

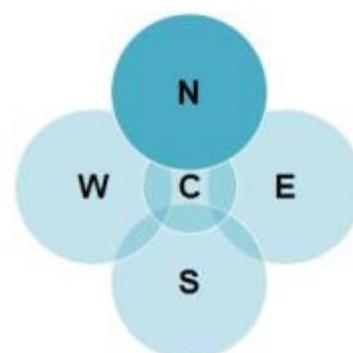
NORTH LONDON

Developing a Sub-regional Transport Plan Interim report on challenges & opportunities

18 February 2010
Prepared by TfL Planning

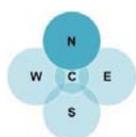
Maps

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Background

TfL is working with boroughs and London regional partners to develop sub-regional transport plans for each of the five London sub-regions (north, south, east, west and central).

This document is a key step in developing north London's sub-regional transport plan. The purpose of this interim challenges and opportunities document is to articulate the goals in the draft Mayor's Transport Strategy in the context of north London and also to set out more specific challenges for the sub-region within this framework. It also outlines examples of potential schemes and policy options for addressing these challenges. A key focus of the work to develop the sub-regional transport plan will be in further understanding the sub-region's needs and assessing potential solutions.

In addition, this document presents detailed data and analysis for the sub-region, including borough specific information for each of the core boroughs in north London. We hope that this information is useful for boroughs in preparation of their Local Implementation Plans, as well as for comparisons with the other four sub-regions.

The sub-regional transport plan – to be completed later this year – will confirm the main challenges and priorities for north London; show how the Mayor's Transport Strategy will be implemented within the sub-region; and set out the priority solutions for north London.

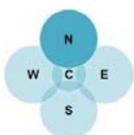
“Fuzzy” boundaries

The north London sub-region consists of the boroughs of Barnet, Enfield, Haringey and Waltham Forest. However, the boundaries between the different sub-regions are intended to be flexible and “fuzzy” as transport challenges do not stop at borough or sub-regional boundaries. TfL's engagement with boroughs reflects this: for example Camden and Islington are involved in both the development of both the central and north London transport plans, and Hackney is involved in north, east and central London plans. Consideration of the transport challenges and opportunities for north London reflects the fuzzy boundaries and therefore includes relevant parts of all seven boroughs.

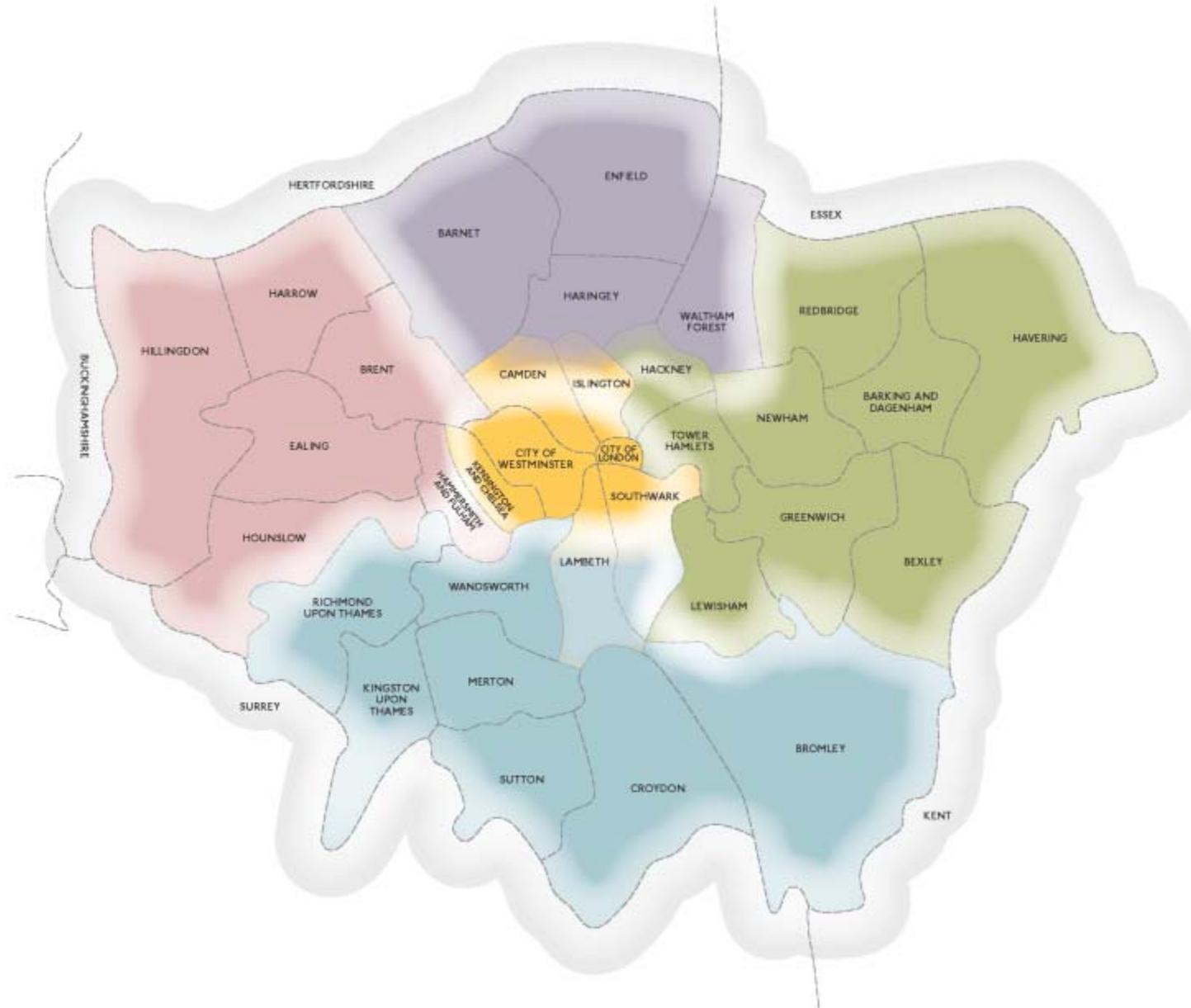
North London context

North London's population is set to grow. This is expected to happen at a faster rate than south or west London. Only east London will grow faster. The population of the four boroughs is expected to grow by 16 per cent or an additional 170,000 people between 2006 and 2031. This increases to nearly 300,000 extra people when Camden, Islington and Hackney are included.

Employment is expected to increase by 10 per cent over the same period. Most north London jobs are in the services sector, although the sub-region has one of the largest clusters of manufacturing and technology-led industrial estates in London in the Upper Lee Valley.



Map showing the “fuzzy boundaries” between sub-regions and the links with neighbouring counties



Comparison of forecast population growth (2006-31)

	North	East	South	West	Central	Greater London
Existing population 2006 (millions)	1.1	2.1	1.6	1.4	1.3	7.5
Projected population 2016/17 (millions)	1.1	2.3	1.7	1.5	1.4	8.1
Population growth to 2016/17 (percentage change)	6%	12%	4%	6%	8%	8%
Proportion of London-wide growth (2016/17)	12%	44%	10%	14%	18%	100%
Projected population 2031 (millions)	1.2	2.7	1.8	1.6	1.6	8.9
Population growth to 2031 from 2016 (percentage change)	9%	17%	4%	5%	10%	10%
Proportion of London-wide growth (2031) (2016 to 2031)	14%	49%	9%	10%	18%	100%

Source: GLA London Plan Forecasts (2009)

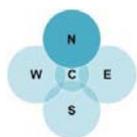
The sub-region includes part of the London-Stansted-Cambridge-Peterborough national growth corridor and part of the North West London to Luton coordination corridor. Both of these have significant potential for housing and population growth. The boroughs in the east of the sub-region will also benefit from investment and regeneration resulting from the 2012 Olympic and Paralympic Games.

North London is polycentric in nature. It has more district centres (as defined in the London Plan) than any other sub-region, and only one metropolitan centre – Wood Green. It is comprised of a range of neighbourhoods, from high to low density residential communities. Key locations in the sub-region, include Wood Green, the major centres (Enfield Town, Edgware, Walthamstow, Camden Town, Kilburn, Dalston, Angel and Nag's Head), many of the district centres and the strategic industrial location at Brimsdown. Other key locations include the opportunity and intensification areas, which will see a significant share of north London's population and employment growth: these include the Upper Lee Valley, Brent Cross/ Cricklewood and Colindale/ Burnt Oak opportunity areas and the Haringey Heartlands/ Wood Green, Mill Hill East and West Hampstead intensification areas.

Over half of North London trips both start and finish in the sub-region. For Enfield, Barnet and Waltham Forest, around half start and finish in the same borough, while for Haringey, the figure is 39%.

Mode shares are related, among other things, to the extent to which a borough is in outer or inner London. Barnet and Enfield residents have mode shares for car/motorcycle of 50 per cent and 49 per cent respectively. Haringey's is 31 per cent (with 37% by public transport), and Camden and Islington's is at or under 20 per cent.

North London also has an extensive public transport network. The National Rail network serves 43 stations, predominately providing for radial travel to central London, the Home Counties north of London and Stansted Airport and the London Overground's Gospel Oak to Barking line provides a useful orbital service. The Underground network consists of 27 stations on the northern, Piccadilly, Victoria and Central lines. Over half of the sub-region's population (56%) lives within 1km of a National Rail or Underground station. The bus network also plays an important role in north London, with buses accounting for 17 per cent of trips, the highest mode share of any sub-region.



There are over 2,300 bus stops in the sub-region; 98 per cent of residents are within 400m of a bus stop. The bus service is now more consistent across London with waiting times between boroughs almost halved.

Only one per cent of trips with an origin or destination in north London are made by bicycle and the number of currently cycled trips (22,000) is around three per cent of the number of trips that could potentially be cycled. North London locations with potentially cyclable trips include Enfield Town, Walthamstow, Wood Green, Edgware and Finchley.

While transport is essential for economic development, the quality of the journey experience is also a key consideration. North London experiences public transport crowding and highway congestion and the forecast growth will lead to an increase in trips which, despite planned committed infrastructure investment, will result in worsening travelling conditions. Managing economic development and population growth, and the related demand for travel, is therefore a key challenge for north London.

The nature of the sub-region is reflected in its transport challenges including the need to facilitate and respond to the forecast population and employment growth; crowding and congestion on the transport network; comparably poor journey times for journeys outside the radial transport corridors; access to key locations and to opportunities; and to reduce emissions from ground-based transport.

The North London context, including data and analysis on population, employment, travel, public transport crowding, highway congestion, cycling, air quality, and casualties can be found in Chapter 2, with more detailed data in Annex 1.

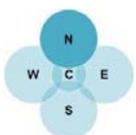
North London's transport challenges and opportunities

The six draft Mayor's Transport Strategy goals have been translated to the sub-regional and local level in this document and specific key sub-regional challenges have been developed in collaboration with the boroughs and other key stakeholders, and through TfL analysis. These were discussed and agreed with boroughs. They are identified as follows.

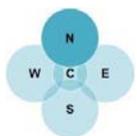
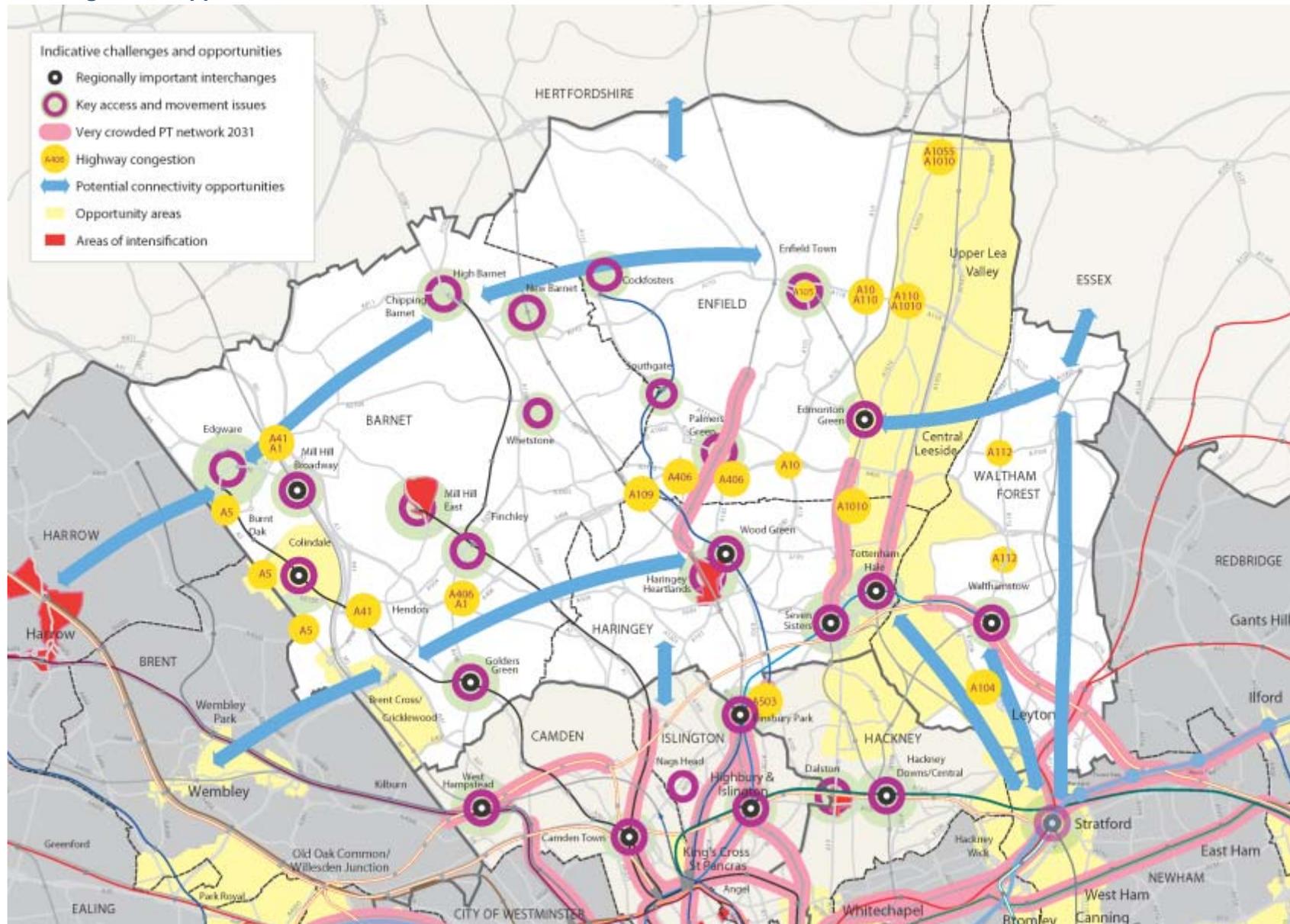
- **Facilitating and responding to growth, particularly in Brent Cross/ Cricklewood and the Upper Lee Valley**
- **Relieving crowding on the public transport network**
- **Managing highway congestion and making more efficient use of the road network**
- **Enhancing connectivity and the attractiveness of orbital public transport**
- **Improving access to key locations and to jobs and services**

Issues such as Climate Change or Safety and Security will be addressed at both the London-wide and local level. For some of the broad goals such as climate change there are also other strategic documents like the forthcoming Climate Change Mitigation and Energy Strategy and the Air Quality Strategy, as well as local frameworks for action such as LIPs and Air Quality Management Areas.

The figure below presents diagrammatically each of the challenges and opportunities identified for north London. These have been identified through a range of analyses, within the framework of the draft Transport Strategy, and engagement and collaboration with boroughs and regional partners which have helped identify the key issues facing the north sub-region. For some of the challenges and opportunities priority locations are well understood and agreed, for others the locations may be indicative requiring further discussion, assessment of need and agreement before further work is undertaken to develop potential solutions.



Challenges and opportunities in north London



Challenge 1: Facilitating and responding to growth, particularly in Brent Cross/ Cricklewood and the Upper Lee Valley

Facilitating and responding to growth is considered by the north London boroughs to be the key transport challenge facing the sub-region to 2031. Population and employment growth is considerable and will be concentrated in a number of key areas, including the inner north London boroughs, around Wood Green and the opportunity areas at Brent Cross/ Cricklewood, Colindale/ Burnt Oak and the Upper Lee Valley. Whilst the forecast growth lies mostly adjacent to existing rail and Underground infrastructure, ensuring that there is adequate road, rail and bus capacity to sustainably enable this growth is vital.

Brent Cross/ Cricklewood is forecast to accommodate up to 20,000 new jobs and up to 10,000 new homes to 2031. As an area it will benefit from developer proposals for a new station on the Thameslink line serving the area and from the funded upgrades of the Thameslink and Northern lines, which both experience severe crowding. Highway congestion is also a significant concern for the area now and in the future.

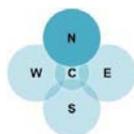
The Upper Lee Valley, including Tottenham Hale, is forecast to accommodate 15,000 new jobs and up to 9,000 new homes to 2031. While the area will benefit from the upgrade to the West Anglia mainline, unfunded proposals, such as four-tracking on the Lee Valley line would provide much needed additional capacity for local services.

Indicative growth and development priority areas in north London include the Upper Lee Valley area; Brent Cross/ Cricklewood area; the Stratford corridor; Colindale/ Burnt Oak area; Wood Green/ Haringey Heartlands; Mill Hill East; West Hampstead; Dalston; the Northern Olympic Fringe area; and the Stansted corridor. Policies and proposals in the draft Transport Strategy that are particularly relevant to this challenge include those supporting the development of rail freight; delivering capacity and accessibility enhancements on Underground routes and prioritising improvements to sub-regionally important interchanges; introducing a criteria based approach to road schemes; promoting and supporting cycling; and encouraging walking.

Challenge 2: Relieving crowding on the public transport network

North London experiences significant crowding in the morning peak on National Rail and London Underground lines. Severe crowding is experienced on the Great Northern routes into Finsbury Park and central London; the West Anglia mainline into Tottenham Hale; the Thameslink route into West Hampstead; and on the Gospel Oak to Barking and Richmond to Stratford lines from Willesden Junction to Gospel Oak and from Barking to South Tottenham. On the Underground, the most substantial crowding occurs on the Victoria and Piccadilly lines from Finsbury Park into central London and on the Northern line into and south of Camden. There is crowding and congestion at the sub-regionally important interchanges of Finsbury Park, Tottenham Hale, Highbury and Islington and at Camden Town Underground station. The busiest bus corridors in north London are the A10 corridor, particularly from Liverpool Street to Edmonton, and a wider range across inner London.

The committed interventions in north London will result in some improvements in crowding in 2031, such as the Thameslink line and services from Welwyn Garden City. However, generally the additional demand resulting from the forecast growth will lead to severe crowding in 2031, particularly on the Finsbury Park to central London corridor, on both branches of the Northern line and on the Jubilee line south of Finchley Road.



Another approach to relieving crowding on the public transport network is to reduce the demand to travel. The analysis work on cycling potential in north London indicates that there are a proportion car journeys that are cyclable. In addition, the proposed Cycle Superhighways will also help to encourage commuters away from crowded rail and Underground lines. Another option for crowding relief is proximity interchanges where improvements in walking between two interchanges can connect two networks. Furthermore, there is a real opportunity to integrate public transport infrastructure with emerging economic growth centres, such as those at Brent Cross/ Cricklewood and in the Upper Lee Valley.

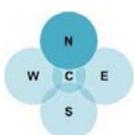
Challenge 3: Managing highway congestion and making more efficient use of the road network

At the area level, highway congestion is worst in inner London and around town centres. Indicative priority locations that experience congestion include the A406 North Circular Road, which is heavily congested between Brent Cross and the A1 and areas of high congestion include Henly's Corner and Bounds Green; the A10, which experiences heavy congestion from Wood Green to the A10; the A1 along Holloway Road; the A5 from Dollis Hill bus garage to Kilburn High Road; the A1055 in terms of freight connectivity to the A1; the A103 on Tottenham Road; and the A112 approaching Stratford and Walthamstow.

Policies and proposals in the draft Transport Strategy that are particularly relevant to managing highway congestion including those supporting the development of national rail freight routes; introducing measures to smooth traffic flows to manage congestion and improve journey time reliability; introducing a criteria based approach to road schemes; examining the potential to increase the use of the Blue Ribbon Network for freight; encouraging more efficient freight movements and supporting the introduction of freight consolidation centres; and keeping under review road user charging and other demand management measures to encourage mode shift.

Challenge 4: Enhancing connectivity and the attractiveness of orbital public transport

The north sub-region generally has very good connectivity in the radial rail transport corridors into central London. However, public transport journeys outside these corridors generally take much longer. The key orbital public transport route in outer London is the London Overground network and the sub-region benefits from several key interchanges. Outside the key orbital routes, demand and supply of orbital connectivity by public transport focuses on journeys to local centres, facilities and interchanges with comparably slower journey times. Indicative locations or corridors for connectivity in the sub-region include the A406, Gospel Oak to Barking line, Richmond to Stratford line, Stratford to Chingford and Brent Cross to Ealing. Policies and proposals in the draft Transport Strategy that will contribute to this challenge including providing extra capacity to assist orbital movements on the Overground; provide additional infrastructure and improving station accessibility; keeping the bus network under regular review; and using Best Practice Guidelines to improve interchange schemes and improving interchange to provide opportunities for orbital public transport. It is likely that a package of measures will be the most effective way of addressing key corridor issues.



Challenge 5: Improving access to key locations and to jobs and services

Access to key locations such as town centres, and to jobs and services, by public transport in north London is relatively fast and convenient along the radial rail corridors into central London.

However, public transport connectivity across the sub-region and between town centres and the opportunity areas is relatively poorer and considerably more time consuming. The massive regeneration and development happening in Stratford, including that for the Olympics, provides an opportunity for north London in terms of accessing jobs. In addition, the opportunity areas at Brent Cross/ Cricklewood and the Upper Lee Valley provide an opportunity for people within and outside the sub-region to access the opportunities provided by the growth in employment and investment in these areas. Potential options to improve access to key locations include “Better Town Centre” improvements, such as those proposed for Wood Green; providing high quality pedestrian and cycling connections with a particular focus on routes to and from key leisure and employment locations and schools; and better integrating land use and transport planning.

London context

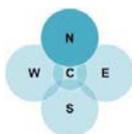
There are many committed improvements set out in the Mayor’s draft Transport Strategy and TfL’s Business Plan which are relevant to north London and will help address some of the transport challenges faced today including:

- London Underground upgrades on the Jubilee, Northern, Piccadilly and Victoria lines
- Increased capacity on rail services including those on the West Anglia, Great Northern and Thameslink lines
- Expansion and enhancement of the London Overground network
- Improvements to the road network including safety and environmental improvements on the North Circular Road at Bounds Green and Henly’s Corner; and
- Northern Line partial separation, a significant further increase in capacity albeit with increased interchange at Camden Town
- Cycle Superhighways, including three routes serving the north London sub-region

In addition to dealing with sub-regional challenges, north London also needs to play a role in addressing the challenges that London faces as a whole and achieving the outcomes for London set out in the draft Transport Strategy. To this end, much needs to be done in order to support continued economic growth; deliver a better quality of life; improve access to opportunities and services; tackle deprivation; support regeneration and delivery of the London Plan; reduce transport’s contribution to climate change; improve safety and security; and support the Olympics and Paralympics legacy.

Next steps

The potential options outlined in this document are indicative and at this stage should not be considered as recommendations or as an exhaustive list. Further work will be undertaken to assess potential demand in more detail and develop potential options further for inclusion in the sub-regional transport plans, including an appreciation of their affordability, feasibility and potential timing for delivery. With limited funding available, particularly in the shorter term, options for addressing these challenges will need to be prioritised. In assessing the suitability or appropriateness of any solution, both sub-regional and London-wide challenges will be taken into consideration.



Potential infrastructure and policy options will need to pass rigorous value for money tests to secure endorsement from TfL and other stakeholders. At this stage, TfL cannot make any commitment to deliver interventions identified (beyond those already included in the Business Plan), but further feasibility analysis will be undertaken to address their relative merits.

This document is only the first milestone in the process of working with stakeholders to agree a common set of challenges and opportunities for north London. Boroughs can use the information presented here in preparation of their LIPs, and there will be further analysis and collaboration between TfL and stakeholders on the issues explored within this document, and development and assessment of options. The final draft of the sub-regional transport plan will go on to include an outline of priority solutions for north London.

We would welcome your comments at the joint TfL/London Councils sub-regional workshop being held on 23 February 2010 and for more detailed discussion, please provide any overview comments by 31 March 2010. There are a number of questions set out below which it would be useful for stakeholders to focus on.

Key questions:

Useful aspects: which aspects of this document do you find most useful?

Less useful aspects: which aspects of this document do you find least useful?

Local concerns: how much does the document reflect your local strategic concerns?

Analysis: what additional analysis/scenarios do you think could be considered in developing the sub-regional transport plans?

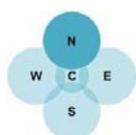
Gaps: what else would you like to be included in the final sub-regional transport plan document drafts in the summer?

MTS translation: what else would help you in the translation of the Mayor's Transport Strategy to a local level and the development of LIPs?

Cross-boundary working: does the document sufficiently reflect the issues which cross sub-regional boundaries within London / beyond London?

Revision: under what circumstances do you think the "live" sub-regional transport plan documents should be revised? What do you consider to be key "triggers"?

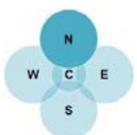
Ambition: how far do you think the sub-regional transport plan should set out a target or level of ambition for the sub-region? What should these be?



The sub-regional transport plan

1. TfL are developing a series of five sub-regional transport plans for London (as outlined in Policy 28 of the draft Mayor's Transport Strategy). The framework of the draft Transport Strategy is being used to ensure that each plan aligns with Mayoral priorities for London, and also that it supports the London Plan and other Strategies.
2. TfL is working in partnership with London boroughs and organisations within each sub-region to ensure that the work also reflect local aspirations and priorities. This has been facilitated by the involvement of Ambassadors from TfL¹ whose role includes ensuring local challenges and issues have been adequately captured and understood.
3. Within the draft Transport Strategy, there is a series of challenges and outcomes which relate to these goals which the Strategy is seeking to achieve across London by 2031 (see Figure 1 below).
4. An important role of the sub-regional transport plan will be to set out how these outcomes will be delivered within each of the sub-regions, recognising that different regions of London have different characteristics and challenges and therefore may contribute differently to delivering the London-wide outcomes. The successful delivery of key outcomes means looking beyond borough boundaries at a sub-regional level and an understanding of how London-wide issues relate to different areas. This work considers these "sub-regional issues"; and the sub-regional transport plan will provide both a strategy and a longer term implementation plan for them. This will be achieved by TfL and the boroughs working together.
5. In summary, the key areas where the sub-regional transport plans will add value are in:
 - Establishing agreed challenges and priorities across the sub-region
 - Providing the evidence that informs and underpins the challenges and priorities
 - A shared understanding, based on the evidence, of the problems, opportunities and potential solutions
 - Prioritising and developing schemes and policies/ proposals identified in the Transport Strategy
 - Better integration of modal planning and delivery, for example along corridors, in town centres/ key locations, or at interchanges
 - Better integration of transport and land use, for example for large trip generators such as new hospitals, and understanding the impacts of major developments
 - Better integration of the plans of London and neighbouring authorities outside London, in particular cross-boundary issues such as commuting
 - Programming and phasing, for example to better integrate with (and between) boroughs' transport plans, planning frameworks, etc

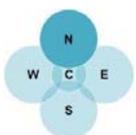
¹ This way of working precipitated from the approach set out by the Mayor and TfL Commissioner in autumn 2008, and subsequently formalised as part of the City Charter in summer 2009.



- Helping to better understand the priorities for transport interventions, and thus help make the case for the investment identified in the Transport Strategy, for example by demonstrating wide stakeholder buy in to schemes, etc
- Provide strategic backing as schemes are developed, for example for TWA process
- Provide a reference point for future monitoring and performance management (link to LIPs)

Figure 1: Goals, challenges and outcomes in the draft Mayor’s Transport Strategy

Goals	Challenges	Outcomes
Support economic development and population growth	Supporting sustainable population and employment growth	• Balancing capacity and demand for travel through increasing public transport capacity and/or reducing the need to travel
	Improving transport connectivity	• 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	• Smoothing traffic flow (managing road congestion and improving journey time reliability) • 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	• Improving public transport customer satisfaction • Improving road user satisfaction (drivers, pedestrians, cyclists) • Reducing public transport crowding
	Enhancing the built and natural environment	• Enhancing streetscapes, improving the perception of the urban realm and developing better streets initiatives • Protecting and enhancing the natural environment
	Improving air quality	• Reducing air pollutant emissions from ground-based transport, contributing to EU air quality targets
	Improving noise impacts	• Improving perceptions and reducing impacts of noise
	Improving health impacts	• Facilitating an increase in walking and cycling
Improve the safety and security of all Londoners	Reducing crime, fear of crime and antisocial behaviour	• Reducing crime rates (and improving perceptions of personal safety and security)
	Improving road safety	• Reducing the numbers of road traffic casualties
	Improving public transport safety	• Reducing casualties on public transport networks
Improve transport opportunities for all Londoners	Improving accessibility	• Improving the physical accessibility of the transport system • Improving access to services
	Supporting regeneration and tackling deprivation	• Supporting wider regeneration
Reduce transport’s contribution to climate change and improve its resilience	Reducing CO2 emissions	• Reducing CO2 emissions from ground-based transport, contributing to a London-wide 60 per cent reduction by 2025
	Adapting to climate change	• Maintaining the reliability of transport networks
Support delivery of the London 2012 Olympic and Paralympic Games and its legacy	Contributing to a successful 2012 Games and its legacy	• Transport infrastructure and services • Physical and behavioural transport legacy

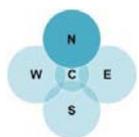


Purpose of this document and the relationship with Local Implementation Plans

6. The purpose of this interim document is to provide a ‘snapshot’ of work to date. It aims both to articulate the draft Transport Strategy goals and challenges in the context of north London and also to set out more specific challenges for the region within this framework. It also outlines a number of (as yet untested) potential solutions for addressing these challenges. More specifically, Chapter 2 describes the draft Transport Strategy outcomes in the context of north London, Chapter 3 presents specific sub-regional challenges and possible solutions and Chapter 4 outlines the next steps for developing the sub-regional transport plans.
7. This interim challenges and opportunities document should be useful for boroughs when drafting the Borough Transport Objectives section of their Local Implementation Plan as it provides information on the sub-regional transport position other data that could be used in a borough’s Local Implementation Plan.

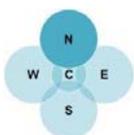
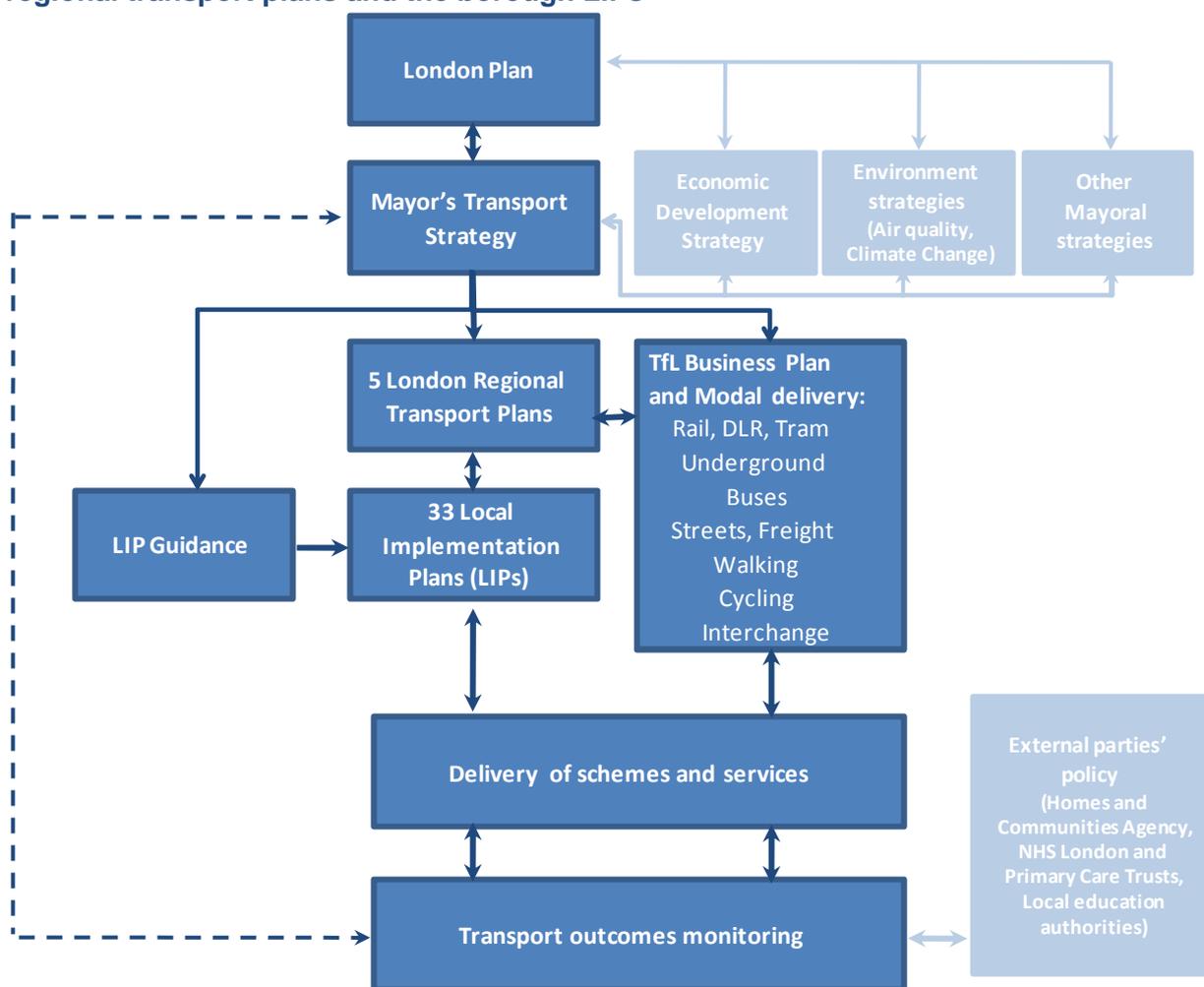
Collaboration and “fuzzy” boundaries

8. The north London sub-region consists of the boroughs of Barnet, Enfield, Haringey and Waltham Forest. However, the boundaries between the different sub-regions are intended to be flexible as transport challenges do not stop at borough or sub-regional boundaries. In addition to the core boroughs within each sub-region, there is also a degree of cross-boundary working, both within London and across the Greater London Authority boundary with the neighbouring local authorities (see Figure 2).
9. This “fuzzy boundary” approach allows issues to be considered which are relevant to more than one sub-region. It also acknowledges the approach set out by the Outer London Commission which stated that a one size fits all approach to working across London is not appropriate. There are also important relationships (particularly in Outer London) with areas beyond London’s boundary.
10. Beyond its boundaries, north London’s principal connection is with central London – where a large proportion of its residents work. TfL’s sub-regional plans and engagement therefore reflect this, for example, Camden and Islington are involved in the development of both the central and north London transport plans, and Hackney is involved in the east, north and central plans.
11. For the purposes of the tabulation of data in these documents, each borough is included in one region although in practice the boundaries between the different sub-regions are to be viewed as flexible to meet specific analysis needs



15. The sub-regional transport plans are not statutory plans but should help provide a context for the development of borough LIPs and other local plans. They will also link to other work being done by the boroughs. This includes each borough's overarching approach to managing growth and development and addressing key issues such as deprivation, as set out in their Core Strategies at the borough-wide level and in area specific Area Action Plans. Related work at the inter-regional level includes the North West London to Luton Corridor work and the planning frameworks for the Upper Lee Valley and Lower Lee Valley opportunity areas. At the central government level, the key focus for north London is the London-Stansted-Cambridge-Peterborough Growth Corridor. Beyond the sub-region, other work being undertaken by TfL that could impact on the north sub-region includes work on Crossrail 2.
16. Figure 3 below shows the context for the development of the sub-regional transport plans. The draft Transport Strategy and London Plan set out the London-wide framework and the outcomes which need to be delivered in each of the regions. The Plans are also intended to provide a framework for the planning and delivery of modal outputs and promote a more multi-modal and integrated approach by TfL and the boroughs. In addition, the sub-regional transport plans will influence the Interchange Best Practice Guidelines and this work will feed into an interchange plan and delivery strategy.

Figure 3: Diagram showing relationships between the Mayor's Transport Strategy, the sub-regional transport plans and the borough LIPs

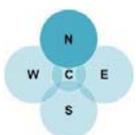


2 The north London context

17. This chapter describes the north London sub-region within the framework of the challenges and outcomes for London as set out in the draft Transport Strategy and highlighted in Chapter 1. In addition to reviewing each of the draft Transport Strategy challenges for north London, it presents data and analysis for the sub-region, including borough specific information. This chapter and the supplementary data in Annex 1 therefore provide a data resource for use by boroughs, as well as useful comparisons with the other four sub-regions.

The north London sub-region

18. As outlined in Chapter 1, the boundaries between the different sub-regions are intended to be flexible. For this purpose, the north London sub-region is said to consist of the boroughs of Barnet, Enfield, Haringey and Waltham Forest. These four boroughs are called “core” north London boroughs (for want of a better phrase). Other boroughs – such as Camden, Hackney and Islington – have also been involved in the sub-regional work, though they are primarily in another sub-region. Data is available at a borough level, and so data for these boroughs appears mainly in other sub-regional documents, although there is some data on them in this document.
19. Links to places within the neighbouring counties of Hertfordshire and Essex are also important and many of the issues and challenges considered within this document will be shared with these areas. The geographical area considered by the sub-region therefore extends from the northern fringes of the Central Activities Zone to outside the northern edge of the Greater London Authority boundary. Consideration of the transport challenges affecting north London therefore reflects the fuzzy boundaries and includes relevant parts of all seven boroughs.
20. North London is comprised of a diverse range of neighbourhoods from high to low density residential communities, linked to central London by radial rail and Underground lines.
21. The north London boroughs are characterised in the London Plan as Outer London boroughs and share certain demographic, demand and network characteristics that will define the challenges for the sub-region. Figure 6 shows the extent of green space in the sub-region, particularly in Barnet and Enfield, as well as the significant band of deprivation to the east of the sub-region through the Lee Valley.
22. The sub-region also includes part of the London-Stansted-Cambridge-Peterborough corridor, which was designated as one of the Government’s four growth areas in the 2003 Sustainable Communities Plan, and is considered to have potential for significant housing and employment growth. The southern tip of this corridor including the London boroughs of Enfield, Haringey, Newham, Redbridge and Waltham Forest. The nature of the London part of this corridor is very different from the rest of the corridor, being dense urban form with a need for significant regeneration, and it is considered that housing and population growth in this area will bring much needed new investment to this part of London.

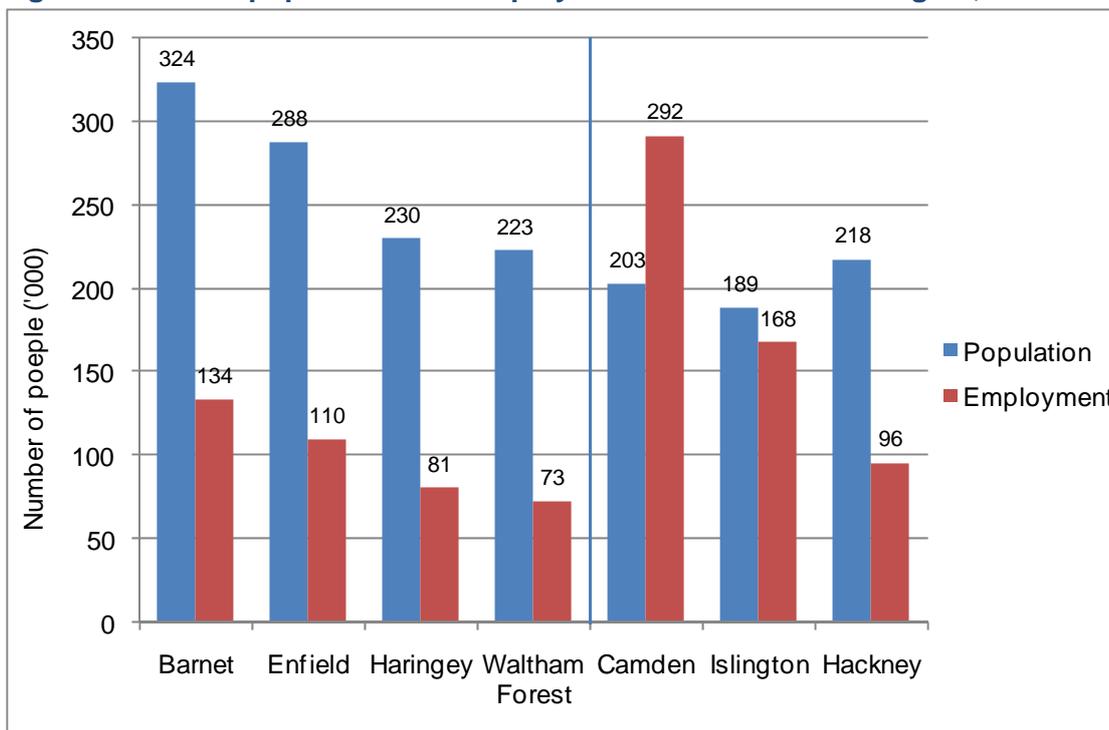


23. The boroughs in the east of the sub-region will also benefit from the 2012 Olympic and Paralympic Games, which brings with it a unique opportunity to support the transformation of the area. The five Olympic host boroughs – Greenwich, Hackney, Newham, Tower Hamlets and Waltham Forest – have been working together to ensure their communities benefit from the opportunities and investment resulting from the Olympics. The host boroughs have developed a Strategic Regeneration Framework that aims to link the physical improvements that will be brought about by the Olympics and the Legacy Masterplan Framework with socioeconomic change in the host boroughs. This is considered in more detail under the draft Transport Strategy outcome of ‘contributing to a successful 2012 Games and its legacy’.

Current population and employment

24. This section outlines the current population and employment profile of the north London sub-region, including age profile and industry types. More detail is also provided at the borough level in Figure B 1 in Annex 1.

