, 129 and 130.	95	6.2
20	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will implement measures that seek to improve operational safety and security on public transport.	This policy is taken forward by proposals: 18, 20, 63, 110, 111 and 112.	95	6.2, 7.3, 7.13
21	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to increase accessibility for all Londoners by promoting measures to improve: <ul style="list-style-type: none"> a) The physical accessibility of the transport system, including streets, bus stops, stations and vehicles b) Information provision, staff service and the travelling environment 	This policy is taken forward by proposals: 5, 9, 13, 18, 19, 21, 22, 23, 24, 25, 26, 27, 29, 40, 41, 42, 43, 44, 45, 60, 83, 84 and 115.	98	7.2
22	The Mayor, through TfL, and working with the LDA, DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to enhance connectivity, reduce community severance, promote community safety, enhance the urban realm and improve access to jobs and services in deprived areas.	This policy is taken forward by proposals: 5, 6, 7, 8, 9, 12, 14, 15, 19, 22, 23, 34, 39, 50, 60, 74, 76, 77, 80, 83 and 85.	100	2.14
23	The Mayor, through TfL, and working with the LDA, DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will support regeneration of Opportunity Areas and Areas for Intensification as described in the London Plan.	This policy is taken forward by proposals: 2, 5, 8, 9, 14, 15, 16, 17, 19, 22, 23, 34, 38, 39, 46, 50, 54 and 60.	102	2.13, 6.4
24	The Mayor, through TfL, and working with the DfT, Defra and other government agencies, Network Rail, train operating companies, freight operators, London boroughs and other stakeholders, will take the necessary steps to deliver the required contribution from ground-based transport to achieve a 60 per cent reduction in London's CO ₂ emissions by 2025 from a 1990 base; and to contribute to further targets that may be set by the Mayor from time to time.	This policy is taken forward by proposals: 1, 2, 4, 7, 8, 9, 12, 14, 17, 22, 25, 26, 27, 30, 31, 33, 38, 39, 45, 46, 47, 50–54, 57–62, 87, 91, 92, 93, 95–109, 113, 115–119, 125, 127, 129 and 130.	103	5.1, 6.1

Policy No.	Policy	Reference	Page No.	Reference to policies in the draft replacement London Plan
25	The Mayor, through TfL, and working with the DfT, Defra and other government agencies, Network Rail, train operating companies, London boroughs and other stakeholders, will take necessary steps to adapt the transport system and improve its resilience and public safety to the anticipated impacts of climate change.	This policy is taken forward by proposals: 110, 111, 112, 113 and 114.	105	5.11, 5.12, 5.13
26	The Mayor, through TfL, and working with the ODA, DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will ensure delivery of the committed transport infrastructure required for the London 2012 Olympic and Paralympic Games, and its successful operation during the Games; and will maximise the benefits of its physical and behavioural legacy to support the principle of convergence.	The behavioural legacy of the Games will be taken forward by proposals 1, 47, 54 and 116.	106	2.4
27	The Mayor and all parties involved in the delivery of this transport strategy will follow the spirit of the London City Charter and the principles (originally set out in 'Way to Go!') which underpin the strategy. These are: to provide value for money, work in partnership, ensure appropriate integration and phasing of programmes, a fair allocation of available resources across modes and delivery agents, London's regions and boroughs, and a fair funding regime for taxpayers and fare and chargepayers.		309	8.1
28	The Mayor, through TfL, and in consultation with the London boroughs and other stakeholders, will develop a London sub-regional transport plan for each of the five sub-regions of London.		311	2.5

Policy No.	Policy	Reference	Page No.	Reference to policies in the draft replacement London Plan
29	The Mayor, consistent with the approach of the London City Charter, will work with TfL and London Councils to seek to ensure the requirements for a LIP demonstrate consistency with the policies and proposals set out in this MTS, and that other legal requirements are kept to a minimum. The boroughs will develop LIPs which set out their transport objectives, a delivery plan and a performance monitoring plan. The goals that are required to be addressed by the London boroughs in their LIPs, are: <ol style="list-style-type: none"> 1. Supporting economic development and population growth 2. Enhancing the quality of life for all Londoners 3. Improving the safety and security of all Londoners 4. Improving transport opportunities for all Londoners 5. Reducing transport's contribution to climate change and improving its resilience 		313	
30	The Mayor, and TfL, will make the case to Government for long-term investment in the transport network to secure the outcomes set out in this strategy.		316	
31	The Mayor, and TfL, will maximise any available efficiencies, subsidise services at appropriate levels and ensure that value for money is otherwise achieved from the existing and planned transport network, while reviewing fares levels to provide, if required, a residual means of achieving the goals of this transport strategy. Innovative ways of financing investment and services, including making the most of the value of transport infrastructure, will be explored.		316	
32	The Mayor, through TfL, will keep the level of subsidy for bus operations under constant review to ensure the correct balance between fares income, bus service levels and quality, social benefits and affordability, in the context of the overall level of funding available for transport.		317	
33	The Mayor, through TfL, will work to secure the investment necessary to remove the backlog of life-expired assets and to deliver the transformation of the Tube.		317	

Policy No.	Policy	Reference	Page No.	Reference to policies in the draft replacement London Plan
34	The Mayor, through TfL, will work with the DfT, Network Rail, the train operating companies and other stakeholders to secure the necessary investment in London's rail network, including new stations where feasible, through additional capital funding and enhancements to rail services through rail franchises.		318	
35	The Mayor, and TfL, will work with the London boroughs to secure developer contributions to transport through planning obligations in order to secure the success of each development and to mitigate any negative impacts on the existing transport system in accordance with relevant legislation and policy guidance. As set out in the proposed London Plan policy, where it is appropriate to seek a Crossrail contribution, this should generally be given higher priority than other public transport improvements. TfL will work with the GLA and boroughs to develop a protocol to implement the policy.		319	6.5, 8.2, 8.3
36	The Mayor, and TfL, will work with the London boroughs and other stakeholders, to seek to secure further investment from a variety of sources that help improve the quality and range of transport services available to Londoners.		320	

Proposal No.	Proposal
1	The Mayor, through TfL, and working with the DfT, Network Rail, the operators of international rail services and other transport stakeholders, will encourage the provision of direct international rail services to a wider range of European destinations, with some of those new services serving Stratford International station.
2	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, freight operating companies, London boroughs and other transport stakeholders, will support the development of more rail freight terminals in or near London, including connections to HS1 for international freight, in line with the London Plan policy to identify new sites for strategic rail freight interchanges.
3	The Mayor, through TfL and working with the DfT, Network Rail, train operating companies, freight operating companies, London boroughs and other transport stakeholders, will support the development of National Rail routes that relieve London of freight without an origin or destination in the Capital.
4	The Mayor and TfL support the development of a national high-speed rail network and will work with the DfT, Network Rail, High Speed Two and other transport stakeholders to ensure that the main London terminal for any new high-speed line is centrally located, well-connected to the existing public transport network, and widely accessible to maximise access to jobs and London's population. It is currently considered that Euston best meets these criteria. Further evaluation will be made of this and other potential termini, in particular, in relation to links to Heathrow.
5	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, freight operating companies, boroughs and other transport stakeholders, will seek to ensure that Crossrail is delivered by 2017, and that it is fully integrated with the rest of London's public transport system; that the impacts of construction on residents and businesses are minimised as far as possible; and that the future benefits Crossrail brings are monitored to ensure the rail link achieves its objectives.
6	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies and other stakeholders, will consider future extensions of Crossrail that reduce congestion and improve connectivity on London commuter routes.
7	The Mayor, through TfL, will seek to ensure that Network Rail and the train operating companies deliver the committed improvements to the rail network and services in London as set out by the DfT's High Level Output Specification for the period 2009 to 2014.
8	<p>The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other transport stakeholders, will seek further rail capacity across London's rail network, beyond those schemes already committed.</p> <p>The highest priorities in the medium term are to further increase capacity on London Overground; on southwest routes; on West Anglia routes, including access to Stratford; on Great Northern services; and at congested stations.</p> <p>In the longer term, further capacity solutions may be required on a number of rail corridors, such as the Brighton Main Line.</p>
9	The Mayor will support new rail capacity in the broad southwest to northeast corridor, for example, new lines or services using the Chelsea Hackney line safeguarded alignment. TfL will undertake a review of the route to ensure it is providing the maximum benefits, including helping the onward dispersal of passengers from central London termini and value for money.
10	The Mayor, through TfL, will seek to ensure that the DfT, Network Rail and the train operating companies achieve the HLOS 'public performance measure' for reliability, as well as an overall reduction in significant lateness and cancellations for London and southeast services.

Proposal No.	Proposal
11	<p>The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies and London boroughs, will seek to deliver capacity enhancements at some of London's most congested stations. The highest priorities include:</p> <ul style="list-style-type: none"> a) Central London termini station congestion relief and onward distribution enhancements (the potential of all onward modes will be considered) b) Clapham Junction station capacity enhancement (new improved links between platforms, additional entrances and more ticketing facilities) c) Improved capacity at National Rail stations with severe congestion, including Finsbury Park, Bromley South, Wimbledon, Vauxhall and Barking d) Improved capacity at National Rail stations with moderate congestion, including Willesden Junction, Balham, West Croydon, Putney, Norwood Junction and Surbiton
12	<p>The Mayor, through TfL, and working with Network Rail, the train operating companies and other transport stakeholders, will encourage the achievement of a seven-day railway by better planning and management of necessary engineering and maintenance work on the railway.</p>
13	<p>The Mayor, through TfL, and working with Network Rail, the train operating companies and other transport stakeholders, will encourage the provision of rail services in London that meet common service standards, including improved ambience, amenities and wayfinding at all stations, and staff availability at each station. It is intended these improvements will be rolled-out as franchises are renewed. However, they would be better achieved if the Mayor had more control over suburban rail services in the London area.</p>
14	<p>The Mayor, through TfL, working with the DfT and Network Rail, will deliver the committed investment in the Overground network, investigate the feasibility of providing further capacity to assist orbital movement, and will review potential benefits of extensions to the network of services.</p>
15	<p>The Mayor, through TfL, will support safeguarding the route of the DLR Dagenham Dock extension as part of the housing proposals for Barking Riverside, and will investigate the feasibility of further capacity and network expansion of the DLR including options south of Lewisham, west of Bank and north of Stratford International.</p>
16	<p>The Mayor, through TfL, and working with the London boroughs and other transport stakeholders, will investigate the feasibility of providing extra capacity on the Tramlink network and will review potential benefits of extensions to the system.</p>
17	<p>The Mayor, through TfL, will seek to deliver upgrades to all Tube lines in a phased programme to provide a significant increase in network capacity. This will involve a combination of new rolling stock and/or signalling systems and other asset replacement. As part of this, continued investment to bring the network to a good state of repair and maintain it at that level will be supported.</p>
18	<p>The Mayor, through TfL, will continue to deliver an ongoing programme of Tube station refurbishments and asset stabilisation to ensure stations are operable and deliver customer service requirements, and continue to improve station accessibility over the life of the strategy.</p>

Proposal No.	Proposal
19	<p>The Mayor, through TfL, and working with the London boroughs, private developers and other transport stakeholders, will develop and implement a prioritised programme to deliver station capacity and accessibility enhancements at London's most congested Underground stations, including:</p> <ul style="list-style-type: none"> a) Congestion relief schemes to complement Tube line upgrades and/or integrate with Crossrail at the key central London interchanges of Victoria, Tottenham Court Road, Bond Street, Paddington (Hammersmith & City) and Bank b) Schemes at further strategic Tube interchanges that are critical to London's transport system (for example, Vauxhall, Finsbury Park, Highbury & Islington, Holborn, Camden Town, Oxford Circus, Edgware Road and Northern line City branch, in particular Old Street and Moorgate) c) Major strategic multi-modal/National Rail interchanges on to the Underground network to disperse onward demand arising from National Rail proposals (HLOS2 and HS2 proposals), for example, London Bridge, Euston, Liverpool Street, Paddington, Elephant & Castle and Waterloo
20	<p>The Mayor, through TfL, will implement the following measures to cool the Underground:</p> <ul style="list-style-type: none"> a) New air-conditioned rolling stock across the sub-surface (Metropolitan, Circle, Hammersmith & City and District) lines, introduced progressively from 2010 b) Improved ventilation shafts and replacement of out of service fans
21	<p>The Mayor, through TfL, will continue to develop and implement measures to deliver the highest standards of customer care on the Underground, including the provision of high quality information about engineering works that affect regular Tube services, and improved information on the accessibility of the Tube network highlighting step-free and mostly step-free routes.</p>
22	<p>The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek longer-term enhancements and extensions to the Underground network, including:</p> <ul style="list-style-type: none"> a) A privately funded extension of the Northern line to Battersea to support regeneration of the Vauxhall/ Nine Elms/Battersea area b) A potential southern extension to the Bakerloo line will be reviewed further. This would utilise spare line capacity, improve connectivity and journey times, while providing relief to congested National Rail approaches to central London from the south/southeast, subject to resources and the results of further study c) A link at Croxley to join the Watford branch of the Metropolitan line to Watford Junction (funding to be secured by Hertfordshire County Council in conjunction with the DfT)
23	<p>The Mayor, through TfL, and working with the London boroughs and other stakeholders, will keep the development of the bus network under regular review, including reviews of the strategic priorities underlying the process approximately every five years, to ensure it caters for growth in population and employment, while maintaining ease of use, attractive frequencies and adequate capacity, reliable services, good coverage and good interchange with other modes. All proposals for change will be appraised to ensure that they deliver good value for money and that the funds available are being invested in optimum service improvements.</p>

Proposal No.	Proposal
24	<p>The Mayor, through TfL, and working with the London boroughs and other stakeholders, including developers, will improve bus passengers' journeys by measures, including:</p> <ul style="list-style-type: none"> a) Incentivising bus operating contracts and expanding staff training in order to consolidate reliability improvements b) Introducing measures such as bus priority at critical locations c) Ensuring that the appropriate enforcement of bus priority is carried out d) Implementing the Countdown 2 project to deliver expanded access to real time information and develop further integration with digital communications to provide real time bus information
25	<p>The Mayor, through TfL, will upgrade its bus fleet to meet increased emissions standards and will appoint bus manufacturers as part of the New Bus for London project. It is intended that the first prototype will enter service during 2011.</p>
26	<p>The Mayor, through TfL, and working with the London boroughs and other stakeholders will support improvements to the taxi service through a number of measures, including:</p> <ul style="list-style-type: none"> a) Continued highway priority for taxi services, for example, access to bus lanes b) Reduced taxi vehicle emissions and development of low emission taxis c) Provision of parking and waiting facilities, including rest facilities d) Provision of ranks and facilities at interchanges e) Taxi marshalling f) Action against touting and illegal cabs g) Improved driving behaviour, to be encouraged through the licensing procedure of taxi drivers h) Ensuring regulated taxi fares changes allow drivers and owners to continue to recover the costs of providing the taxi service and provide a sufficient incentive for taxi provision to meet demand, in particular at night i) Continuous process improvements to provide a modern and cost effective licensing service
27	<p>The Mayor, through TfL, and working with the London boroughs and other stakeholders, will support improvements to private hire services (especially minicabs) through the following:</p> <ul style="list-style-type: none"> a) Initiatives that deliver further the success of the Safer Travel at Night scheme b) Provision of facilities to pick up as well as drop off passengers where appropriate c) Action against plying for hire, touting, un-roadworthy vehicles and illegal cabs d) Continuous process improvements to provide a modern and cost effective licensing service e) Lower emissions from PHVs
28	<p>The Mayor, through TfL, and working with the London boroughs, coach operators and other stakeholders, will seek to maximise the use of the existing facilities to increase capacity for coaches, given the anticipated growth in demand for their use and to develop parking standards for coaches. In the longer term, the Mayor will work with all relevant partners to investigate the feasibility of developing a series of coach hubs or the potential for alternative locations for coach station facilities to provide easier access to the coach network, while retaining good access to central London for coach operators.</p>
29	<p>The Mayor, through TfL, and working with the London boroughs and other stakeholders, will encourage and support the community transport sector's contribution to the development and provision of transport services in London.</p>

Proposal No.	Proposal
30	<p>The Mayor, through TfL, and working with the London boroughs and other stakeholders, will introduce measures to smooth traffic flow to manage congestion (delay, reliability and network resilience) for all people and freight movements on the road network, and maximise the efficiency of the network. These measures will include:</p> <ul style="list-style-type: none"> a) Further investment in intelligent traffic control systems (such as the urban traffic control system, SCOOT) and the infrastructure to support them b) Allowing motorcycles and scooters to use TLRN bus lanes subject to a trial period and evaluating its impact c) Upgrading, rationalising or removing traffic management equipment and optimising timings at signal controlled junctions to keep traffic moving d) Working with the DfT to pilot and develop the concept of pedestrian countdown at traffic signals to optimise the amount of 'green time' for both pedestrians and road traffic e) Planning and implementing a targeted programme of improvements to the existing road network, including junction upgrades to improve traffic flow on the most congested sections of the network, and to improve conditions for all road users
31	<p>The Mayor, through TfL, and working with the London boroughs and other stakeholders, will utilise advances in ITS technology to better manage the road network, improve real time traffic management capability, lay the foundations for communication with in-vehicle systems and develop state-of-the-art traffic signal control systems.</p>
32	<p>The Mayor, through TfL, and working with the London boroughs and utility companies, will seek to minimise the adverse impact of planned interventions on the road network on the movement of people and goods, by:</p> <ul style="list-style-type: none"> a) Strengthening the Mayor's Code of Conduct for Roadworks to further improve coordination between different highway authorities and utilities across London b) Utilising 'LondonWorks' to improve roadworks planning, coordination and information availability c) Encouraging collaboration between utility companies and the use of innovative road engineering techniques such as minimum dig technology and temporary plating over roadworks d) Implementing the concept of 'lane rental' charges for utilities to reflect the value of their temporary possession of road capacity (in terms of cost of delay to the road user) and to incentivise reductions in the duration of roadworks
33	<p>The Mayor, through TfL, and working with the London boroughs and other stakeholders, will improve the real time management of unplanned interventions and incidents on the road network, and improve communications to minimise the disruption and raise levels of public satisfaction with road network management.</p>
34	<p>The Mayor, through TfL, and working with the London boroughs and other stakeholders, will work in collaboration to maintain cost-effectively London's road network assets in a good state of repair in order to maximise their operational safety and effectiveness, and to promote road user satisfaction. This will include:</p> <ul style="list-style-type: none"> a) Conducting programmes for the maintenance of roads, pavements, bridges, tunnels and traffic systems so that the TLRN and borough road network is serviceable b) Ensuring highway structures are inspected regularly c) Developing a Tunnels Safety Enhancement Programme taking account of, among other matters, fire risks, lighting, communications and surveillance