Figure 4: Current population and employment in the north sub-region, 2006



25. In 2007, London was home to 7.6 million people and 4.7 million jobs, generating about 24 million trips per day. Over one million people currently live in the core north London sub-region, which is 14 per cent of London’s population. Barnet and Enfield have the highest share of this population with 30 per cent and 27 per cent of the core sub-region’s population. With the addition of the neighbouring boroughs of Camden, Islington and Hackney, the north London population increases to 1.6 million, which is 22 per cent of London’s population.
26. The core sub-region occupies around 14 per cent of London land area. In 2006, the population densities were 3.5 - 3.7 persons per square metre in Barnet and Enfield. This is consistent with average densities in other Outer London boroughs such as Hillingdon, Hounslow, and Bexley.
27. The age profile in north London is very close to the London-wide distribution and the other sub-regions, with the highest proportion in the 30-44 age range. The scale and characteristics of the population is a key driver for travel demand and the type of transport provision that can be supported. More detail on the age profile in Section B in Annex 1.

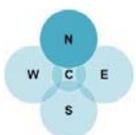
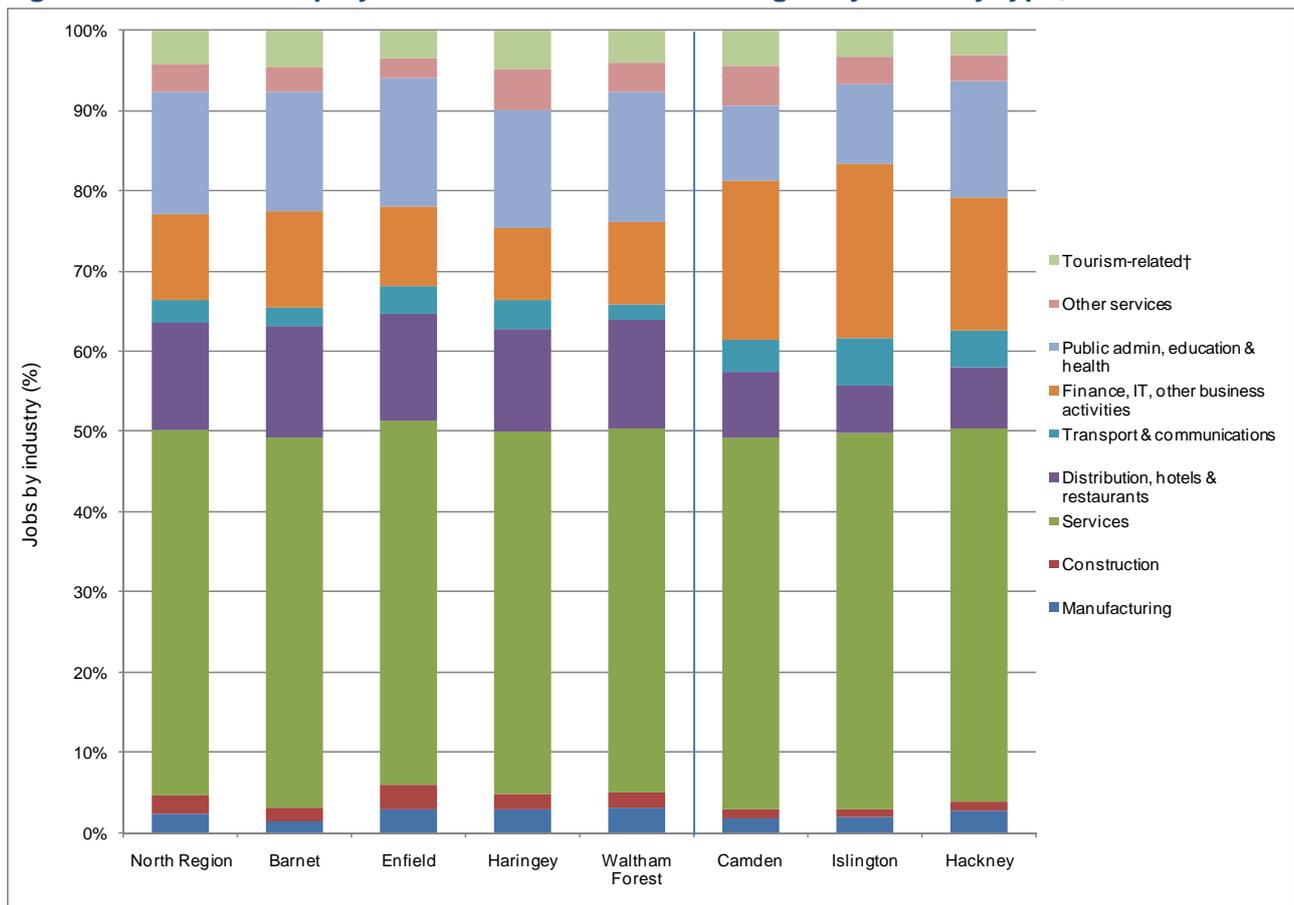
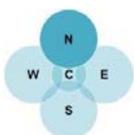


Figure 5: Profile of employment in north London boroughs by industry type, 2008



Source: ONS Annual Business Inquiry, 2008

28. In terms of employment, there are over 400,000 jobs in the core north London sub-regions, which is around eight per cent of London’s total. The highest density of jobs is in Barnet and Enfield, with 34 per cent and 27 per cent of the sub-region’s employment. With the addition of the neighbouring boroughs of Camden, Islington and Hackney, north London’s employment increases to just under one million jobs, which is 21 per cent of London’s population, although a significant share of Camden and Islington’s jobs will be actually be contained in the Central Activities Zone.
29. Employment density in the sub-region, 1.3 – 1.5 jobs per square metre, is broadly comparable with that in other Outer London boroughs, such as Barking and Redbridge.
30. Most of the jobs in north London are in the services sector, as can be seen in Figure 5. Jobs in public administration, education and health, as well as in distribution, hotels and restaurants are also consistently seen across the boroughs in north London. The sub-region also has one of the largest clusters of manufacturing and technology-led industrial estates in London, in the Upper Lee Valley and this is reflected in the higher proportion employment in manufacturing and transport and communications industries in Waltham Forest and in Enfield and Haringey. The inner London boroughs of Camden, Islington and Hackney have a relatively higher proportion of jobs in other services which reflect their proximity to the Central Activities Zone.



Key locations in north London

31. Figure 6 highlights spatial features from the London Plan, which provide a starting point for identifying sub-regionally significant locations in north London, in collaboration with the boroughs and London regional partners. It shows the metropolitan and major centres, opportunity and intensification areas, preferred industrial locations and industrial business parks.
32. North London is comprised of a diverse range of neighbourhoods ranging from high to low density. It is polycentric in nature, and more polycentric than any other sub-region. While it has only one of London's 12 metropolitan centres, it has 45 major and district centres, which is one quarter of all these centres in London. Barnet has more defined district centres than any other borough in London. Given north London's polycentric nature, many of the key locations tend to be smaller and more local in character.
33. The north London sub-region has one metropolitan centre, Wood Green in the London borough of Haringey.
34. Major centres in North London include Edgware in Barnet, Enfield Town in Enfield, Walthamstow in Waltham Forest, Camden Town and Kilburn in Camden, Dalston in Hackney and Angel and Nag's Head in Islington.
35. Following discussions with the boroughs, further key locations in the sub-region include many of the district centres such as Edmonton Green, Southgate, Palmers Green, New Barnet, Chipping Barnet, Finchley and Hackney Mare Street. Another key location is Brimsdown, a strategic industrial location, which is the second largest commercial and industrial area in London, strategically located in the Upper Lee Valley near junction 25 of the M25. Central Leaside, part of the Upper Lee Valley opportunity area is also considered a key location.
36. The north London sub-region has a number of defined opportunity areas, including Upper Lee Valley, Brent Cross/ Cricklewood and Colindale/ Burnt Oak. Population and employment growth in these areas is considered in more detail under the draft Transport Strategy outcomes.
37. Brent Cross/ Cricklewood and Colindale/ Burnt Oak are in the North West London to Luton coordination corridor. The opportunity area at Brent Cross/ Cricklewood, covering 324 hectares, is currently defined as a regional shopping centre and is, subject to office demand, a potential strategic Outer London development centre². Colindale/ Brunt Oak comprises a range of sites over 262 hectares with capacity mainly for residential-led mixed use development.
38. The Upper Lee Valley, including Tottenham Hale, is in the London-Stansted-Cambridge-Peterborough growth corridor and covers an area of 3,884 hectares, the largest opportunity area in London. It is largely industrial in nature, which is set to be maintained.
39. Intensification areas of relevance to the sub-region include Haringey Heartlands/ Wood Green, Mill Hill East and West Hampstead Interchange.

² Identified in the London Plan as centres 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

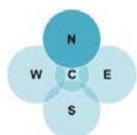
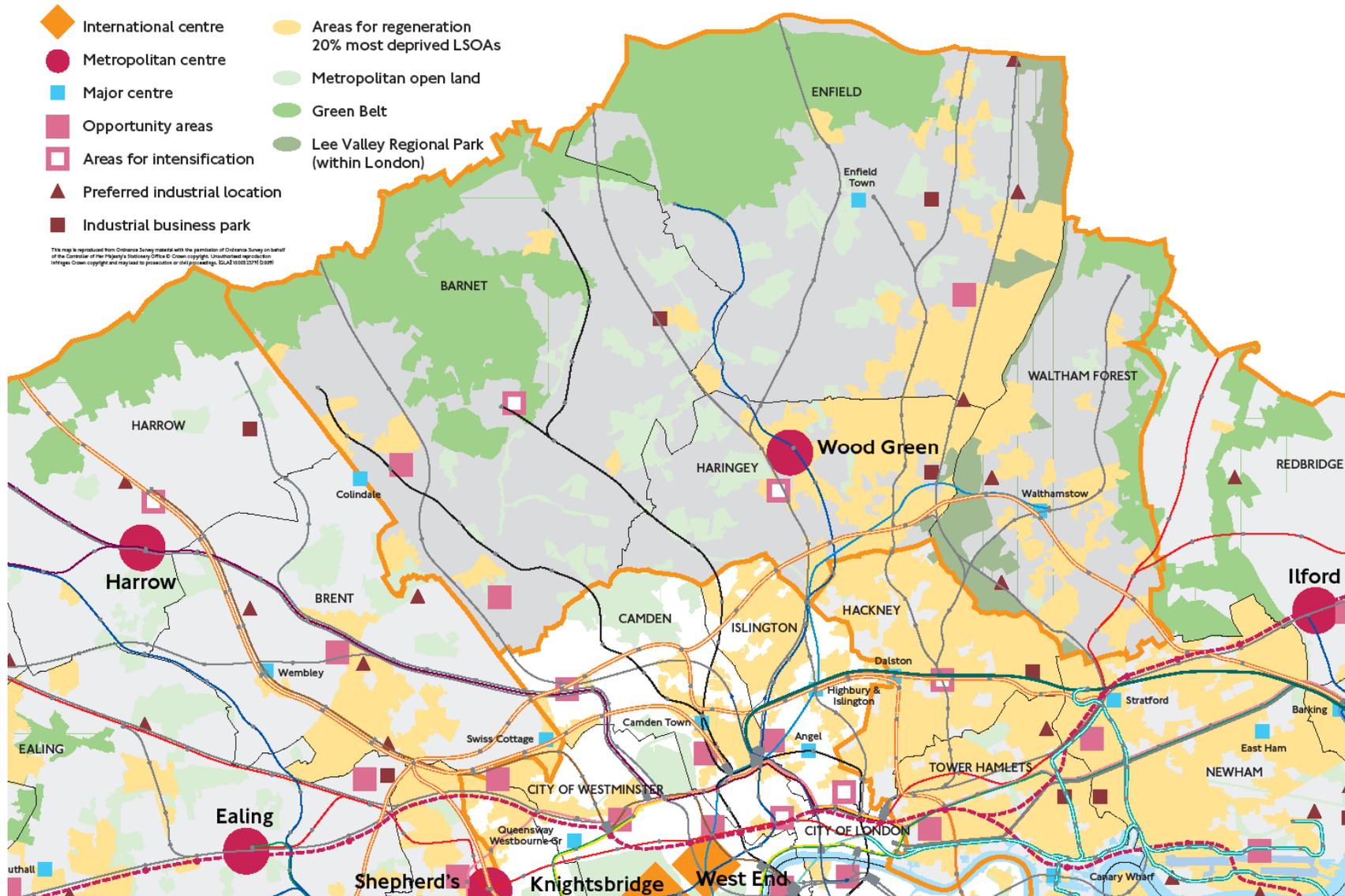
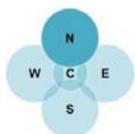


Figure 6: Map showing London Plan designations for north London



Note: Key locations not shown on this map include many of the district centres in north London



Current transport network in north London

40. The sub-region is not homogenous in terms of development density, which reflects the related differences in transport network density and service provision and hence accessibility by road and public transport, as well as development decisions. Towards central London and the town centres, development densities and public transport provision and use are relatively high, while in other parts of Outer London, densities are lower and the car plays, and will continue to play, a significant role. Figure 7 shows the road, rail and Underground network in north London.
41. The road network is predominantly focused at meeting radial movements and is London's gateway to the north. Key strategic radial routes are provided by the M1, A1 and A10. The key strategic orbital route through the sub-region is the A406 North Circular Road, with the M25 providing a strategic orbital route immediately to the north of the sub-region. These strategic links give the sub-region relatively good levels of highway accessibility. In common with most of London the highway network experiences levels of peak period traffic congestion. Congestion through parts of the North Circular endures for much of the working day.



Congested North Circular Road, near Bounds Green (TfL)

Note: There is a committed safety and environment scheme for this stretch of road.

Spotlight on Brent Cross Cricklewood



Brent Cross Cricklewood is the subject of a comprehensive planning application and transport assessment. The regeneration area covers over 150 hectares, bordered by Brent Cross Shopping Centre in the north, the A41 (Hendon Way) in the east, Cricklewood Lane in the south and the A5 (Edgware Road) in the west. The A406 (North Circular Road) also passes through the site, as does the Midland Mainline rail infrastructure. The development proposals, in five phases over a 20 year period, include 110,000 m² retail; 7,500 residential units; 400,000 m² office; schools, health, community and leisure facilities; hotels; and transport and distribution facilities. The London Borough of Barnet has resolved to grant outline planning permission and this has been endorsed by the Mayor. Given the time involved in construction, the impacts of the development may not be felt on the transport network until at least 2015.

The first phase involves the expansion of the existing Brent Cross shopping centre and will include improvements to the highway and public transport network as well as an enhanced six lane Templehoff bridge, bus priority and segregated walking and cycling lanes.

The key transport improvement over the phases include a new railway station and rail freight facility; waste transfer facility; a new bus station; a Rapid Transit Scheme; step free access at Brent Cross station, including forecourt works; up to 40 new buses including three new routes and increased frequency of existing services; new pedestrian and cycle transport facilities; and major improvements to the strategic transport network including the A41, A406 and A5. An area wide walking and cycling study and an A5 corridor study will be undertaken and the a scope of works agreed and funded by the developer to provide high quality links through the site and the surrounding area including to key transport hubs.

The major transport interventions will shape growth and demand in this area. This is important when considering what capacity improvements are required. As there are relatively few additional retail car parking spaces provided north of the A406, public transport patronage mainly through buses is expected to increase until the homes and jobs come forward. Brent Cross Cricklewood will gradually begin to operate more like a town centre as the development phases are progressed and this will give rise to more linked trips and internalised trips. However, it is likely that car trips would remain high as Brent Cross shopping centre gains more regional significance and due to the high level of residential car parking spaces proposed. The balance will be ensuring that car ownership is not a precursor for car use. The developer has committed to bring about a substantial change in the mode share for cars: from the current 78% to 66% for the "Primary Development Phase" and to 34% for development-related trips by the development "end state" (assumed to be 2026 in the transport assessment). A varied and comprehensive package of green travel planning initiatives is proposed and will be funded by the developer in consultation with the borough and TfL. The development will be monitored and mitigation provided as the development progresses to ensure that transport infrastructure is provided in advance of or concurrently with the development. This will also consider the impacts on the neighbouring boroughs of Brent and Camden.

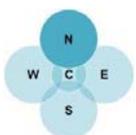
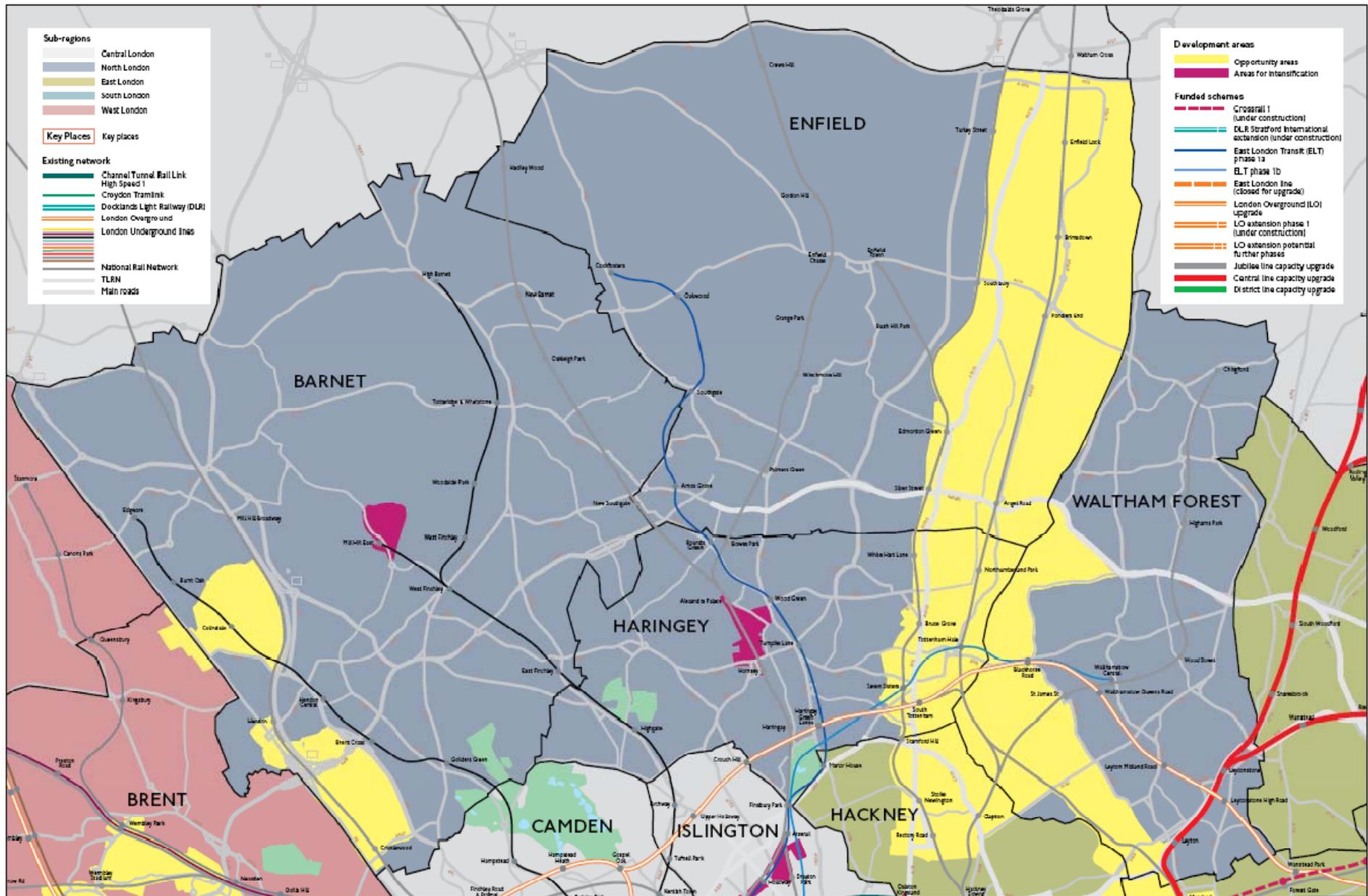
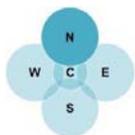


Figure 7: Transport network in north London showing funded London Underground and National Rail schemes



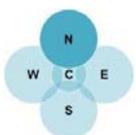
Note: North London also has an extensive bus network, which is not shown on this map. A full list of planned commitments north London can be found in Appendix C.



42. North London also has an extensive public transport network. The National Rail network serves 43 stations, predominately providing for radial travel to central London, the Home Counties north of London and Stansted Airport. The London Overground's Gospel Oak to Barking line provides a useful orbital service although it has a relatively infrequent service. The Underground network consists of 27 stations on the northern, Piccadilly, Victoria and Central lines. Over half of the sub-region's population (56%) lives within 1km of a National Rail or Underground station. The bus network also plays an important role in north London, with buses accounting for 17 per cent of trips, the highest mode share of any sub-region. There are over 2,300 bus stops in the sub-region; 98 per cent of residents are within 400m of a bus stop.
43. Most parts of the sub-region have relatively good access to one or two of the three major airports of Heathrow, Stansted and Luton. Improved access by employees and passengers to airports by public transport and more sustainable modes is a key issue.
44. North London has relatively good connections with the adjacent regions outside London, both by road and rail.
45. The major sub-regionally important interchanges in north London include Tottenham Hale, Finsbury Park, Highbury and Islington, West Hampstead, Seven Sisters/ South Tottenham, Walthamstow Central/ Queens Road and Hackney Downs/ Central. Other sub-regionally important interchanges include Brent Cross, Colindale, Walthamstow central, Mill Hill Broadway, Edmonton Green and Golders Green, which has developed into an important interchange for scheduled coach services. North London is also serviced by three major bus stations – Brent Cross, North Finchley and Muswell Hill – which can also be considered sub-regionally important interchanges.

Planned commitments in north London

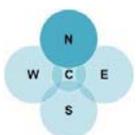
46. TfL's Business Plan and the draft Transport Strategy set out planned committed investment, particularly to 2017/18, that will impact on north London. The major committed National Rail and London Underground schemes are show in Figure 7. A full list of the committed planned interventions that will impact north London is included at Appendix C.
47. In terms of major infrastructure improvements, north London will benefit from additional capacity on National Rail and Underground routes into central London and from improved orbital connectivity provided by the London Overground network. There are a number of road schemes in north London that will assist in smoothing the flow of traffic, including a London-wide permit scheme for road works, as well as safety and environmental improvements on junctions of the A406 North Circular Road at Bounds Green and Henly's Corner and the removal of the Tottenham Hale gyratory. The sub-region has benefited from increases in the size and quality of the bus network over the last 10 years. The bus network remains under regular review in consultation with stakeholders.
48. Many of the planned commitments will also help to improve journey experience in north London including station refurbishment and modernisation and the continuing roll-out of rail and Underground step-free access and bus stop accessibility. In addition, integrated fares and ticketing and enhanced travel planning tools will benefit public transport users in north London.



49. A number of the planned commitments seek to achieve a modal shift away from motorised forms of transport and a reduction in the need to travel, including targeted smarter travel initiatives and the increased use of travel plans. In addition, Cycle Superhighways, additional cycle parking and cycling initiatives in Outer London centres will help north London contribute to meeting the Mayor's five per cent cycling target for London. Projects aimed at enhancing the urban realm and pedestrian environment will contribute to an increase in walking trips.
50. North London will also benefit from environmental schemes including increased tree and vegetation coverage, provision of infrastructure to support low emission road vehicles, promotion of emission-based parking charges and the planned and potential further Low Emission Zone enhancements.
51. However, despite a public transport capacity increase of over 30 per cent to 2031, the increase in demand for travel across London resulting from population and employment growth will more than match this by 2031. In north London, responding to and facilitating this growth remains a key challenge and further action and investment will be needed to meet the objectives set out in the draft Transport Strategy.

Mayor's Transport Strategy outcomes in north London

52. The draft Transport Strategy sets out a range of challenges that need to be tackled in order to meet the goals for London. This chapter goes on to describe the transport characteristics and context of the north London sub-region (now and in the future) within the framework of the challenges and outcomes for London described in the draft Transport Strategy. In some cases the challenges are very similar across the sub-regions and need to be addressed pan-London, but in many cases the challenges have different implications for north London.



A

Economic development and population growth

A1

Supporting population and employment growth

Balancing capacity and demand for travel

North London is forecast to have an additional 170,000 people and 30,000 jobs by 2031. The biggest share of this growth is forecast for Barnet. Employment growth will also be concentrated around Wood Green and the opportunity areas at Brent Cross/ Cricklewood and the Upper Lee Valley. The sub-region will also see significant growth in car ownership, with an additional 62,000 cars in the sub-region to 2031, the highest growth of any sub-region except east London. Barnet currently has high levels of car ownership and car mode share, which combined with the forecast population and employment growth could lead to many car journeys, on already congested roads. The sub-region currently experiences public transport crowding and highway congestion and the forecast growth will lead to an increase in trips which, despite planned committed infrastructure investment, will result in worsening travelling conditions. Managing economic development and population is therefore a key challenge for north London.

Population and employment growth

53. The population and employment figures quoted in this document are those used in the Draft Replacement London Plan (2009) and the Mayor's Transport Strategy Public Draft (2009). The forecasts will be revised, and it is likely that the numbers will change in the next iteration of the London-wide documents. The sub-regional figures will be revised in line with the London Plan as and when appropriate.
54. As can be seen in Figure 8, population levels have been broadly consistent in the boroughs of the core north London sub-region since the 1930s, with changes mirroring London-wide trends, although not as significant in scale. If the projected population levels are realised in the region in 2031 will mean that population be higher than 1930s levels.
55. The forecast 16 per cent population growth in north London, or 172,000 additional from 2006 to 2031, is slightly lower than the overall London growth of 18 per cent. However, these figures belie significant growth, at 30 per cent for example, in Barnet, which is currently the second highest populated borough in London after Croydon in the south sub-region.
56. North London's population is set to grow at a faster rate than south or west London. East London will grow faster than any other sub-region.
57. Population density is skewed towards inner London, as can be seen in Figure 10. While the overall population density in north London will not greatly change from 2006 to 2031 (see Figure 11), a number of key sites and corridors are forecast to see more significant growth and become more densely populated, including Brent Cross/ Cricklewood and Colindale opportunity areas, in the North West London to Luton Corridor and the Upper Lee Valley in the London-Stansted-Cambridge-Peterborough corridor. It should also be noted that Enfield, in its emerging Core Strategy, aspires to 9,000 homes more than in its London Plan housing target. Of these, it is targeting 5,000 at Central Leaside and 1,700 north east Enfield; both within the Upper Lee Valley opportunity area.

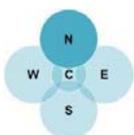
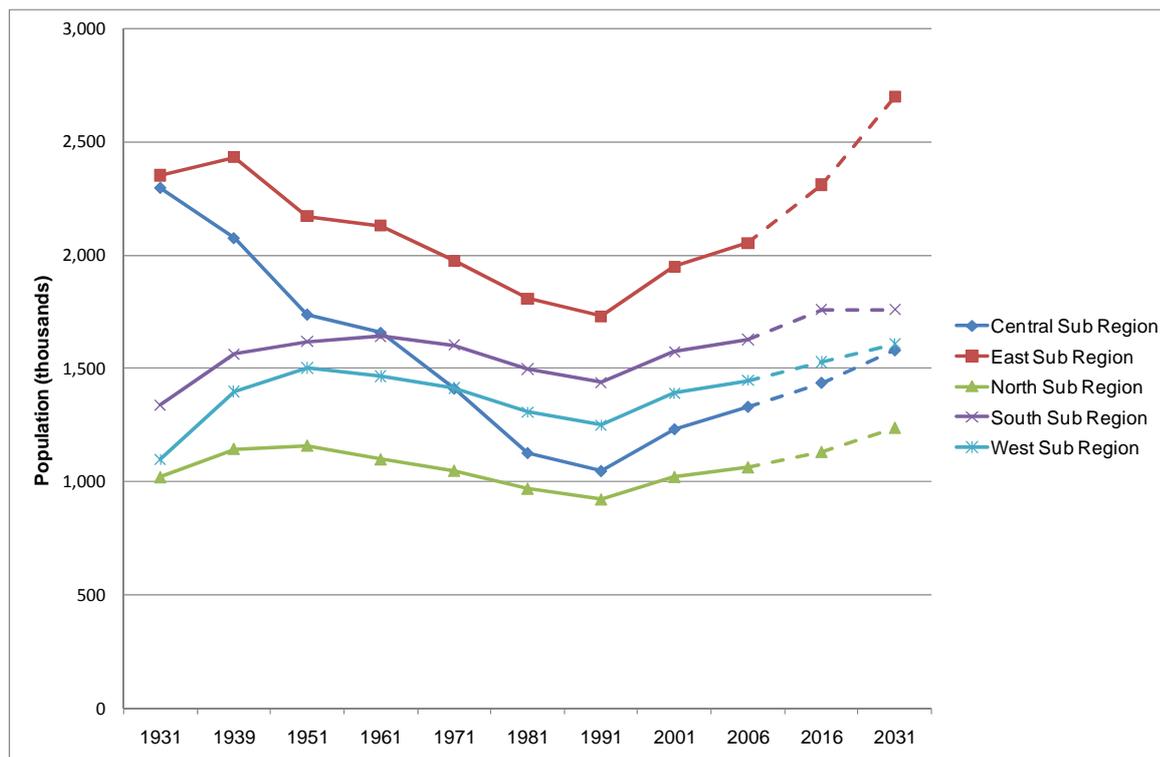


Figure 8: Historic population profile for each sub-region with projected population from 2006 to 2031



Source: Census data and GLA forecasts 2009

Figure 9: Comparison of forecast population growth (2006-2031)

	North	East	South	West	Central	Greater London
Existing population 2006 (millions)	1.1	2.1	1.6	1.4	1.3	7.5
Projected population 2016/17 (millions)	1.1	2.3	1.7	1.5	1.4	8.1
Population growth to 2016/17 (percentage change)	6%	12%	4%	6%	8%	8%
Proportion of London-wide growth (2016/17)	12%	44%	10%	14%	18%	100%
Projected population 2031 (millions)	1.2	2.7	1.8	1.6	1.6	8.9
Population growth to 2031 from 2016 (percentage change)	9%	17%	4%	5%	10%	10%
Proportion of London-wide growth (2031) (2016 to 2031)	14%	49%	9%	10%	18%	100%

Source: GLA London Plan Forecasts (2009)

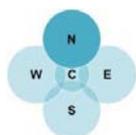


Figure 10: North London population density, 2006

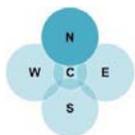
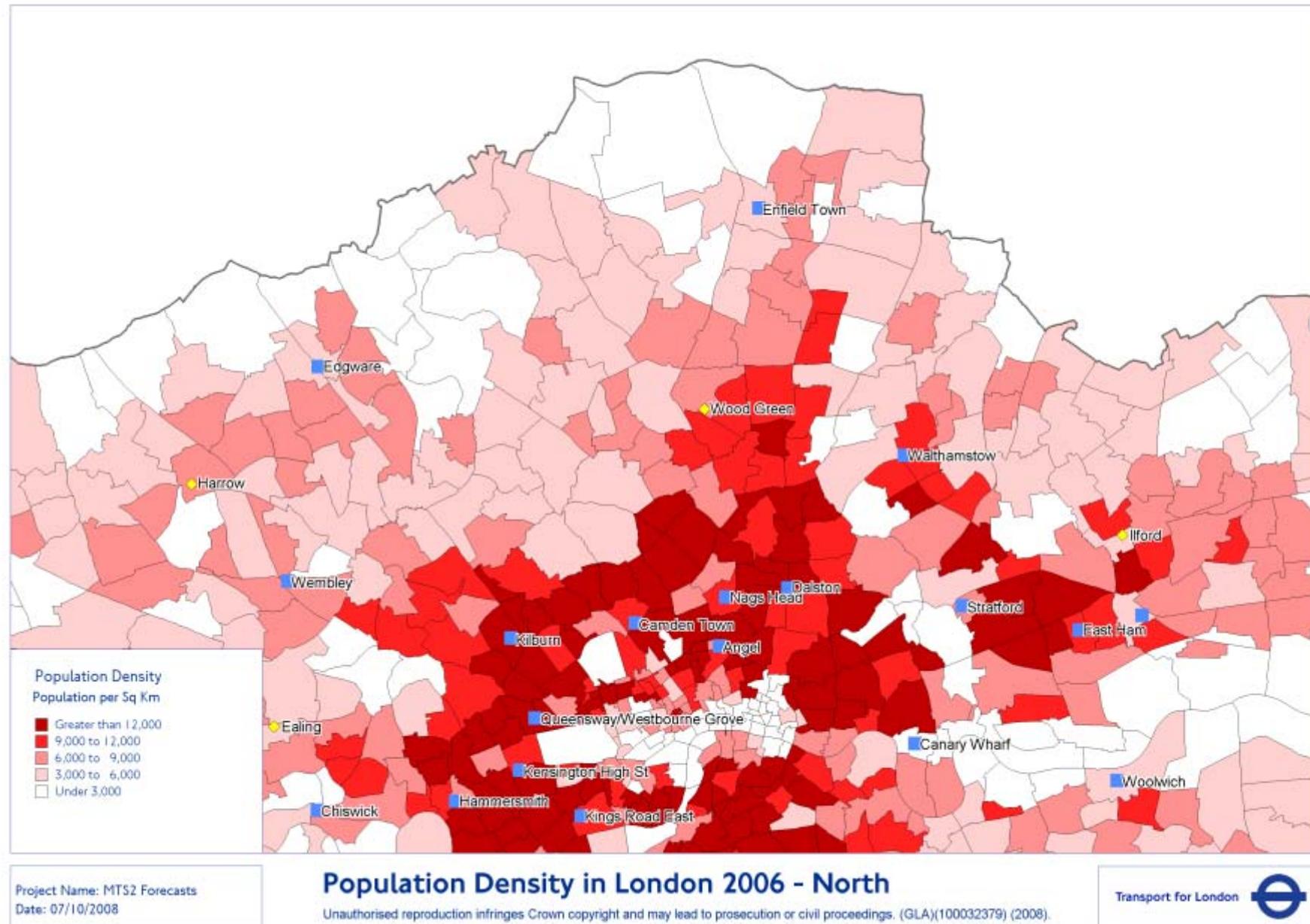
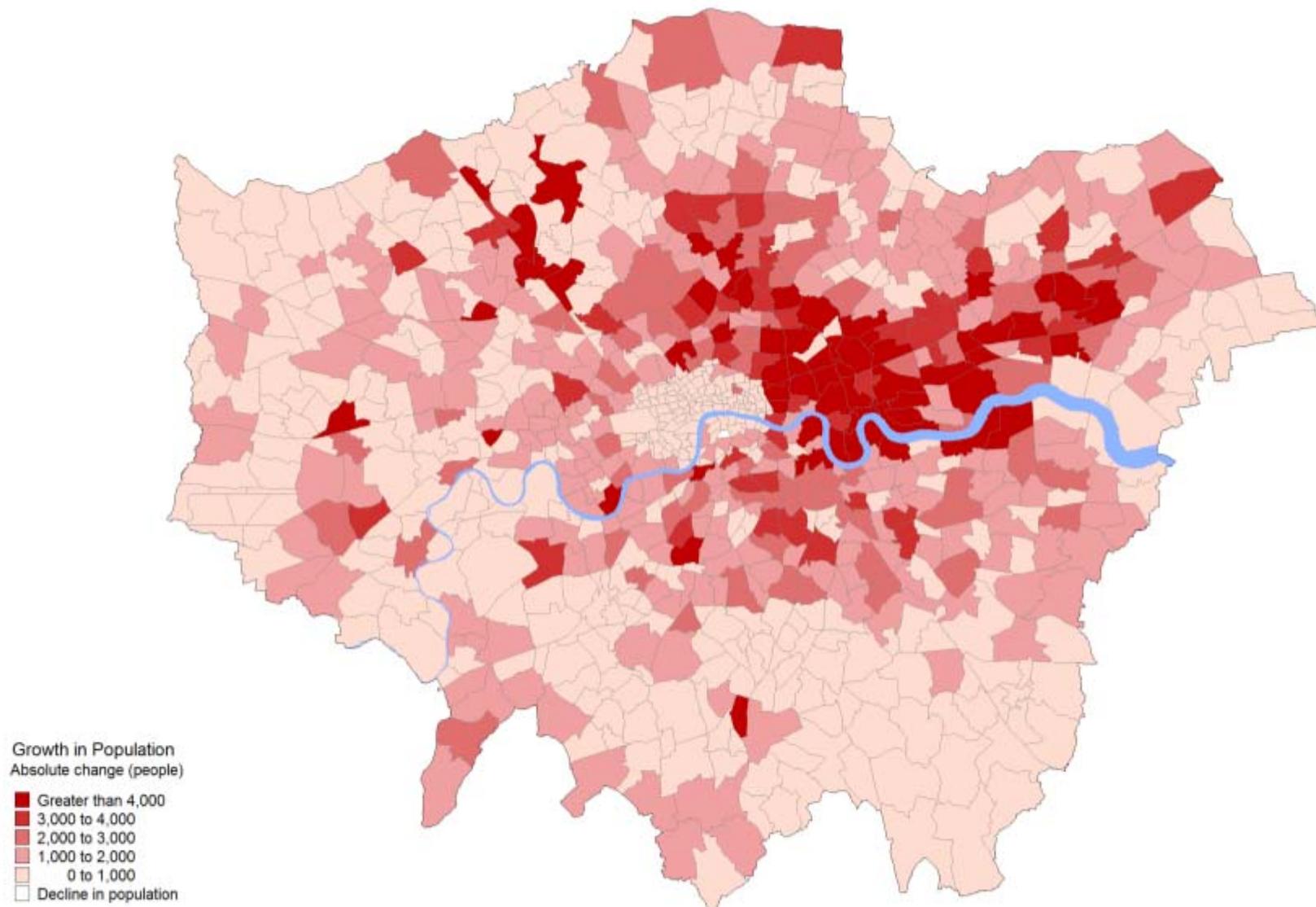


Figure 11: Growth in population, absolute change, 2006-31



58. As can be seen in Figure 12, overall employment is forecast to grow by 10 per cent to 2031 in the core sub-region. While this forecast growth across the sub-region is less than half the London-wide rate of growth (18%), the forecast employment growth in Haringey (20%) is slightly above the London-wide rate. Inclusion of much higher employment growth rates for Camden (28%) and Islington (34%) push the wider north London sub-region rate at 20 per cent just over the London-wide rate. Figure 14 shows that employment density in north London is skewed towards inner London and the metropolitan centres.
59. North London contains London's largest opportunity area, the Upper Lee Valley, covering 3,884 hectares and with projected growth of 9,000 homes and 15,000 jobs, it is also the second largest industrial area in London. Figure 13 lists the opportunity and intensification areas in north London and their indicative employment and housing growth.