Proposal No.	Proposal
35	<p>The Mayor, through TfL, and working with the London boroughs and other stakeholders will give consideration to new road schemes where there is an overall net benefit when judged against the following criteria:</p> <ul style="list-style-type: none"> a) The contribution to London's sustainable development/regeneration including improved connectivity b) The extent to which congestion (average vehicle delay, unreliable journey times and poor levels of network resilience) is reduced c) How net benefit to London's environment can be provided d) How conditions for pedestrians, cyclists, public transport users, freight transport and local residents can be improved e) How safety for all is improved <p>All proposals will demonstrate how any disbenefits will be mitigated.</p>
36	<p>The Mayor, through TfL, and working with the Port of London Authority, ODA, boat operators, pier owners, riparian boroughs and other interested parties, will continue by means of the River Concordat to work to enable the development of London's river services to reach their full potential and to better integrate river services into the land-based public transport network.</p>
37	<p>The Mayor, through TfL, and working with the London boroughs and other stakeholders, will encourage the provision of more pier capacity, particularly in central London and will seek financial support for new piers when considering development proposals in the vicinity of the Thames. The Mayor, through TfL, will also work with the Port of London Authority, boroughs and operators to identify and promote suitable boat yard facilities in London.</p>
38	<p>The Mayor, through TfL, and working with the Port of London Authority, London boroughs and operators, will seek to ensure that existing safeguarded wharves are fully utilised for waterborne freight (including waste), and will examine the potential to increase the use of the Thames and London's canal network for waterborne freight transport.</p>
39	<p>The Mayor, through TfL, and working with the London boroughs and other stakeholders, will take forward a package of river crossings in east London, including:</p> <ul style="list-style-type: none"> a) A new fixed link at Silvertown to provide congestion relief to the Blackwall Tunnel and provide local links for vehicle traffic b) An upgraded Woolwich Ferry and consideration of a new vehicle ferry at Gallions Reach to improve connectivity c) Local links to improve connections for pedestrians and cyclists d) Consideration of a longer-term fixed link at Gallions Reach to improve connectivity for local traffic, buses, cyclists and to support economic development in this area e) The encouragement of modal shift from private cars to public transport, using new rail links including High Speed One domestic services, Crossrail and the DLR extension to Woolwich, reducing road demand, and so road congestion at river crossings, where possible f) Support for Government proposals to reduce congestion at the Dartford crossing
40	<p>The Mayor, through TfL, and working with the DfT, Network Rail, the London boroughs and others will improve the physical accessibility of the transport system by prioritising step-free access at strategic interchanges, improving street accessibility in town centres and around accessible stations and maximising the accessibility benefits of new transport schemes, such as Crossrail. In doing so, the Mayor will seek to maximise the benefits of investment by ensuring that resources are focused on improving accessibility for the maximum number of people, while ensuring an equitable balance across London.</p>

Proposal No.	Proposal
41	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will improve the availability, quality, quantity and timeliness of information about the transport system to remove barriers to travel.
42	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will improve attitudes of transport staff and travellers towards each other to ensure excellence in customer service and a courteous, safe and friendly travelling environment that does not present a barrier to travel.
43	The Mayor, through TfL, will work to ensure a greater staff availability to provide direct assistance to customers and continue to improve customer experience, by enhancing staff training to ensure that the access needs of disabled passengers are understood by all frontline staff.
44	The Mayor, through TfL, will support door-to-door services for people with mobility problems who require this form of transport service.
45	<p>The Mayor, through TfL, and working with Network Rail, the train operating companies, London boroughs and other stakeholders, will improve the customer experience and physical accessibility at interchanges across London through the application of the principles set out by the TfL Interchange Best Practice Guidelines of 'efficiency', 'useability', 'understanding' and 'quality' to all interchange schemes in London. Such measures include:</p> <ul style="list-style-type: none"> a) Provision of consistent and enhanced travel information b) Improved walking and cycling facilities at, and on routes to, public transport stations and stops c) Improved integration of public transport services in London, both in terms of service planning and physical location d) Improved efficiency, effectiveness and quality of interchanges across London to further integrate London's transport system e) Provision of consistent customer service delivery standards f) Assurance that interchange facilities have sufficient capacity to meet travel demand
46	<p>The Mayor, through TfL, and working with Network Rail, the train operating companies, London boroughs and other stakeholders, will prioritise improvements to strategic interchanges, that will:</p> <ul style="list-style-type: none"> a) Provide opportunities for orbital public transport services b) Provide interchange opportunities before arriving in central London, in order to reduce interchange capacity pressure at London's rail termini c) Provide opportunities to accommodate population and employment growth, with developer contributions towards the interchange improvements sought in appropriate circumstances
47	<p>The Mayor in partnership with the London boroughs, TfL and Olympic Park Legacy Company, will develop a Transport Legacy Action Plan and monitoring programme to ensure the benefits of the legacy of the 2012 Games are maximised and that transport interventions support convergence as set out in the five Olympic Boroughs Strategic Regeneration Framework. The plan will be monitored for 10 years after the Games, and will define:</p> <ul style="list-style-type: none"> • Partners and their responsibilities • The monitoring area within the five Olympic boroughs • Key indicators and targets within the monitoring area and London-wide • Actions and interventions required to meet the targets • Annual review of targets

Proposal No.	Proposal
48	The Mayor recognises that the provision of adequate airport capacity serving the South East is critical to the competitive position of London in a global economy, but will oppose any further increases in runway capacity at Heathrow.
49	The Mayor believes the aviation industry should meet its full environmental and external costs and supports the position of 'The Future of Air Transport' White Paper published in 2003. This states that airport operators should be responsible for paying the costs of upgrading or enhancing road, rail or other transport networks or services where these are needed to accommodate additional passengers travelling to, and from, expanded or growing airports.
50	The Mayor, through TfL, and working with the London boroughs, DfT, airport operators, Network Rail, train operating companies and other stakeholders, will seek to improve access to London's airports for passengers and staff by public transport, particularly from those parts of London which do not currently have good access by rail or bus; and for goods through better management of the road network, development of consolidation/break-bulk centres and encouragement of access by rail and waterway.
51	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will provide support, including sharing best practice, to enable and empower employers, schools, community groups, other organisations and individuals to deliver the improvements necessary to create a cycling revolution in London.
52	The Mayor, through TfL, and working with the London boroughs that are keen to pilot the Biking Borough approach, will develop the Biking Borough scheme including measures such as cycle hubs and marketing initiatives to promote cycling.
53	The Mayor, through TfL, will work with the DfT, London boroughs and stakeholders to raise the profile of cycling, using information and behavioural change measures, including smarter travel initiatives and major events.
54	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will deliver improvements to cycling infrastructure and training to support the cycling revolution, including: <ul style="list-style-type: none"> a) The launch of the central London Cycle Hire scheme in 2010 b) Twelve Cycle Superhighways will be developed for commuters and others to cycle to central London, improving the capacity of the radial network c) Enhanced cycle links to the Olympic Park by 2012, and the development of a wider network of Greenways across London d) Further phases of the Cycle Hire scheme introduced in Inner and Outer London subject to sufficient demand and feasibility e) Increased provision of secure bicycle parking facilities, particularly at stations, workplaces, schools, retail and leisure sites f) Improving permeability for cycling by further integrating the road network and open spaces g) Delivering road enhancements to make cycling easier and safer, including managing car access to residential areas, through physical or design measures, to create pleasant and safer cycling environments h) Offering cycle training for people of all ages
55	The Mayor, through TfL, and working with the police, London boroughs and DfT, will encourage changes to be made to the Highway Code and road traffic regulations, where necessary, to make cycling more convenient and to encourage a culture of mutual respect between all road users.

Proposal No.	Proposal
56	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will press for specific primary legislation to establish an effective legal framework for pedicabs, including specific licensing powers for the boroughs.
57	The Mayor will seek to use his planning powers and work with the London boroughs to encourage cycling by supporting development that: <ul style="list-style-type: none"> a) Provides cycle parking to an appropriate standard b) Integrates the needs of cyclists into the design c) Promotes the co-location of key trip attractors to make cycling a more viable and attractive travel option d) Provides cycle hire docking stations dependent on sufficient demand and feasibility studies
58	The Mayor, through TfL, and working with Network Rail, the train operating companies and London boroughs, will review cycle parking standards and aim to implement ‘best-practice’ levels of cycle parking provision at any new station or as part of any comprehensive station redevelopment works. Additional cycle parking provision will also be provided at other stations to meet demand, wherever possible.
59	The Mayor, through TfL, and working with the London boroughs, employers, schools, community groups, other organisations and individuals, will bring about a step change in the walking experience in London to make walking count.
60	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will improve the walking experience by enhancing the urban realm and taking focused action to ensure safe, comfortable and attractive walking conditions, including: <ul style="list-style-type: none"> a) Development of the ‘key walking route’ approach, to encourage walking and improve corridors between local destinations where people want to travel, encapsulating squares and open spaces where appropriate (for example, London parks) b) Providing direct, convenient pedestrian access (for example, with surface crossings) where appropriate c) Street audits to identify pedestrian needs and guidance (such as pedestrian comfort levels) d) Delivery of the seven Strategic Walk Network routes, separate from, but alongside the development of, Greenways e) Training for those involved in the design and delivery of schemes that impact walking conditions f) Enhancing pavement space for pedestrians and removing guardrails and other obstacles g) Seeking to manage car access to residential areas, through physical or design measures, to create pleasant and safer walking environments h) Tackling the fear of crime and feeling unsafe on the streets i) Supporting major projects such as high street revitalisation through good quality public realm designed to support regeneration of small businesses and encourage local shopping and activity j) Improving access, safety and security between the station and surrounding areas for pedestrians (and cyclists) to encourage active and smarter travel k) Encouraging the extension of a network of linked green spaces (namely, the All London Green Grid) l) Supporting developments that emphasise the quality and permeability of the pedestrian environment (section 5.18 Better streets)