Figure 12: Key employment growth indicators at a sub regional level (2006-2031)

	Central	East	North	South	West	Greater London
Existing employment on 2006 (millions)	1.9	0.83	0.40	0.73	0.80	4.6
Projected employment 2016/17 (millions)	2.1	0.88	0.41	0.73	0.82	4.9
Employment growth to 2016/17 from 2006 (Percentage change)	13%	7%	2%	0%	2%	7%
Proportion of London-wide growth (2016/17)	75%	18%	2%	0%	5%	100%
Projected employment 2031 (millions)	2.3	0.99	0.44	0.78	0.90	5.5
Employment growth to 2031 from 2016 (Percentage change)	11%	13%	8%	6%	10%	10%
Proportion of London-wide growth (2031)	45%	22%	7%	9%	16%	100%

Source: GLA London Plan Forecasts (2009)

Figure 13: North London opportunity areas and intensification areas

	Area (Ha)	Indicative Employment Capacity	Minimum Homes
Opportunity areas	Upper Lee Valley	15,000	9,000
	Cricklewood/Brent Cross	20,000	10,000
	Colindale/Burnt Oak	2,000	12,500
Intensification areas	Mill Hill East	1,800	2,100
	Haringey Heartlands/Wood Green	2,000	1,000
	Dalston	1,000	1,700
	West Hampstead Interchange	100	800

Source: Draft London Plan 2009

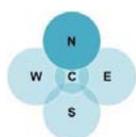


Figure 14: North London employment density, 2006

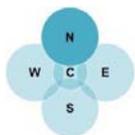
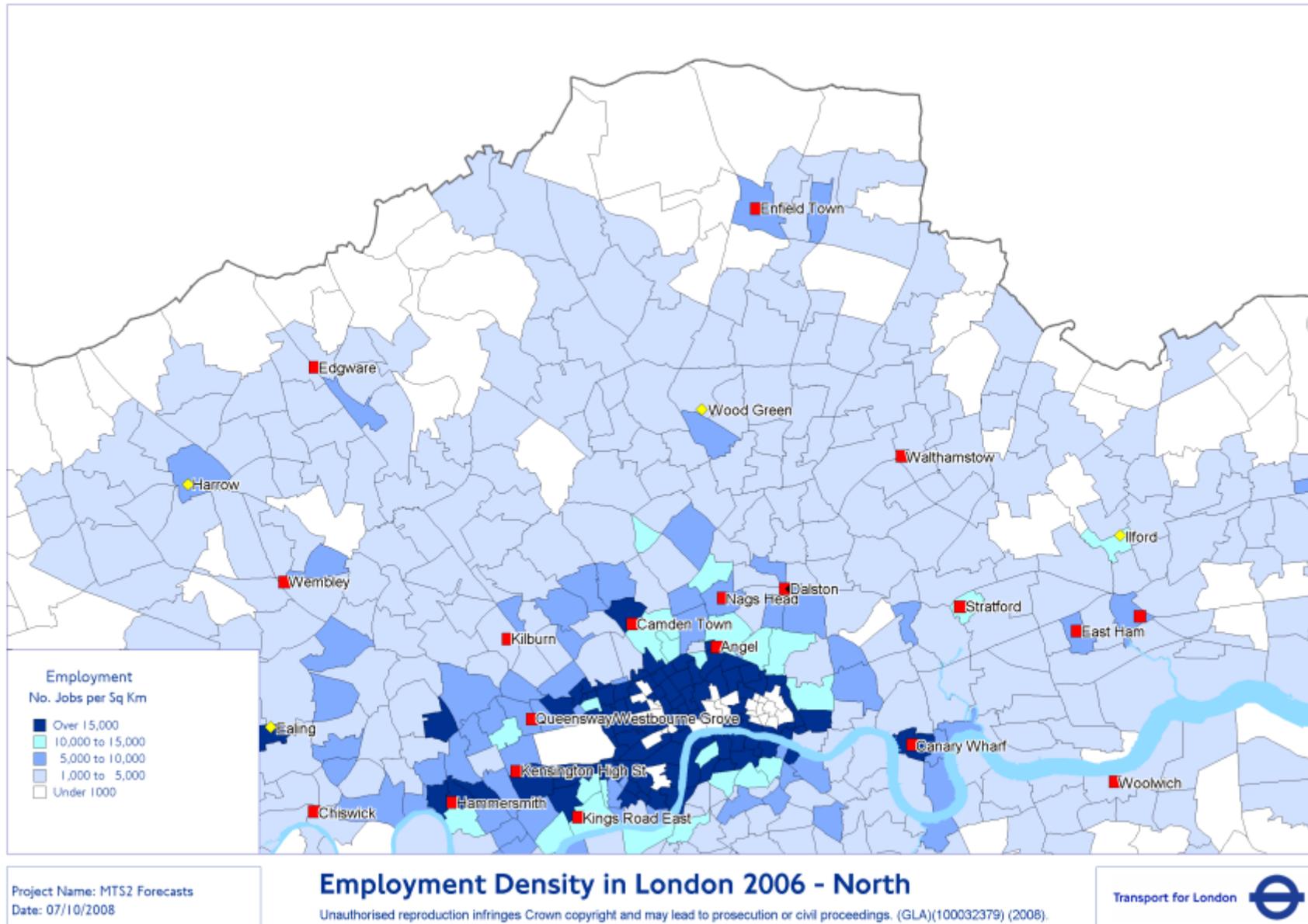
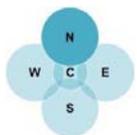
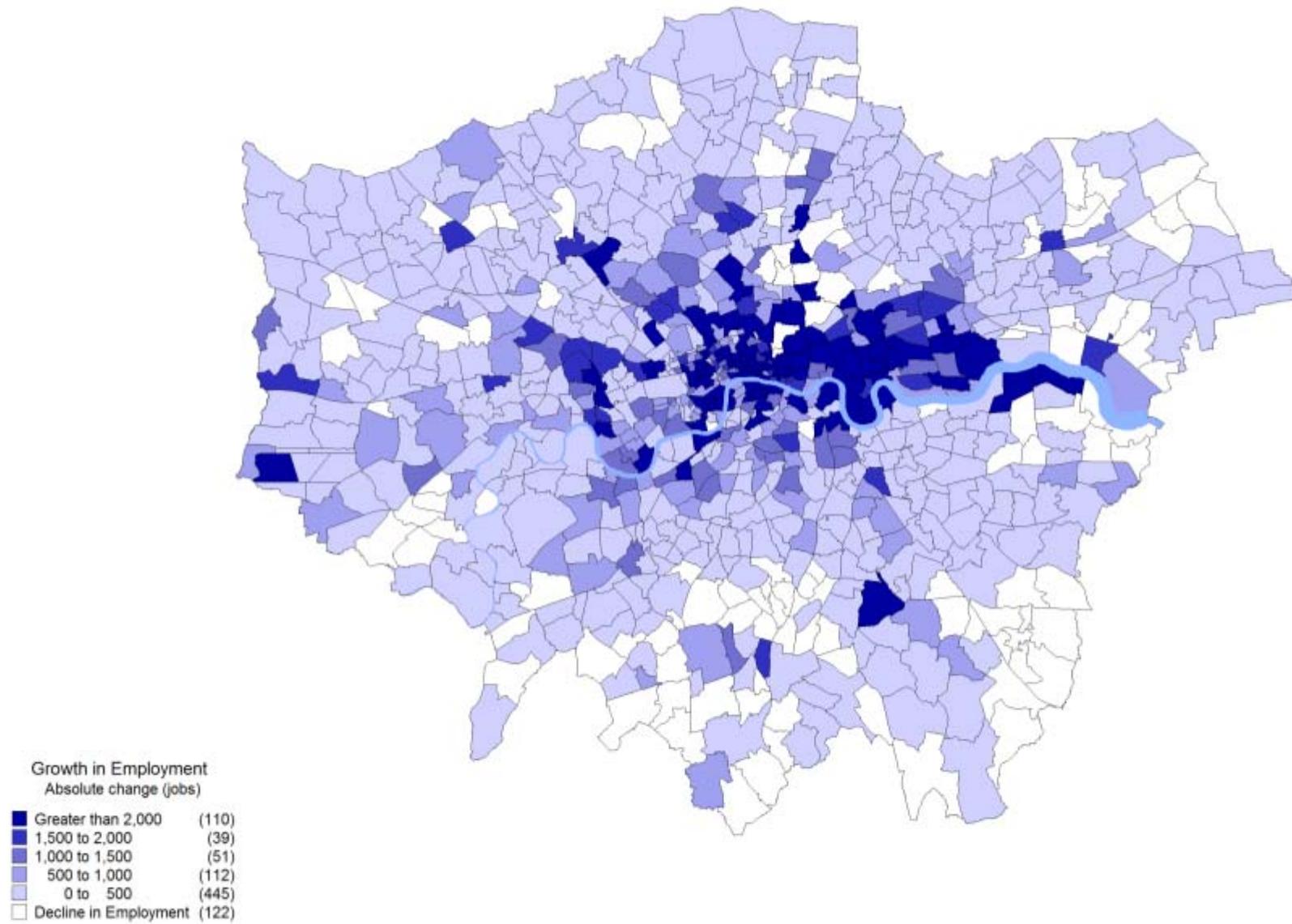


Figure 15: Growth in employment, absolute change in jobs, 2006-31

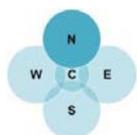


Travel patterns in north London

60. This section describes the nature of travel in the north sub-region including the travel patterns of residents of the sub-region, and the possible impacts of population growth on this. This analysis will help to identify key links between the north sub-region and elsewhere, as well as highlighting specific challenges presented by current, and possible future, travel patterns. More detail on travel patterns, including the data that supports the figures in this section can be found in Annex 1.

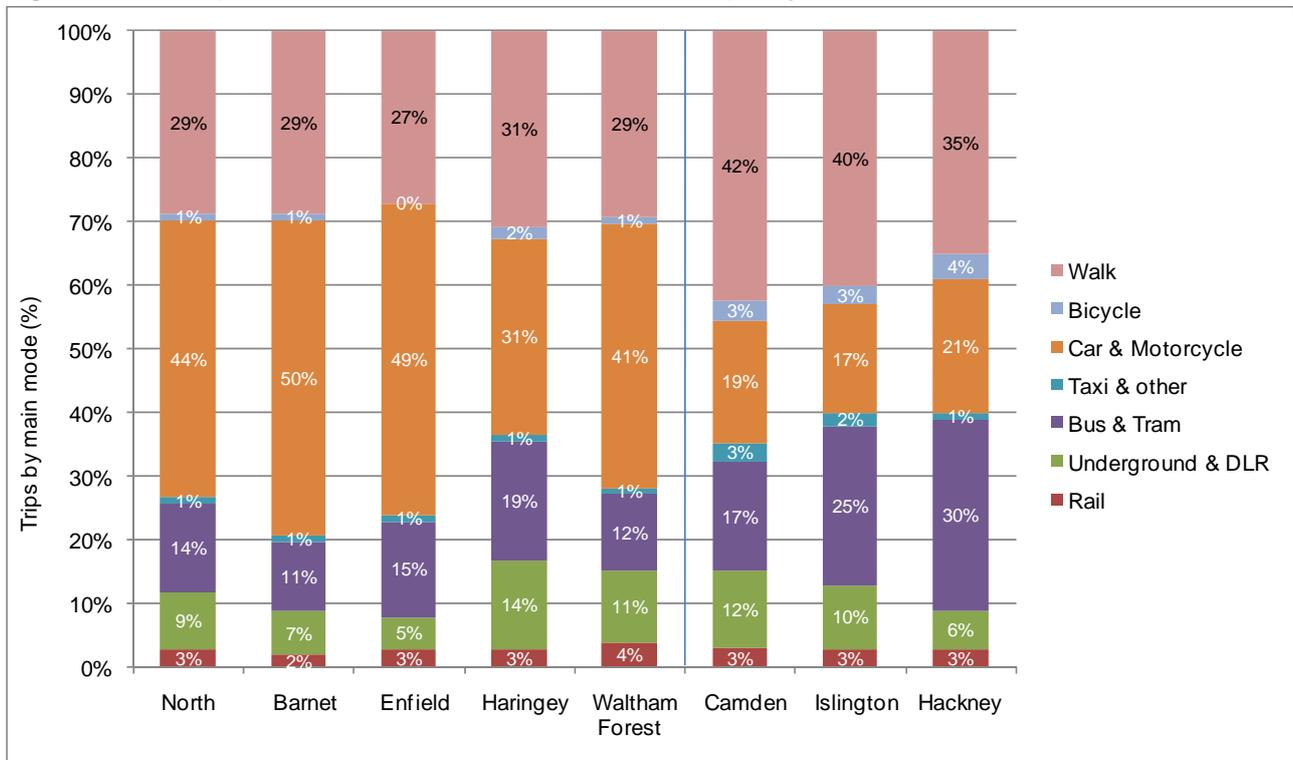
Current travel by residents of the north London sub-region

61. There are close to one million residents aged over five in the core boroughs of the north London sub-region. North Londoners make up 14 per cent of London residents and make the same proportion of trips: on average, north London residents make around 2.6 million trips per day, which is the lowest of any sub-region. The trip rate for north London residents of 2.6 trips per person per day is the same as rate for Greater London. Trip rates in Enfield, Haringey and Waltham Forest are close to the London average, at 2.4 to 2.5 trips per person per day. However, trip rates in Barnet are considerably higher than average, at 3.1 trips per person per day. Residents of Barnet make 35 per cent of the north London residents' total trips, but make up only 31 per cent of the population.
62. In terms of distance travelled per person per day, north London residents (15.3 km) travel further than the London-wide average (14.9 km) but less than residents of south or west London. Total distance travelled per person per day is slightly higher for the outer boroughs which can be explained by the fact that commuting journeys might, on average, be longer.
63. The mode share of trips made by residents of the north sub-region is generally typical of the Greater London average. Of trips made by north London residents, 44 per cent are made by car or motorcycle, 27 per cent by public transport and 30 per cent by walking or cycling.
64. North London residents have a higher car mode share at 44 per cent, than the London-wide share of 41 per cent, although this is lower than average for Outer London, where half of journeys are made by car. In total, residents of north London make more than 1.1 million trips by car or motorcycle every day.
65. As can be seen in Figure 16, car mode share is highest in Barnet and Enfield, at 50 per cent and 49 per cent respectively. Given that Barnet also has a high level of projected growth to 2031, at 30 per cent, this could be of concern if the new Barnet residents had car ownership and travel habits akin to existing residents. Simply translating existing to new would produce over 300,000 new trips per day, 40,000 extra cars, and 137,000 extra trips by car per day, by new Barnet residents alone. If the recent trend in car ownership in boroughs like Barnet were to continue (increasing numbers of households with more than one car) the potential shift to higher car ownership and car use could be even more pronounced. However, much of the planned growth in Barnet will be located in areas of more dense development, such as Brent Cross/ Cricklewood, which should contribute to a reduction in the extrapolated number of car trips generated.
66. Haringey has a mode share more typical of inner than Outer London, with 37 per cent of trips made by public transport and only 31 per cent by car or motorcycle. Nearly one in five trips are made by bus, and one in seven by rail or Underground. Haringey's higher bus mode share contributes to the north sub-region having the highest bus mode share of the Outer London sub-regions.



67. Mode share across the other outer North London boroughs is fairly similar to the profile for the region as a whole, and for Outer London but differs comparatively with that for the inner London boroughs of Camden, Islington and Hackney. The inner London boroughs can be seen to have higher relative proportions of journeys by walking, cycling and public transport modes and lower car and motorcycle mode share.

Figure 16: Comparison of mode share for current trips by north London residents



Source: London Travel Demand Survey, 2006-09

68. Daily trip purpose patterns for residents of north London largely mirror those of other sub-regions. The largest proportion of trips, around a third, are made for shopping and personal business. Leisure also accounts for a significant proportion of trips in north London, as with the other sub-regions, with more than a quarter of trips undertaken for leisure pursuits. A similar proportion of trips, 23 per cent, take place for work purposes, including commuting and travel on work business.

69. The profile of trips by purpose at borough level (see Figure 17) largely reflects the patterns observable at a sub-regional level, with the highest proportion of trips being undertaken for shopping and leisure purposes. The share of work related travel is somewhat higher than average in Haringey, where 26 per cent of trips are made for this purpose compared to 23 per cent across the region as a whole.

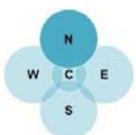
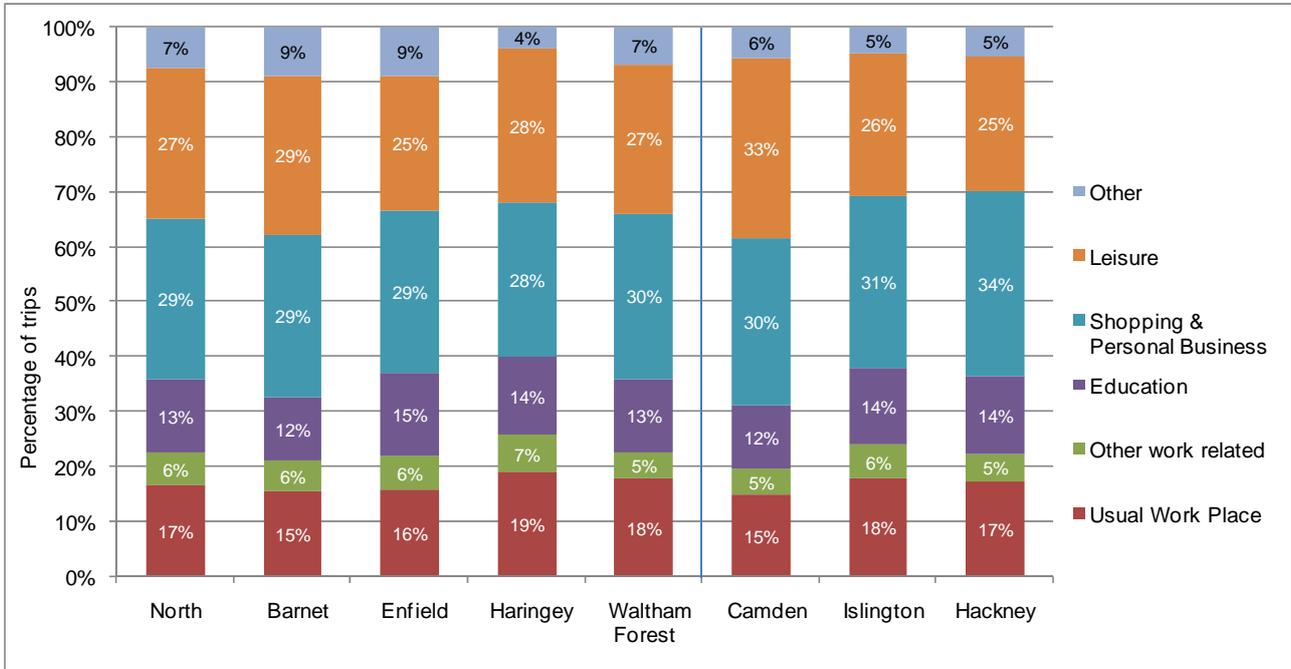


Figure 17: Comparison of journey purpose for current trips by north London residents



Source: London Travel Demand Survey, 2006-09

Current car ownership

70. Household car ownership levels increase spatially across London from inner London to Outer London. Overall, the north sub-region has a higher than London-wide average proportion of households that own one or more cars. However, there is also a significant difference in car ownership across the four north London boroughs, as can be seen in Figure 19. Barnet has the highest proportion of car owning households, with nearly three quarters owning more than one car. This contrasts with Haringey where over half of households do not own a car.

71. In terms of future predicted car ownership, the north London sub-region is forecast to have an additional 62,000 cars, which is the highest growth of all the sub-regions except east London (see Figure 18). Managing for this growth in car ownership is a significant transport challenge for north London.

Figure 18: Additional cars forecast by sub-region, 2006-31

Area	Central	East	North	South	West
Additional cars ('000)	53	162	62	49	54

Current travel to, from and within the north sub-region

72. There are approximately 2.3 million trips per day made by London residents which originate in the north London sub-region.

73. Trips by all London residents to, from and within north London share the same characteristics as trips by north London residents. The section above on trips by north London residents provides an analysis of trip mode share and journey purposes. Further analysis on trip modes and journey purposes for trips by London residents to, from and within north London is presented in Annex 1.

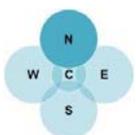
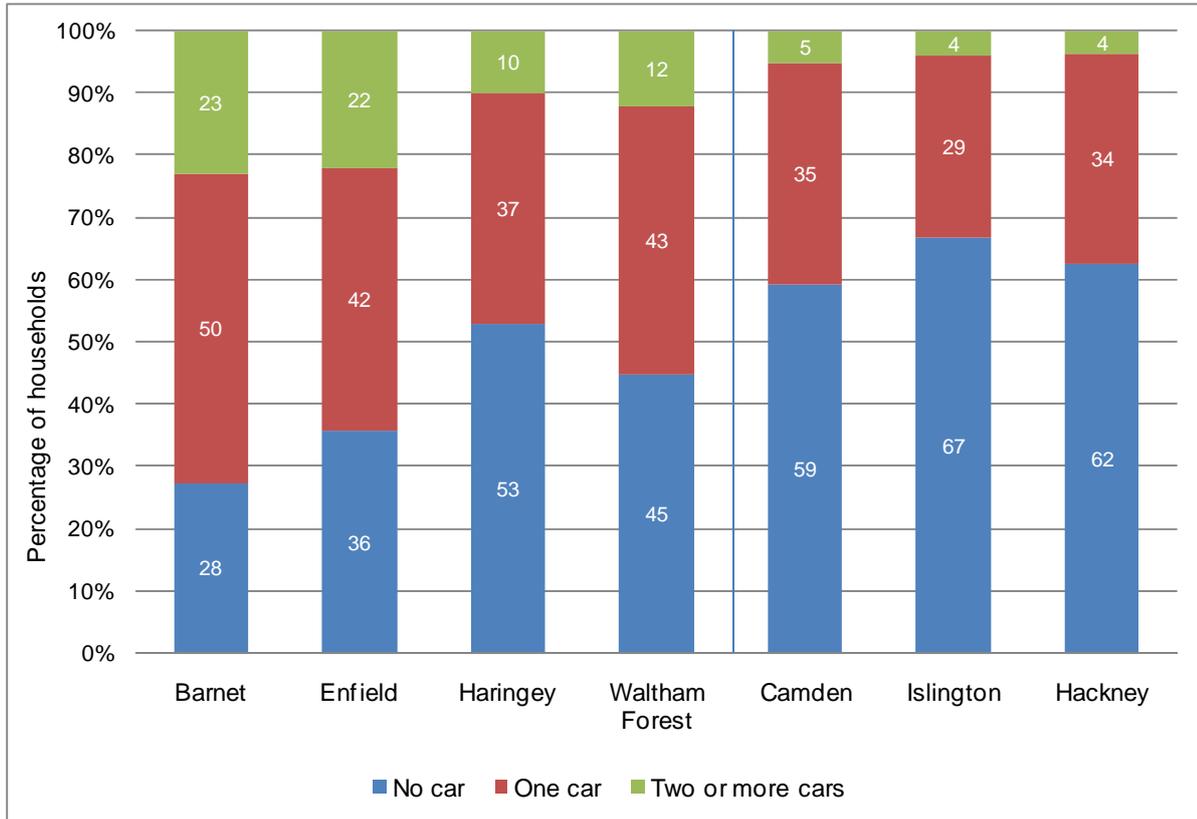


Figure 19: Car ownership by household between London sub-regions, 2006-09



Source: London Travel Demand Survey, 2006-09

Journey origin and destination

74. The vast majority of trips by London residents are relatively local, with three quarters wholly contained within a sub-region. In terms of trips by all London residents, 60 per cent have both an origin and destination in the north sub-region. This is the same proportion as trips by residents of the north London sub-region wholly within the sub-region. The pie chart in Figure 20 shows the relationship between the north sub-region and other regions, showing the proportion of trips with an origin or destination in north, and an origin or destination elsewhere. As would be expected, the region has a stronger relationship with the adjacent boroughs and with outside Greater London than with the south sub-region. As with all regions, a significant proportion of trips are made to and from the central sub-region.

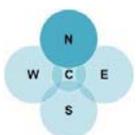
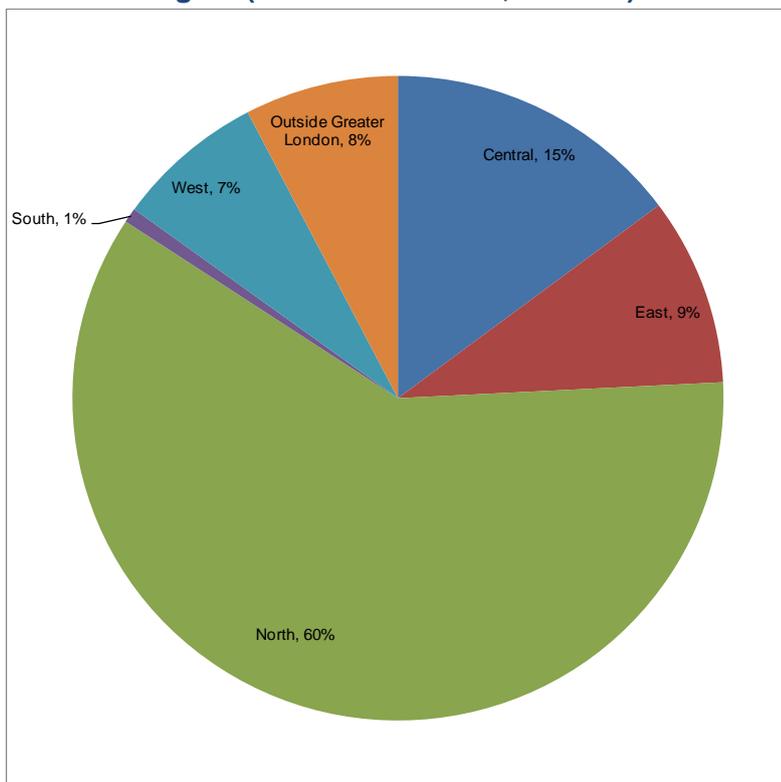


Figure 20: Sub-regional origin and destination of trips with an origin or destination in the north sub-region (London residents, 2006-09)

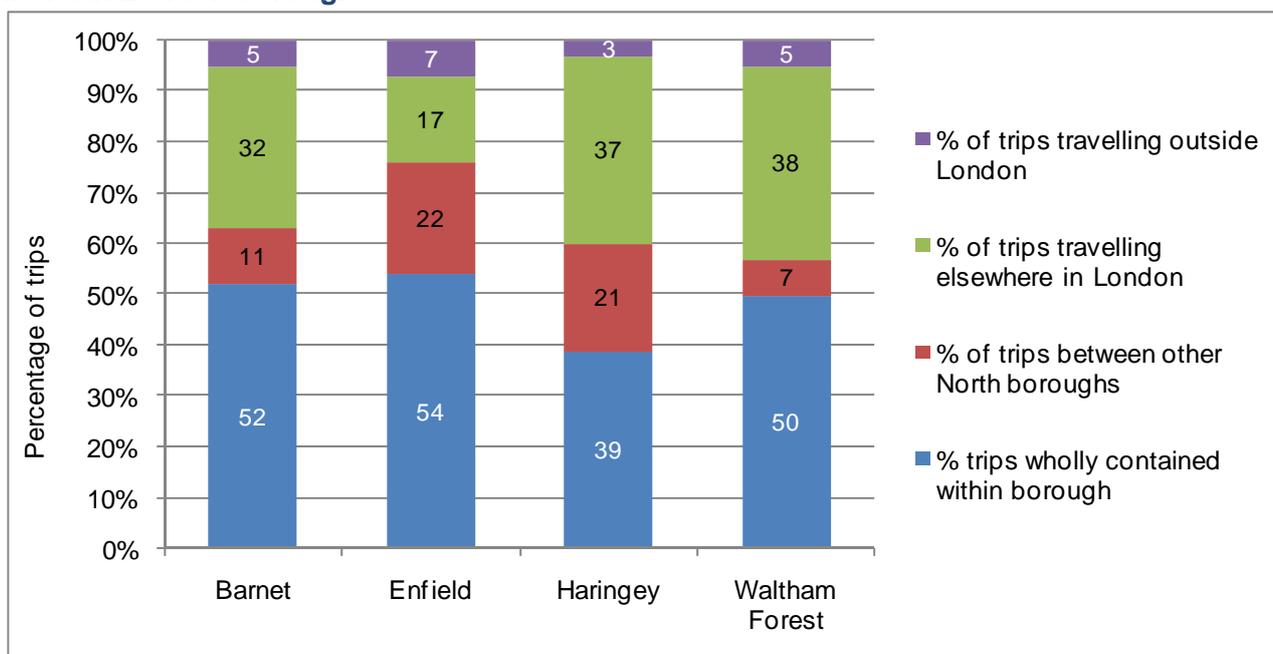


Source: London Travel Demand Survey 2006/9

75. Of the trips made in the north sub-region, 1.7 million trips are made wholly within the north sub-region; just over half a million trips are made travelling from the north to elsewhere; and a similar number from elsewhere to the north sub-region. Figure 21 shows the relationships between the north London boroughs and elsewhere in terms of trips made with an origin or destination in the borough.

76. Haringey has the smallest proportion of trips wholly contained within the borough and the largest proportion of trips elsewhere in London, with almost a quarter of trips with an origin or destination in the central sub-region. Not surprisingly, given its proximity to inner London, it has the smallest proportion of trips with an origin or destination outside Greater London. Enfield has the highest proportion (76%) of trips contained within the sub-region, with 54 per cent of trips wholly within the borough. Enfield also has the smallest proportion (17%) of trips with an origin or destination elsewhere in London. The origin and destination patterns for Barnet and Waltham Forest are relatively similar, with each having around half of trips entirely within the borough and a relatively small proportion (7% and 11% respectively, compared with 22% for Enfield and 21% for Haringey) of trips to or from the other boroughs in the sub-region.

Figure 21: Origin and destination of trips by London residents with an origin or destination in north London borough



Source: London Travel Demand Survey 2006-09

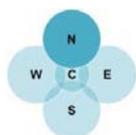
See Annex 1 for tables providing detailed analysis of the origins and destinations of trips for each sub-region and the north London boroughs

Temporality of journeys

77. At the London-wide level, the number of commuting journeys made is reflected in the high numbers of trips during the AM and PM peaks. However, as can be seen in Figure 22, most trips originating in north London occur during the inter-peak period, partly reflecting the longer duration of this period but also reflecting the fact that most shopping and personal business trips take place during this time as well as work related trips other than commuting. The afternoon school peak also occurs during the inter-peak period which would account for a significant number of journeys. There will also be service and delivery vehicles making most of their trips during this time. Fewest trips in north London take place before 7am, in common with the other sub-regions. As would be expected, fewer journeys take place after 7pm with very few after 10pm and in the early hours of the morning.

78. In the AM peak, around four in ten trips are made by car, just over a quarter by walking and the remainder by public transport, particularly bus (14%) and underground (12%). In the inter-peak, the proportion of trips made by car is similar, but a higher proportion of trips are walked or made by bus, and a much lower proportion are made by rail and underground. This reflects the radial nature of many commuting trips compared to the more local nature of many of the shopping and leisure trips made during the inter-peak period. It also reflects the profile of travellers, as commuters to central London will have a higher value of time and be prepared to travel by the more expensive, faster public transport modes.

79. In the PM peak and later in the evening, a higher proportion of trips are made by car (53% in the pm peak) and relatively few trips are made by underground. Overnight, very few trips are walked, and the mode share is fairly evenly split between car and public transport.

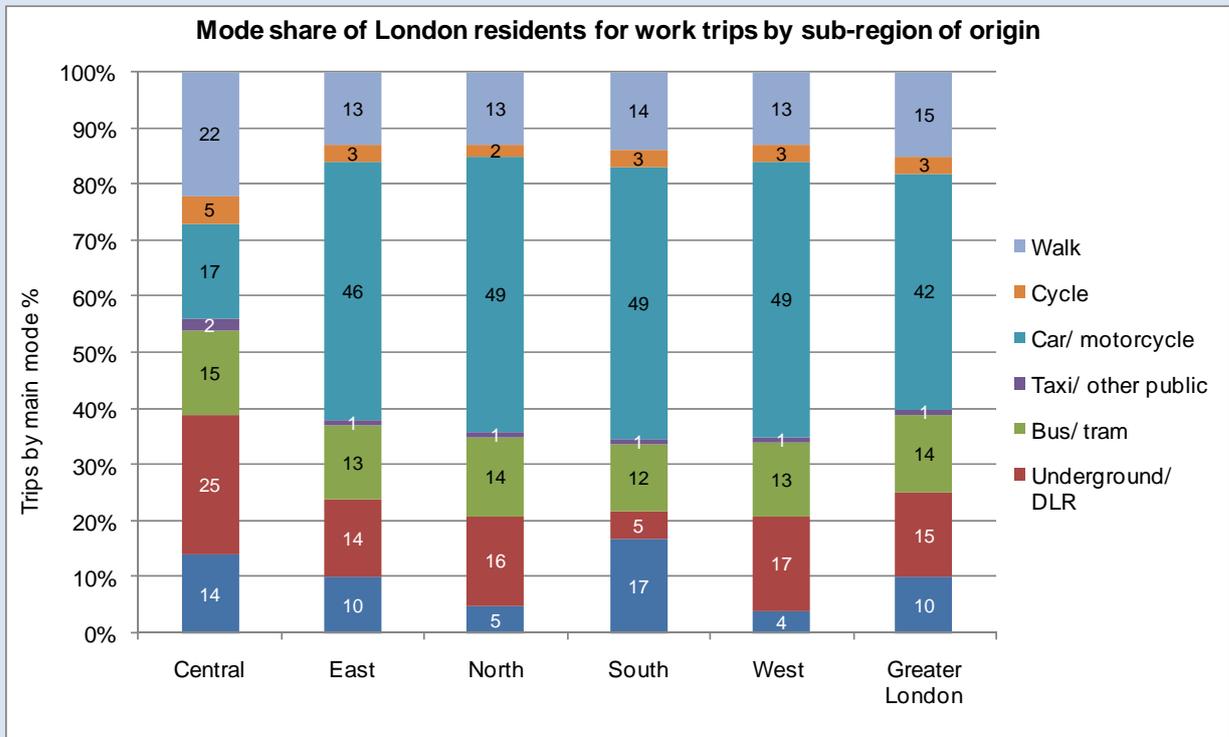


Spotlight on work trips by London residents originating in north London

As in all the sub-regions, around one in five trips originating in the north sub-region are made for commuting purposes. A majority occur during the morning and afternoon peaks, contributing to London’s most congested periods on both the highway and public transport networks. It is also notable that a large proportion of these trips are destined for central London.

Mode share for work trips by region of origin								
	Trips per day (000s)	National rail / Overground	Underground / DLR	Bus / tram	Taxi / Other Public	Car / Motorcycle	Cycle	Walk
Central	1,198	14%	25%	15%	2%	17%	5%	22%
East	890	10%	14%	13%	1%	46%	3%	13%
North	432	5%	16%	14%	1%	49%	2%	13%
South	759	17%	5%	12%	1%	49%	3%	14%
West	707	4%	17%	13%	1%	49%	3%	13%
Greater London	3986	10%	15%	14%	1%	42%	3%	15%

Source: London Travel Demand Survey 2006/9



Source: London Travel Demand Survey 2006/9

The private car/ motorcycle has the highest mode share for work related trips originating in north London and is higher than any other region. North London also shows a much lower proportion (5%) of rail use for commuting, than most other sub-regions reflecting relatively limited network coverage. North London is well served by underground lines with the northern, Victoria and Piccadilly Lines all passing through the region and 17 per cent of work-related trips are made by underground. North

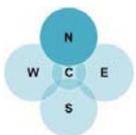
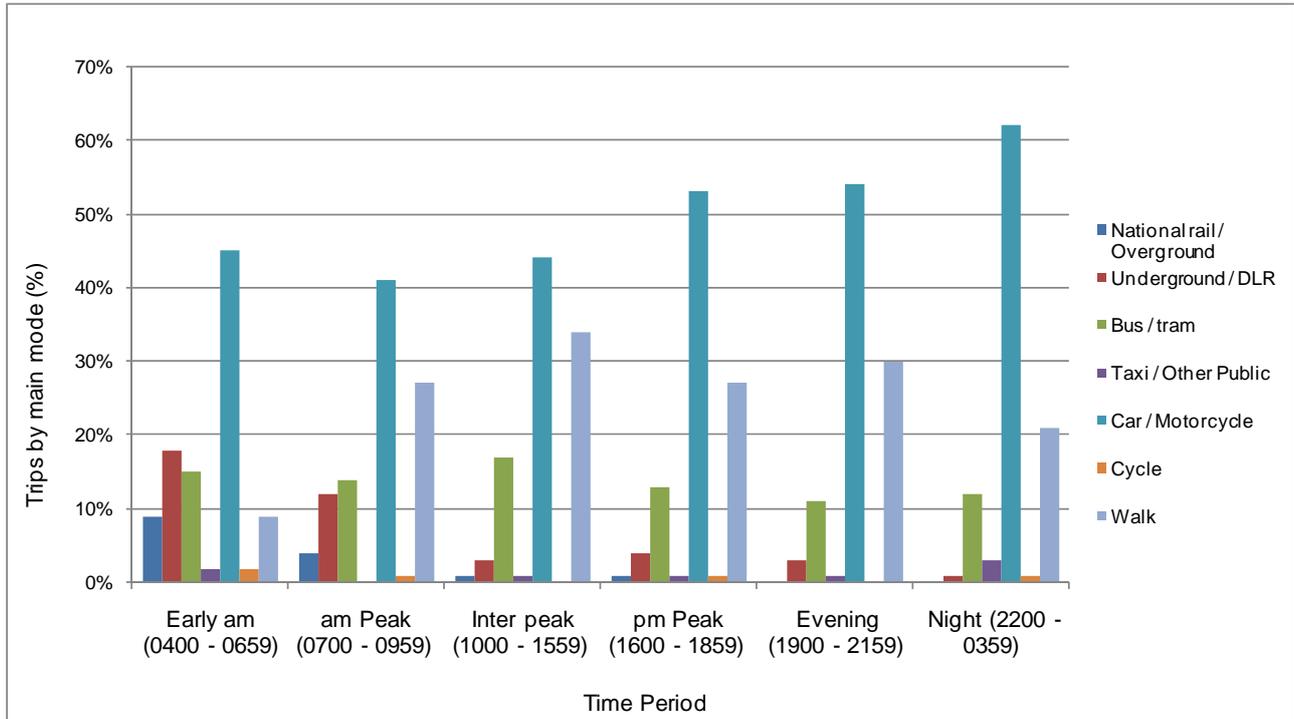


Figure 22: Mode share by time of day originating in the north sub-region



Source: London Travel Demand Survey

80. In north London, fairly similar numbers of trips are made on weekdays and Saturdays (around 2.3 million), with around three quarters as many trips made on an average Sunday. As shown in Figure 23, this compares with the other sub-regions, where fewer trips are generally made on a Saturday than a weekday.

Figure 23: Weekday and weekend trips originating in the north sub-region, 2006-09

Mode	Weekday	Saturday	Sunday
Total	2,313,000	2,344,700	1,856,500

Source: London Travel Demand Survey 2006/9

81. At the weekend, a higher proportion of trips are made by car, at 54 per cent and 58 per cent on Saturdays and Sundays respectively, compared to 43 per cent of trips on an average weekday (see Figure 24). This means that nearly 300,000 more trips are made by car in the sub-region on a Saturday than on an average weekday and the number of trips made by car on a Sunday is broadly the same as that on an average weekday, despite lower overall trip volumes on Sundays. The share for all public transport modes is reduced at the weekend, as is the walk mode share, so clearly users of all modes tend to move towards greater car use at the weekend.

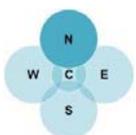
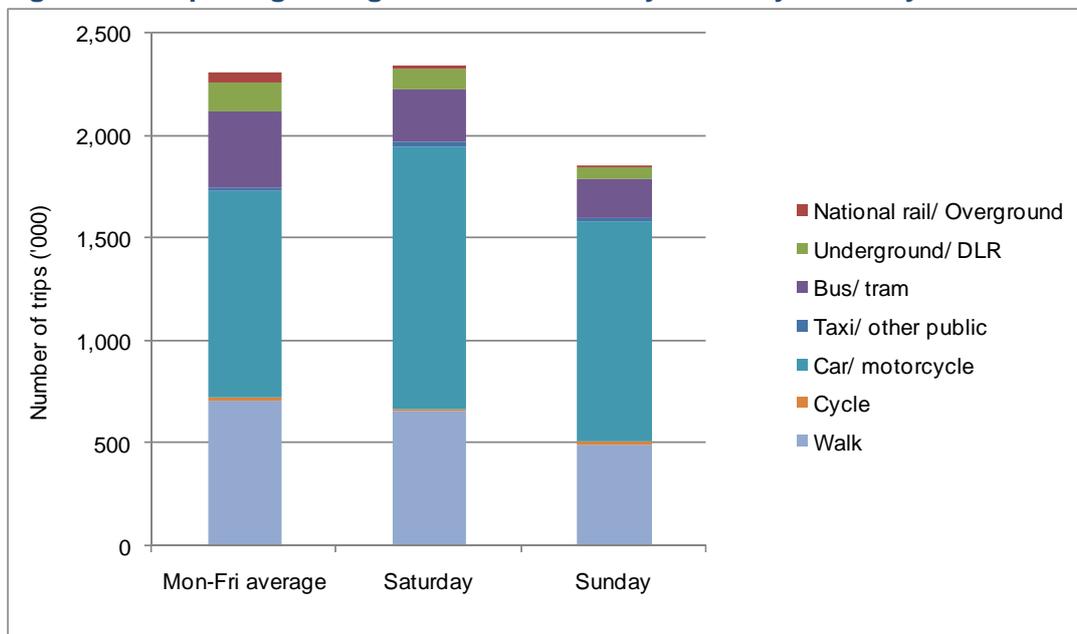


Figure 24: Trips originating in north London by mode by weekday or weekend



Source: London Travel Demand Survey, 2006-09

Journey length by mode

82. In north London, three quarters of trips less than 1 km are walked and most of the remainder are made by car, equivalent to 172,600 car journeys under 1 km per day; 16 per cent of all trips made by car. Figure 25 shows that trips to metropolitan centres tend to cluster around these centres. Major and district centres, such as the majority of centres in north London, have a smaller catchment area and a more local focus.

83. Figure 26 shows the proportion of mode share by trip length for journeys originating in north London. For mid-length trips of between 1 and 10 km, six in ten are made by car and between a quarter and a fifth by bus. A relatively low proportion of trips between 1 and 5km are walked or cycled (14%), a similar proportion of trips between 6 and 10km are made by rail and underground (16%). Nine in ten rail and underground trips are longer than 5 km; for the longest trips (over 20 km), rail is more commonly used than underground. For trips between 10 and 20 km, as many trips are made by rail and underground (45%) as are made by car (46%). For longer trips, car once again becomes the dominant mode, with 73 per cent of trips over 20 km made by car and most of the remainder by rail or underground (26%).

Future trips

84. By 2031, the total number of trips originating in Greater London, by both London residents and non-residents is expected to increase by around 16 per cent, an overall addition of over three million trips a day. Within London, the east region will both generate and receive a significantly greater increase in trips than any of the other regions. Conversely the lowest increase in total trips will come from the south region, followed by the west. This follows the trends seen in the population and employment forecasts presented earlier in this document.