Proposal No.	Proposal
61	The Mayor, through TfL, and working with the London boroughs, developers and other stakeholders, will improve the quality and provision of information and resources for walking, especially at stations, interchanges and in town centres by measures, including: <ul style="list-style-type: none"> a) Extending Legible London to other areas b) Creating an online one-stop walking resource to facilitate walking, linked to an enhanced Journey Planner with advanced walking options c) Developing consistent wayfinding formats and making use of new wayfinding technologies
62	The Mayor, through TfL, working with the London boroughs, developers and other stakeholders, will promote walking and its benefits through information campaigns, events to raise the profile of walking, and smarter travel initiatives such as school and workplace travel plans.
63	The Mayor, through TfL and working with the London boroughs, Network Rail, train operating companies, the police and other stakeholders, will seek to reduce fatality and injury rates on London's transport system further; and will aim to reduce London bus road user fatality, major and minor injury rates.
64	The Mayor, through TfL, and working with the London boroughs, police, Highways Agency, road safety partnerships, and other stakeholders, will seek to achieve any new national road safety targets and such further road safety targets as the Mayor may set from time to time.
65	The Mayor, through TfL, working with the police, Highways Agency, London boroughs, road safety partnerships and other stakeholders, will develop a new Road Safety Plan to reflect any new road safety targets to be set by the Government or the Mayor and review progress every five years.
66	The Mayor, through TfL, will continue to monitor road safety schemes and publish road safety casualty reports and research.
67	The Mayor, through TfL, and working with the London boroughs, police, DfT, and other stakeholders, will undertake public information and engagement to improve road user behaviours and reduce the risk of collisions.
68	The Mayor, through TfL, the police and working with the DfT, London boroughs, road freight operators and other stakeholders, will improve safety for cyclists in the vicinity of HGVs and other vehicles, by: <ul style="list-style-type: none"> a) Encouraging the Government to amend legislation and remove the current exemption for HGVs being fitted with sideguard protection b) Working to increase the number of HGVs with sideguards or fitted with electronic warning devices that detect cyclists c) Raising awareness among drivers of the safety benefits of advance stop line areas
69	The Mayor, through TfL and working with the DfT, London boroughs, road freight operators and other stakeholders, will seek enhanced vehicle and driver safety from organisations operating corporate fleets by working with the freight sector and other stakeholders, promoting increased membership of the Freight Operator Recognition Scheme, and encouraging operators to uptake and demonstrate freight best practice.
70	The Mayor, through TfL, and by working with the DfT, London boroughs and Health and Safety Executive, will seek to improve road safety by developing initiatives and working with employers to increase work-related road safety and to reduce casualties involving work-related vehicles and activities.
71	The Mayor, through TfL, and working with the London boroughs, Highways Agency and other stakeholders, will implement targeted physical engineering and other design considerations to improve road safety across London's road network.

Proposal No.	Proposal
72	The Mayor, through TfL, and working with the DfT, London boroughs, vehicle manufacturers and other stakeholders, will encourage the introduction of voluntary 'intelligent speed adaptation', subject to the outcome of trials in corporate fleets, including freight, passenger transport and company cars and vans.
73	The Mayor, through TfL, and working with the police, London boroughs and other partners will continue implementing effective enforcement measures, targeted at locations with poor collision records across London's road network, including new average speed cameras which will be trialled subject to local consultation, for example, on main roads and for enforcing speed in 20mph zones.
74	The Mayor, through TfL, and working with the London boroughs, transport operators, police and local communities, will establish a statutory community safety partnership for transport and travelling in London. These partners will seek to ensure a strategic, effective, integrated and financially sustainable approach to improving safety and security across the transport system. The partnership will develop and implement a rolling three-year community safety strategy to tackle crime, fear of crime and antisocial behaviour. The strategy will set out shared priorities, objectives and targets based on a joint annual strategic assessment.
75	The Mayor, through TfL, and working with the London boroughs, police and other stakeholders, will make best use of available resources, basing decisions on evidence and shared intelligence, to: <ul style="list-style-type: none"> a) Increase the visibility and accessibility of uniformed staff and officers, including special constables, at the right times and locations and provide them with the right powers to maximise their impact on crime, antisocial behaviour and public confidence in travelling in London b) Target enforcement activity on priority crimes, antisocial behaviour and behaviour that feeds the fear of crime using a problem-solving approach c) Create a small joint intelligence unit between TfL and policing agencies to improve intelligence sharing and the efficiency and effectiveness of resource deployment
76	The Mayor, through TfL, and working with the London boroughs, police and other stakeholders will integrate local policing structures on the transport system; improve coordination and deploy resources collectively. Joint tasking of uniformed staff will help maximise their effectiveness.
77	The Mayor, through TfL, and working with the London boroughs, police and other stakeholders, will integrate reporting systems for antisocial behaviour, crime and disorder on the transport system.
78	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will introduce a package of measures including marketing, education and engagement activities to help passengers make informed, safer travel choices, and raise awareness of the effect of inconsiderate and antisocial behaviour on others.
79	The Mayor, through TfL, and working with the London boroughs, police, and other stakeholders, will seek to ensure that: <ul style="list-style-type: none"> a) Safety and security considerations are incorporated into the planning and design of transport facilities b) Existing transport infrastructure, including pedestrian routes and cycle parking facilities, are kept in a good state of repair and have adequate lighting, signage, clear lines of vision and CCTV coverage where appropriate
80	The Mayor, through TfL, and working with the London boroughs, police, and other stakeholders, will exploit the opportunities provided by new technology to prevent crime and disorder.

Proposal No.	Proposal
81	The Mayor, through TfL, and working with the London boroughs, police, and other stakeholders, will seek to: <ul style="list-style-type: none"> a) Improve the safety of night-time public transport services b) Improve the safety of cabs c) Provide better information about, and access to, safer travel options
82	The Mayor, through TfL, and working with the London boroughs, police and other emergency services and stakeholders, will seek to reduce the likelihood and impact of potential terrorist attacks on the transport system.
83	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will use the principles of 'better streets' to seek to improve town centres, in particular: removing clutter and improving the layout and design of streets; enhancing and protecting the built and historic environment; increasing the permeability of streets; and creating clear and easily understandable routes and spaces to make it easier for cyclists, pedestrians and disabled people to get about.
84	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will introduce accessible for all, 'better streets' initiatives. Consideration will be given to trialling the removal of traffic signals where safe and appropriate.
85	The Mayor, through TfL and the LDA, and working with the London boroughs, Network Rail and other stakeholders, will seek to implement integrated and complementary improvements to town centres, streets and pedestrian and cycling routes directly adjacent to where major public transport investment projects are being delivered, using sustainable materials.
86	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will target the provision of noise reduction measures and noise mitigation measures in areas significantly affected by transport noise, to improve perceptions of noise and reduce the impacts of noise on dwellings and people, by: <ul style="list-style-type: none"> a) Timely and effective rail maintenance and replacement works b) Working to the TfL Health Safety and Environment policy c) Ensuring all new transport projects consider noise mitigation d) Introducing road maintenance programmes to replace road surfaces with low noise surfacing where possible e) Improving traffic management and signal control techniques f) Introducing speed enforcement measures which do not encourage noisy, rapid acceleration and deceleration g) Introducing quieter buses h) Procuring new, quieter public sector service vehicles, potentially through joint procurement to achieve efficiency
87	The Mayor, through TfL, and working with London Councils, London boroughs, freight operators, and other stakeholders, will explore opportunities to use the London Lorry Control Scheme to encourage companies to operate quieter vehicles as well as to promote improvements in air quality, and reduce CO ₂ emissions.
88	The Mayor, through TfL, and working with the London boroughs, motorist organisations, freight operators and other stakeholders will encourage quieter driving through publicity campaigns aimed at private drivers and motorcyclists, and training programmes for professional drivers.

Proposal No.	Proposal
89	<p>The Mayor, through TfL, and working with the DfT, the national air traffic control service and the European Commission, will:</p> <ul style="list-style-type: none"> a) Encourage the development and use of quieter aircraft b) Seek to coordinate flight paths so they minimise their impact on London
90	<p>The Mayor, through TfL, and working with the DfT, Highways Agency, London boroughs, Network Rail, and other stakeholders, will make the most of open spaces across the transport system (for example, green spaces alongside railway lines, roads, rivers, canals, cycling and walking routes, green grids and on roof tops) to improve the quality and diversity of London's natural environment.</p>
91	<p>The Mayor, through TfL and working with London boroughs, transport operators and other stakeholders, will encourage behavioural changes to reduce vehicle emissions, by:</p> <ul style="list-style-type: none"> a) Promoting walking and cycling, the use of car clubs, car sharing, the use of fuel efficient vehicles and smarter driving techniques and raising awareness about air quality b) Implementing eco-driving training for all GLA/functional body, taxi and bus drivers c) The Mayor will also reduce emissions from the wider fleet by supporting eco-driving training for members of the public and freight drivers (through the existing FORS scheme) and tackling emissions caused by unnecessary idling d) Providing better information about emissions from private vehicles and the public transport fleet
92	<p>The Mayor, through TfL, and working with the London boroughs, DfT, Network Rail, train operating companies and other stakeholders, will introduce measures to reduce emissions, including:</p> <ul style="list-style-type: none"> a) Cleaner buses b) Cleaner taxis and PHVs c) Further rail electrification, including the recently announced Great Western Main Line electrification scheme and the Barking to Gospel Oak line d) Cleaner passenger boats and other river vessels, which use more environmentally friendly fuels e) Encouraging the introduction and use of cleaner public service and local authority vehicles
93	<p>The Mayor, through TfL, and working with the London boroughs and other stakeholders, will take further action to reduce private vehicle emissions, by:</p> <ul style="list-style-type: none"> a) Supporting the uptake of low emission vehicles, such as electric cars and vans b) Incentivising of low emission vehicles through pressing for changes to vehicle excise duty and parking regulations c) Working with the European Commission, the Government and vehicle manufacturers, the Mayor will encourage the development of new technologies which reduce vehicles emissions, such as better tyres which wear less, more sophisticated abatement technology and automatic hybrid-switching
94	<p>The Mayor, through TfL, and working with the London boroughs and other stakeholders, will introduce targeted local measures at poor air quality priority locations to reduce emissions and improve local air quality.</p>

Proposal No.	Proposal
95	<p>The Mayor, through TfL, will continue to operate the existing London Low Emission Zone. The Mayor will consider further tightening of the standards of the current LEZ, as well as the introduction of further emissions control schemes to encourage the use of cleaner vehicles in London:</p> <ul style="list-style-type: none"> a) The current LEZ scheme will continue to operate to reduce emissions from the heaviest vehicles, and tighter standards will be introduced in 2012 as planned b) The Mayor will defer extending the LEZ to LGVs and minibuses (which was due to commence in 2010) to 2012 c) In 2015, the Mayor will, subject to technical feasibility, introduce an emissions standard for NOx (Euro IV) into the LEZ for HGVs, buses and coaches d) If necessary, the Mayor will consider introducing minimum requirements for other vehicles or tighter standards in particular locations within London e) The Mayor will work with boroughs that propose to take local action to address air quality through local low emission zones or similar measures
96	<p>The Mayor, through TfL, and working with the London boroughs, transport operators and other stakeholders, will promote behavioural change and smarter travel measures aimed at encouraging more use of lower carbon modes, eco-driving practices, better vehicle maintenance and flexible working patterns to reduce CO2 emissions.</p>
97	<p>The Mayor, through TfL, and working with the London boroughs, transport operators, and other stakeholders, will support, promote and improve sustainable, low CO2-emitting transport (including public transport, cycling, walking, and rail and water for freight), and reduce the need to travel through integration of transport and land use planning.</p>
98	<p>The Mayor, through TfL, and working with the London boroughs, car club operators, and other stakeholders, will support expansion of car clubs and encourage their use of ultra low carbon vehicles.</p>
99	<p>The Mayor, through TfL, and working with the London boroughs, road freight operators and other stakeholders, will:</p> <ul style="list-style-type: none"> a) Adopt planning conditions that specify Delivery Service Plans for major developments (by spring 2011) b) Aim for 50 per cent of HGVs and vans serving London to be members of FORS by 2016 c) Encourage, and where appropriate specify, improved freight movement efficiency through, for example, greater consolidation, more off-peak freight movement and greater use of water and rail-based transport d) Support freight industry land requirements for locally focused consolidation and/or break-bulk facilities and access to waterways and railways
100	<p>The Mayor, through TfL, will introduce automatic train control (a tool that can optimise energy efficiency through driving style) across the Tube network. Drivers of non-automatic railways, such as London Overground, will be given training on energy efficient driving style, as will London's bus drivers.</p>
101	<p>The Mayor, through TfL, or otherwise, will work with the DfT and other stakeholders to promote research, investment and regulation to achieve improved aviation carbon efficiency.</p>
102	<p>The Mayor, through TfL, and working with the London boroughs, Highways Agency, and other stakeholders, will implement a package of measures (including signal timing reviews and the coordination of traffic signals) to reduce road traffic emissions by smoothing the flow of traffic and optimising the efficiency of London's road network.</p>

Proposal No.	Proposal
103	The Mayor, through TfL, and by working with the London boroughs, will encourage a switch from conventional to low CO ₂ -emitting road vehicles and low carbon fuel sources where feasible. The Mayor will lobby Government and other stakeholders to follow suit in order to establish a package of integrated incentives across national, regional and local government to ensure low carbon road vehicles are price competitive with conventional technology.
104	The Mayor, through TfL, or otherwise, will continue to examine the feasibility of increasing the use of sustainable biofuels in vehicle fleets controlled or regulated by Mayoral bodies, and will encourage the boroughs and other vehicle fleet operators to do likewise.
105	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will enable and support the development and mass market uptake of low carbon road vehicles (including EVs) through, for example, the delivery of infrastructure required for the distribution of alternative transport fuel sources, including EV recharging points.
106	The Mayor, through TfL, and working with Network Rail, and the DfT, will endeavour to: a) Provide low loss electricity supply infrastructure on London's rail networks b) Implement regenerative braking where feasible on London's rail networks c) Develop, trial and seek to implement measures that minimise the loss through electricity distribution on the Underground
107	The Mayor, through TfL, and working with the DfT, energy companies, and other stakeholders, will deliver additional low/zero carbon electricity-generating capacity and investigate the potential for micro-generation at sites on the transport system.
108	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will promote CO ₂ standards for vehicles and infrastructure controlled, procured or regulated by the Mayor, GLA Group and/or other public sector bodies (for example, public transport vehicles, taxis, street and station lighting and infrastructure embodied carbon) to reduce emissions from existing and new vehicles and infrastructure, including the following specific measures: a) The Mayor, through his functional bodies, will increase the proportion of his vehicle fleet powered by electricity b) All new buses entering fleets operated on behalf of the Mayor from 2011/12 will be lower carbon c) Work with vehicle manufacturers and the taxi trade to develop a new low carbon and low air pollutant version of the London taxi d) A trial of at least five hydrogen powered buses from 2010 e) Trialling of low energy station lighting and automatic meter reading f) LED traffic signals preferred to conventional technology when replacing life-expired signal sets and further development of LED lighting leading to a preference for LED technology when replacing life-expired lighting, if proved to be feasible g) Major infrastructure schemes will conduct a carbon footprint assessment h) Where relevant, encourage the GLA group, boroughs, other public sector bodies and their suppliers to procure freight services from FORS members or freight operators able to demonstrate equivalent competencies
109	The Mayor, through TfL, and working with the London boroughs, DfT, Highways Agency, and other stakeholders, will keep under review the option of road user charging and/or regulatory demand management measures to influence a shift to more CO ₂ -efficient private and commercial road vehicles, and to lower carbon travel options such as walking, cycling and public transport.

Proposal No.	Proposal
110	The Mayor, through TfL, and by working with the London boroughs, Network Rail, Highways Agency, airport operators and other stakeholders, will determine the vulnerability of transport assets to the impacts of climate change and maintain existing infrastructure (including remedial works where effective and affordable) to improve resilience to climate change.
111	<p>The Mayor, through TfL, and working with the London boroughs, Network Rail, and other stakeholders, will prepare adaptation strategies to improve safety and network resilience to threats posed by climate change, and ensure that new transport infrastructure is appropriately resilient. The adaptation strategy should include:</p> <ul style="list-style-type: none"> a) Climate change impacts risk assessment of infrastructure and operations to identify key risks and mitigation opportunities b) The prioritisation of identified risks and proposals for appropriate management and/or mitigation action plans, including emergency planning and investment plans c) Guidelines for major procurement contracts (including design, construction and maintenance) to demonstrate a climate risk assessment for the lifetime of the investment
112	<p>The Mayor, through TfL, and working with the London boroughs, Network Rail and other transport infrastructure owners, will ensure the transport system is developed with climate change in mind, by:</p> <ul style="list-style-type: none"> a) Designing, locating and constructing new infrastructure to withstand climatic conditions anticipated over its design life b) Introducing energy efficient air-conditioned rolling stock where feasible, for example, on London Overground services and sub-surface Tube lines c) Continuing to investigate the feasibility of innovative methods of cooling the deep tunnelled sections of the Tube network d) Ensuring that all new buses entering the London fleet will feature specific climate change adaptation measures
113	The Mayor, through TfL, and working with London boroughs, Network Rail and other transport infrastructure owners, will plant an additional 10,000 street trees by 2012, with the ambition of an additional two million trees in London's parks, gardens and green spaces by 2025.
114	The Mayor, through TfL, and working with the London boroughs, Network Rail, and other stakeholders, will develop and test plans and procedures to minimise risk to person and property, manage disruption and ensure rapid transport system recovery from the impact of climate change related events.
115	<p>The Mayor, through TfL, and working with the London boroughs, DfT, Network Rail, train operating companies, and other stakeholders, will enhance the provision of information to improve customers' knowledge and understanding of service availability, delays and other information to improve customer satisfaction, and the way Londoners use public transport and make travel decisions, by:</p> <ul style="list-style-type: none"> a) Improving the provision of real time and other journey planning information, including upgrading the TfL web-based journey planner, allowing further improvements to its real time performance, accuracy and personalisation b) Providing customers with a range of paper-based information (Tube, cycle and bus 'spider' maps, timetables, fares and service changes) c) Raising public awareness and knowledge of existing public transport provision, particularly, orbital public transport services d) Further development of journey planning, including web-based information, for local trips to town centres e) Developing town centre journey planning tools consistent with other information resources proposed in the strategy