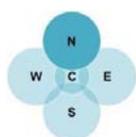
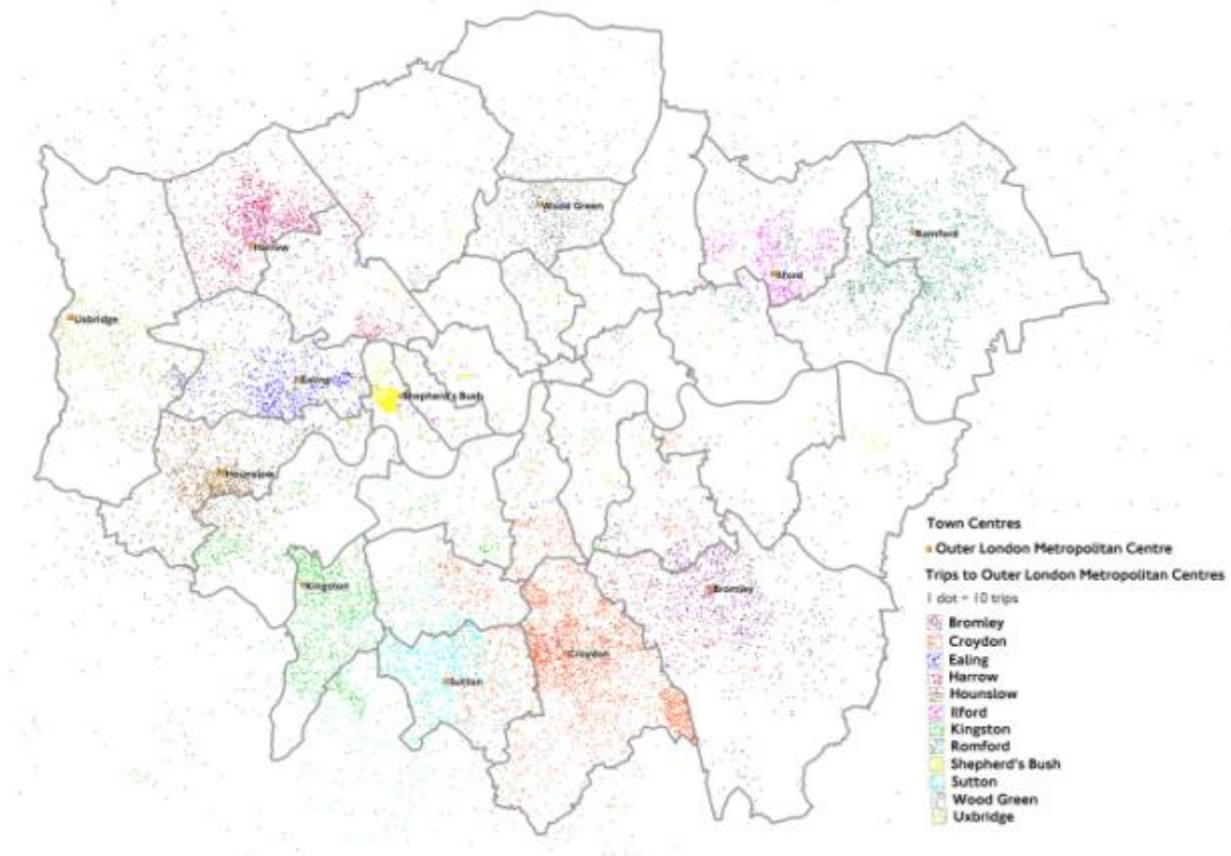
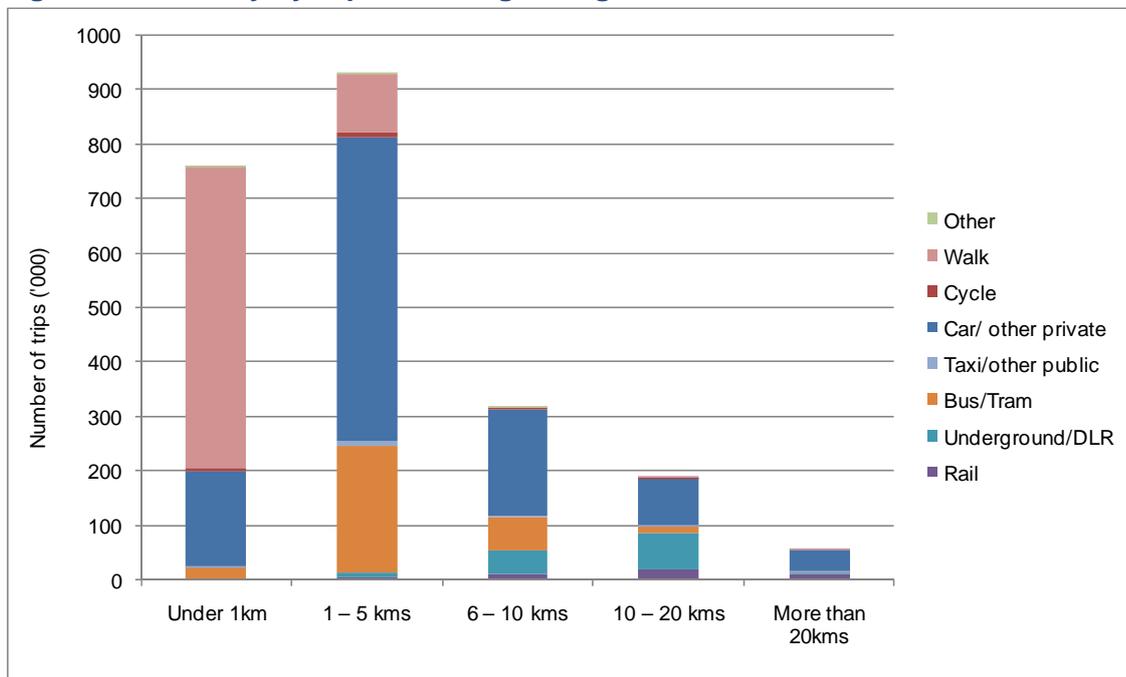


Figure 25: Local trips to London metropolitan town centres



Source: Draft Mayor's Transport Strategy, October 2009

Figure 26: Journey by trip mode originating in north London



Source: London Travel Demand Survey, 2006/09

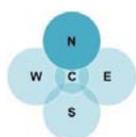
85. Of all the individual movements between sub-regions (see Figure 27) those between the east and west experience the greatest increase (an increase of over 100% in both directions). This increase is due to both the relatively low flows between these regions currently and Crossrail making travel from east to west significantly easier by public transport. The single greatest increase is within the east region, of more than 640,000 trips between 7am and 7pm. This is almost twice as large as the next highest increase, trips within the central region, which will increase by just over 340,000.

Figure 27: Percentage change in total trips to 2031 from each sub-region

	Total Trips	To Central	To East	To North	To South	To West
Central	18%	17%	35%	14%	11%	17%
East	28%	38%	25%	32%	27%	127%
North	12%	14%	35%	8%	35%	25%
South	8%	11%	27%	37%	5%	11%
West	10%	16%	115%	23%	11%	6%
Greater London	16%	18%	28%	12%	7%	10%

Source: LTS model

86. The total number of trips originating in north London is expected to increase by approximately 12 per cent by 2031. This represents over 200,000 additional trips between 7am and 7pm. Movement from the north sub-region to the east sub-region represents the greatest percentage increase in inter regional trips, although in actual terms the increase is similar to that into the central Region from the north Region. Internal trips within north London are forecast to increase at a similar level to trips between the central and north sub-regions, an increase of nearly 100,000 trips.
87. The number of trips originating in Greater London in both the morning and evening peaks is forecast to mirror the overall increase and grow at a similar rate (see Figure 28 and Figure 29). For example morning peak trips are expected to increase by around 16 per cent, and evening peak trips by around 17 per cent, additions of over 800,000 and one million trips respectively. As with total trips, the east region will again experience the greatest increase during the peak periods, with the lowest increase coming in the south region. The greatest individual percentage increases will be between the east and west regions, whilst trips wholly within the east region represent the largest absolute increase in trips in both peak periods.



Spotlight on travel by non-London residents

The National Travel Survey describes trips made to, from and within London in the wider context of travel in the UK as a whole. This shows that:

- 12% of trips had a destination in Greater London – of these, 92% had originated in London, 5% in the south east and 3% in the eastern region
- Only 8% of car (as driver) trips had a destination in Greater London, but 14% of these had an origin elsewhere, primarily the south east (8%) and east (6%) regions
- More than four in ten rail trips made in the UK had a destination in Greater London, of which around two thirds were within London; 17% came from the south east, 11% the east and a small proportion from elsewhere in the UK

These figures suggest that non-Londoners make up a fairly significant proportion of those making trips in London, and particularly for 'longer distance' modes such as car and rail.

Trips to London from outside London were more likely to have a destination in outer than inner London. Car was the mode most commonly used to travel to Outer London, whilst rail was the most commonly used mode for travel to inner London. Two thirds of all trips with a destination in London (and an origin elsewhere) made by residents of the south east were to Outer London, whereas residents of the eastern region in 2002-06 were equally likely to be travelling to inner or Outer London (49% and 51% of London trips respectively).

At around six in ten, the majority of trips into London on a weekday were for commuting or business purposes, with around one in three trips made for shopping or leisure. At the weekend, most trips were made for shopping or leisure purposes. However, the profile of trips to and from inner and Outer London by residents of the south east and eastern regions was quite different, with around seven in ten trips to inner London and four in ten trips to Outer London being for commuting and business purposes.

During the week, around six in ten trips into London were made by car or van, and around three in ten by rail. In comparison, at the weekend, more than 80% of trips into London from the south east and eastern regions were made by car. The mode split was sharply differentiated by whether visitors were travelling to inner or Outer London. Around nine in ten trips to Outer London were made by car, whereas around 60% of trips to inner London were by rail. Whilst in London, visitors were more likely to make shopping, leisure and personal business trips (for example, a lunchtime shopping trip or after-work drinks), and tended to travel by car or on foot.

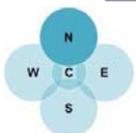
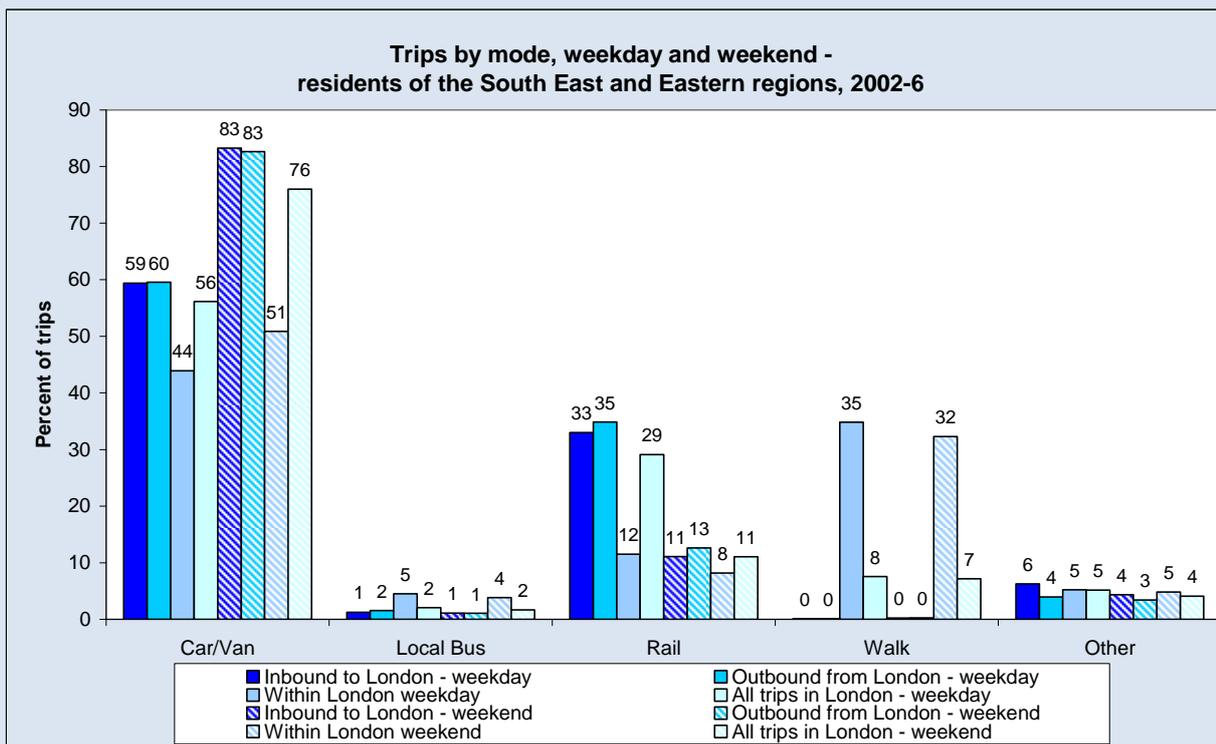


Figure 28: Percentage change in total AM peak trips to 2031 from each sub-region

	Total Trips	To Central	To East	To North	To South	To West
Central	18%	13%	42%	13%	16%	19%
East	30%	37%	26%	28%	26%	98%
North	14%	15%	42%	7%	33%	33%
South	8%	10%	32%	31%	4%	8%
West	10%	14%	116%	12%	12%	5%
Greater London	16%	14%	29%	9%	7%	8%

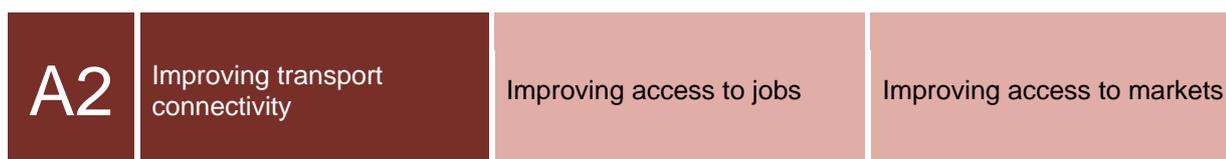
Source: LTS model

Figure 29: Percentage change in total PM peak trips to 2031 from each sub-region

	Total Trips	To Central	To East	To North	To South	To West
Central	17%	19%	29%	15%	10%	17%
East	28%	41%	25%	39%	29%	139%
North	10%	12%	28%	7%	30%	16%
South	8%	17%	22%	32%	5%	14%
West	10%	20%	99%	28%	10%	6%
Greater London	17%	21%	28%	14%	9%	11%

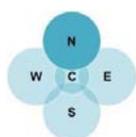
Source: LTS model

88. The number of trips in the am peak originating in north London is expected to increase by approximately 14 per cent by 2031, whilst trips in the PM peak are only expected to increase by around 10 per cent. This represents approximately 80,000 additional trips in the am peak and just under 50,000 addition trips in the PM peak. The greatest percentage increase in inter regional trips is to the east and then south regions in the am peak and the south and then east regions in the pm peak, however in both cases the absolute increase is significantly greater heading to the east region than the south region. As in all regions, the greatest absolute increase in trips is internal to the region.



Sufficient, fast, efficient and reliable links are vital for the ensuring the success of the north London and wider London economy. North London has excellent rail and Underground connections to central London and to town centres on these radial corridors. Inter-suburban transport links reflect the much more dispersed patterns of demand and trips which are generally shorter (by all modes). Improving north Londoner’s access to jobs and improving access to job markets in north London are a key challenge.

89. North London has good transport connections provided by National Rail and the Underground lines on the radial corridors into central London. central London is the single largest focus for trips outside the sub-region and, as set out above, the majority of these trips are made by public transport. However, the majority of trips in north London (70%) are made entirely within the sub-region and around half of these are by car.



90. Access to the town centres in north London by public transport is relatively fast and convenient along the radial rail corridors into central London. For example, Wood Green is well served by the Piccadilly Line, Edgware by the Northern Line and Walthamstow by the Victoria Line. There are also comprehensive bus links into each centre its main catchment areas. There is much less demand for longer inter-suburban trips by all modes, and car is the dominant mode for these. Car will generally retain a significant time advantage over public transport for these longer trips as, even with the growth forecast, for most such links the intensity of trip-making will remain relatively low. A good example is Brent Cross which is served by a large number of bus routes but still has a car mode share of 73 per cent.

Access to jobs

91. Good access to jobs is important for facilitating labour markets to work efficiently as it ensures people can access a wide range of jobs within reasonable travel time. Providing public transport which links people and jobs is important for supporting London's economic development and population growth; a key goal of the draft Transport Strategy.
92. Figure 30 shows the number of jobs which are accessible within 45 minutes travel time from each home location by public transport in the morning peak period (7am to 10am). As the measure depends on the density of jobs as well as the availability of transport links, central London which has the highest employment density and a dense public transport network, has the highest accessibility to jobs.
93. There are over 2.5 million jobs within 45 minutes of travel time by public transport in central London. The number of accessible jobs generally declines as the distance from central London increases although accessibility is higher around some major employment centres in Outer London. In north London the majority of the sub-region has access to over half a million jobs within 45 minutes by public transport mainly around the key radial links into central London. However, a key challenge for north London is to ensure that access to jobs is improved for north London residents in the future, particularly taking into account the forecast employment growth in the opportunity areas at Brent Cross/ Cricklewood, Colindale/ Burnt Oak and the Upper Lee Valley, as well as employment areas outside the sub-region including Stansted and Stratford.

Connectivity

94. London Underground plays a vital role in the accessibility of north London. It is important for north London that London Underground is able to continue to provide a good service. The network needs continuous renewal to ensure that reliability does not deteriorate. Furthermore, it is forecast that Underground and rail routes will become more crowded over time. Crowding can make the existing public transport system less accessible to new users, if no further capacity is made available. Although most of the capacity constraint is in central and inner London, it impacts on, and potentially restrains, journeys made to and from north London. The currently planned investments in public transport will not alleviate all future crowding. Public transport crowding is considered further under the quality of life challenge in terms of the outcome of improving journey experience.
95. Another aspect of improving transport connectivity to improve people's access to jobs is ensuring that public transport is physically accessible. Physical accessibility is considered further under the transport opportunities for all challenge in terms of improving accessibility.

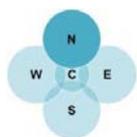
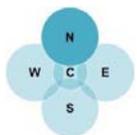
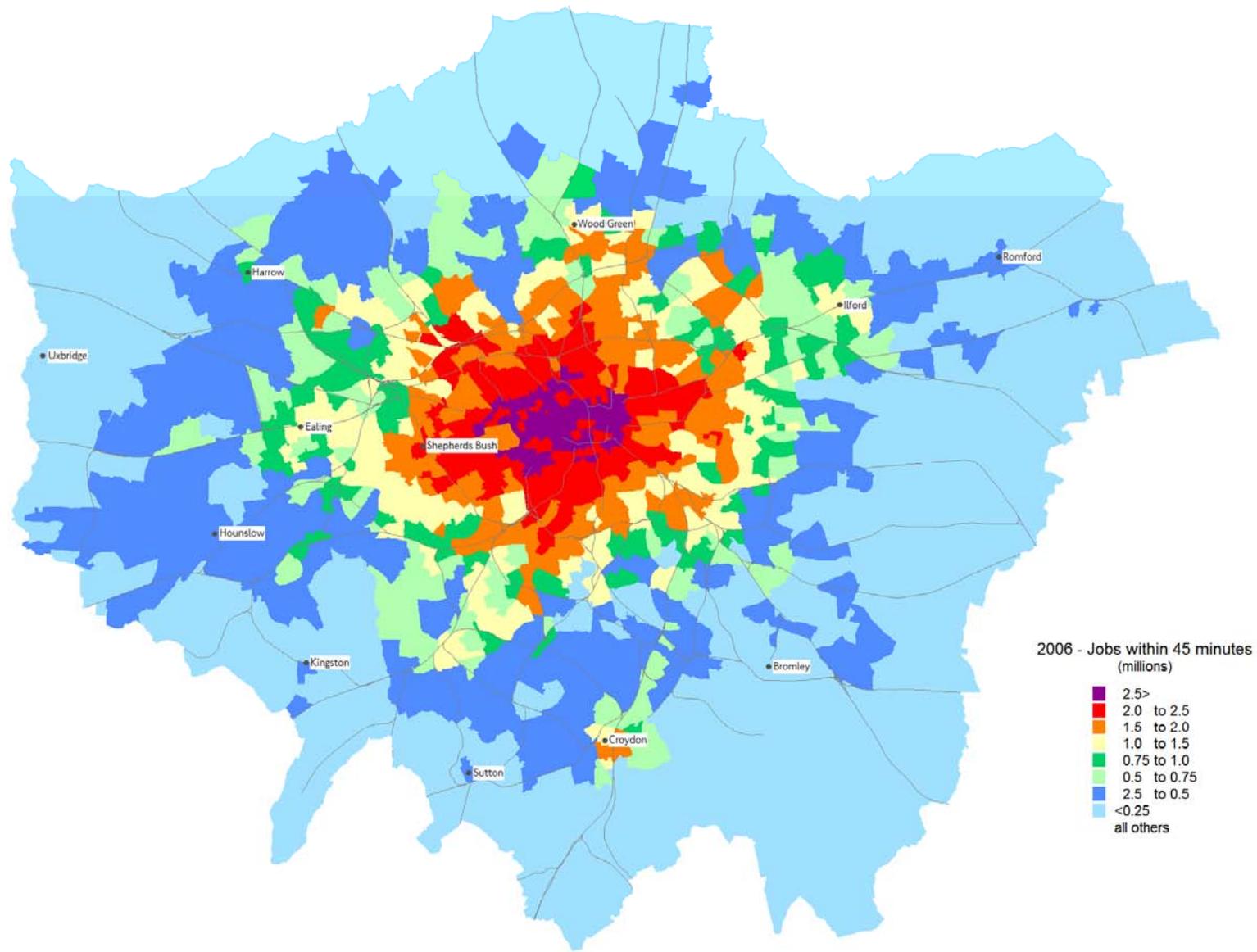


Figure 30: Number of jobs accessible by mass public transport within 45 minutes travel time (by ward, 7am to 10am, 2006)



96. The highway network in north London includes several busy radial-centric corridors and the A406 North Circular Road, the busiest non-radial route in London, and operates at capacity during peak times. Most of the journeys originating in north London by car remain within north London. This indicates both that a substantial amount of the peak traffic on the TfL controlled road network are journeys through the area.
97. Buses in the sub-region have seen a significant growth in usage over the last decade and the sub-region's usage as a whole is representative of the bus mode share across London. Within the sub-region, usage is focused on the town and local centres, with a clear pattern of increase towards each centre. This is overlaid with an increase in intensity of trip-making when moving south and east, from Barnet and Enfield towards Haringey and Waltham Forest. The network provides key connections to centres and interchanges from their hinterland and also access to schools, hospitals and other local facilities. There has been much investment in expanding the size and quality of the network with improvements to service reliability and coverage, including at night. In some centres, this has resulted in capacity pressures on infrastructure such as bus stations or bus stands.
98. A selection of inter-suburban 'orbital' bus connections is shown in Figure 31 below. Aspirations for further direct links will be consulted on and examined as part of the bus network review process. It may be that the growth in jobs and homes expected in the sub-region over the next 20 years will provide opportunities that do not exist at present, for example through increasing demand for particular links, by releasing land or funding for bus priority, services or infrastructure. An example is links to Stratford from Walthamstow and the northern parts of Waltham Forest, to access the new opportunities at Stratford. Currently there are two high frequency bus services between the Walthamstow area and Stratford, with interchange in Walthamstow available for longer trips. TfL and the boroughs are seeking to provide more bus priority on these links in order to speed up journeys. It is planned to extend a third high-frequency service from Chingford and Walthamstow into the new Stratford City development.

Figure 31: Orbital bus services in Outer London, excluding radial and local bus routes

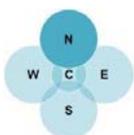
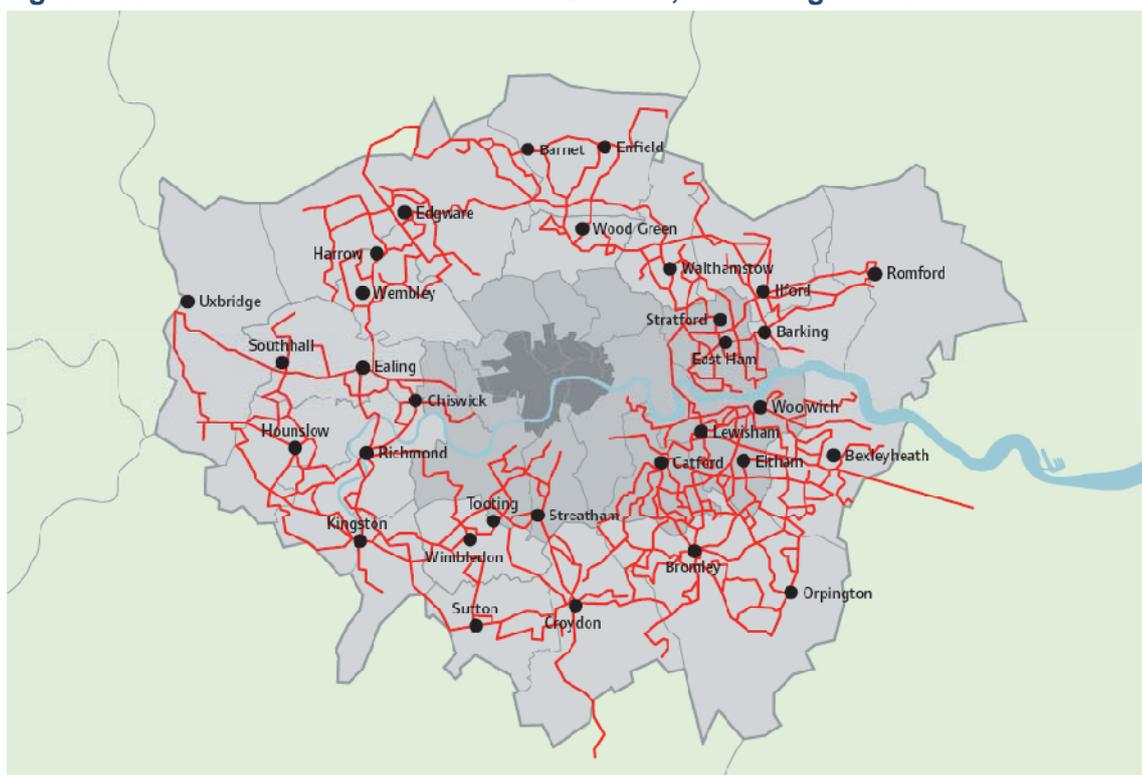


Figure 32: Daily boarders at bus stops in north London

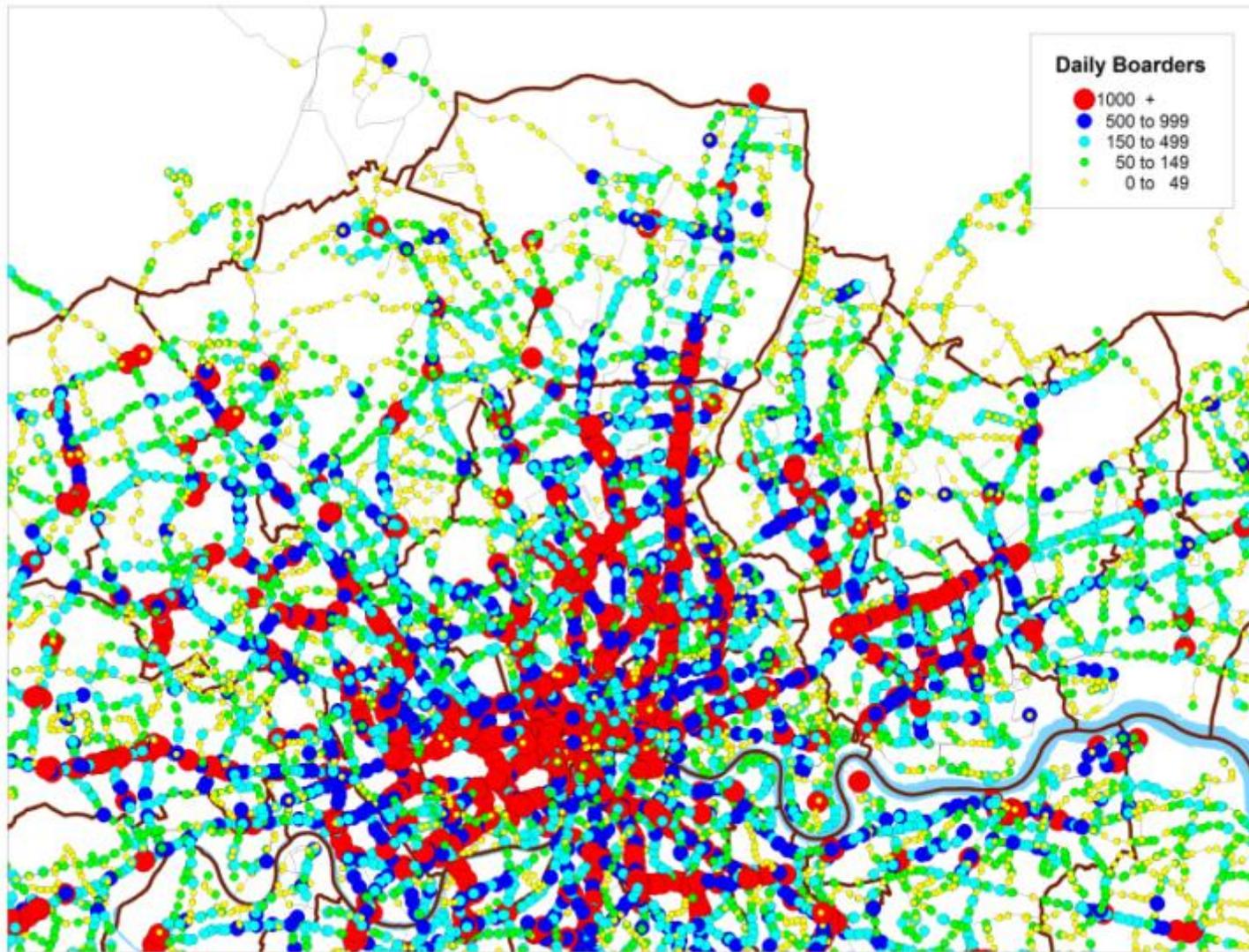
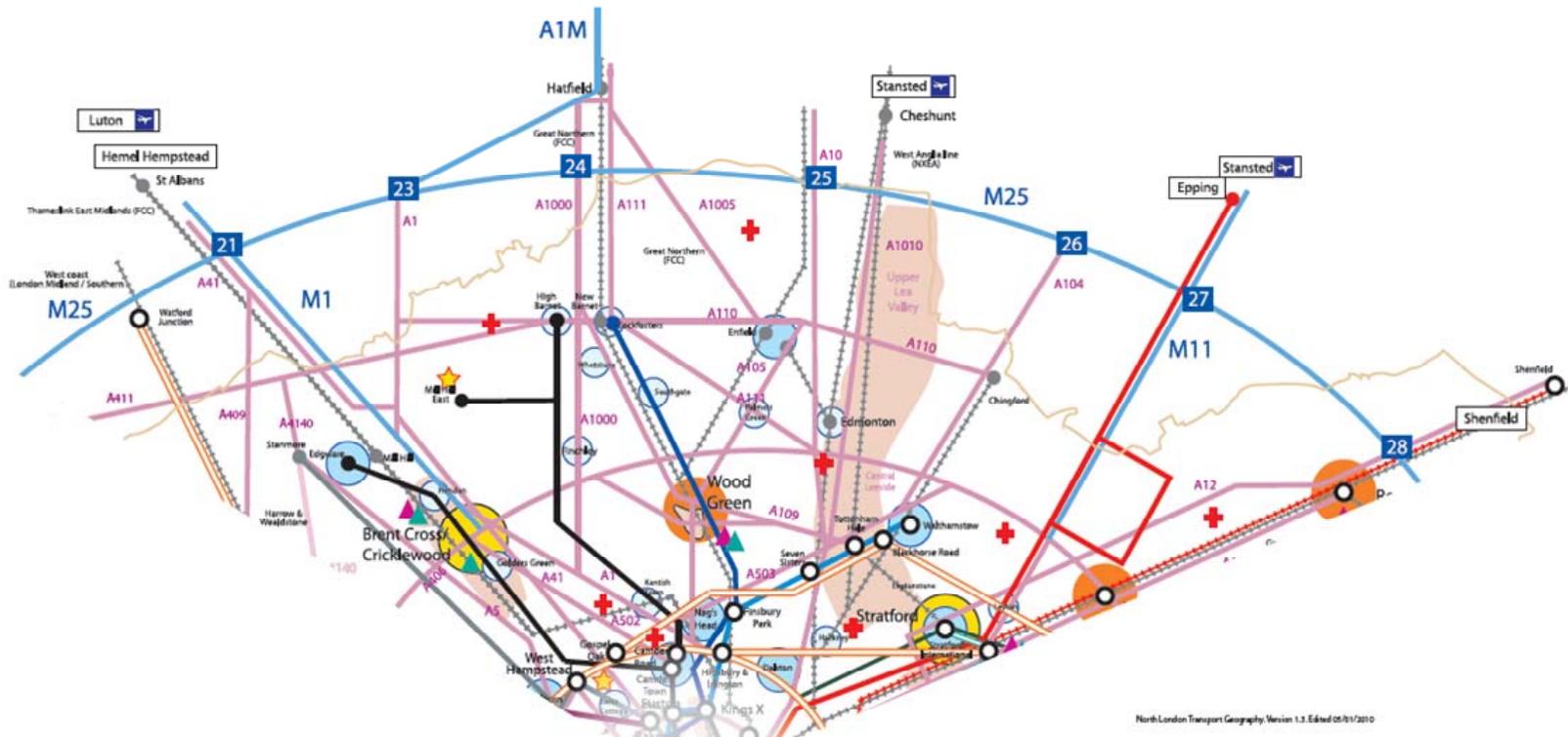


Figure 33: North London transport geography

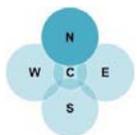


Origins and destinations

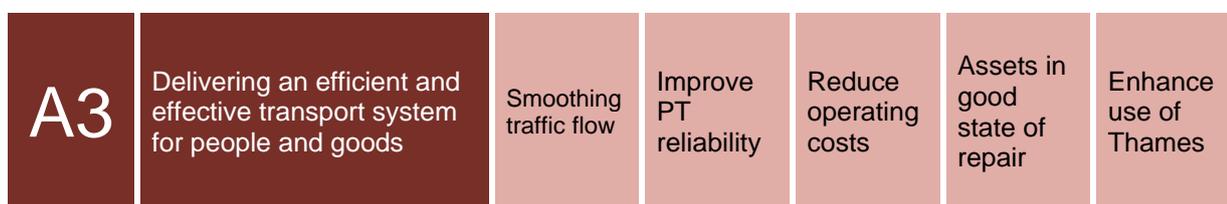
- London Plan metropolitan centres
- Major centres
- Key places as determined by sub-regional partnerships
- Potential metropolitan centres
- London Plan Opportunity Areas
- ▲ Major employment hubs
- ▲ Major shopping centres
- + Hospitals
- Universities
- Other
- ★ Areas for intensification

Transport infrastructure and administrative boundary

- GLA boundary
- London Overground
- Jubilee line
- Central line
- Crossrail
- Tramlink
- District line
- Bakerloo line
- Strategic rail routes
- London Overground
- Strategic road routes
- Docklands Light Railway
- Northern line
- Piccadilly line
- Victoria line
- Metropolitan line



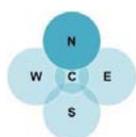
99. Boroughs in north London have also expressed concerns about connectivity within the sub-region: in particular, east to west and north-east to south-west connectivity across the sub-region and connectivity across the Upper Lee Valley. Figure 33 shows the transport geography in north London, including connectivity by road and public transport between the key places and opportunity areas within north London.
100. While public transport connectivity into central London is generally very good, and access to many town centres in north London is already very good, enhancing connectivity and the attractiveness of orbital public transport remains a key challenge for the sub-region. This is considered in more detail under Challenge 2 in Chapter 3 of this document.
101. Another key outcome of improving transport connectivity is improving access to commercial markets for freight movements and business travel, supporting the needs of business to grow. Freight traffic in terms of heavy goods vehicles and light goods vehicles tends to be greatest on the busiest roads in north London, such as the North Circular, M1, A1 and the north south Connector Road linking the North Circular with the M25. The importance of delivering an efficient and effective transport system for goods is considered in more detail in the next challenge.



To sustainably support economic development and population growth, an efficient and effective transport system for people and goods is essential. There are significant opportunities in north London to integrate land use development with transport planning to make the most of the existing transport infrastructure. However, highway congestion and journey unreliability will remain a challenge in north London as employment and population growth cannot be matched by increases in capacity.

Integrating land use development with transport planning

102. The London Plan supports the integration of land use development with transport planning to encourage patterns and forms of development that improve accessibility of services and reduce the need to travel. In particular, priority is given to maximising development opportunities around existing or committed transport infrastructure to make the best use of the available capacity. In north London, the London Plan identifies a number of key opportunity areas, including Brent Cross/ Cricklewood and the Upper Lee Valley, as areas of brownfield land with significant capacity to accommodate new housing and development linked to existing or potential improvements to public transport accessibility. It also identifies intensification areas, including Haringey Heartlands/ Wood Green, Mill Hill East and West Hampstead as built up areas with good existing or potential public transport accessibility which can support redevelopment at higher densities.
103. The draft Transport Strategy includes policies and proposals to use local and strategic development control processes to ensure that high trip generating developments are located in areas of high public transport accessibility, connectivity and capacity and that the design and layout of development sites maximises access by walking, cycling and public transport.



Highway congestion/ smoothing traffic flow

104. TfL (as do all local authorities) has detailed speed and congestion data from a company called Traffic master through a Department for Transport contract. The data is obtained from vehicles fitted with GPS devices and provide average speeds and delay (expressed in minutes per kilometres over and above nominal free flow conditions) for a pre-defined network of interest. This dataset provides good geographic coverage across all London sub-regions and includes the majority of roads of strategic importance. Results from preliminary analysis of weekday data from a neutral month (May) in 2009 are presented here.
105. Average speed across the north sub-region in the morning peak period, from 07:00 to 10:00, is 33 kilometres per hour while during the interpeak, from 10:00 to 16:00, it is 34 kilometres per hour. The average speed across the evening peak period, from 16:00 to 19:00, is slower at 30 kilometres per hour. These compare somewhat favourably with the average speeds in Outer London for the equivalent time periods; 31 kilometres per hour in the morning peak period, 34 kilometres per hour in the interpeak and 30 kilometres per hour in the evening peak period.
106. The average speeds in the different boroughs in the north sub-region are shown in Figure 34. Haringey has lowest speeds across all time periods while Enfield and Barnet have the highest. It is notable that the slowest speeds are observed in the evening peak period and this is consistent across all boroughs. Figure 35 shows average delay by borough with the worst levels of delay measured in Haringey during the evening peak period at 1.6 minutes per kilometre which approaches levels of congestion experienced in inner London areas.

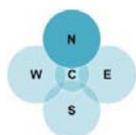
Figure 34: Average speed in kilometres per hour by time period in the north sub-region boroughs derived from Trafficmaster data obtained from vehicles fitted with GPS devices, May 2009

	Barnet	Enfield	Haringey	Waltham Forest	Camden	Islington	Hackney
AM peak	34	36	21	36	16	17	20
Interpeak	37	37	21	33	16	17	19
PM peak	33	35	18	28	15	17	17

Figure 35: Average delay in minutes per kilometre by time period in the north sub-region boroughs derived from Trafficmaster data obtained from vehicles fitted with GPS devices, May 2009

	Barnet	Enfield	Haringey	Waltham Forest	Camden	Islington	Hackney
AM peak	0.6	0.5	1.1	0.4	1.4	1.4	1.0
Interpeak	0.5	0.5	1.1	0.6	1.5	1.4	1.1
PM peak	0.7	0.6	1.6	0.9	1.6	1.5	1.5

107. Figure 36 shows average link delay for the morning peak period across London in minutes per kilometre. Congestion is generally more acute in central and inner London areas and on radial more so than orbital routes. Delay in south and east London seems to be more widespread compared with west and north London while there are locations where delay is over 1.5 minute per kilometre scattered across all the areas.



108. More detailed analysis of the data has been undertaken in order to identify congestion hotspots in the region. For this analysis the thresholds chosen are delay over 2 minutes per kilometre and speed below 10 kilometres per hour. The analysis suggests that highway congestion in the north sub-region is concentrated on parts of the network such as the North Circular and some radial routes into central London. There are some clear hotspots where highway delay is high but unlike other regions congestion is not such a wide-spread issue.
109. London's projected growth will add extra pressures on the highway network. Congestion levels are predicted to worsen across London and it is likely that the areas where currently congestion levels are high will become even higher in future. Therefore assuming trip patterns do not change substantially the congestion hotspots identified currently on the network will become an even greater issue in the future.
110. Demand for travel interacting with these networks and the supply of services on them, brings about patterns of movement on the networks, that in-turn creates issues of crowding or congestion or connectivity and accessibility. Some of these 'challenges' are highlighted as key ones for the sub region.
111. The Mayor's 'cycling revolution' provides an opportunity for north London to increase cycling mode share. The London-wide target is five per cent cycling mode share by 2025 which requires a 400 per cent increase in trips from 2000, equivalent to an additional 1.3m trips per day by bike. There are about 27,000 trips made each day by pedal cycle with either an origin or a destination in north London. This is about one per cent of all trips and is slightly below the London-wide average.
112. Three cycle superhighway schemes are proposed for the north London sub-region with indicative routes from Tottenham Hale to Liverpool Street along the A10, from east Finchley to Angel along the A1 and A1000 and from Cricklewood to Marble Arch along the A5 (see Figure 37). Increasing cycling for commuting journeys along these corridors provides an opportunity to encourage transport users to shift from more crowded public transport corridors to cycling. In addition, the draft Transport Strategy allows for up to 66,000 cycle parking spaces across London and the potential future expansion of the central London cycle hire scheme to Outer London centres which would each help to facilitate an increase in cycling mode share.
113. Population and employment growth, coupled with ageing assets and continuing utilities works, will continue to put pressure on the congested road network across London increasing the probability of delays. In addition, increases in road freight mean that more of the network will have to function at or beyond peak capacity, reducing its resilience to delays. Managing highway congestion and making more efficient use of the road network is a key challenge for north London and is considered in more detail in Challenge 3 in Chapter 3.

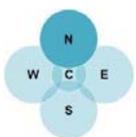
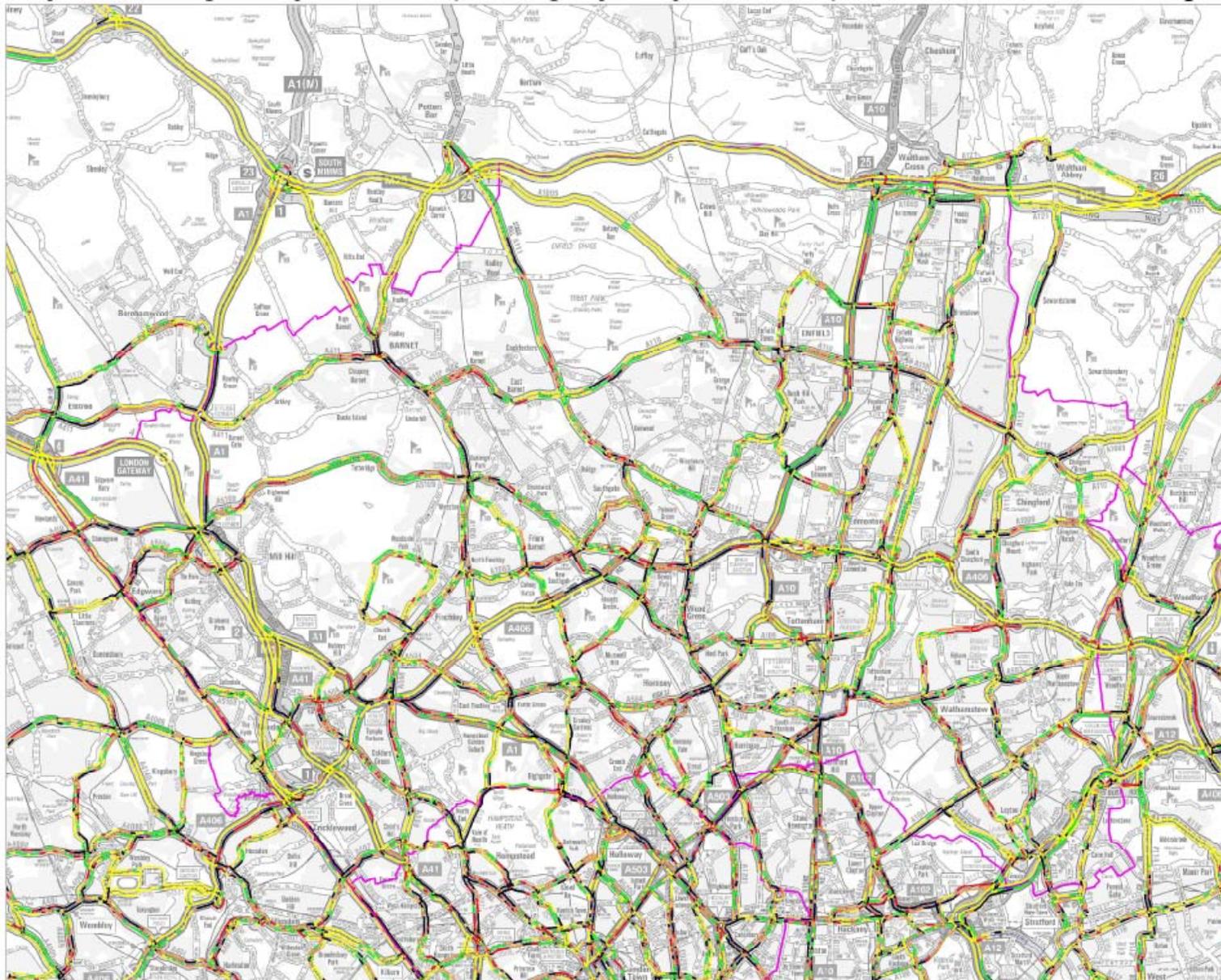


Figure 36: Average link delay in minutes per kilometre for the morning peak period derived from Trafficmaster data obtained from vehicles fitted with GPS devices, May 2009

May 2009 Average Delay - AM Peak (Working days only - Mon to Fri)

North Sub Region



Road Network Performance and Research

- Note:
- Network shown is OS ITN links on Network of Interest.
 - AM Peak is 7am to 10am.
 - Delay measurement is peak speed compared to night speed (10pm to 6am - free flow) in mins/km
 - Links with 2 or more observations are shown
 - Both directions are shown
 - Processed as per DfT instructions issued in Apr 09



Information derived from data provided by TrafficMaster obtained from vehicles fitted with GPS devices

Delay Measurement (mins per km)

- Greater than 1.5
- 1 to 1.5
- 0.5 to 1
- 0.25 to 0.5
- Less than 0.25
- No Data

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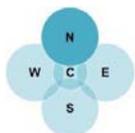
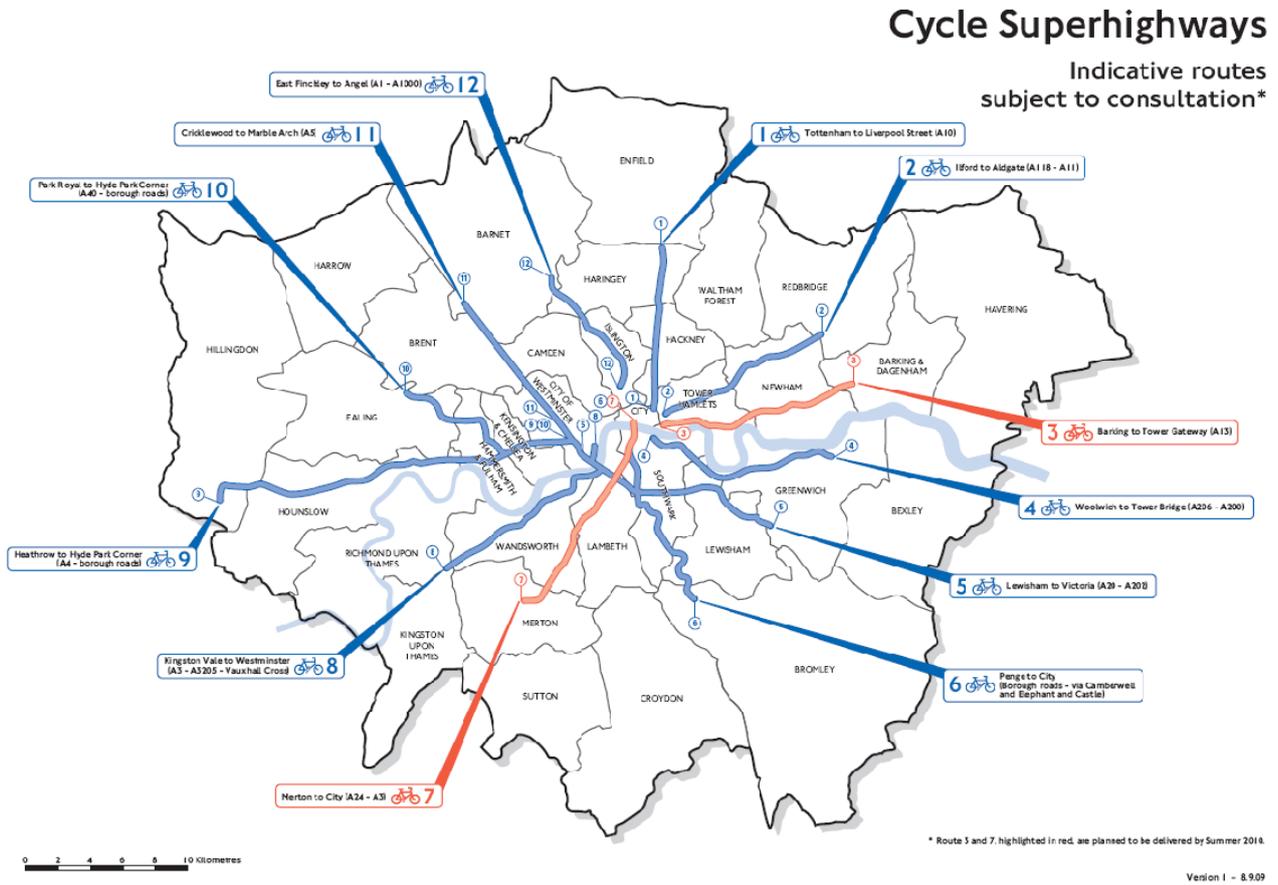


Figure 37: Cycle superhighways proposed in the draft Transport Strategy



Improving efficiency of freight distribution

114. Freight makes up around 17 per cent of all road traffic in Greater London, and forecasting suggests that freight traffic will grow by 25 per cent between now and 2031 as London's economy and population increases. As can be seen in Figure 38 below, north London has a significant proportion of the roads with the highest annual average daily flows of heavy goods vehicles, particularly on the North Circular and the M1, with medium flows on the A1, A10 and the north south route between the North Circular and the M25.
115. The draft Transport Strategy includes policies and proposals to encourage a shift from road freight to rail where possible, for example by building more rail freight terminals, and to relieve London of rail freight without an origin or destination in the Capital. It also includes proposals to increase the use of the Thames and London's canal network for waterborne freight transport, which could lead to a reduction in the amount of freight traffic using roads in north London.
116. In north London, there is potential to increase water-based freight transportation activity using the London Blue Ribbon Network, as shown in Figure 39. In particular, the Lee Navigation Canal, provides a significant opportunity for to shift to water-based transport, including the transportation of waste, although work is required to upgrade the canal to enable this to happen.

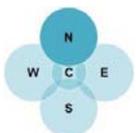
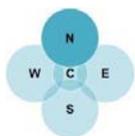
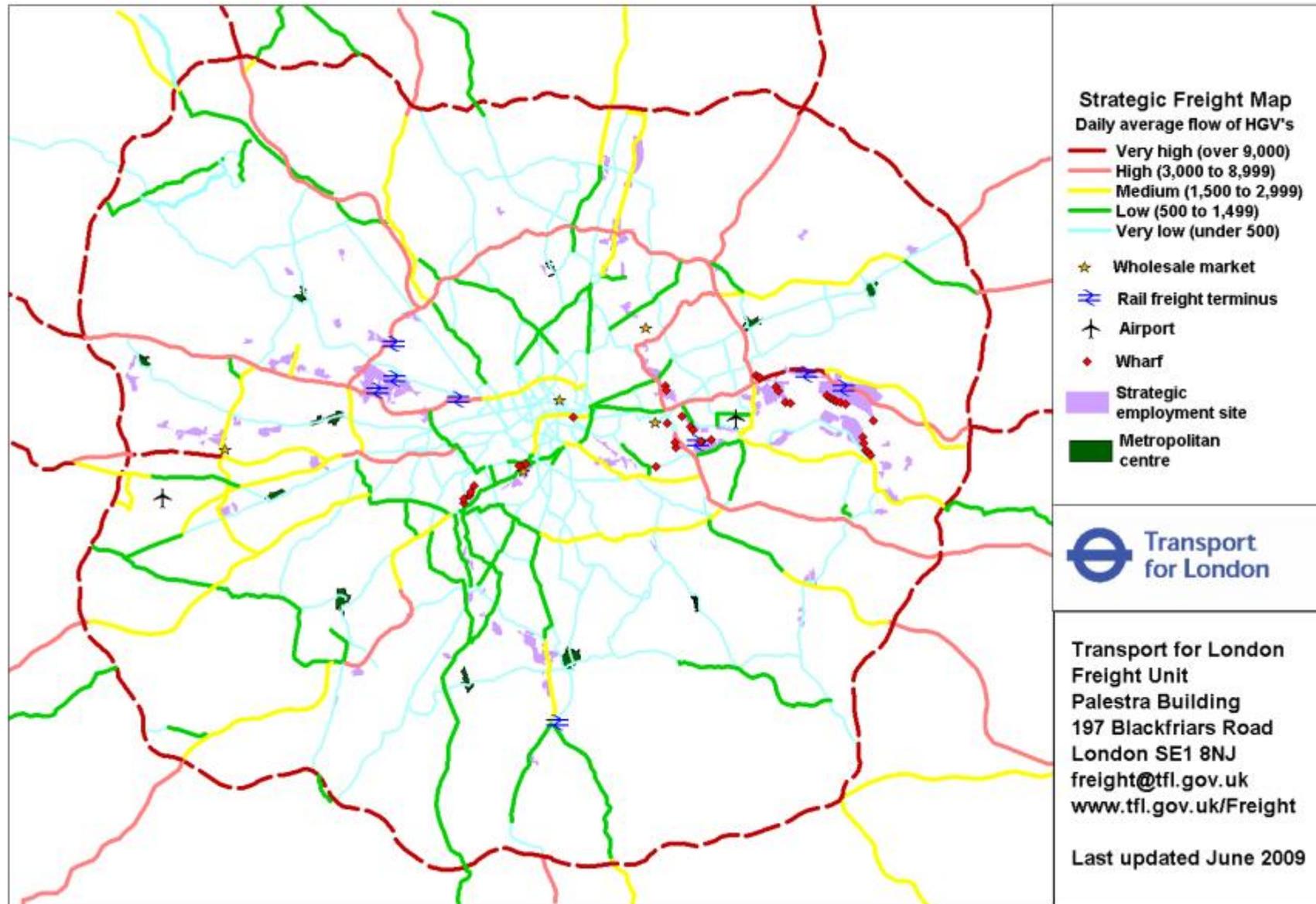


Figure 38: London strategic freight corridors

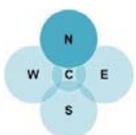
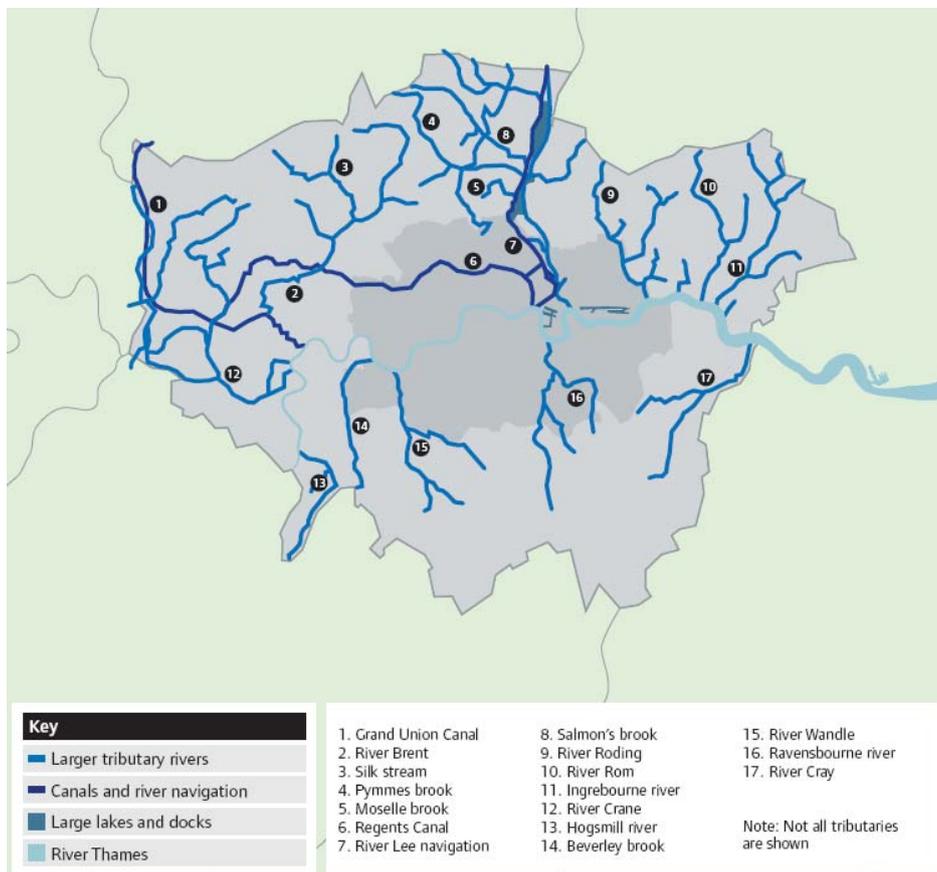




Freight using North Circular Road (enfield.gov.uk)

117. To deliver an effective and efficient transport system for people and goods will require management of conflicting demand for road space. Encouraging a shift away from road for freight to rail or water provides one option. The draft Transport Strategy also includes a package of measures to manage congestion ranging from the rephasing of traffic lights to better information for drivers to reduce congestion and achieve more reliable journey times. Tackling congestion is particularly important for the freight industry and the efficiency of freight distribution is targeted through a number of measures in the draft Transport Strategy to promote best practice. However, any measures to reduce congestion for motorised vehicles must also take into account the impacts on other road users including pedestrians, cyclists and public transport users. Measures that seek to encourage mode shift away from cars to walking, cycling and public transport will also have a beneficial impact on levels of congestion.

Figure 39: The London Blue Ribbon Network, showing Lee Navigation Canal through Upper Lee Valley



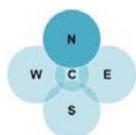
Improving public transport reliability

118. It is important for north London that London Underground is able to continue to provide a reliable service, where delays are minimised. Disruption on London Underground services can lead to extended travel times and less predictable journeys. The efficiency of London can be compromised by these delays. A slight delay to London Underground services has a large impact on the increasingly crowded network. The London Underground network needs to be maintained and renewed on a regular basis to ensure that the currently high levels of reliability and recoverability do not deteriorate. Continuous investment in the renewal of the infrastructure will be required beyond the current PPP to safeguard the future of the network. Periods without investment can lead to the longer term degradation of the assets, and increase the future costs of providing a reliable and efficient service.
119. The majority of National Rail services into central London are running 90 per cent or more of services within five minutes of schedule. 'Excess wait time' – London Underground's reliability measure – has been reducing year on year; it was 6.6 minutes in 2008/09, as compared to 8.1 minutes in 2006/07. The percentage of scheduled kilometres operated has also risen over the same period, from 93.6 per cent to 96.4 per cent.
120. Station closures can have a major impact upon journey time reliability. While this is most pronounced in central London, with 401 out of 782 London Underground stations closed in zone 1, this also has an impact on residents of the sub-region who use these stations. One such example is Kings Cross London Underground station, where congestion is so great that passengers are regularly held beyond the gate line during the morning peak, which affects passengers changing to the Underground from Thameslink and National Express east Anglia services. However with passenger levels forecast to grow, it could impact upon more stations in the central area.
121. In terms of bus reliability, the table below shows that large improvements have been made in excess waiting time across London – down 45 per cent London-wide since 1999/2000, with improvements in individual Boroughs ranging between 27 per cent and 55 per cent. The service is now much more consistent across all areas of London, with the range in excess waiting times between boroughs having almost halved.

Figure 40: Excess bus waiting times in the north sub-region

(minutes)	1999/2000 EWT	2008/2009 EWT	Change
Barnet	2.10	1.02	-51%
Enfield	2.02	0.97	-52%
Haringey	2.12	1.02	-52%
Waltham Forest	1.76	1.19	-32%
Worst (London-wide)	2.12	1.19	-44%
Best (London-wide)	1.76	0.97	-45%
Range*	0.36	0.22	-39%

* Range is the difference between the two rows above



B	Quality of life			
B1	Improving journey experience	Improving PT customer satisfaction	Improving road user satisfaction	Reducing PT crowding

While transport is essential for economic development, the quality of the journey experience is also a key consideration. North London experiences both public transport crowding and highway congestion, particularly in inner London, that has a negative impact on journey experience.

Improving public transport customer satisfaction

122. Crowding on public transport and congestion, poorly maintained roads and congestion can negatively impact on the quality of journeys in London.
123. In north London, public transport crowding is most severe in inner London and into the sub-regionally important interchanges, including Tottenham Hale and Finsbury Park. This crowding and congestion in stations has an impact on the journey experience of all travellers using the rail and Underground network into central London. In addition to crowding being uncomfortable, crowding means that travellers are unable to access trains, which makes journey times less reliable and reduces journey experience.
124. A new composite indicator of public transport customer satisfaction has been created and will be reported in the forthcoming Travel in London 2 report. Measures of satisfaction with each principal mode of public transport are also described in the report. It is not possible to disaggregate this data at a sub-regional level.

Improving road user satisfaction

125. Similarly, highway congestion in north London is worst in inner London and on the key radial routes, as set out above. For the majority of private motorists the biggest impact of congestion is inconvenience and wasted time. The emotional impact is also significant with a lack of consistency and predictability resulting in stressful and uncomfortable journeys, all of which negatively impacts on customer satisfaction. TfL's research suggests that road users travelling in Outer London experience less dissatisfaction than those travelling in inner London. However, people in Outer London often find predictability less of an issue because they have a better knowledge of local routes.
126. In addition to public transport crowding and highway congestion, other factors that impact on public transport customer and road user satisfaction include the physical accessibility of the network, the provision of information, journey time reliability and the fear of crime.
127. A new measure of road user satisfaction is currently under development and a methodology will be published in Travel in London 3 in 2011. The results of surveys carried out with road users on the TfL controlled road network and with London residents are described in the forthcoming Travel in London 2 report.

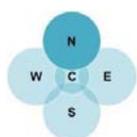


Figure 41: Current rail crowding, 2006

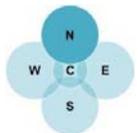
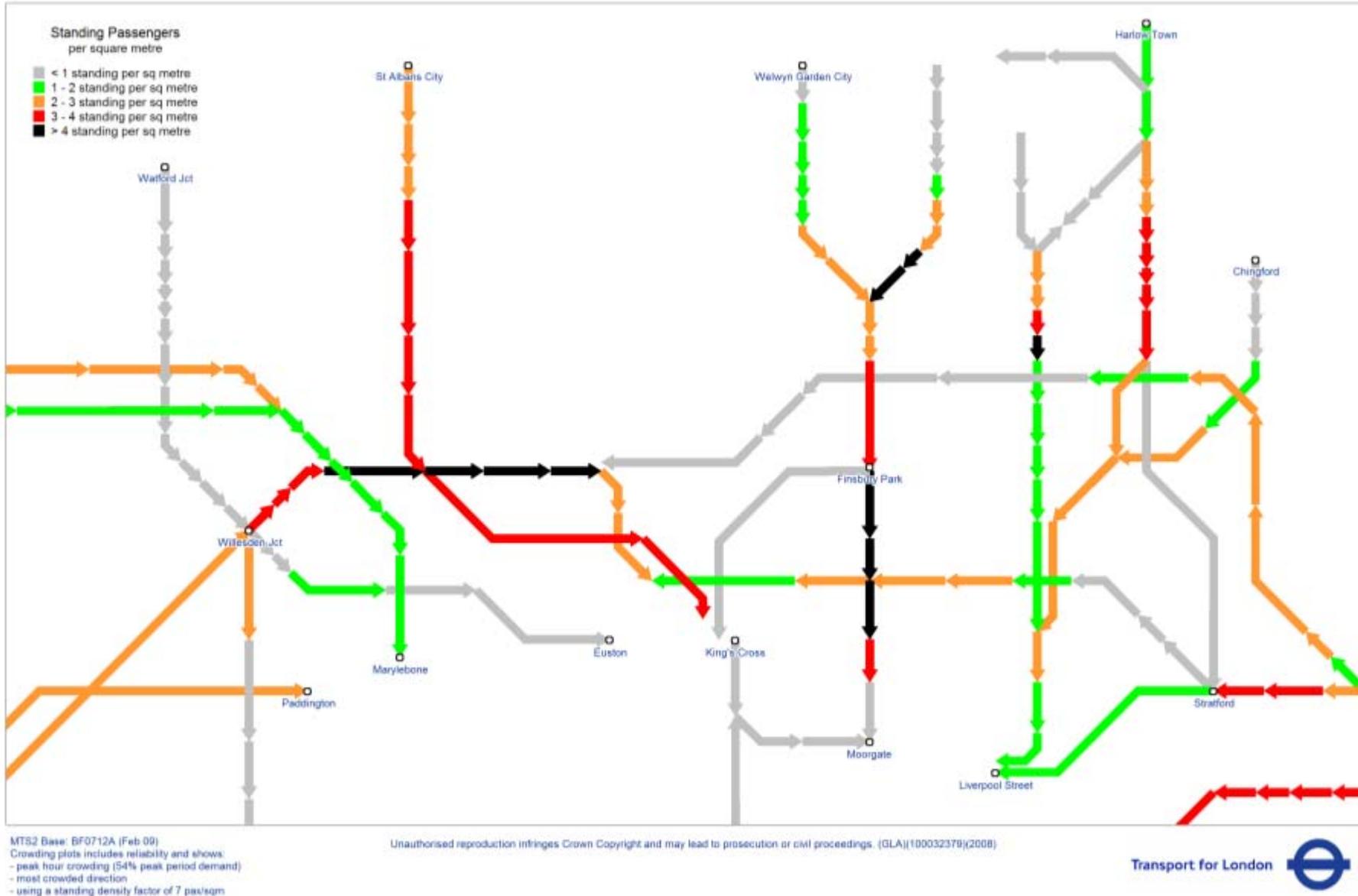
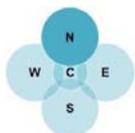
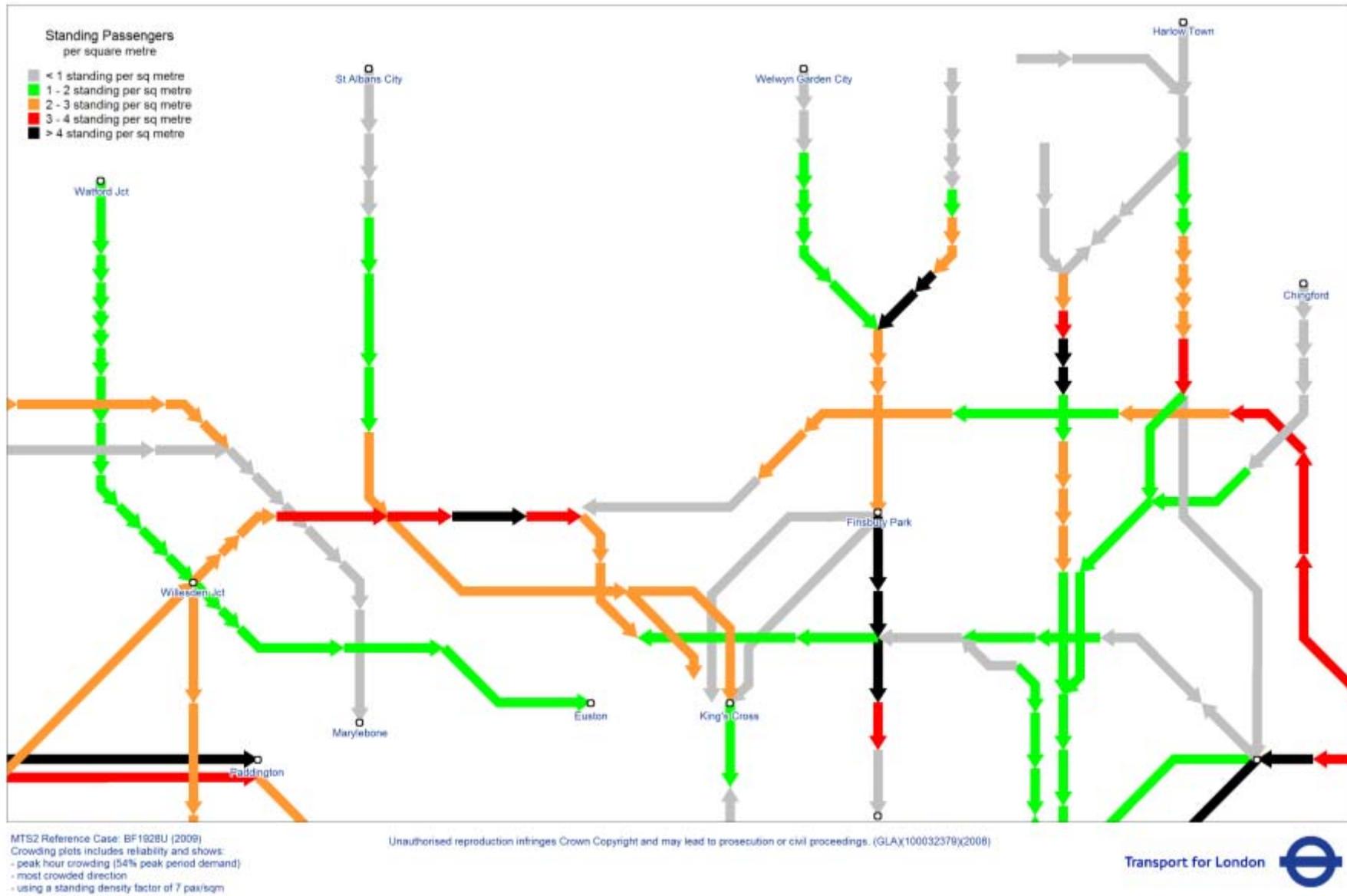


Figure 42: Rail crowding in the future, despite interventions in the draft Transport Strategy (funded in TfL's Business Plan 2009/10 to 2017/18)



Reducing public transport crowding

National Rail crowding

128. North London currently experiences significant morning peak crowding on National Rail and London Underground lines and this is forecast to worsen by 2031, despite the funded interventions contained in the draft Transport Strategy.
129. As can be seen in Figure 41, crowding in the morning peak is currently significant on the Great Northern routes into Finsbury Park and into central London, the West Anglia Main Line into Tottenham Hale and the Thameslink route into West Hampstead. There is more analysis of crowding on the London Overground network in the spotlight on the following page. There is also severe congestion at Finsbury Park station.
130. Figure 42 shows that, with the committed interventions in the draft Transport Strategy, crowding improves on a number of lines in 2031, such as the Thameslink line and on services from Welwyn Garden City. However, in 2031 crowding will worsen on a number of lines in north London, including from Willesden Junction to Gospel Oak and from Barking to South Tottenham on the London Overground lines. Crowding will also worsen in inner London on services from Finsbury Park and from Tottenham Hale. Figure 2.xx also shows that the funded improvements to the West Anglia Lee Valley line to enhance services to Stansted will lead to limited improvement to inner suburban services through the Lee Valley. In terms of future funding, the draft Transport Strategy prioritises increasing capacity on the West Anglia Main Line and at congested stations including four-tracking to deliver additional 12-car services to Stansted, additional capacity on inner suburban services and an enhanced local service to Stratford.

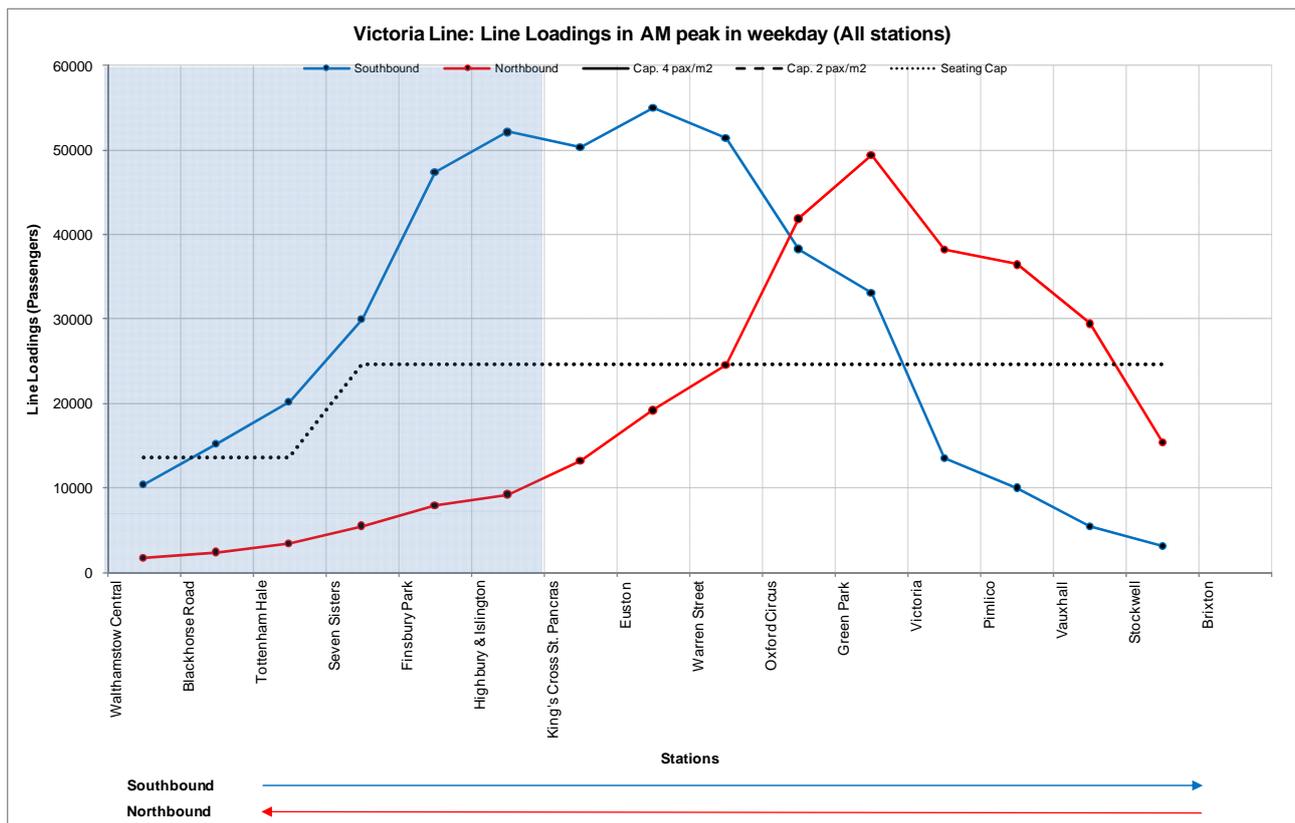
London Underground crowding

131. As can be seen in Figure 44, on the London Underground network, the most substantial crowding occurs on the Victoria Line into Finsbury Park and on the Victoria and Piccadilly Lines from Finsbury Park station into central London. There is also substantial crowding on the Jubilee Line into Finchley Road station and on the Northern Line into Camden. In terms of station crowding, there is crowding at the regionally important interchanges between rail and Underground in north London including Finsbury Park, Tottenham Hale and Highbury and Islington and at Camden Town station.



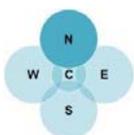
Station/ Underground crowding on northern Line (TfL)

Figure 43: Line loadings in the AM peak (7AM to 10AM) in weekday for the Victoria Line, 2008



Source: Rail origins and destinations data, London Underground, 2008

132. Figure 43 above describes line loadings on the Victoria Line in the morning peak (between 7am and 10am), which experiences some of the most severe Underground crowding in north London. Journeys from the north into central London become significantly more crowded from Finsbury Park, which provides interchange between National Rail and the Underground. Line loadings for the morning peak for the other London Underground lines that run through north London are described in Annex 1.
133. The committed interventions in north London will alleviate some of the crowding on the Underground closer to central London when they are completed. However, as can be seen in Figure 45, the additional demand resulting from the forecast growth will lead to severe crowding in 2031, particularly on the Finsbury Park to central London corridor and on both branches of the Northern Line through central London. The challenge remains to ensure that continued renewals allow Underground and rail services to operate reliably and that further capacity improvements as set out in the draft Transport Strategy are funded to ensure that the network can cope with the growing levels of demand.

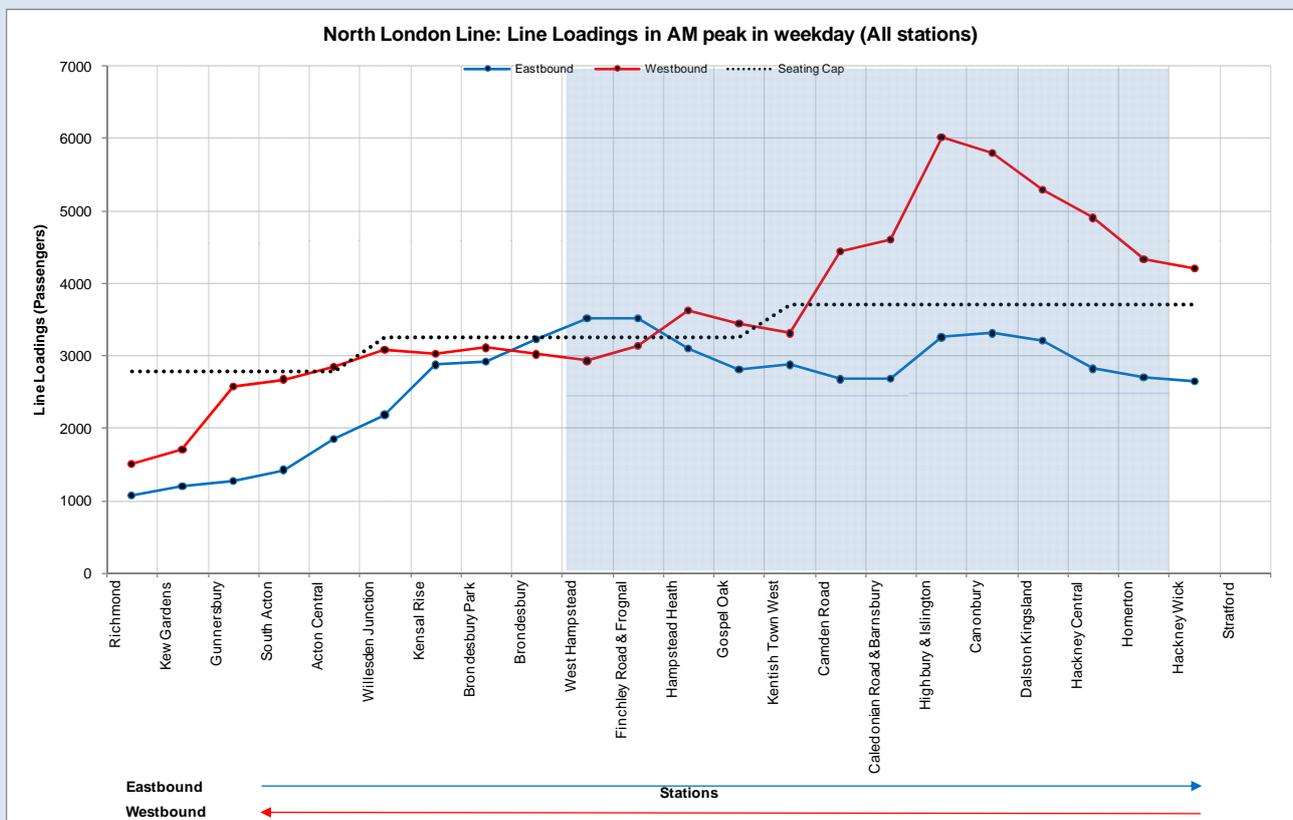


Spotlight on London Overground

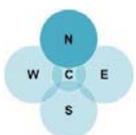
In November 2007 the North and West London Lines were integrated into the London Underground network and rebranded as London Overground, with TfL assuming responsibility for operation from the Department for Transport. Operating under a new TfL London Rail Concession, London Overground services will also run on the East London Railway when it opens in 2010, following TfL's £1bn extension of the existing East London Line. The continuity provided by integration under the TfL banner aims to deliver a safe, secure metro-style service that forms an important orbit rail link for London as a whole.

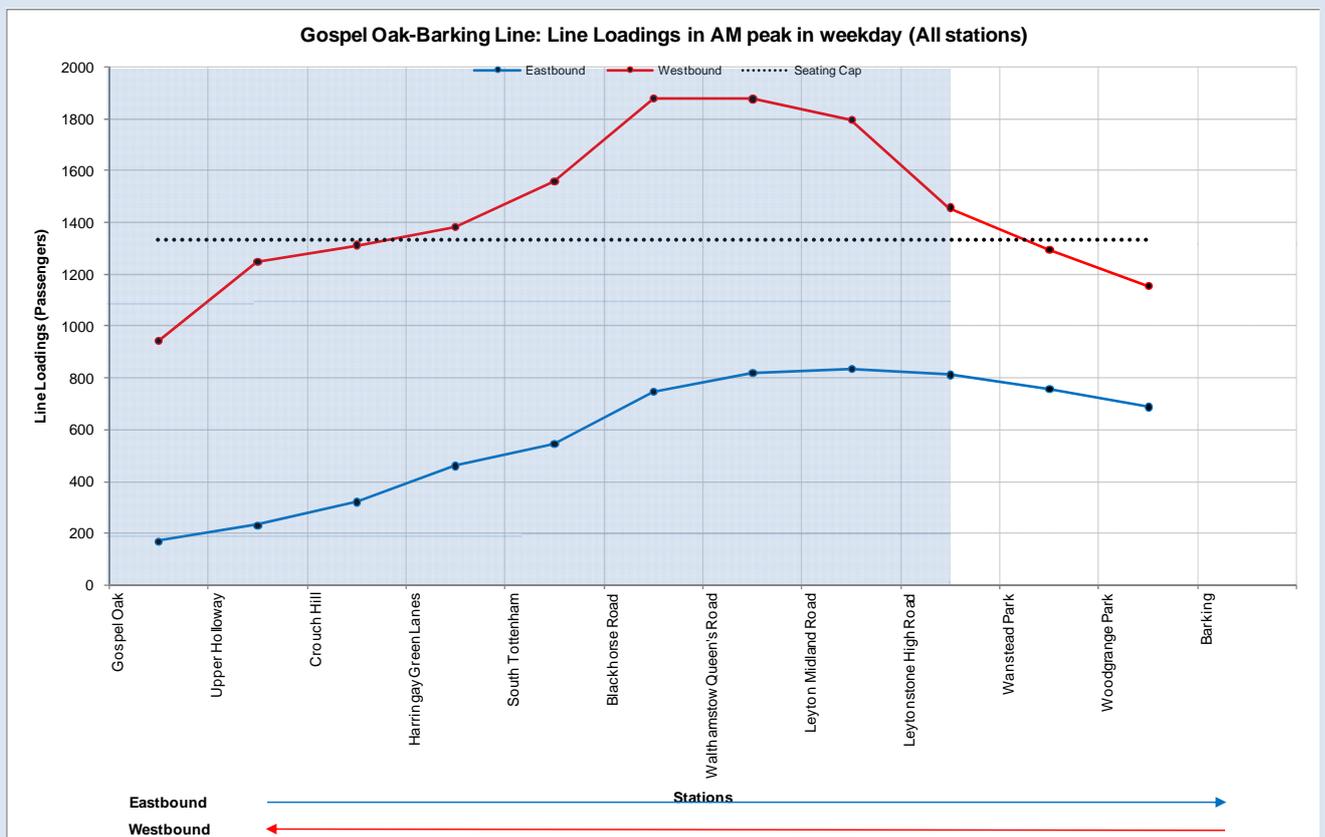


The Richmond to Stratford line (North London Line) provides a significant and continuous orbital connection between Richmond in the south and Stratford in the east and runs roughly along the perimeter of London Underground Zone 2. The graph below shows the flow of passengers in the AM peak (7am-10am). In the eastbound direction the line enters the north sub-region from the west just before the sub-regionally important interchange of West Hampstead where the highest flow of passengers is seen on the route, and the only point where seating capacity is exceeded. Trains leaving from Stratford in the westbound direction are twice as full as those arriving and can be observed to exceed seating capacity, increasing steadily until its peak at the North's sub-regionally important interchange of Highbury & Islington, where the level of crowding begins to fall, dropping below total peak seating capacity by the time Kentish Town West is reached. This level of crowding is then maintained throughout the rest of the NLL in the North sub-region.



Source: Rail origins and destinations data, London Underground, 2008



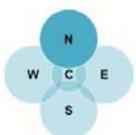


Source: Rail origins and destinations data, London Underground, 2008

The Gospel Oak to Barking Line originates at the Gospel Oak terminus in the north sub-region and terminates at Barking in the east sub-region. In the eastbound direction, total peak seating capacity is never exceeded as the number of passengers increases slowly along the route, peaking between Leyton and Leytonstone. The line is more heavily used in the westbound direction, as seating capacity is exceeded between Wanstead Park and Haringey Green Lanes. In both directions it is this section of the line, on the boundary of the north and east sub-regions, which is the most used and crowded. As with the North London Line, this is probably due to the lack of London Underground infrastructure in this area of London.