Proposal No.	Proposal
116	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will use smarter travel initiatives across London to facilitate more efficient use of the transport system, achieve mode shift to cycling, walking and public transport and encourage the take-up of healthier travel options.
117	The Mayor, through TfL, and working with the London boroughs, and other stakeholders in the public and private sectors, will improve the efficiency and effectiveness of freight operations through the promotion of 'delivery and servicing plans', 'construction logistics plans', the Freight Operator Recognition Scheme, Freight Quality Partnerships and other efficiency measures across London.
118	The Mayor, through TfL, and working with the London boroughs, freight industry, and other stakeholders, will develop the London freight information portal to exchange information and share knowledge to ultimately improve the performance of freight operators, boroughs and TfL.
119	The Mayor, through TfL, working with the London boroughs, freight operators and other stakeholders, will support the introduction of consolidation centres and break-bulk facilities where appropriate, especially at Strategic Industrial Locations, to allow distributed goods to be transferred from lorries using the trunk road network to more environmentally friendly vehicles for servicing urban centres.
120	The Mayor will ensure that fares provide an appropriate and necessary level of financial contribution towards the cost of providing public transport services to ensure that public transport continues to play a central role in London's transport system and overall economic development.
121	The Mayor will keep the range of concessions for which he is responsible under review to ensure that they are focused on where they will be most effective at helping those in most need of them. Concessions for schoolchildren are also conditional on good behaviour. If removed for poor behaviour, concessions can be earned back through programmes of community activity and good behaviour.
122	The Mayor, through TfL, will seek to conclude the creation of a fully integrated fare collection system for London that covers both TfL and National Rail services with a common set of travel products simplified to the maximum extent possible, in cooperation with the Association of Train Operating Companies and the DfT.
123	The Mayor, through TfL, and working with the London boroughs, train operating companies, other transport operators and stakeholders, will explore ways to reduce the cost of revenue collection and to make fare payment quicker and more convenient for passengers through the use of new technology and other initiatives.
124	The Mayor, through TfL, and working with the London boroughs, London Councils, and other stakeholders, will seek to ensure fair and consistent enforcement of parking and loading regulations across London, together with more consistent regulations, clearer signage, and more advance information regarding parking availability. Pan-London parking provision and regulations information will be published on the internet in an easy-to-access format.
125	The Mayor, through TfL, and working with the London boroughs, car park operators, and other stakeholders, will encourage implementation of pricing differentials based on vehicle emissions, including banded resident parking permits and other on and off-street parking charges, including incentives for EVs.
126	The Mayor, through TfL, the LDA, and working with the London boroughs and other stakeholders, will seek to ensure that new developments generating significant volumes of freight activity provide adequate off-street lorry parking and waiting facilities.

Proposal No.	Proposal
127	The Mayor, through TfL, the LDA, and working with the London boroughs and other stakeholders, will support those park and ride schemes in Outer London that lead to an overall reduction in congestion, journey times and road vehicle kilometres.
128	The Mayor, through TfL, subject to consultation, will remove the Western Extension of the central London Congestion Charging zone after putting in place such measures in mitigation of negative impacts as are both desirable and practicable.
129	The Mayor, through TfL, will operate and monitor Congestion Charging in the original Central London Congestion Charging zone. The Mayor will keep the scheme under review, making variations to ensure the continued effectiveness of the policy reflects best practice, improves the operation of the scheme, or helps it to deliver the desired outcomes of the MTS.
130	The Mayor, through TfL, and working with the London boroughs and other stakeholders, if other measures are deemed insufficient to meet the strategy's goals, may consider managing the demand for travel through pricing incentives (such as parking charges or road user charging schemes). This would depend upon there being a reasonable balance between the objectives of any scheme and its costs and other impacts. Any scheme would need to take account of local conditions, as well as the impact on surrounding regions, and to be fair and flexible relating charges to the external costs of travel with sensitivity to time of day, and with scope for discounts or exemptions for specific user groups. The Mayor will also consider imposing charges or tolls to support specific infrastructure improvements, such as river crossings.

Annex C – Freight and servicing contents

Freight and servicing is considered throughout the MTS and most policies and proposals apply to both people and goods. For ease of reference, these chapters are most relevant for freight and servicing:

Chapter three – Context

3.1	London’s transport geography	39
3.1.1	International travel	41
3.2	Integrating transport and land use planning	53

Chapter four – Challenges and strategic policies

4.2.1	Supporting sustainable population and employment growth	65
4.2.2.3	Delivering radial capacity and connectivity improvements into central London	70
4.2.3.1	Integrating land use development with transport planning	82
4.2.3.4	Improving efficiency of freight distribution	87
4.3	Enhancing the quality of life for all Londoners	88
4.3.4	Improving air quality	91
4.3.5	Improving noise impacts	91
4.6.2	Reducing CO ₂ emissions	102

Chapter five – Transport proposals

5.2.2	International and National Rail links and services	111
5.6	Managing the road network	151
5.6.3	Smoothing traffic flow	154
5.6.8	Developing the road network	158
5.7.5	Making better use of rivers and canals for waterborne freight	165
5.8	River crossings	168
5.12.2	Surface access to airports	184
5.13.7	Using bicycles for commercial purposes	193
5.16.6	Work-related road safety	207
5.19.2	Reducing the noise impacts of roads and public transport	224
5.21	Improving air quality	228
5.21.3	Behavioural changes	230
5.21.7	London Low Emission Zone	232
5.22	Reducing carbon dioxide emissions	237
5.22.2	Carbon efficient travel behaviour	239
5.22.3	Reducing CO ₂ emissions from freight delivery	241
5.22.9	Mayoral innovation and leadership	249
5.24	Better journey planning and smarter travel for people and goods	255
5.24.3	Smarter transport of freight and services	258
5.26	Parking and loading	264
5.27	Road user charging for economic and environmental aims	267



Accessibility: The general term for how easy it is for people to get to places, jobs, homes and services.

Accessibility Plan: The GLA Act 1999 requires the production of a specific accessibility plan covering the full remit of the policies and proposals in this area, together with a timetable for implementation. It is currently intended that a draft will be prepared alongside the public consultation draft of the MTS.

Air quality: The main air pollutant emissions from ground-based transport are:

- Oxides of nitrogen
- Particulate matter of varying size fractions, notably PM₁₀ and PM_{2.5}

The Mayor's Air Quality Strategy considers emissions of these pollutants from all sources in London, including transport.

All London Green Grid: A strategic framework for creating, improving and managing London's green infrastructure (for example, parks, Greenways) and promoting active travel.

Antisocial behaviour: The Crime and Disorder Act 1998 describes antisocial behaviour as that which is 'likely to cause alarm, harassment or distress to members of the public'.

BAA Ltd: The body that owns and operates six UK airports, including Heathrow.

Better streets: A street with a minimal amount of visual clutter and obstacles that encourages a degree of negotiation between road users.

Biking Boroughs: London Boroughs that prioritise cycling in their local transport strategies

and LIPs. Strong political commitment will help to unlock the potential for cycling trips within the borough, especially in areas of more significant opportunity, such as local town centres. Biking Boroughs will demonstrate partnership working, for example, with schools, NHS Primary Care Trusts and businesses, to deliver an integrated package of measures including smarter travel interventions, traffic management and infrastructure. TfL will offer support with programme development and technical expertise.

Break-bulk facilities: These are locations where larger vehicles unload materials and goods (often for retail), which are then transported to their final destination by smaller vehicles. Consolidation centres are currently only used by the construction industry, but are essentially the same concept.

Carbon dioxide (CO₂): The primary greenhouse gas emission associated with transport. Produced through the burning of fossil fuels, either in engines or electricity generators, to produce power for transport purposes.

Car clubs: A car club provides its members with quick and easy access to a car for hire. Members can make use of car club vehicles as and when they need them.

Central Activities Zone (CAZ): The area where planning policy promotes finance, specialist retail, tourist, cultural uses and activities.

Central London: The area, broadly speaking, within the Inner Ring Road, similar to the area covered by the central London Congestion Charge.

Central London Congestion Charging scheme:

The charge applied to vehicles entering a defined area of central London to reduce congestion.

Climate change: Long-term significant change in the expected patterns of average weather conditions of a specific region over an appropriately significant period of time.

Civils: Infrastructure assets such as bridges, viaducts, embankments and drainage systems.

Construction Logistics Plans (CLPs): Travel plans which aim to improve the sustainability of construction freight movements by establishing site management and procurement processes to reduce the impact of construction traffic on the road network.

Consolidation centre: See break-bulk facilities.

Convergence (as in London 2012 Olympic and Paralympic Games legacy): The principle and aim that within 20 years the communities of the five London boroughs hosting the 2012 Games would have the similar social and economic chances as their neighbours across London.

Cycle Safety Action Plan: The Mayor's action plan includes input from expert groups as well as ordinary Londoners to identify the types of collision most likely to result in serious cycling accidents and sets out measures to reduce them.

dBa: Refers to decibel, a logarithmic measurement used to express sound intensity and power.

Delivering a Sustainable Transport System (DaSTS): A framework for the assessment of funding for schemes intended for implementation in the period 2014 to 2019.