Interchange crowding

134. Interchanges, whether locally focused or key transport hubs, are essential to ensuring multi-modal journeys or journeys involving more than one public transport service, are convenient, comfortable, safe and reliable. Interchanges have a crucial role to play in improving the relative attractiveness of public transport to the car and tackling dependency. Sub-regionally important interchanges have been defined as those which provide opportunities for orbital public transport services within the sub-region; are of regional importance in terms of the operation of the network and/ or the access/ regeneration of town or metropolitan centres. They provide opportunities to accommodate sub-regional growth in population and employment, potentially as a result of new and planned infrastructure schemes.
135. The sub-regionally important interchanges in north London include Tottenham Hale, Finsbury Park, Highbury and Islington, West Hampstead, Seven Sisters/ South Tottenham, Walthamstow central/ Queens Road, Hackney Downs/ Central, Brent Cross, Colindale, Golders Green and Walthamstow central. As set out above, many of these stations experience crowding now and in 2031.



136. There is an established process within TfL for prioritising interchanges for improvements. The sub-regionally important interchanges will be included in this process and prioritised for improvements as appropriate to fit with the Transport Strategy, London Plan, borough priorities and transport need.
137. The draft Transport Strategy sets out that there are strategic interchanges that have the potential to relieve interchange capacity pressures at London's central rail termini and enhance travel time. The challenge for north London is ensuring there is adequate capacity in the regionally important interchanges to cope with the forecast growth in population and employment. Examples include, Tottenham Hale with growth as a result of any increase in services at Stansted airport; and Brent Cross and/ or Colindale with forecast growth in the opportunity areas.

Bus crowding

138. The regular review process for the bus network seeks to ensure that overcrowding is addressed promptly. Between 1999/00 and 2008/09 usage of the bus network outside inner and central London increased by 48 per cent while bus kilometres increased by 33 per cent. Usage grew at all times of day and week. Capacity provision has grown faster than bus-km through the use of larger buses where appropriate and by the use of network revisions to redirect capacity to areas of fastest growth. Ongoing review of the network in consultation with stakeholders will help ensure that matching of capacity with demand continues. Desirable bus network changes may require the creation of terminals at new locations. These may include bus stands and driver facilities, and passenger facilities. Figure 32 in section A2 (Improving transport connectivity) shows the pattern of daily boarding on the network. Figure 46 below shows how level of service across the network, which reflects the pattern of demand, again with comprehensive coverage and a focus on the sub-region's town and local centres.

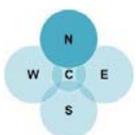


Figure 44: Current crowding on London Underground and Docklands Light Rail lines

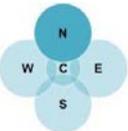


Figure 45: Underground and DLR crowding in the future, despite Business Plan interventions

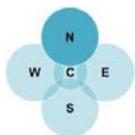
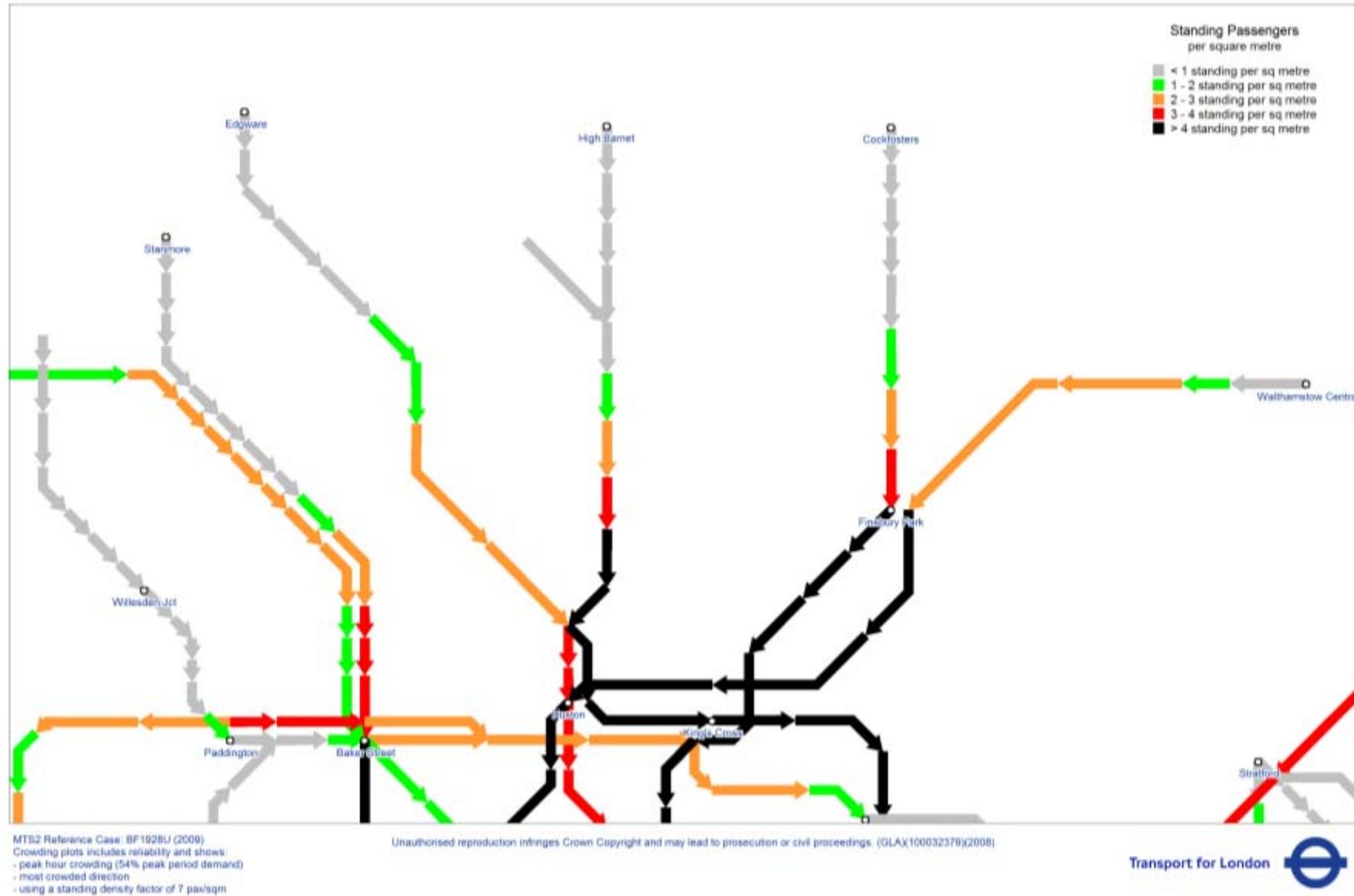
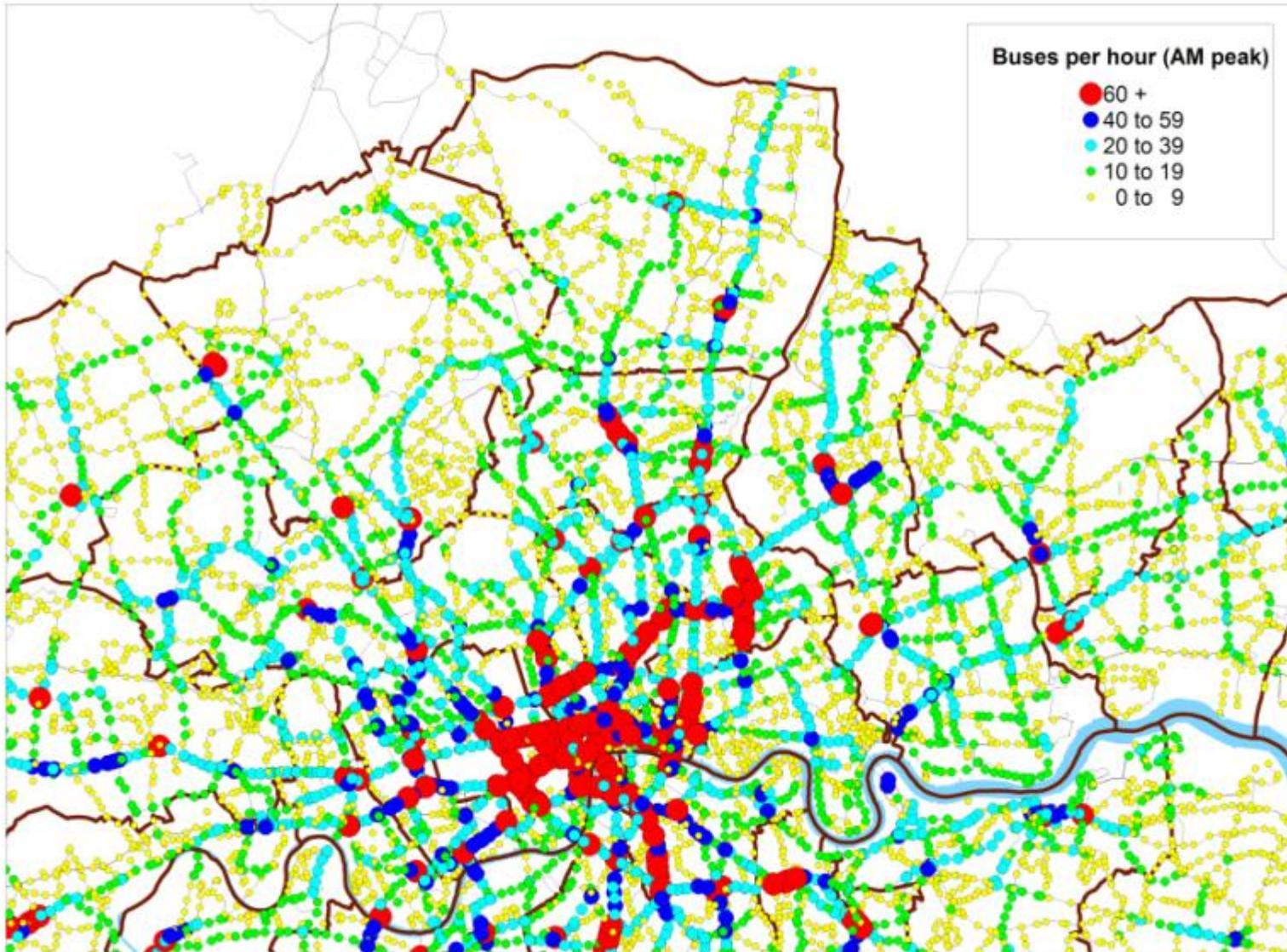
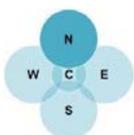


Figure 46: Buses per hour at bus stops in the north London Region (AM Peak)



North London benefits from a large amount of green space, particularly in the Lee Valley. A number of projects have been proposed to further develop north London's green spaces and built environment.

139. North London is a diverse area which plays a significant role in the capital. Renowned for its leafy suburbs, its dynamic local centres and larger parks, it is also crisscrossed with significant road and rail infrastructure providing rapid access to central London and to the countryside, and also has major employment corridors and centres, such as parts of the Lee Valley.
140. Accessible parks and open spaces are hugely important to the well-being of local communities in north London. They are also fundamental to the fabric and character of the sub region and contribute much too outer north London. Yet in spite of its numerous open spaces, parks and recreational areas, a large part of north London is considered to be under-served or lacking access to open and green space (North London Development and Investment Framework, LDA 2007).
141. This network of green spaces is currently being extended under the Mayor's Green Grid initiative. Piloted in east London, the Green Grid is being rolled out across London. The aim is to create a network of interlinked, multi-functional and high quality open spaces that connect with town centres, public transport nodes, the countryside in the urban fringe, the Thames and major employment and residential areas. Besides improving the network of spaces, it will also enable investment in existing and new spaces to be coordinated, addressing such issues as accessibility and visibility mentioned above, and also quality.
142. Linked to this is the Mayor's Great Spaces initiative, helping transform some of London's recognised and lesser known streets, squares, parks and riverside walks. The Mayor has recently published his manifesto for public spaces which is supported by a guide on 'better streets' and a guide on 'better green and water spaces' Within this programme, north London has two secured projects - the Dollis Valley Green Walk in Barnet and a better streets project to improve the street scene on Camden High Street from Camden Town Station to Regent's Canal.
143. Better streets proposals in development for north London are centred on the inner north London boroughs and include two projects in Camden at St Giles Circus and Bloomsbury, a number of Open Spaces in Hackney and Highbury Corner in Islington. In addition, there is also a development proposal for a better streets project at Tottenham Hale in Haringey, linked to the wider masterplan for Tottenham Hale, including the replacement of the gyratory with two-way traffic, and a network of public spaces between Tottenham High Road and Lee Valley Regional Park. The replacement of the gyratory is already funded in the draft Transport Strategy.



144. In terms of aspirational projects, there are better streets projects set out for Golders Green in Barnet, the High Street in Waltham Forest and Farringdon Station in Islington.. There are also a number of aspirational green space projects for north London including Ponders End in Enfield, Tottenham Hale Green Link in Haringey, Danbury Street Ramp and Towpath in Islington and Walthamstow Marshes and Upper Roding Valley in Waltham Forest. Many are linked to masterplan frameworks which have been recently undertaken, exploring development opportunities and better linkages.
145. The secured, development and aspirational projects set out in the Mayor's manifesto, together with the wider Green Grid, will provide significant improvements to the public realm, creating further opportunities for place making, creating new and improved settings for investment in new development to support the diverse population living and working in north London. It will also provide a network of routes for sustainable modes of transport, improving connections and creating greater travel choices in this important sub region.



Wood Green High Street (www.haringey.gov.uk)

146. London Borough of Haringey has established a vision for Wood Green. TfL are currently working in partnership with the Haringey to investigate the potential of delivering the draft Transport Strategy policies and objectives to support the borough's vision and objectives in initiating a pilot town centre study on Wood Green. The study will identify how transport can support the economy and therefore ongoing viability and growth of Outer London town centres. Transport concerns will include cycling, walking, strategic interchange inclusive of bus access and the urban realm as set out within the Better Streets guidance.

Poor air quality has been identified as a key challenge for north London, with the highest emissions from transport occurring in inner London and around the main road corridors in Outer London. Electrification of the Gospel Oak to Barking rail line will help to reduce air pollutant emissions from rail in north London.

Air quality in north London

147. In north London air quality is poorest in the inner north London boroughs and around the main roads in the outer north London boroughs including the M1 and A406, particularly for concentrations of NO₂. The need to reduce air pollutant emissions from road transport has been identified by the boroughs in north London as a key transport challenge. Full rail electrification of the Gospel Oak-Barking line, which is proposed in the draft Transport Strategy for 2013 – 2020, will assist in improving air quality by replacing more polluting diesel trains with electric-powered trains. However, electrification outside London to allow more high speed services into St Pancras and Kings Cross would make a far greater contribution.
148. While no non-compliant PM₁₀ hotspots have been identified by TfL modelling, there may be areas of concern to boroughs. TfL will work with local boroughs to identify appropriate mitigation measures for these locations.

Air pollutant emissions from ground-based transport

149. This section is based on air quality modelling using the 2006 LAEI and is included for background information only. Modelling using the 2008 LAEI is underway and this section will be updated once it becomes available in Spring 2010 with the publication of the Mayor's Air Quality Strategy for public consultation.
150. The extent to which transport affects air quality can be seen clearly in figures 2.48 and 2.49 below which show measured nitrogen dioxide (NO₂) and particulate matter (PM₁₀) concentrations. The highest concentrations are found around busy roads and diesel-operated rail lines. The figures below show that the highest concentrations of these air pollutant emissions are in central and inner London and around Heathrow Airport.
151. Since 1997 local authorities in the UK have been carrying out a review and assessment of air quality in their areas. If a local authority finds any places where the national air quality objectives are not likely to be achieved, it must declare an Air Quality Management Area there. All boroughs in London have declared part or all of their borough an Air Quality Management Area, and have Local Air Quality Actions Plans to seek to address these (see Figure 49).
152. It can be gleaned from the NO₂ and PM₁₀ maps (see Figure 47 and Figure 48) how the North Circular Road and other major roads contribute to NO₂ and PM₁₀ concentrations.

Figure 47: NO₂ annual mean concentrations (µg/m³) for north London, 2006

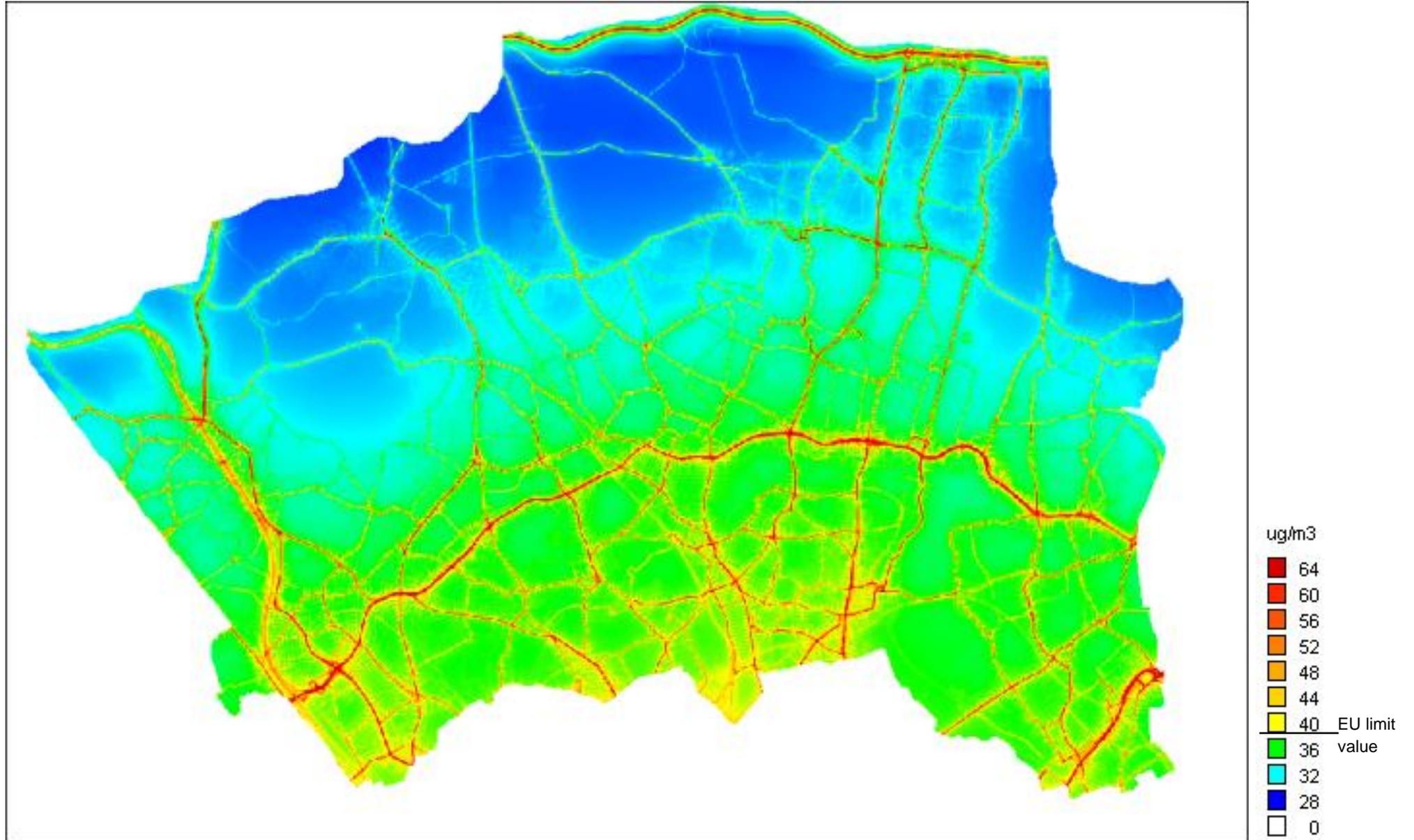


Figure 48: PM₁₀ annual mean concentrations ($\mu\text{g}/\text{m}^3$), 2006

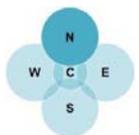
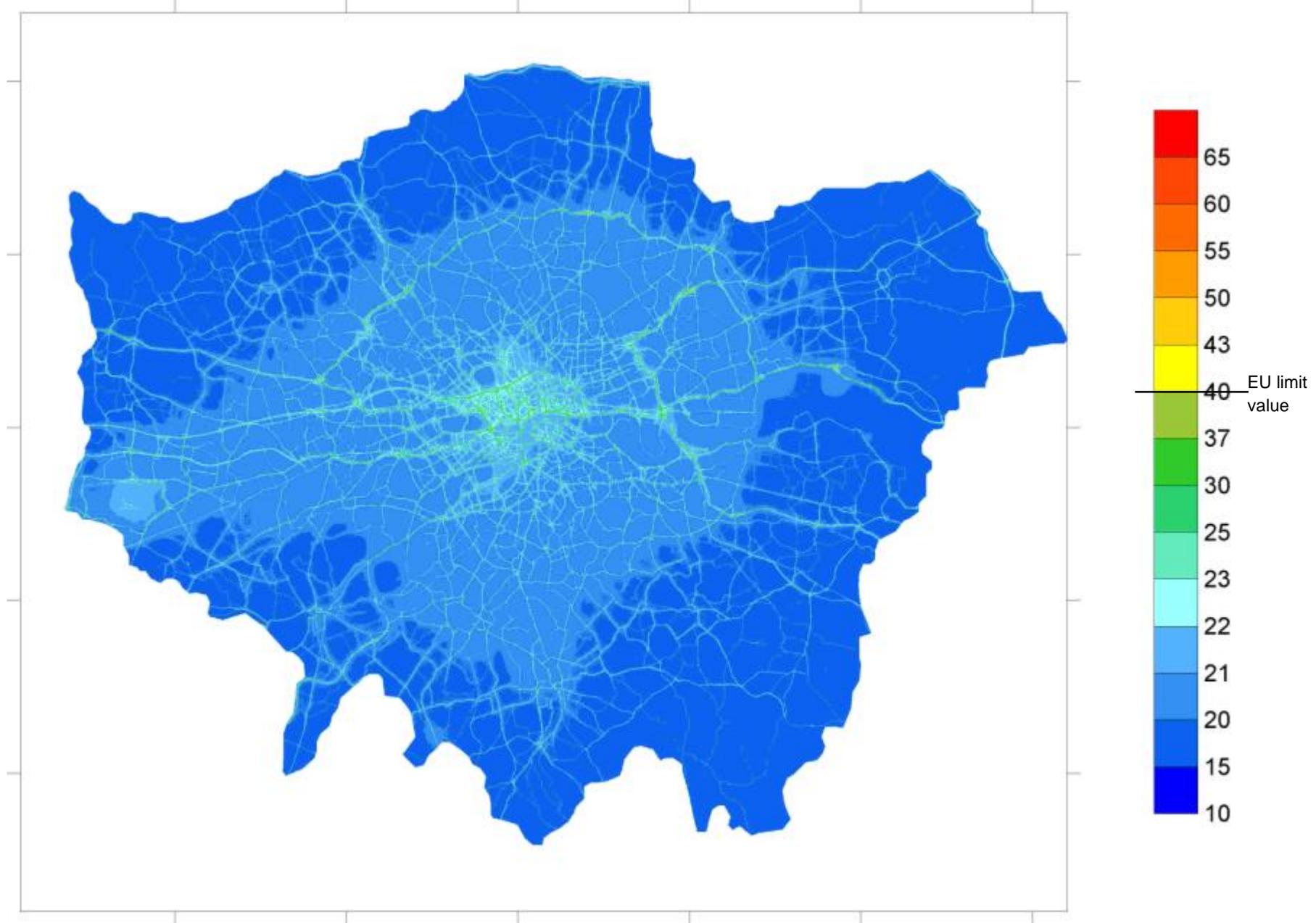
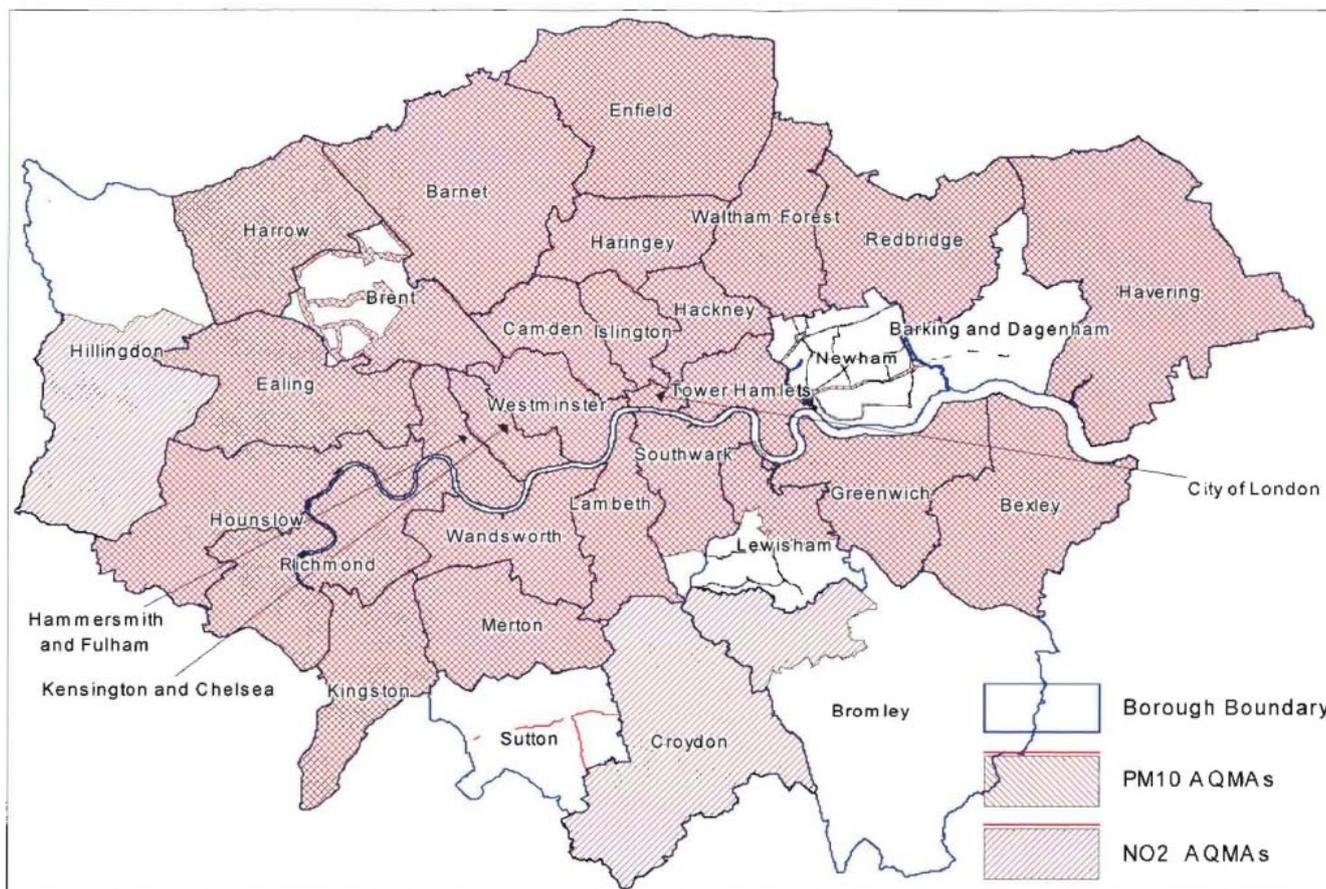


Figure 49: Borough Local Air Quality Management Areas (AQMAs)



Note: All boroughs have declared at least part of their borough as an AQMA. This ranges from only areas with PM₁₀ or NO₂ exceedances, such as major roads, to the whole borough.

The Mayor's Air Quality Strategy

153. The Mayor's Air Quality Strategy sets out how the Mayor proposes to improve air quality in London and meet EU limit values for concentrations of PM₁₀ and NO₂. For transport, the Strategy focuses on measures which will promote behavioural change (e.g. providing more eco-driving training) or will result in a cleaner fleet of vehicles using London's roads (e.g. introducing a new Euro IV NO_x standard from 2015 for heavy goods vehicles, buses and coaches as part of the Low Emission Zone). The overall approach of the Mayor's Transport Strategy to promote mode shift with increased rates of walking and cycling will also deliver air quality benefits.

154. However, some areas of London have specific air quality problems as a result of the make-up of the vehicle fleet using them, traffic speed and other factors. While external contributions can account for up to 40 per cent of PM₁₀ and 25 per cent of NO₂ concentrations, reducing local contributions remains important. For this reasons the situation at these hotspots can be improved by tailored local action. Where necessary special measures can also be used to respond to periods of extremely poor air quality.

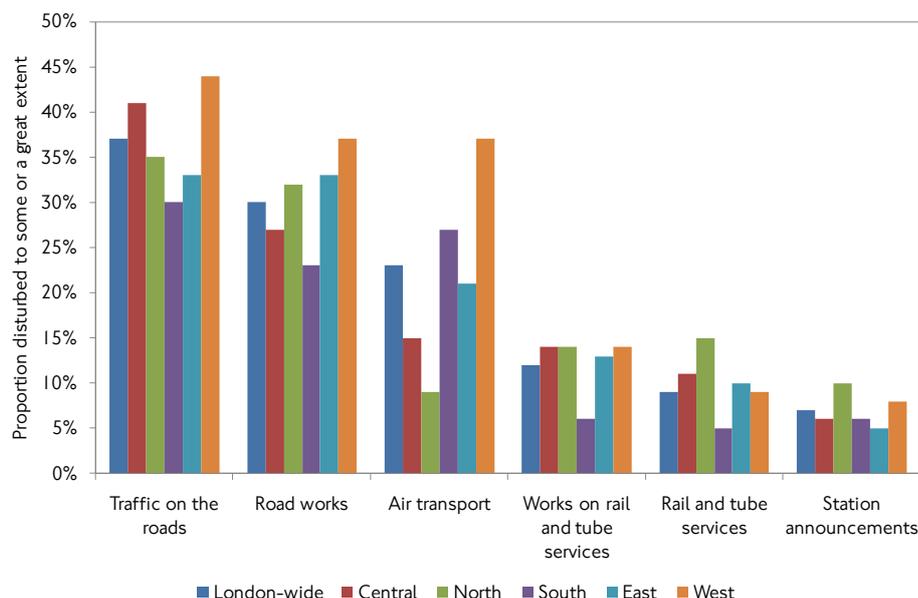
155. Further details of these local and special measures will be included in the public and stakeholder consultation version of the Mayor's Air Quality Strategy. Any measures undertaken by TfL to improve air quality at hotspots will be developed in close partnership with the relevant London boroughs, as these retain their own responsibilities for local air quality as part of the Local Air Quality Management process.

156. Together with the Mayor's Air Quality Strategy a significant achievement can be made in the reduction of emissions of air pollutants, especially by road transport.

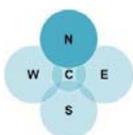
Noise from transport in north London is predominantly highest around the main road corridors, reflecting the make-up of the vehicle fleet using such roads.

- 157. 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 hypertension.
- 158. Noise is predominantly highest around the main road corridors, including the M1, the M25, (and to a lesser extent the A10.). As part of the draft Transport Strategy, TfL is dedicated to reducing the noise impacts of roads & public transport and many of the opportunities outlined in this document will consider this challenge.
- 159. This section provides a summary of the noise analysis in the forthcoming Travel in London 2 report. More detailed analysis of noise at the London-wide and sub-regional level can be found in that report.
- 160. Residents of the north and west regions tend to be the least satisfied with general noise levels in their local area. In general, noise from traffic and congestion was the greatest source of dissatisfaction for respondents to TfL’s Perceptions of the Travel Environment Survey (see Figure 50). North London residents were the most likely to say that general and transport-related noise levels had deteriorated in the past year, with 27 percent and 24 percent of residents saying so respectively, compared with the other sub-regions where most respondents felt that general and transport-related noise levels had remained the same over the past year. In terms of sources of disturbance from noise, north London residents were more likely than residents of other sub-regions to consider rail and Underground services and station announcements caused disturbance by noise.

Figure 50: Disturbance caused by noise from different aspects of transport, residents by sub-region



Source: TfL Perceptions of the Travel Environment Survey, November 2009



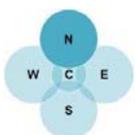
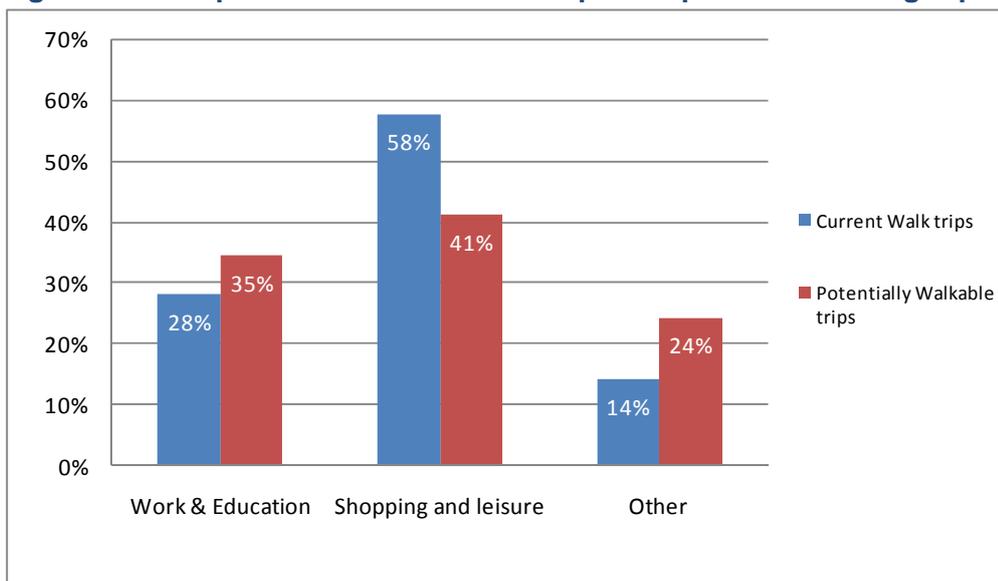
There is significant potential in north London to facilitate an increase in walking and cycling, particularly around town centres. Cycle superhighways offer an opportunity to encourage a mode shift to cycling for journeys through inner London and into central London, journeys which currently experience public transport crowding or highway congestion.

161. Transport affects health both directly, for example through exposure to harmful air pollutant emissions, and indirectly by providing an opportunity for health benefits through physically active travel. This section focuses primarily on the opportunities provided by the draft Transport Strategy to facilitate an increase in cycling and walking.
162. Londoners' health is shaped by where they live and factors such as background, income, employment and education. Social and economic inequalities underpin many of the health inequalities seen in London. North London as a sub-region ranks poorly in terms of the factors making up health inequalities, such as self-assessed health, life expectancy at birth, childhood obesity, infant mortality and lung cancer. Only east London as a sub-region scores worst. However, there is also a spatial aspect this distribution. Health inequalities are strongly linked with deprivation and, there is a significant band of deprivation through the east of the sub-region.
163. One of the outcomes of the draft Transport Strategy is to facilitate an increase in walking and cycling. Increasing physical activity is one of the key lifestyle actions that can help to reduce health inequalities. Analysis of walking and cycling potential in north London indicates that there is considerable potential to facilitate an increase in walking and cycling trips. In addition to improving health impacts by encouraging more physically active modes, any mode shift away from motorised modes of transport is also likely to be beneficial in terms of reducing congestion and reducing emissions from transport.
164. The analysis in this section considers the potential for walking and cycling trips by London residents. 'Potentially walkable / cyclable trips' are defined as trips currently made by other (mechanised) modes which could reasonably be walked/ cycled all the way. This analysis is based upon trips made by London residents, from the London Travel Demand Survey 2005-8 dataset. Trips that were already walked or cycled and trips that could not reasonably be walked or cycled, based upon characteristics of the trip and traveller, were excluded from the analysis. This included trips made by young children, elderly and disabled people, trips which involved carrying luggage, travelling at night, or were over long distances and would be significantly slower. Note that this analysis does not identify any potential for additional cycle or walk trips that could be made by non-residents or the potential for parts of trips to be walked or cycled, which has particularly important implications for central London. This is not a demand analysis and no conclusions are drawn as to whether the potentially cyclable / walkable trips could or would ever be walked or cycled.

Facilitating an increase in walking

165. Each day about a third of a million London residents make at least one walk trip in north London, a total of around 0.8 million walk trips. 27 per cent of all trips in the region are undertaken on foot (a rate which is very similar to the other non-central regions). The walking mode share for London as a whole is somewhat higher, at 31 per cent of trips. In this case, walking mode share refers only to fully walked trips. Many other trips will include some walking and there will be other walk trips by non-Londoners, for example workers on their lunch break, shoppers, etc, that are not included in this figure.
166. A further third of a million trips that are currently undertaken daily in north London by mechanised transport could potentially be walked. This represents 17 per cent of all mechanised trips and 12 per cent of all trips in the region, and if actualised would increase the number of walk trips by more than a third to 39 per cent of all trips.
167. A slightly lower 16 per cent of all mechanised trips made across London by its residents are categorised as potentially walkable, suggesting that actualising these in north London trips could reduce the use of mechanised modes slightly more than the London average. Overall, the potential mode share for walking is similar, at 10 per cent of all trips taken by London residents. It is worth noting in the comparison of actual walking trips with potential walking trip volumes below, that the potentially walkable trips are decreasingly easy to actualise and therefore it could not be expected that the whole pie would ever be walked.
168. People walk, and could walk, for the same sorts of journeys in north London as in other non-central regions. 58 per cent of current walk trips are made for shopping and leisure purposes and 19 per cent are made for education. Potential walking trips are also most likely to be for shopping and leisure purposes, though to a lesser extent (41%), and potential walking trips are a little more likely than current trips to be for other purposes (24%). Though fifty percent higher than the share of current walk trips, work trips still account for only 13 per cent of potentially walkable trips; this probably reflects the relative length of commute journeys compared to more local shopping trips, for example. Figure 51 shows the proportion of current walk and potential walking trips by journey purpose.

Figure 51: Comparison of current walk trips and potential walking trips by journey purpose

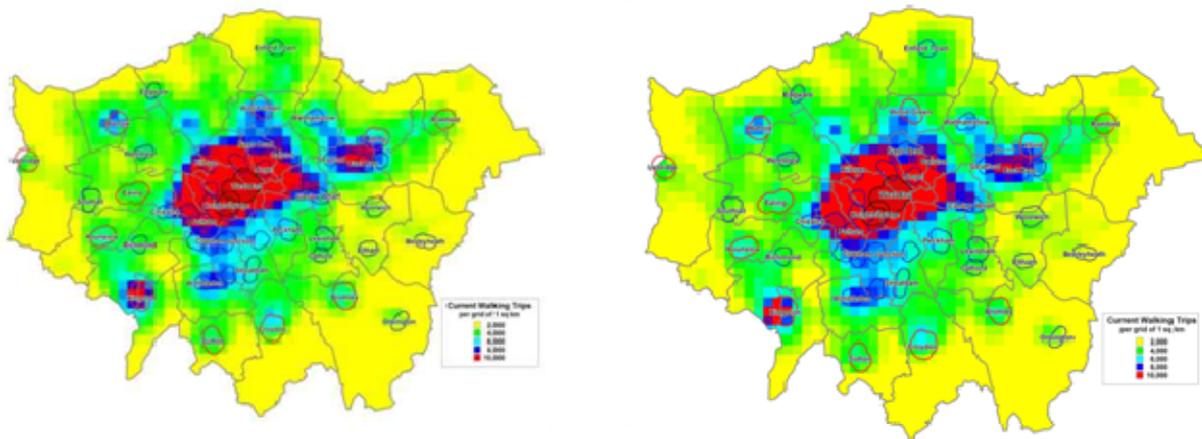


169. About 89 per cent of potential walking trips in the north London sub-region are currently made by car and the majority of the remainder are made by bus (10%), therefore significant benefit could be realised by encouraging the maximum take up of walking. Figure 52 below shows current journey mode for the potentially walkable trips in this sub-region.

Figure 52: Potentially walkable trips by current journey mode

Mode	Trips ('000)	Share of total
Car	321	89%
Bus	36	10%
Underground and Rail	1	0%
Other	4	1%
All Modes	362	100%

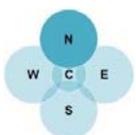
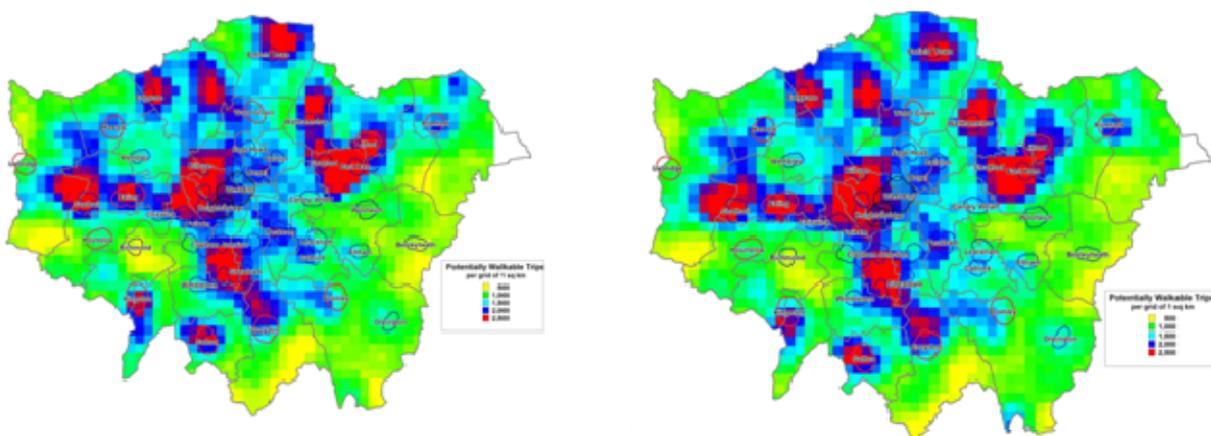
Figure 53: Current walk trips in London by origin and destination



170. Within north London, clusters of origins and destinations of current walk trips can be seen around Wood Green, Walthamstow and Hendon area, otherwise current walk trips are quite dispersed across the sub-region

171. Significant clusters of potentially walkable trips can be seen around Enfield Town, Walthamstow, Edgware and North Finchley town centres, with a lesser concentration of potentially walkable trips around Wood Green.