Delivery and Servicing Plans (DSPs): Travel plans which aim to improve the sustainability of freight and servicing by working with suppliers, clients and the freight industry to reduce the number of deliveries required, while ensuring remaining deliveries are made as safe and as environmentally friendly as possible.

Department for Transport (DfT): The Government department responsible for the UK transport network.

Defra: The Department for Environment, Food and Rural Affairs.

Disability Equality Scheme (DES): A statutory document which sets out in detail what TfL is going to do to ensure that the services it offers are accessible to disabled people. TfL is required to produce a DES every three years containing an outcome-based action plan that sets out what will be achieved during that timescale.

Economic Development Strategy (EDS): A strategy produced on behalf of the Mayor by the LDA to support the development of the Capital's economy.

Equal Life Chances for All: The Mayor's framework to address the remaining and significant pockets of deprivation and inequality, providing a fresh analysis and different solutions to inclusion, community cohesion and tackling disadvantage. It aims to achieve equal life chances for all and proposes an approach that brings Londoners together, rather than dividing them. It sets out the Mayor's equality vision and the framework necessary to deliver it.

Fail to stop collision: Collisions resulting in injury where one or more vehicle leaves the scene, so that information about the vehicle and its driver may be unknown. These collisions are often referred to as ‘hit and run’ collisions.

Freight: The delivery, collection and physical carriage of goods by any mode. This includes the provision of servicing, utilities and the movement of waste. Servicing incorporates maintenance and other skilled trades supplied to individual and corporate clients.

Freight Operator Recognition Scheme (FORS): An industry-led membership scheme aiming to improve freight efficiency and operation in London.

Greater London Authority (GLA): The region-wide governing body for London. It consists of a directly elected executive Mayor of London and an elected 25-member London Assembly with scrutiny powers.

GLA Act 1999: The Greater London Authority Act 1999 as amended by the 2007 Act of the same name.

Greenways: These are reliable, safe and pleasant walking and cycling routes running through parks, forests, waterways and quiet residential streets.

HGV (heavy goods vehicle): Motor vehicles (for example, trucks/lorries) with a maximum gross vehicle weight of more than 3.5 tonnes.

High Level Output Specification (HLOS): The railway investment and service improvements the Government has committed to funding for the period 2009 to 2014.

Highways Agency: An executive agency of the Department for Transport which is responsible for

operating, maintaining and improving the strategic road network in England.

iBus: An automatic vehicle location (AVL) system to improve the reliability and operation of London’s buses.

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

Integrated Impact Assessment (IIA): The MTS is subject to a number of legal requirements to prepare complementary assessments of how the strategy might affect people, places and conditions in London. TfL has undertaken an IIA to meet all these requirements simultaneously and to maximise the contribution which the strategy can make to progressing sustainability. The IIA integrates the following assessments to take into account all aspects of sustainability:

- Strategic Environment Assessment (SEA)
- Health Impact Assessment (HIA)
- Equality Impact Assessment (EqIA)
- Assessment of Economic Impacts
- Habitats screening exercise

Community safety, including crime and disorder, was also considered as part of the IIA.

Intensification Areas: These areas have significant potential for an increase in residential, employment and other uses through development of sites at higher densities with more mixed and intensive use.

Intensification Area Planning Frameworks

(IAPFs): See Opportunity and Intensification Area Planning Frameworks.

Journey stage: A journey stage is part (or sometimes all) of a trip made by a single mode of transport. A home to work trip, for example, may contain three journey stages: a walk to a bus stop, a bus journey stage, and a further walk from the bus stop to the workplace. Note that if the same home to work trip were made directly by car, walking or bicycle, there would be only one journey stage.

Key walking route: A program of projects to improve the walking environment across London. These projects include improving routes to shops, schools, leisure centres and work, new or improved pedestrian crossings, and clearer signing.

Legible London: A map-based pedestrian wayfinding and information system that gives people clear and consistent information to facilitate and encourage walking journeys. It is managed by TfL but available for third party use.

Leq: A well-established index of long-term constant average exposure to noise and is an abbreviation for 'equivalent continuous noise level'. It replaces the Noise and Number Index used previously. Calculated values give the level of a steady sound which, if heard continuously, would contain the equivalent total amount of sound energy (decibels) as all the noise events over the same period of time. For example, at Heathrow, a 16-hour core operating period is analysed, from 07:00 to 23:00.

LGV (light goods vehicle): Motor vehicles (for example, vans/pick-ups) with a maximum gross vehicle weight of up to 3.5 tonnes.

Lifetime neighbourhoods: These are designed to be welcoming, accessible and inviting for everyone, regardless of age, health or disability. They are sustainable in terms of climate change, transport services, housing, public services, civic space and amenities, making it possible for people to enjoy a fulfilling life and take part in the economic, civic and social life of the community.

Local Implementation Plans (LIPs): Statutory transport plans produced by London boroughs bringing together transport proposals to implement the MTS at a local level.

London Councils: This organisation represents London's 33 local authorities and lobbies on their behalf. London Councils also runs a number pan-London services.

London Electric Vehicle Centre of Excellence: Established within the Greater London Authority group to implement the London Electric Vehicle Delivery Plan. The unit will seek to exchange knowledge and experience with other cities intending to take forward similar plans.

London Freight Plan: Produced by TfL in conjunction with stakeholders in the private and public sector, outlines a vision for sustainable freight distribution in the Capital. The plan highlights challenges faced by London's diverse freight sectors and details four key projects (FORS, DSPs, CLPs and the freight information portal). The London Rail Freight Strategy sets out how TfL would like to see rail freight develop in the medium term.

London Plan: The Mayor of London's spatial development strategy for London.

London sub-regions: While having fuzzy boundaries to encourage cross-boundary working, London regions are proposed to contain the following boroughs:

- Central London region: Cities of London and Westminster, plus the boroughs of Camden, Islington, Kensington & Chelsea, Lambeth and Southwark
- North London region: Boroughs of Barnet, Enfield, Haringey and Waltham Forest
- East London region: Boroughs of Barking & Dagenham, Bexley, Greenwich, Hackney, Havering, Lewisham, Newham, Redbridge and Tower Hamlets
- South London region: Boroughs of Bromley, Croydon, Kingston upon Thames, Merton, Richmond upon Thames, Sutton and Wandsworth
- West London region: Boroughs of Brent, Ealing, Hammersmith & Fulham, Harrow, Hillingdon and Hounslow

Londoners: Anyone in London, including permanent and temporary residents, visitors, students, workers and tourists.

LondonWorks: Planning software used by TfL and London boroughs to coordinate utility street works in the Capital with the aim of reducing negative impacts on traffic flows.

Low Emission Zone (LEZ): The application of charges across Greater London based on emissions of air pollutants to reduce the amount of harmful vehicular emissions in the city.

Mayoral functional bodies: The bodies which provide services for which the GLA is ultimately responsible. They include TfL (transport), the Metropolitan Police Authority (policing), the London Fire and Emergency Planning Authority (fire and rescue) and the LDA (development and strategic planning).

Mayor's Air Quality Strategy (MAQS):

See air quality.

Metropolitan town centres: The 12 metropolitan centres currently identified are Bromley, Croydon, Ealing, Wood Green, Harrow, Romford, Uxbridge, Hounslow, Kingston, Ilford, Shepherd's Bush and Sutton. The London Plan also identifies three potential metropolitan town centres: Stratford, Woolwich and Brent Cross.

Mobility impairment: People who may find it harder to get around streets and use public transport for a variety of reasons. This can include people with a disability (sensory, physical or people with learning difficulties), older people, the very young, expectant mothers and people with luggage.

Mode share: This is a measure of the relative use of each mode of transport. It can be measured in several ways including trips by each mode and journey stages by each mode. A trip is defined as a one-way movement from one place to another to achieve a single main purpose. Trips may be further sub-divided into journey stages, the single components of parts of a trip using a single mode of transport between the interchanges. Each of these definitions is valid, though gives a differing result.

Natura 2000: A European network of protected sites which represent areas of the highest value for

natural habitats and species of plants and animals which are rare, endangered or vulnerable in the European Community.

Network Rail: The company that owns and operates Britain's rail infrastructure.

Noise contour: The Civil Aviation Authority estimates the noise exposures around major airports (such as Heathrow, Gatwick and Stansted) for the DfT. The magnitude and extent of the aircraft noise around these airports are depicted on maps by contours of constant aircraft noise index (Leq) values. The contours are generated by a computer model validated with noise measurements, which calculates the emissions and propagation of noise from arriving and departing air traffic.

Opportunity Areas: London's principal opportunities for accommodating large scale development to provide substantial numbers of new employment and housing. Each typically has more than 5,000 jobs and/or 2,500 homes, with a mixed and intensive use of land and assisted by good public transport accessibility.

Opportunity and Intensification Area

Planning Frameworks: Planning frameworks take different forms depending on local circumstances. They focus on implementation, identifying both opportunities and challenges that need resolving including land use, transport infrastructure requirements and other intervention. With support from strategic partners they should set realistic programmes and timescales for delivery.

Orbital travel: Non-radial journeys made between one part of London and another, where the end destination is not in central London.

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

Outer London Commission: The Outer London Commission was established by the Mayor to explore how Outer London can better realise its economic potential, especially in town centres, as well as identify Opportunity and Intensification Areas and Strategic Industrial Locations. Its membership includes representatives of business, the boroughs, the (property) development industry and the voluntary sector.

The Commission is tasked with identifying opportunities to enhance the 'quality of life' and encourage economic development. It will also examine the relationship between demographic, housing and economic growth and the transport improvements needed to facilitate this.