Figure 54: Potentially walkable trips in London by origin and destination



Facilitating an increase in cycling

172. The analysis used here to identify potentially cyclable trips seeks to quantify the nature and extent of the potential for cycling in London by looking at trips currently made by other modes, as identified in the London Travel Demand Survey 2005/08, and assessing whether they could potentially be cycled. The first stage in this process is to identify all trips which are not already walked or cycled. Next, trips that might not reasonably be cycled are excluded (such as those made by young children, elderly and disabled people; trips which are longer than 8km or which would take at least 20 per cent longer to cycle; trips made at night; and trips made with heavy or bulky goods). It also excludes cycle trips made by non-London residents.
173. This analysis does not draw any conclusions about whether or not potentially cyclable trips could or would in practise transfer to cycling. Many aspects of trips and the people making them are unknown – and previous studies saw around 40 per cent of people say that cycling is simply “not for them” (for example, TfL Attitudes to Cycling Surveys).
174. These results should therefore be seen as providing a maximum potential for cycling and to indicate suitable locations, trips and population groups for further analysis.
175. Only one per cent of all trips with an origin or destination in north London are made by bicycle. This is lower than the overall London average (1.7%). The other non-central London regions (east, west and south London) have rates of 1.5 per cent, 1.6 per cent and 1.8 per cent respectively, while central London has a dramatically higher rate of 2.7 per cent.
176. However, there is great potential to increase the rate of cycling in the north London sub-region. Only one sixteenth of all potentially cyclable journeys are currently cycled. The number of currently cycled trips (22,000) originating in north London is around three per cent of the number of potentially cyclable trips (629,000, a figure which excludes currently cycled trips, as well as trips of lengths and distances which make them impractical for cycling); thus the current rate of cycling is therefore perhaps at one thirtieth of its potential – much lower than the comparable proportion in south and west London which is around one fifteenth. Perhaps a third of all mechanised trips and a quarter of all trips within the north London sub-region could be cycled.
177. In identifying potential approaches to increase the use of cycling as a mode, it is useful to analyse the role that cycling currently plays in the mix of modes in north London, compare this with its potential role, and consider the policy implications.
178. Figure 55 shows that most current cycle trips in north London are made for work and education (41%) or for shopping and leisure (41%). In contrast, potentially cyclable trips are slightly less likely to be for work and education (39%) and slightly more likely to be for other purposes (20%). The proportion of current and potentially cyclable trips for shopping and leisure remains the same. Measures targeted at increasing the uptake of cycling for work and education, such as improved cycle parking facilities at schools, and colleges, as well as education and training, might help to capture this set of potential cyclists.

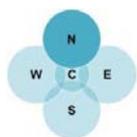
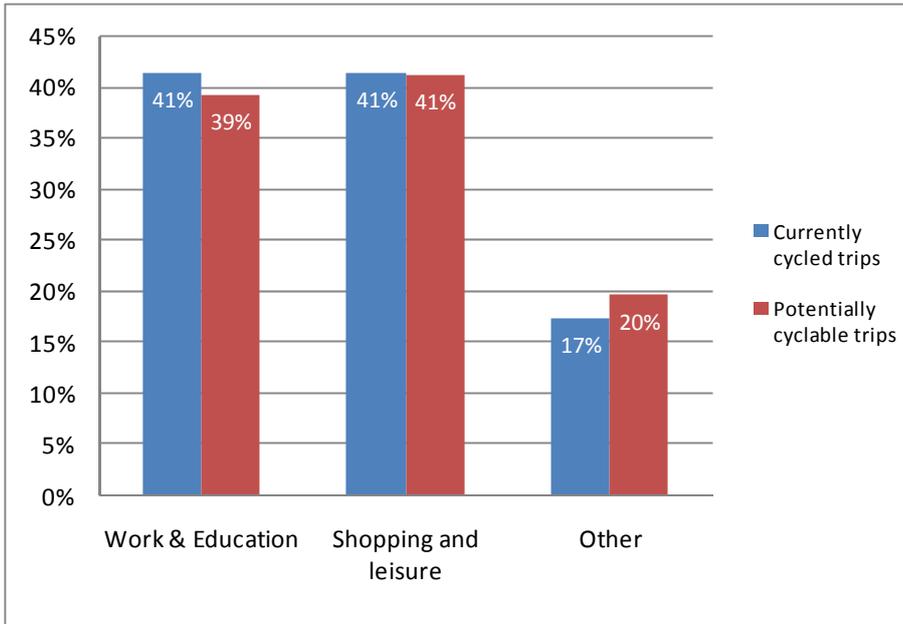


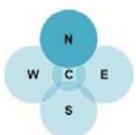
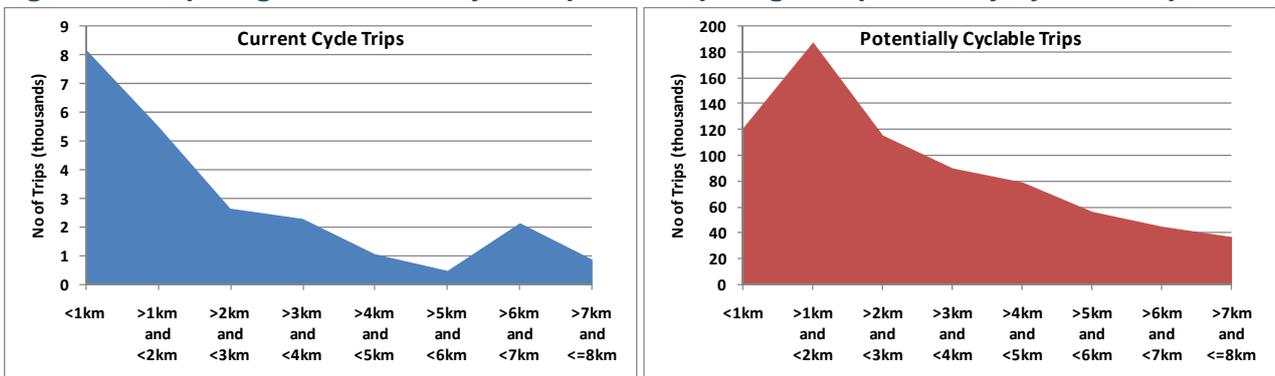
Figure 55: Journey purpose for current and potential cycle trips, 2005-08



179. While 61 per cent of current cycle trips are less than 2 km and 26 per cent are between 2 and 5km, only 42 per cent of potentially cyclable trips are less than 2 km. And while current cycle trips under 1km in length are roughly a fifth of the number of potentially cyclable trips, there is a sharp drop off over 1km and the number of currently cycled trips between 3 and 4km in length is less than a fortieth of the number of potentially cyclable trips of this distance. A similar pattern is discernable also in west and south London, while central and east London exhibit quite different patterns.

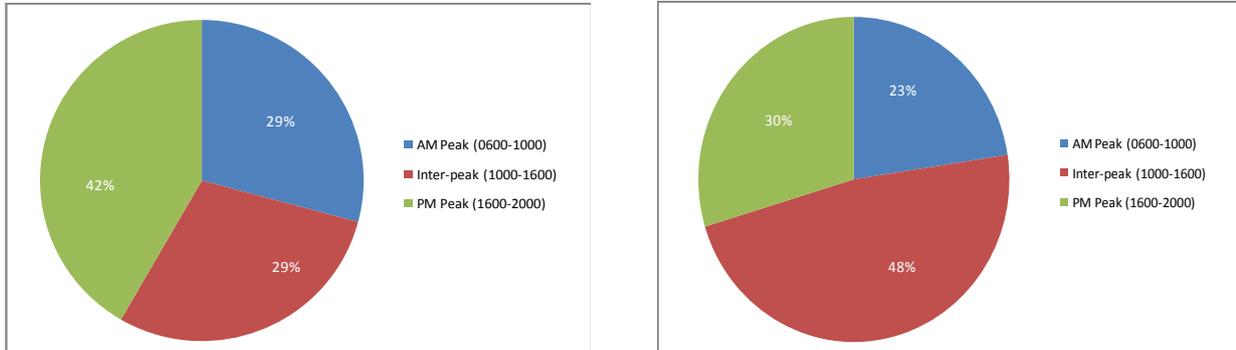
180. An implication is that in north London, policy should target the uptake of cycling for ‘middle-distance’ trips as these are already somewhat underrepresented compared to trips of other distances. Another benefit of targeting middle distance trips is that for these trips cycling is often a quicker option than public transport or the car. A final point to note is that shorter potential cycle trips are often also shorter potential walk trips – it is not clear that targeting these for cycling would be the most appropriate policy when there is far less likelihood of competition for middle distance trips between cycling and walking.

Figure 56: Trip length of current cycle trips and trip length of potentially cyclable trips



181. In common with other regions, current cycle trips in north London are heavily peaked with 71 per cent taking place during the am and pm peaks. However, unlike other regions, potentially cyclable trips are significantly less peaked with 53 per cent taking place during the am and pm peaks. Figure 57 below shows the proportion of current cycle and potentially cyclable trips by time of day. The larger proportion of trips in the inter-peak period probably reflects the much lower proportion of potentially cyclable trips which are work or education related compared to current trips, emphasising that other journey purposes are likely to have greater potential.

Figure 57: Proportion of current cycle trips and potentially cyclable trips by time of day



182. In common with other regions, the majority of currently cycled trips (77%) and potentially cyclable trips (87%) with an origin in north London also have a north London destination. The pattern is very similar for trips with a destination in north London (and similar to the pattern for most sub-regions excluding central London), suggesting that many round trips are undertaken. Also in common with other regions, the destination with the next greatest share of trips originating in north London is central London which accounts for 14 per cent of current trips. These trips are likely to benefit from initiatives such as Cycle Superhighways.

183. However, trips to central London make up only five per cent of potentially cyclable trips, suggesting that further investment should be targeted at trips internal to north London, and again reflecting the greater prevalence in the current cycle mode share of work trips which are in various ways more readily provided for (for example, through the installation of shower facilities and secure cycle storage), and perhaps because the prevalence of these journeys results in a perception of greater safety in numbers for cycling.

184. The most popular destinations and origins for current cycle trips are Barnet, Enfield, Haringey and Waltham Forest. This fits closely with analysis showing that boroughs with high levels of cycling tend to be those which have populations with a high propensity to cycle (who are younger and in steady employment for example), have good access to parks and open spaces, and which have invested more heavily in cycling over the last eight years. It is possible that the level of cycling in these town centres is underreported because of the greater prevalence in Outer London town centres of people from outside London, who are not captured in the analysis.

185. Meanwhile Barnet and Enfield also offer the most potential as both origins and destinations (both at around 30% for both origin and destination). All other things being equal, targeting investment here ought to maximise benefit. However, recent analysis undertaken on behalf of TfL suggests that the influence of sociological factors on the uptake of cycling should not be overlooked and that targeting areas where the population is for various reasons less likely to take up cycling, might yield relatively little benefit.

186. Within the north London sub-region, clusters of potentially cyclable trips are observed around Enfield town and Walthamstow. Smaller clusters are also visible around Wood Green and Edgware and Finchley, but the origins of the rest of the potentially cyclable trips are quite dispersed.

Figure 58: Potentially cyclable trips in London by trip origin

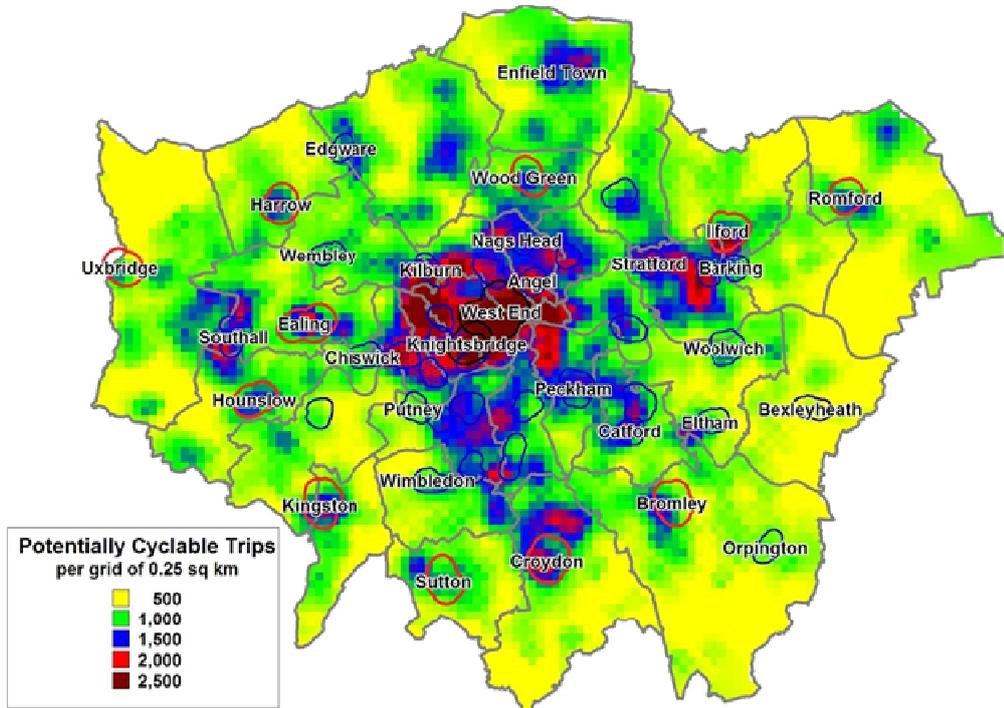
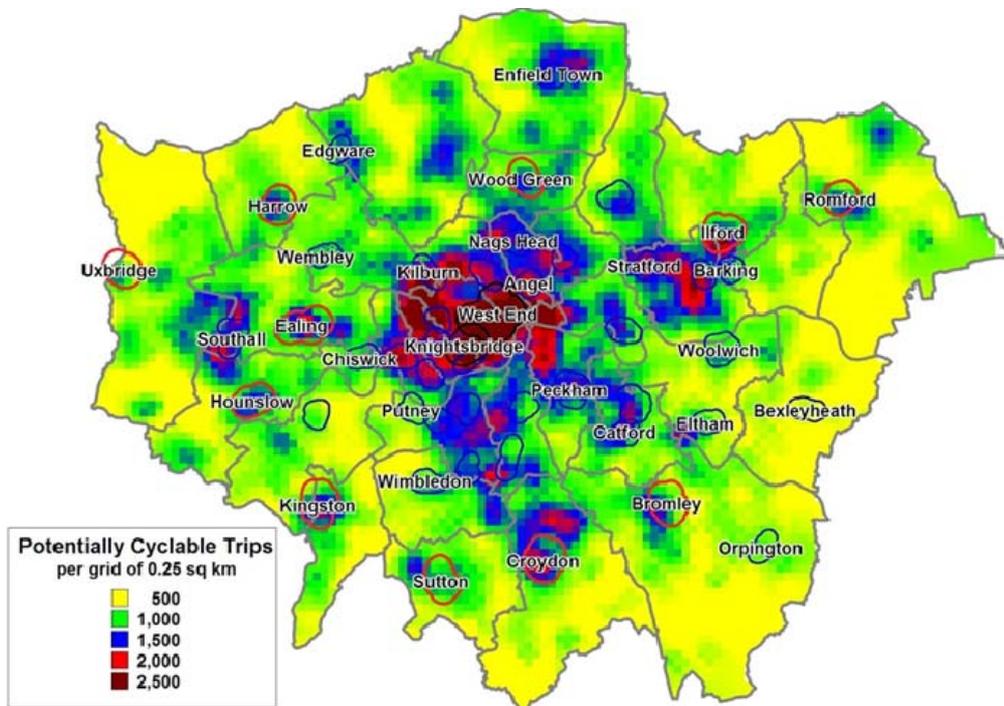
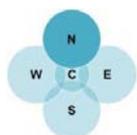


Figure 59: Potentially cyclable trips in London by trip destination



187. In common with all the sub-regions excluding central London, around three quarters of potentially cyclable trips are currently made by car, a figure which demonstrates on one hand the enormous potential of an increase in cycling to reduce congestion and emissions of CO₂ and atmospheric pollutants. On the other hand, however, this figure serves as a reminder of the huge challenge inherent in converting potential cycle trips to actual cycle trips.
188. TfL has recently announced that Haringey is to become a 'biking borough'. It will receive funding from TfL for a local study examining how cycle journeys can be increased. Any potential cycling initiatives can then be integrated into Haringey's Local Implementation Plan, setting out how it supports the Mayor's transport priorities.
189. TfL analysis shows that 4.3 million potentially cyclable trips take place each day in London. In very broad terms, around one in seven of these trips would need to be cycled in order to achieve the mode share target (assuming no other change, in today's conditions and for London residents only). This means that although TfL is not yet in a position to assess the likely demand for cycling, or to fully appreciate what measures would need to be put in place in order to realise this demand, the potential is available to achieve the Mayor's target of a five per cent mode share for cycling.
190. TfL is in the process of refining its understanding of the factors influencing the likely uptake of cycling, including undertaking surveys to assess the effects of demographic characteristics on cycle usage. This work will also assist in the formulation of potential packages of measures optimised to specific sets of conditions in order to maximise the return on investment in cycling.



C

Safety and security

C1

Reducing crime, fear of crime and anti-social behaviour

Reducing crime rates (and improved perceptions of personal safety and security)

191. The risk of becoming a victim of crime on the transport system is at its lowest since recording began five years ago on London Underground, DLR and London bus networks³. In 2008/9, there were 12.1 crimes per million bus passenger journeys and 13.1 crimes per million London Underground passenger journeys, (down from 15.2 and 14.4 respectively in 2007/08). This reduction is coupled with improving passenger feelings of safety and security while travelling on the network.
192. North London experiences generally lower levels of crime and anti-social behaviour on both the bus and rail network than the London average.
193. Figure 60 and Figure 61 show relative levels of vulnerability to crime and antisocial behaviour using the CSEP “composite index”. This includes violence, theft, damage and disturbance. Green areas have a composite index of below 175 (lower than the London average); and orange and red areas have an index of 250-324 and over 325 respectively (both higher than the London average). These maps are based on actual numbers rather than crimes per journey so the areas with higher numbers of both journeys and people are expected to have the highest level of vulnerability. The level of vulnerability is derived from a composite index which yields a score per ward indexed to the average ward score across the whole of London, rather than across the sub region.
194. For the bus network, there appear to be higher levels of crime and anti-social behaviour in inner London, west of Haringey and its border with Waltham Forest and south of Barnet around Cricklewood. This corresponds with relatively high levels of bus use. In terms of the rail network, there is only one ward with very high levels of crime and anti-social behaviour, Grange ward which includes Grange Park and Winchmore Hill stations.

³ Community Safety Plan for travelling and transport in London 2009/2010

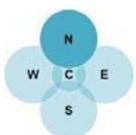
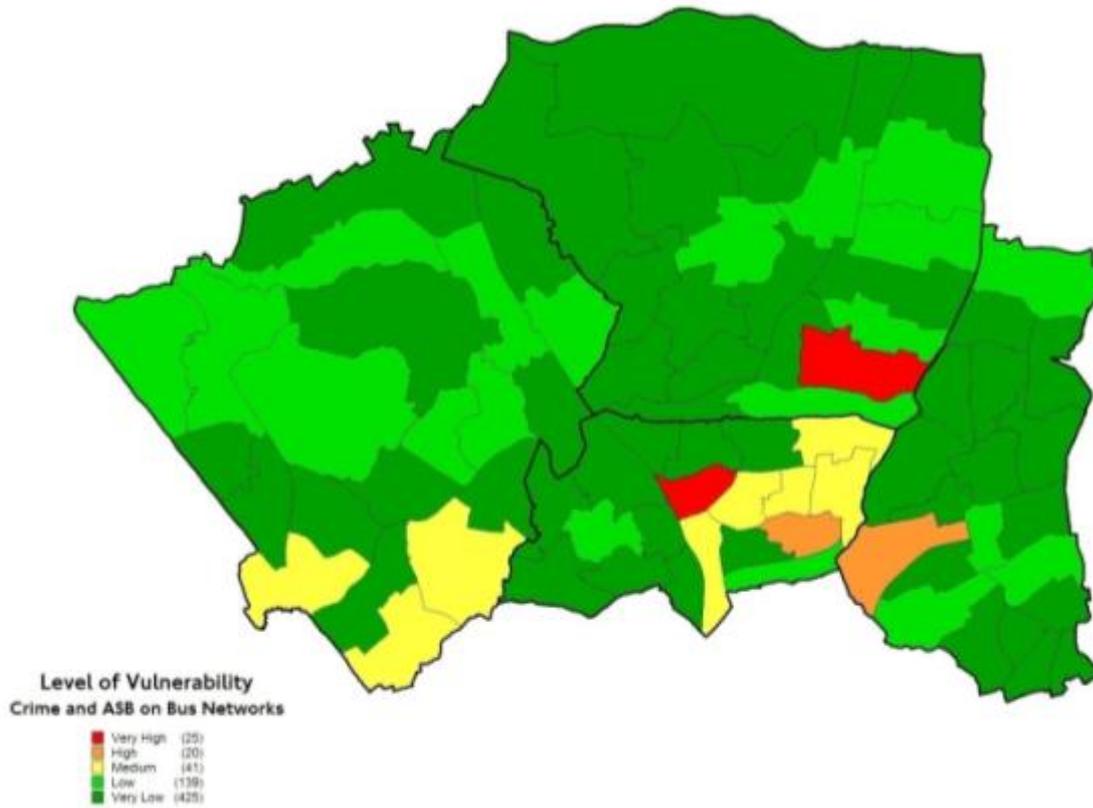
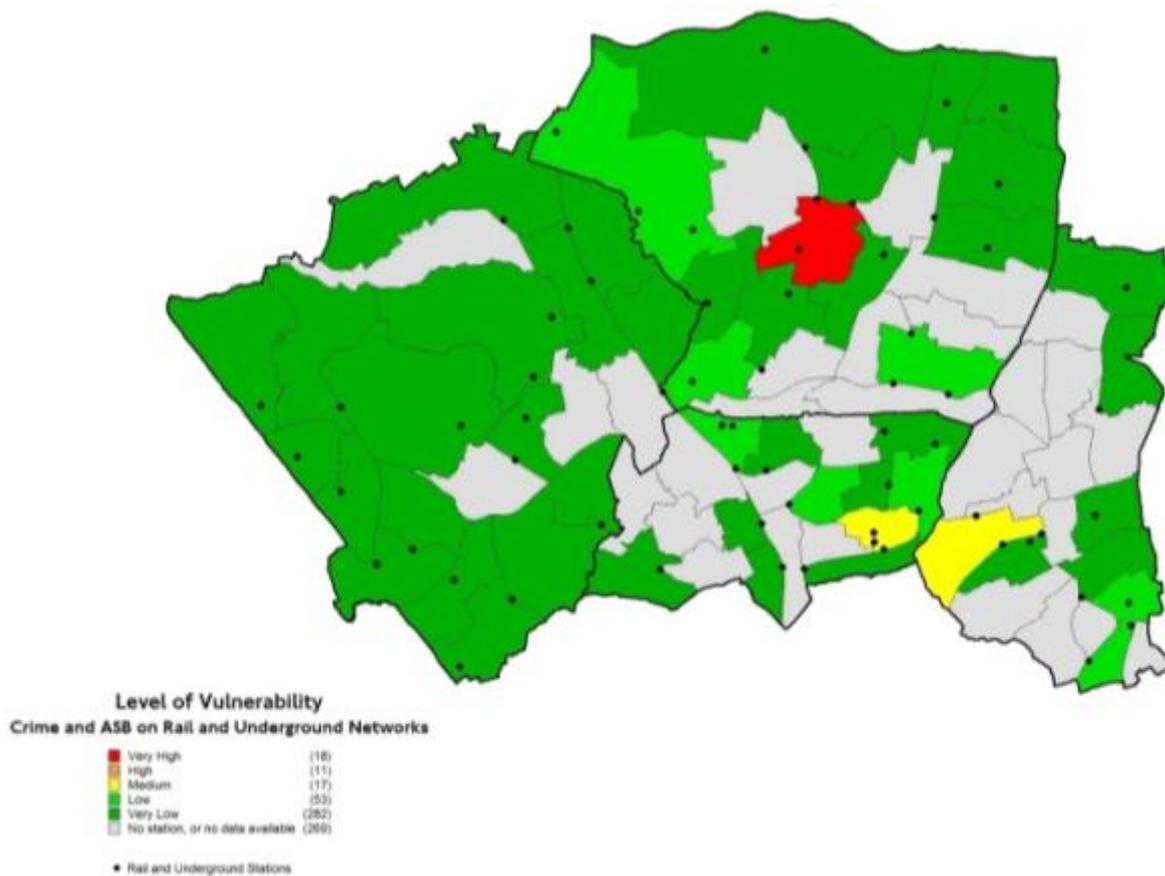


Figure 60: Bus and Rail Overall Crime and Anti-social Behaviour in the north sub-region



Source: TfL Community Safety, Enforcement & Policing (CSEP) - 2009 Strategic Assessment

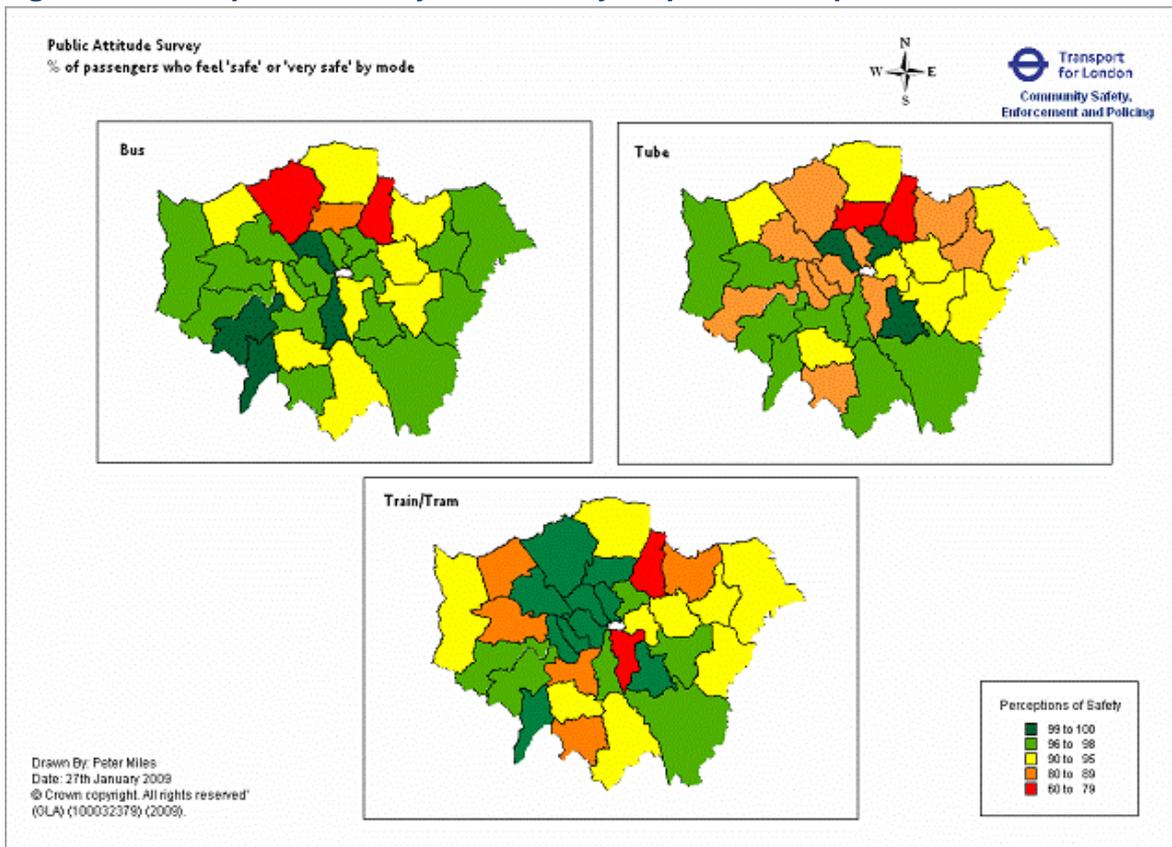
Figure 61: Rail (including Underground) overall crime and anti-social behaviour in the core north sub-region



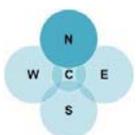
Source: TfL Community Safety, Enforcement & Policing (CSEP) - 2009 Strategic Assessment

195. The perception of safety and security can act as a significant barrier to travel. The Metropolitan Police Service Public Attitude Survey for October 2006 to September 2007 identifies Londoners' perceptions of safety whilst travelling, by mode. Results of this survey are based on the Borough of residence of the respondents, rather than the Borough of travel. North London has low levels of perception of safety compared to the other sub-regions. The scores for safety on the bus network were generally very high across London with only three boroughs receiving less than 90 per cent response of feeling safe or very safe (see Figure 62). All three are in north London, Barnet, Waltham Forest and Haringey. Perception of safety and security on the Tube network shows a similar pattern to the bus network with low levels reported across the four boroughs. Waltham Forest and Haringey scored 76 per cent.
196. Perception of safety and security results for train/ tram network are somewhat inconclusive due to, in some cases, very low volumes of respondents.

Figure 62: Perception of safety and security on public transport



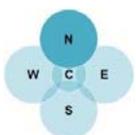
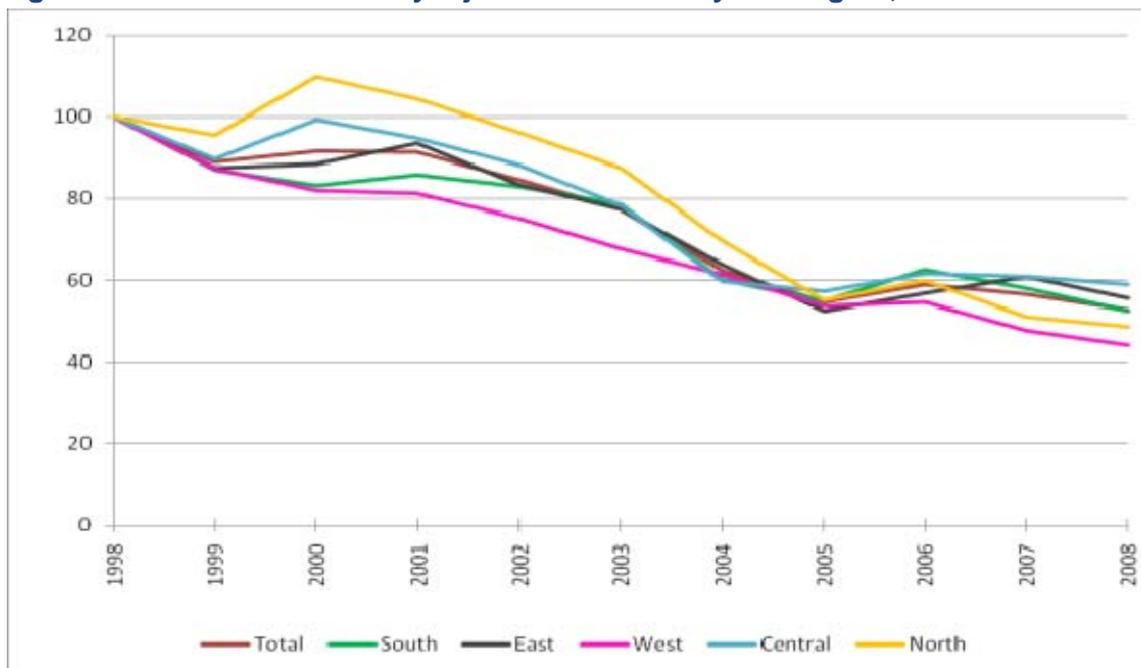
197. The data shows that north London has very low levels of crime and anti-social behaviour on the public transport network, however, the residents of north London report the lowest levels of feeling safe or very safe. The perception of safety may act as a barrier to travel for some residents of north London which would have an impact on both their quality of life and the economy of north London.



North London has experienced larger decreases in the number killed or seriously injured in road accidents than the London average though more should still be done. There are key casualty hotspots in Wood Green, Leyton, Walthamstow and Turnpike Lane.

198. In 2008 there were around 3,700 road casualties in the north sub-region. This figure represents an improvement in safety as in recent years generally the number of casualties on London's roads as a whole have fallen substantially and the London target for a 50 per cent reduction in the number killed or seriously injured by 2010 is likely to be achieved. Despite this progress the number of injuries is unacceptable and new targets are likely to be set in 2010 for reductions to be achieved by 2020 to mirror new targets to be set by government.
199. The reduction in the number of injuries has varied by region as Figure 63 illustrates. The core north sub-region has had a 51 per cent reduction in the number killed or seriously injured. It has experienced larger decreases than the London average.

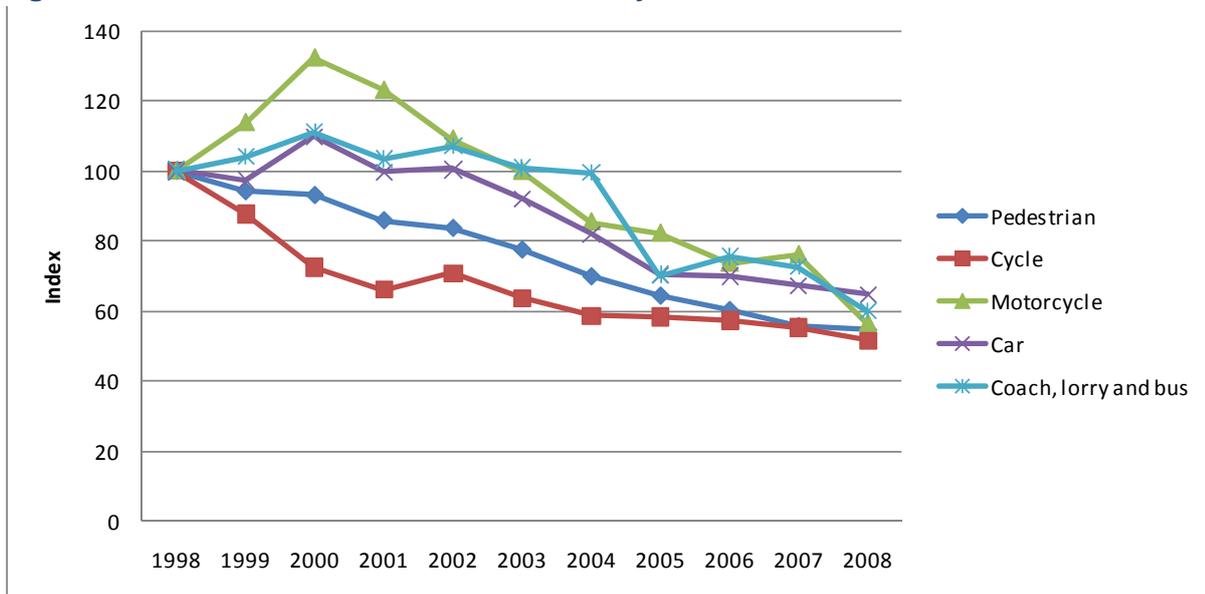
Figure 63: Killed and seriously injured casualties by sub-region, indexed from 1998



Casualties by mode

200. Overall casualties have reduced for all road user groups in the core north boroughs. However, progress and declines have varied by road users. In particular, the number of cyclist killed or seriously injured has reduced in the last three years which is different to the trends seen in other sub-regions (Figure 64).

Figure 64: Road casualties in north London by mode, indexed to 1998

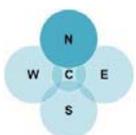
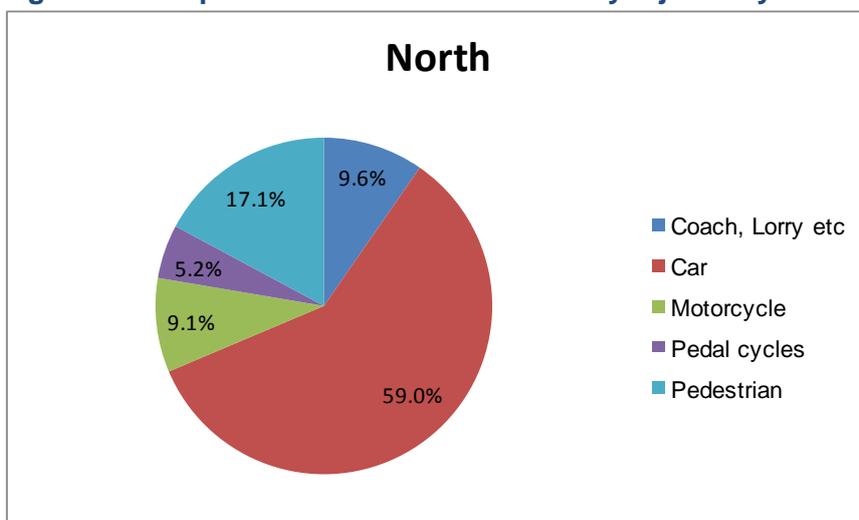


201. Pedestrian, motorcyclist and cyclist casualties have all fallen at a faster rate than casualties in cars between 1998 and 2008. However, the casualty rates per km travelled for their modes remain considerably higher than for car.

202. Figure 65 shows the distribution of casualties by mode. In the north sub-region, car users have a slightly higher than average proportion of casualties – and cyclists and motorcyclists a lower proportion – than other parts of London. Overall, mode shares in north London are very similar to other (non-central) sub-regions.

203. Between 1998 and 2008, there has been an increase in the proportion of car KSIs and smaller decreases in the proportion of motorcyclist and cyclist KSIs.

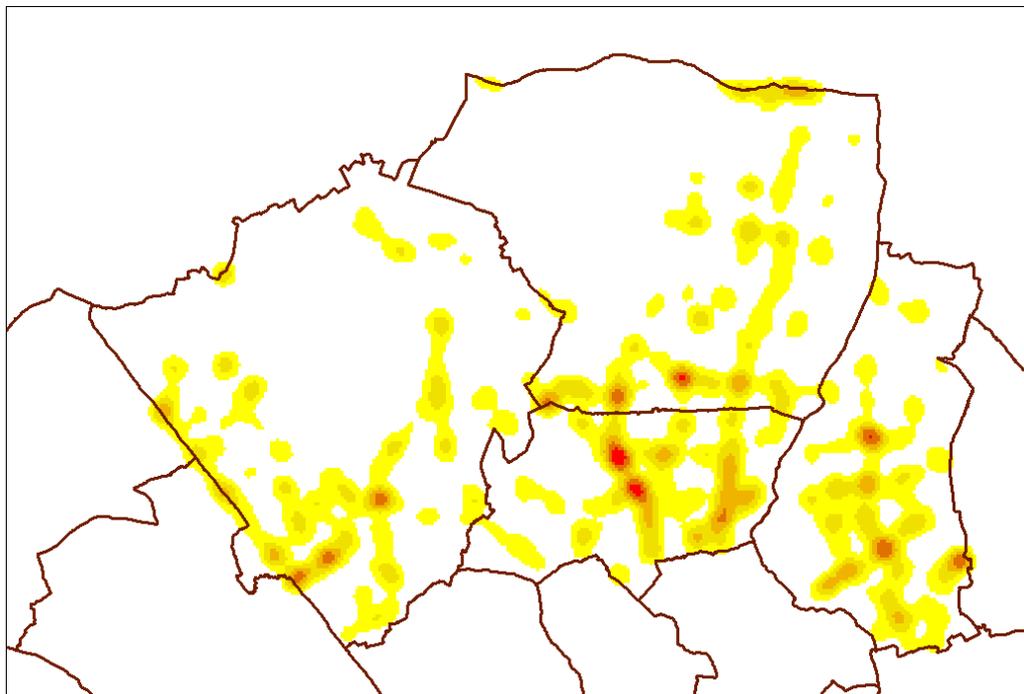
Figure 65: Proportion of Killed and seriously injured by mode, north London, 2008



Where the casualties are in the sub-region (hot spots)

204. A cluster analysis, as set out in Figure 66 below, reveals that there are several hotspots where casualties are concentrated. The areas immediately surrounding Wood Green, Leyton, Walthamstow and Turnpike Lane have elevated casualty distributions.

Figure 66: Cluster analysis of hotspots where casualties are concentrated based on 5 years of data



205. The draft Transport Strategy includes a number of proposals that seek to improve road safety. In addition, some of the boroughs in north London have also identified improving road safety as a local issue, for example Islington has already implemented 20mph zones across the borough. Given that improving road safety is addressed at a London-wide level in the draft Transport Strategy and by boroughs at the local level, improving road safety is not considered in any more detail as a challenge specific to north London in this document.

C3

Improving public transport safety

Reducing casualties on public transport networks

While the risk of injury to passengers and staff on London's public transport network is low it is essential that high health and safety standards are maintained as the demand for public transport increases.

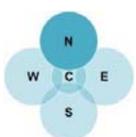
206. The injury risk posed to passengers and staff on London's public transport networks is already very low. The draft Transport Strategy seeks to ensure that high health and safety standards are maintained as public transport provision expands and to reduce the risk of disruption from unpredictable events. Therefore, improving public transport safety is not considered in any more detail as a challenge specific to north London.

D	Transport opportunities for all Londoners		
D1	Improving accessibility	Improving the physical accessibility of the transport system	Improve access to services

Access to public transport in north London is highest in inner London and in Outer London on the radial rail corridors into central London. There are, however, pockets of lower accessibility throughout the sub-region. In terms of physical accessibility, few rail stations in north London, other than the most regionally important interchanges are accessible. While buses are fully accessible, not all bus stops are and TfL has a target of 65 per cent compliance for the current Business Plan.

Physical accessibility to the transport network

207. Providing a transport system which is accessible to as many people as possible is a key priority for providing transport opportunities for all Londoners. Some parts of the transport network are accessible such as the DLR and Tramlink networks and almost the entire bus fleet. However, other parts of the network are more problematic with only a small percentage of London Underground stations providing step free access from platform to train at all platforms and almost 50 percent of the bus stops being accessible. In the north sub-region just over a third of bus stops are accessible while almost a third of junctions on the TLRN meet BV165 criteria which state ‘*signal controlled crossings incorporate dropped kerbs, tactile paving and audible and tactile signals*’. There is an ongoing programme of improvement of the transport network and current plans include a target for making 65 percent of bus stops accessible in London by the end of the business plan period (2017/18).