PHV: Private hire vehicles, for example, minicabs.

Physical accessibility: How easy it is for all people to get around streets and to use public transport.

Planning Policy Guidance 13 (PPG13):

National guidance regarding the integration of planning and transport at the national, regional, strategic and local level, and to promote more sustainable transport choices for carrying people and for moving freight.

Polyclinic: Polyclinics provide a wide range of health care services (including diagnostics) without the need for an overnight stay. Polyclinics

are sometimes co-located with a hospital or may be located in another locality entirely. A typical polyclinic will house a number of general medical practitioners such as doctors and nurses.

Potential metropolitan town centres:

See metropolitan town centres.

Public transport accessibility level (PTAL):

This is a measure of accessibility to the public transport network. For any given point in London PTALs combine walk time to the network (stations, bus stops) with service wait time at these stops to give an overall accessibility index. This can be allocated to six accessibility levels with one being poor and six being excellent.

Police: All police forces in London tasked with law enforcement on transport infrastructure. Principally, this incorporates all relevant divisions of the Metropolitan Police Service, City of London Police and British Transport Police.

Public private partnership (PPP): A mechanism for using the private sector to deliver outcomes for the public sector, usually on the basis of a long-term funding agreement.

Rail Vehicle Accessibility Regulations (RVAR):

Legislation created in 1998 which ensures that all new trains, trams and other track-based systems, are accessible to disabled people, including wheelchair users.

Reference case: The situation that is projected to occur in a future year under existing policies. It is a baseline or 'default' position. The reference case is based on GLA projections for population and employment, and the investment in the published TfL Business Plan and HLOS, including:

- The investment in the TfL Business Plan up to 2017/18
- Completion of the full LU PPP line upgrade specification (including the Bakerloo line upgrade assumed to be in 2020)
- Crossrail
- HLOS improvements in 2009 to 2014
- Removal of the Congestion Charging Western Extension zone

Regenerative braking: A mechanism that reduces vehicle or train speed by converting some of its kinetic energy into a storable form instead of dissipating it as heat as with a conventional brake. The captured energy is stored for future use or fed back into a power system for use by other vehicles/trains.

Road pricing: Normally refers to the use of charges on moving vehicles for the use of roads. It normally includes tolls for specific sections of the road system and Congestion Charging where prices are intended to influence the level of traffic. It usually excludes taxes on fuel or vehicles, hire charges and charges for parking. Road user charging can be used synonymously, though it sometimes includes taxes and charges for parking.

Road pricing is a flexible policy measure. For example, schemes can be implemented to influence the degree of use that is made of limited road space (as is the primary objective of the central London Congestion Charging scheme) or the characteristics of the vehicles using the roads (the primary objective of the LEZ).

Scheme order (Congestion Charging): A legal document specifying the precise details of

the operation of the central London Congestion Charging scheme, such as its hours of operation, its geographical scope, the vehicles affected, any discounts and exemptions, and charges applicable. Its full title is the Greater London (Central Zone) Congestion Charging Order 2004.

Scheme order (Low Emission Zone): A legal document specifying the precise details of the operation of the London LEZ scheme, such as its hours of operation, its geographical scope, the vehicles affected, any discounts and exemptions, and charges applicable. Its full title is the Greater London Low Emission Zone Charging Order 2006.

SCOOT: An urban traffic control system which automatically optimises traffic signal settings based on traffic demand over a sequence of signalised junctions.

Shared space: A concept which suggests a degree of sharing of streetscape between different transport modes and street users, requiring everyone to consider the requirements, aspirations and needs of each other.

Smarter travel: Programmes of targeted measures to promote sustainable travel, helping to reduce congestion and crowding and mitigate the environmental impacts of transport.

Smoothing traffic flow: Overarching term for the package of measures that seeks to manage road congestion and which includes managing delay, improving journey time reliability and network resilience.

Spider map: A diagrammatic map to show all the bus routes from a single location.

Strategic Industrial Locations (SILs): These are London's main reservoirs of industrial land comprising approximately 40 per cent of the Capital's total supply. They are of two types to meet and support the requirements of different sorts of industrial occupier:

- Preferred industrial locations which are particularly suitable for general industrial, light industrial, storage and distribution, waste management, recycling, some transport-related functions, utilities, wholesale markets and other industrial related activities
- Industrial business parks which are particularly suitable for activities that need better quality surroundings including: research and development, light industrial and higher value general industrial, some waste management, utility and transport functions, wholesale markets and small scale distribution

Strategic Outer London development centres:

Centres in Outer London or adjacent parts of Inner London with one of more strategic economic functions of greater than sub-regional importance, with specialist strengths that generate growth significantly above the long-term Outer London trend. The inclusion of strategic Outer London development centres in the London Plan and the MTS does not imply that development growth should be concentrated in these centres over town centres.

Strategic Road Network: Strategically significant roads in London for which TfL has a Network Management Duty, comprising the 580km TLRN and 500km of borough roads.

Strategic Walk Network (SWN): A 350-mile network of seven strategic walking routes across London. The network provides the opportunity for leisure walking and connects both rural and suburban areas, in addition to some of the Capital's most popular central destinations. The network also provides quality pedestrian access to transport links, education and employment destinations.

Sub-regions: See London sub-regions.

The Committee on Climate Change: An independent body established under the Climate Change Act to advise the UK Government on reducing greenhouse gas emissions.

TfL Park and Ride Assessment Framework: The framework sets out the criteria for considering new park and ride provision in London.

Transport for London Road Network (TLRN): Described in the GLA Act 1999 as the Greater London Authority Road Network. The Mayor has decided to call this the Transport for London Road Network. It comprises 580km of London's red routes and other important streets.

Train operating companies (TOCs): Businesses operating passenger trains on the railway system of mainland Great Britain under the collective National Rail brand.

Transport and Works Act (TWA): Legislation created in 1992 regulating the construction and operation of railways, tramways and other guided transport schemes, and works which interfere with navigational rights.

Travel plans: Plans promoting and providing guidance on sustainable transport options for a given location with the aim of promoting sustainable and environmentally friendly modes.

Trip: A complete movement from origin to destination, for example, from home to work.

20mph zone: Areas with self-enforcing speed limits that reduce vehicle speeds. Research has found that as speeds reduce casualties can be reduced by more than 40 per cent after a zone is implemented in London.

Urban realm: The area between building alignments including public spaces next to streets. The street makes up the greatest part of the urban realm in most cities.

Variation Order: A legal document specifying changes to be made to the Congestion Charging or LEZ scheme orders. Any change to the Congestion Charging or LEZ scheme must be made by TfL and then be subject to public and stakeholder consultation. In light of this, the Mayor may choose to confirm the variation order, make modifications to it, or not confirm it.

'Way to Go! – Planning for Better Transport': This non-statutory publication, published in November 2008, sets out the Mayor of London's vision for transport in the Capital.

Other formats and languages

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Public Liaison Unit

Greater London Authority
City Hall
The Queen's Walk
More London
London SE1 2AA

Telephone **020 7983 4100**
Minicom **020 7983 4458**
www.london.gov.uk

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Chinese

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Vietnamese

Nếu bạn muốn có văn bản tài liệu này bằng ngôn ngữ của mình, hãy liên hệ theo số điện thoại hoặc địa chỉ dưới đây.

Greek

Αν θέλετε να αποκτήσετε αντίγραφο του παρόντος εγγράφου στη δική σας γλώσσα, παρακαλείστε να επικοινωνήσετε τηλεφωνικά στον αριθμό αυτό ή ταχυδρομικά στην παρακάτω διεύθυνση.

Turkish

Bu belgenin kendi dilinizde hazırlanmış bir nüshasını edinmek için, lütfen aşağıdaki telefon numarasını arayınız veya adrese başvurunuz.

Punjabi

ਜੇ ਤੁਹਾਨੂੰ ਇਸ ਦਸਤਾਵੇਜ਼ ਦੀ ਕਾਪੀ ਤੁਹਾਡੀ ਆਪਣੀ ਭਾਸ਼ਾ ਵਿਚ ਚਾਹੀਦੀ ਹੈ, ਤਾਂ ਹੇਠ ਲਿਖੇ ਨੰਬਰ 'ਤੇ ਫ਼ੋਨ ਕਰੋ ਜਾਂ ਹੇਠ ਲਿਖੇ ਪਤੇ 'ਤੇ ਰਾਬਤਾ ਕਰੋ:

Hindi

यदि आप इस दस्तावेज की प्रति अपनी भाषा में चाहते हैं, तो कृपया निम्नलिखित नंबर पर फोन करें अथवा नीचे दिये गये पते पर संपर्क करें

Bengali

আপনি যদি আপনার ভাষায় এই দলিলের প্রতিলি (কপি) চান, তা হলে নীচের ফোন নম্বরে বা ঠিকানায় অনুগ্রহ করে যোগাযোগ করুন।

Urdu

اگر آپ اس دستاویز کی نقل اپنی زبان میں چاہتے ہیں، تو براہ کرم نیچے دئے گئے نمبر پر فون کریں یا دیئے گئے پتے پر رابطہ کریں

Arabic

إذا أردت نسخة من هذه الوثيقة بلغتك، يرجى الاتصال برقم الهاتف أو مراسلة العنوان أدناه

Gujarati

જો તમને આ દસ્તાવેજની નકલ તમારી ભાષામાં જોઈતી હોય તો, કૃપા કરી આપેલ નંબર ઉપર ફોન કરો અથવા નીચેના સરનામે સંપર્ક સાધો.