Access to opportunities and services

208. Access to opportunities and services is a new accessibility measure for London which has been developed to help assess the level of access to employment and essential services. Improving Londoners' access to key services which have the greatest impact on life is important in providing transport opportunities for all Londoners. The measure includes access to education, health services, quality food shopping, open spaces and jobs.
209. Figure 67 shows the composite accessibility score for all areas in London by public transport and/or walk with A representing the highest level of access and E the lowest. Areas in central and inner London as well as town centres across London have higher level of access to employment and services with the less dense populated areas of Outer London having the lowest scores. These results reflect both the level of public transport provision but also the density of services in London. North London benefits from relatively high level of access to jobs and services. Figure 68 shows average travel time to key services by public transport and/or walk. Average travel time for accessing any of the services is under 20 minutes for all boroughs within the sub-region. Travel time to further education colleges from Haringey and Waltham Forest is between 30 and 45 minutes and is the longest travel time for accessing a service in the north sub-region.

Figure 67: Average travel time (in minutes) to key services by borough in the north sub-region, by public transport and/ or walk, 2009

Borough	Travel time to primary schools	Travel time to secondary schools	Travel time to further education	Travel time to GPs	Travel time to food shopping	Travel time to services
Barnet	10	15	28	11	11	15
Enfield	10	14	33	11	11	16
Haringey	8	11	30	9	10	14
Waltham Forest	9	11	25	9	10	13
<i>Camden</i>	8	12	26	8	9	13
<i>Islington</i>	8	11	23	8	9	12
<i>Hackney</i>	7	10	21	8	10	11

Public transport accessibility

210. Access to public transport in London is measured through the Public Transport Accessibility scores (PTALs). Figure 69 below shows public transport accessibility levels in London with band 1 representing low level of accessibility and band 6 high while zero represents no public transport access within the specified parameters. There are areas in the North sub-region which have relatively low PTAL score especially areas furthest from radial underground links. However, this does not necessarily mean that access to key services is a problem across the sub-region. A number of areas, particularly in the inner/ Outer London boundary have high access to services despite a low PTAL score as these services are more easily accessible by walking. This highlights the importance of service provision planning and how it can assist with promoting more sustainable (and active) modes of travel.

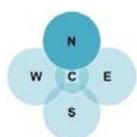


Figure 68: Access to opportunities and services by public transport and/ or walk, composite score, 2009

Access to Opportunities and Services 2009

ATOS Service Composite Score

Mode: PT and/or Walk

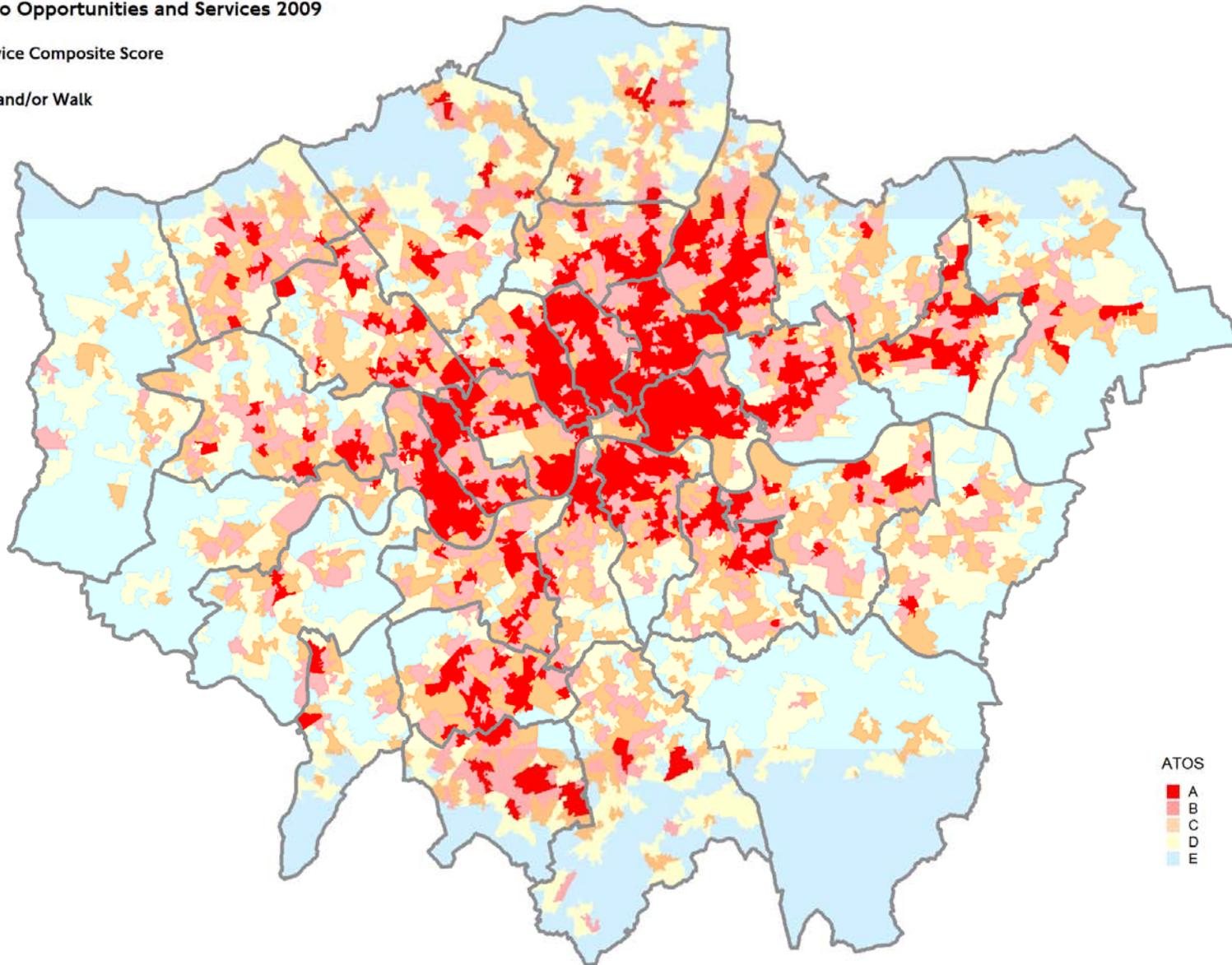
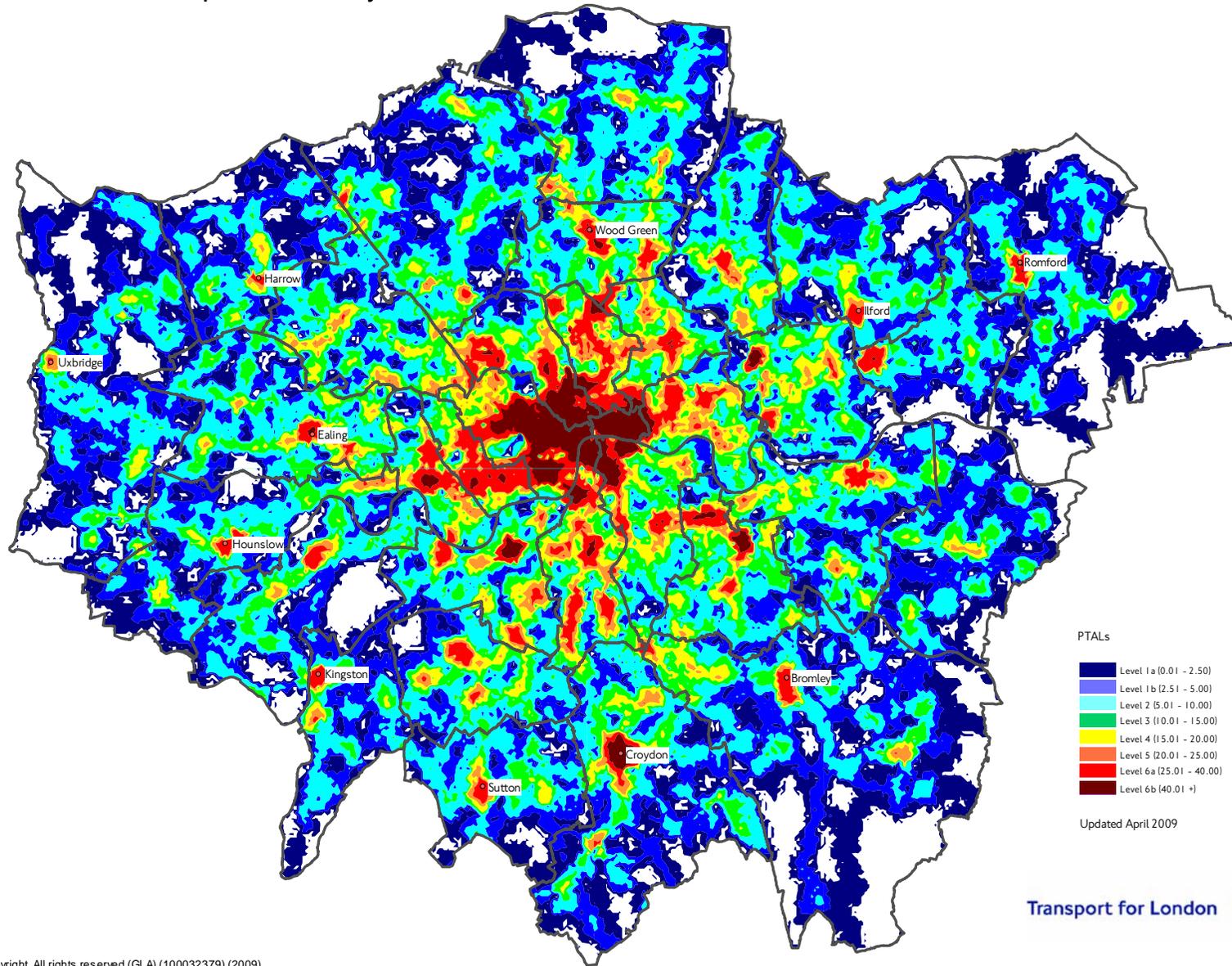
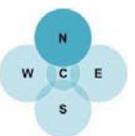


Figure 69: Public transport accessibility, 2008

Greater London Public Transport Accessibility Levels
PTALs



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There is a significant band of deprivation through the Lee Valley but the designation of opportunity areas, intensification areas and strategic industrial locations provides a significant opportunity to tackle this deprivation through development and regeneration. While the intensification areas are well served by transport, regeneration in the opportunity areas will require additional investment in public transport infrastructure alongside policies in demand management to realise their full potential. Development related to the Olympics and its legacy provides an important opportunity for tackling deprivation within the Olympics boroughs.

211. There is a significant band of deprivation through the Lee Valley but the designation of opportunity areas and intensification areas, such as the Upper Lee Valley, Brent Cross/ Cricklewood and Wood Green, provides a significant opportunity to tackle this deprivation through regeneration. While the intensification areas are well served by transport, regeneration in the opportunity areas will require additional investment in public transport infrastructure to realise their full potential.
212. Within the north London area, there is a fairly well defined line that can be drawn in a north east to south west direction that separates wards in the 20 per cent most deprived areas in the UK, from wards that tend towards being in the 20 per cent least deprived, as can be seen in Figure 70. This division is also partially seen in car ownership, and both will reflect differences in travel demand, relative ability to travel, and mode choice and share.
213. In north London, many deprived areas have relatively good public transport accessibility scores, particularly where the areas correspond with the major radial transport corridors. One challenge for north London, particularly for the eastern boroughs, is ensuring access to Stratford to benefit from opportunities arising from the Olympics and development.
214. There is no clear correlation between deprivation and public transport accessibility. As can be seen in the public transport accessibility map above, particularly in inner north London, public transport accessibility is generally pretty good in the areas that are shown in the areas of multiple deprivation map above as being in the 20 per cent most deprived in London. In 2007, Haringey is ranked the 18th out of 354 boroughs in the Index of Multiple Deprivation (IMD) 2007 (1 = most deprived, 354 = least deprived). Deprivation pervades the north east of the borough, in White Hart Lane and Northumberland Park, including Wood Green and Haringey Heartlands. Waltham Forest ranking the 27th has eight wards with at least one statistical output area in the top 10 per cent of deprived statistical output areas in the country. These are Hoe Street, Cathall, Markhouse, Wood Street, Cann Hall, Leyton, Valley and Higham Hill.
215. Investment in new transport links in north London can make a positive contribution to local regeneration when coordinated with the spatial planning process. Opportunity areas in the Upper Lee Valley, Brent Cross/ Cricklewood and Colindale/ Burnt Oak and the areas for intensification are the focus of transport investment concentrated on supporting growth, which should also have a beneficial impact on supporting regeneration and tackling deprivation. Supporting wider regeneration has not been identified as a specific transport challenge in north London and is not considered in more detail in this document.

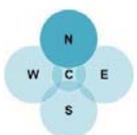
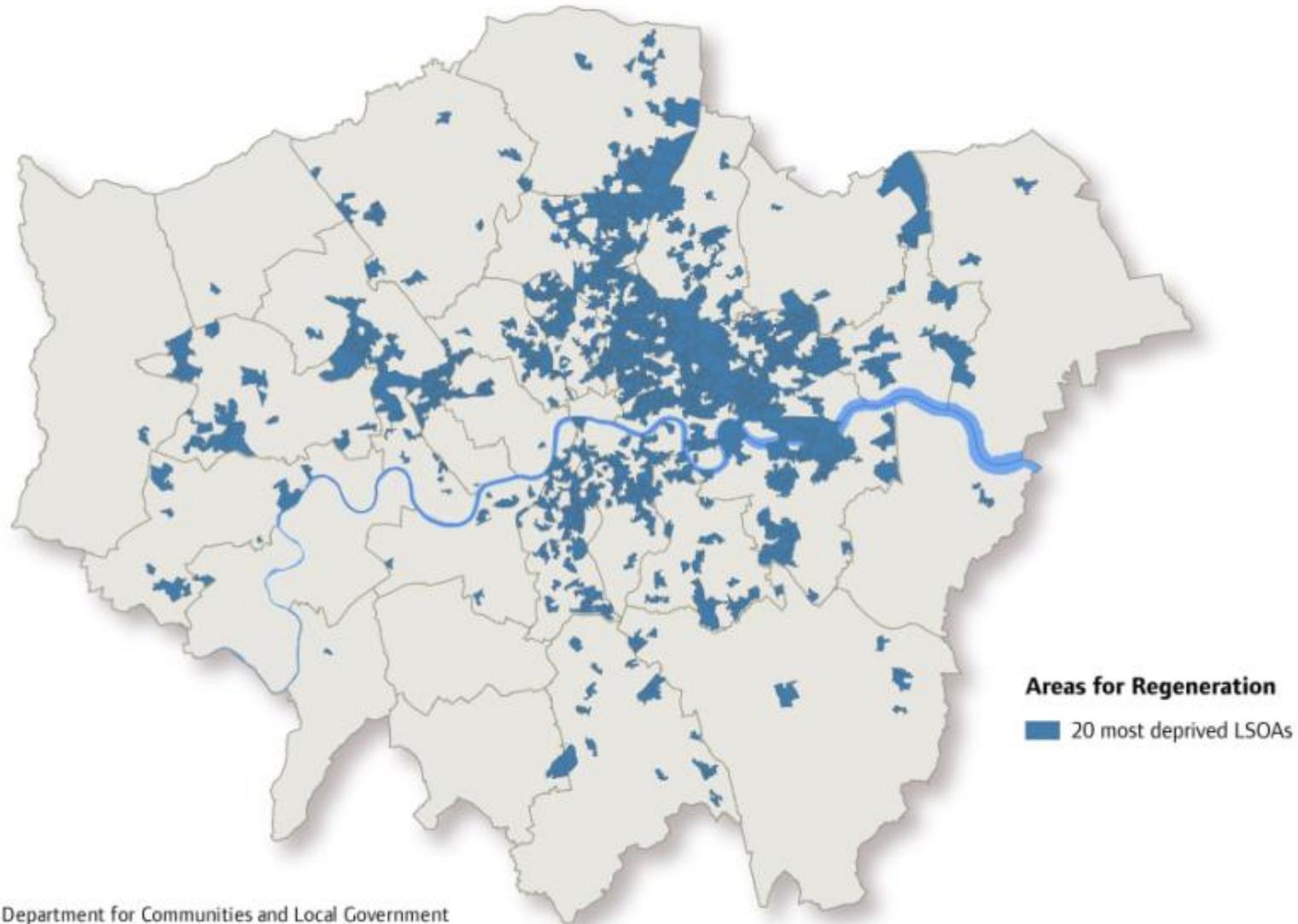
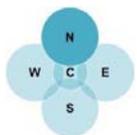


Figure 70: Areas of multiple deprivation in London



Source: Department for Communities and Local Government
ONS Super Output Area Boundaries.
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Greater London Authority 100032379 (2009)

The London Plan Review Draft Consultation Plan (2009)



E	Climate change	
E1	Reducing CO ₂ emissions	Reducing CO ₂ emissions from ground-based transport to a London-wide 60 per cent reduction by 2025

While north London has the lowest total transport emissions of CO₂ of any sub-region, emissions per kilometre of road are at the London average, reflecting high flows of car traffic and the relatively high contribution of cars to CO₂ emissions. Proposals in the draft Transport Strategy to tackle congestion, high car use and freight activity are particularly important at the sub-regional level to reduce CO₂ emissions from ground-based transport.

216. The Mayor has a legal duty to have regard to climate change and to take action to address both the causes and the consequences. He has responded by setting an exacting target to reduce London's greenhouse gas emissions by 60 per cent from their 1990 levels by 2025. Ground transport accounts for 21 per cent of London's greenhouse gas emissions and therefore has a role to play in meeting this target.
217. The Mayor's Climate Change Mitigation and Energy strategy sets out the relative contribution of London's transport to CO₂ emissions in the capital, and actions currently underway or proposed that will contribute towards minimising them as set out in the Mayor's Transport Strategy.
218. In terms of sub-regional breakdown of CO₂ emissions the north has the lowest total transport emissions of the sub-regions emitting approximately 1.1 million tonnes in 2006 (see Figure 71). Despite this, emissions per km of road are in line with the Greater London average at 1,590 tonnes per km (see Figure 72). This can be explained by looking at the composition of the network in the region where five per cent of the total road length in the north region is classified as motorway, where high flows will contribute significantly to the north sub-region's per km road emissions.
219. Although the draft Transport Strategy proposals to reduce greenhouse gas emissions tend to be applicable London wide, such as promoting a shift to more efficient modes of transport; increasing the efficiency of operation of transport; and increasing the use of low carbon vehicles, technologies and fuels, some causes of elevated greenhouse gas emissions, particularly congestion, high car use and freight activity can be tackled at a sub-regional level.

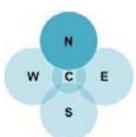


Figure 71: London CO₂ emissions by transport source type

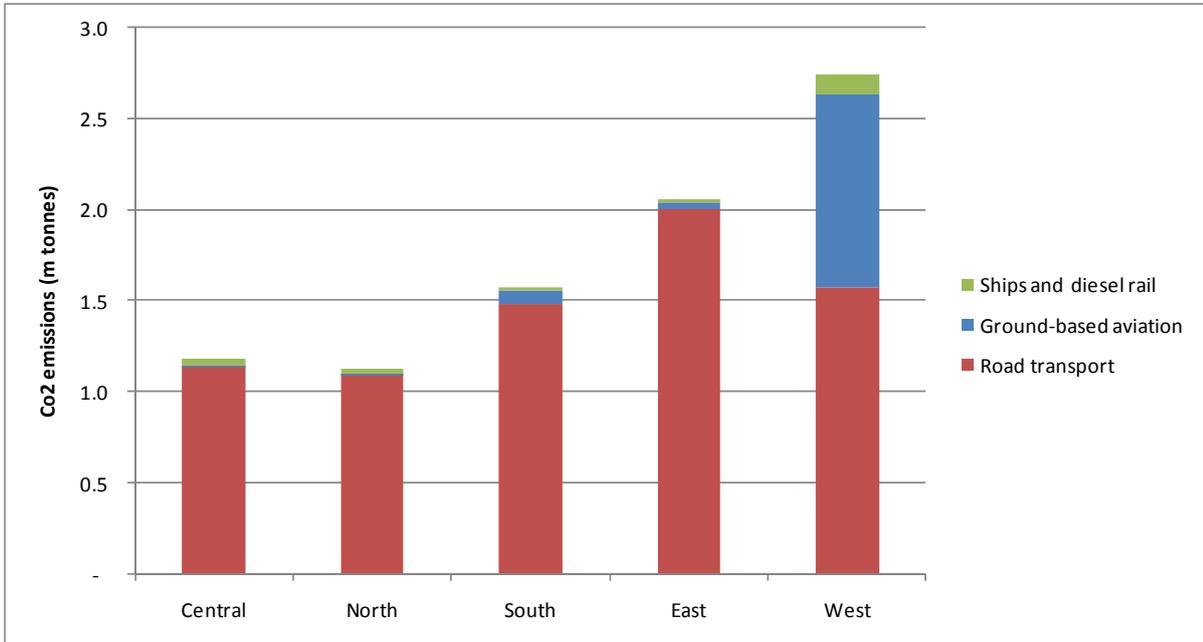
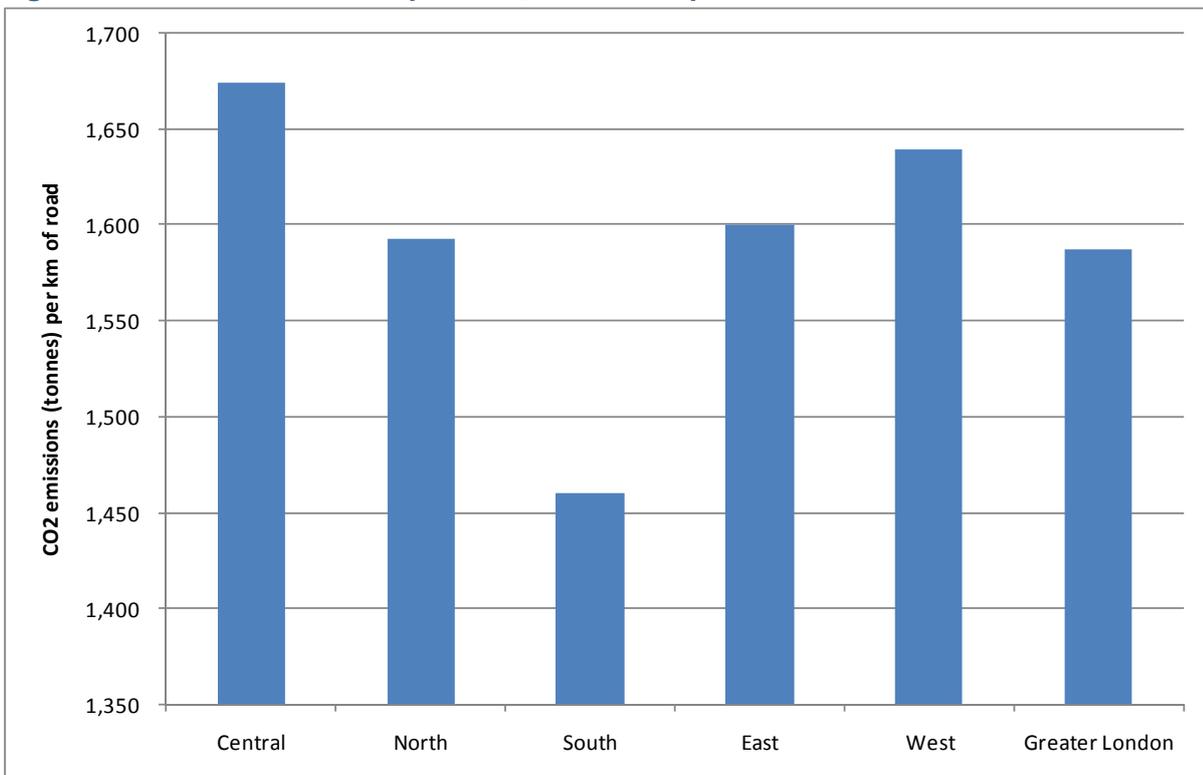
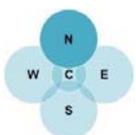


Figure 72: London road transport CO₂ emissions per km of road

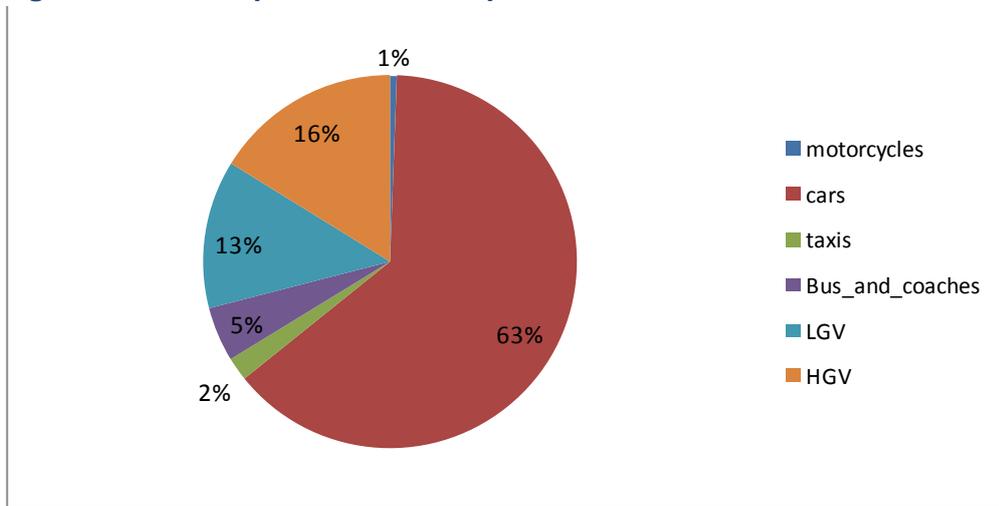


220. Figure 73 shows the mode split of road transport emissions with cars making up 63 per cent of the total road emissions and freight 29 per cent. The high contribution to emissions from cars is reflective of the relative importance of car trips in Outer London. Localised measures to promote an increase in journeys made by walking or cycling would facilitate a change in mode choice and could contribute to a decrease in congestion. For those journeys that public transport is not suitable for, supporting and encouraging the uptake of low emission vehicles as proposed in the Mayor’s Electric Vehicle Delivery Plan will aid the shift to low carbon vehicles.



221. Improving the wider London area efficiency of freight distribution will have significant CO₂ saving benefits in the north given the size of this sector's contribution to emissions. Freight traffic tends to be greatest on the busiest roads in north London and the draft Transport Strategy provides a number of opportunities to encourage a shift in freight journeys to more sustainable modes such as rail and waterborne transport.

Figure 73: mode split of road transport emissions, 2006



E2	Adapting to climate change	Maintaining the reliability of transport networks
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Ensuring the resilience of the transport system and adapting to climate change are important challenges across London.

222. The draft Transport Strategy recognises that some degree of climate change is inevitable with, among other weather related incidences, the potential for increased risk of flooding. In north London, the Environment Agency estimates there is significant annual likelihood of flooding through the Upper Lee Valley and, to a lesser extent, around the River Brent (see Figure 74). The flood risk in the Upper Lee Valley is from the River Lee and River Lee Diversion and there is therefore flooding risk to the rail infrastructure in this area. The Environment Agency's Lower Lee Flood Risk Management Strategy indicates there was severe flooding from the river in 1947 as a result of which the flood relief channel was built, being fully opened in 1977. Whilst there has not been a serious flood event since, the flood relief channel has almost reached its capacity on three occasions since, the most recent being in 2000.

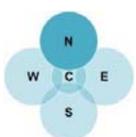


Figure 74: Areas at risk of flooding in London

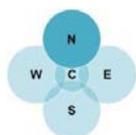


223. The draft Transport Strategy includes policies and proposals that help adapt to climate change that will have an impact across London, including within the north London sub-region. Adapting to climate change has not been identified as a specific challenge in the north London sub-region.

F	Olympic and Paralympic Games		
F1	Contributing to a successful 2012 Games and its legacy	Transport infrastructure and services	Physical and behavioural transport legacy

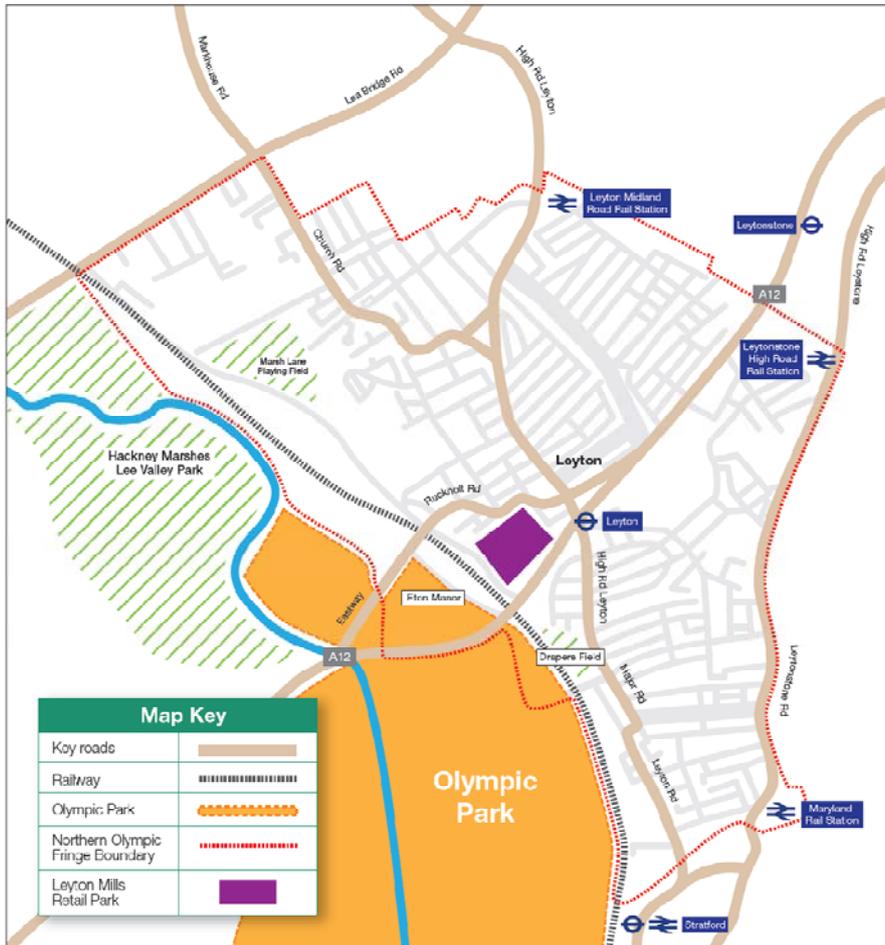
The north sub-region borders the Olympic area and will benefit from the Olympic legacy, including regeneration, increased opportunities, improved built and natural environment and emerging transport links.

224. London won the right to host the 2012 Olympic and Paralympic Games on the promise of regenerating the area for the benefit of everyone who lives there. In November 2009, the Strategic Regeneration Framework for the Olympic host boroughs was published. In it, the host boroughs have outlined an Olympic Legacy vision which goes beyond the Olympic Park and sporting arenas. The Strategic Regeneration Framework sets out an ambitious legacy vision. Its aim is that, within 20 years, the communities who host the 2012 Olympic and Paralympic Games will enjoy the same social and economic chances as their neighbours across London. This is often called the principle of convergence. Achieving this will mean a pace of change that, in many cases, is two to three times the average London improvement rate.
225. The Strategic Regeneration Framework will influence all aspects of the regeneration of the host boroughs for the next 20 years. To secure the first part of this vision, by 2015 the host boroughs and their partners need to ensure:
- 120,000 more residents are in jobs
 - 99,000 fewer residents have no qualifications at all
 - 185,000 more residents have degree-level qualifications
 - Approximately 21,000 fewer children living in poverty
 - 1,800 more children achieve 5 A*-C GCSEs, including Maths and English
 - More affordable family homes are available
 - Fewer people with a chronic health condition
 - 25,000 more adults will do weekly physical activity
 - 44,000 fewer people are affected by reported burglaries
226. This presents a challenge to ensure that in the short/medium term existing investment in these boroughs are maximised to support these goals.
227. Waltham Forest, in the core north sub-region, and Hackney, in the wider sub-region, are both Olympic boroughs. Eton Manor in Leyton forms the northern end of the Olympic Park and Waltham Forest will benefit from new facilities following the Games including the National Hockey Centre, tennis courts, football and multi-sport facilities as well as access to the velodrome. Waltham Forest and its partners are working on plans for the northern Olympic Fringe masterplan. The masterplan will make sure that the neighbourhoods in and around Leyton are able to get the best from the legacy of 2012.



228. The Olympics provides a significant opportunity for Hackney to achieve better public transport, in particular the extension of the east London Line to Dalston, which will link the borough with the Underground network. The media and broadcast centre will be located in Hackney Wick and the borough is looking to create a new neighbourhood, with a new employment hub and improved public realm in this area.

Figure 75: Northern Olympic Fringe map



Source: www.walthamforest.gov.uk

229. The fringe area, which includes Waltham Forest and Hackney, as shown in Figure 75 above, is home to a large number of existing communities in north London who are well located to benefit from the Olympic-led regeneration. As part of the legacy the LDA is proposing to create new housing, leisure and employment centres on the Olympic grounds. There is an opportunity to take advantage of the emerging transport links, enhanced parks and new development by enhancing the environment and streetscape in the Olympic fringe area and ensuring that the transport links are in place so that north Londoners can benefit from the emerging social infrastructure and employment growth centres.

230. The Olympic boroughs are also using the opportunities provided by the Olympic-led regeneration to help improve a range of key life indicators to match the London average and have proposed an Olympic Strategic Research Framework to achieve this.

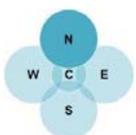
3 Challenges and opportunities in north London

The London-wide challenges

231. The six goals from the draft Transport Strategy, set out in the previous section, provide the overarching framework for the five sub-regional transport plans. Policies and proposals from the draft Transport Strategy will be used to help meet these goals and deliver their underlying objectives across London.
232. Whilst the Transport Strategy goals are fundamental to delivering the Mayor's vision for London, there are also specific challenges, and geographically distinct locations within each sub-region, which need to be addressed within this framework. These are set out for north London in this Chapter, with a focus on the particular characteristics of north London and the boroughs within it.
233. Issues such as Climate Change or Safety and Security will be addressed at both the London-wide and local level. For some of the broad goals such as climate change there are also other strategic documents like the forthcoming Climate Change Mitigation and Energy Strategy and the Air Quality Strategy, as well as local frameworks for action such as LIPs and Air Quality Management Areas.
234. Additionally, determining the impact of sub-regional policies or schemes on these challenges should be undertaken – however they are not included as specific sub-regional challenges in this Chapter since they apply, to a large extent, equally across all the sub-regions and boroughs.

Sub-regional challenges in north London

235. This chapter considers the sub-regional challenges that have emerged from TfL's analysis and discussions with the boroughs in the north London sub-region and the North London Strategic Alliance (NLSA). It sets out in more detail the specific challenges and opportunities for north London and identifies the places or corridors affected by the challenges and opportunities. Finally, this chapter considers the north London challenges in the context of the delivery of the draft Transport Strategy.
236. Following the presentation of TfL's analysis and discussions with the north London boroughs and the NLSA during summer and autumn 2009, nine challenges were agreed for north London at a sub regional level. Stakeholders were asked at the north London TEC workshop held in December 2009 for views on the importance of the different challenges. There was support for all of the challenge with "Facilitating and responding to growth and economic development" considered by the boroughs to be the most important challenge for the sub-region.



Nine challenges for north London, as discussed and agreed with boroughs

1. Facilitating and responding to growth and economic development, including in Brent Cross and Upper Lee Valley (including central Leaside and Tottenham) and Stratford and Stansted
2. Crowding and congestion on existing networks, especially radial into central London north London
3. Orbital congestion, gaps in connectivity, and comparably poor journey times
4. Gaps in connectivity, or relatively poor journey times associated with part-orbital, part-radial routes and across the Lee Valley
5. Supporting/ improving access to existing & new town centres including public realm enhancements of town centres
6. How interchanges are now and how they are placed to cope with growth
7. CO₂ and local air pollutant emissions
8. How to manage and respond to growth in demand
9. Access to jobs and services, which include hospitals, in the light of NHS re-organisation

237. At the December 2009 workshop, stakeholders were presented with a consolidated version of the nine challenges. It was agreed by boroughs that certain challenges could therefore be grouped to simplify the challenges. The remainder of this document looks at the sub-regional transport challenges listed below, within the context of the draft Transport Strategy and the policies and proposals that apply to the north sub-region. Figure 76 below presents diagrammatically each of the challenges and opportunities identified for north London. For some of the challenges and opportunities priority locations are well understood and agreed, for others the locations may be indicative requiring further discussion, assessment of need and agreement before further work is undertaken to develop potential solutions

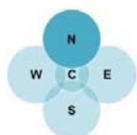
Five challenges and opportunities considered in more detail for north London

- Facilitating and responding to growth, particularly in Brent Cross/ Cricklewood and the Upper Lee Valley
- Relieving crowding on the public transport network
- Managing highway congestion and making more efficient use of the road network
- Enhancing connectivity and the attractiveness of orbital public transport
- Improving access to key locations and to jobs and services

238. Public realm enhancements are considered in terms of the challenge of improving access to town centres and to jobs and services. How to manage and respond to growth in demand is considered in terms of the challenge of facilitating and responding to growth. Gaps in connectivity, or relatively poor journey times associated with part-orbital, part-radial routes and across the Lee Valley and orbital congestion, gaps in connectivity and comparably poor journey times are incorporated into the challenge of enhancing connectivity and the attractiveness of orbital public transport.

Reducing air pollutant and CO₂ emissions from transport

239. Reducing emissions has been identified by the north London boroughs as a key transport challenge in the sub-region. However, reducing emissions from transport is also key transport challenge at both the local level and for the whole of London.



240. The Mayor's Transport Strategy and forthcoming Climate Change Mitigation and Energy Strategy both focus on reducing CO₂ emissions and the Mayor has a stated target of a London-wide 60 per cent reduction in CO₂ emissions by 2025. At the local level, CO₂ emissions are also a core indicator for borough LIPs. The Transport Strategy recognises that achievement of CO₂ emissions targets will require fundamental changes in transport CO₂ efficiency and travel behaviour and the majority of proposals will contribute to this target.
241. Reducing air pollutant emissions from transport will be addressed at the London level through the policies and proposals in the Mayor's Transport and Air Quality Strategies. Policies to improve the efficiency of transport and to change travel behaviour in favour of more sustainable modes will also benefit the sub-region in terms of reduced air pollutant emissions from transport. Given the London-wide nature of emissions from transport, reducing these emissions is not taken forward as a challenge requiring a sub-regional intervention in this chapter.

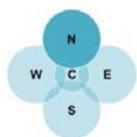
The scope for change

242. It must be noted that potential options outlined in this document (which have emerged through a number of sources – see Box 1) are indicative and at this stage should not be considered as recommendations or as an exhaustive list. Further work will be undertaken to assess potential demand in more detail and develop potential options further for inclusion in the sub-regional transport plans in the summer of 2010, including an appreciation of their affordability, feasibility and potential timing for delivery. With limited funding available, particularly in the shorter term, options for addressing these challenges will need to be prioritised. In assessing the suitability or appropriateness of any solution, the London-wide challenges will also be taken into consideration.
243. Potential infrastructure and policy options will need to pass rigorous value for money tests to secure endorsement from TfL and other stakeholders. At this stage, TfL cannot make any commitment to deliver interventions identified (beyond those already included in the Business Plan), but further feasibility analysis will be undertaken to address their relative merits.

Box 1: Potential interventions have emerged through a variety of mechanisms:

- Some are historic schemes which are already well understood
- Some have become apparent upon analysis of problems / issues in discussion with the TfL modes
- Some have been proposed by external stakeholders
- Some have been identified to support successful delivery of the new Mayor's Transport Strategy
- Some have emerged through investigation of key places and corridors for attention

244. As identified in the draft Transport Strategy, there are a number of funding sources to meet London's transport needs. These include Government grants, revenue from fares, developer contributions, borough funding and investment from other Government departments. In order to successfully achieve the Transport Strategy objectives, sustained investment will be needed beyond the current 10-year funding settlement. Funding issues are covered further at the end of this chapter.



Potential funding avenues

245. TfL has a substantial investment programme in place to deliver major projects such as Crossrail, as well as upgrades to the other existing TfL networks, and investment is also secured for some national rail projects such as Thameslink through Network Rail.
246. Where potential projects have been identified as part of the sub-regional transport plans, it will be necessary for affordability to be considered, including potential funding sources. In the case of some projects, this will necessarily mean that the scheme is unlikely to attract significant public sector contribution before the end of the current Business Plan period in 2017/2018. In other cases, however, there may be potential for alternative funding sources to be identified before that date.
247. It may be possible for some schemes to be funded from TfL's existing budgets; for example, in some cases an identified scheme may be aligned with an existing programme of works, and the Sub-Regional Plan may assist in prioritising where such funds should be prioritised. Other funding budgeted but not yet allocated includes allowances for local borough schemes which will be funded through the Local Implementation Plans submitted by boroughs to TfL, and in particular the Area Based Scheme funding. The sub-regional transport plan can help to identify and prioritise the schemes which fall within the scope of this funding.
248. Other governmental funding is available to support infrastructure projects, and the Sub-regional transport plans may be used to provide the policy support for applications for such funding. This includes opportunities for investment on lines and stations of the national rail network, through programmes such as the High Level Output Specification (HLOS) and the National Stations Improvement Programme (NSIP).
249. Third-party funding may be available for some projects, particularly where large-scale development will be taking place. Opportunities exist through Section 106 contributions towards mitigating the effects of a development, which may have wider benefit to other transport users, and increasingly through newer means such as the Community Infrastructure Levy, which allows for development contributions to be pooled allowing for better co-ordination of infrastructure funding where multiple developments are proposed.
250. Finally, in some cases there will be scope to raise private finance for the implementation of capital projects, where a defined revenue stream is forthcoming from those benefitting from the scheme. New road infrastructure, for example, has long been funded by charging users a toll, and this model could provide opportunities for private investment within London.

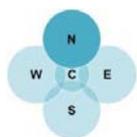
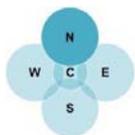
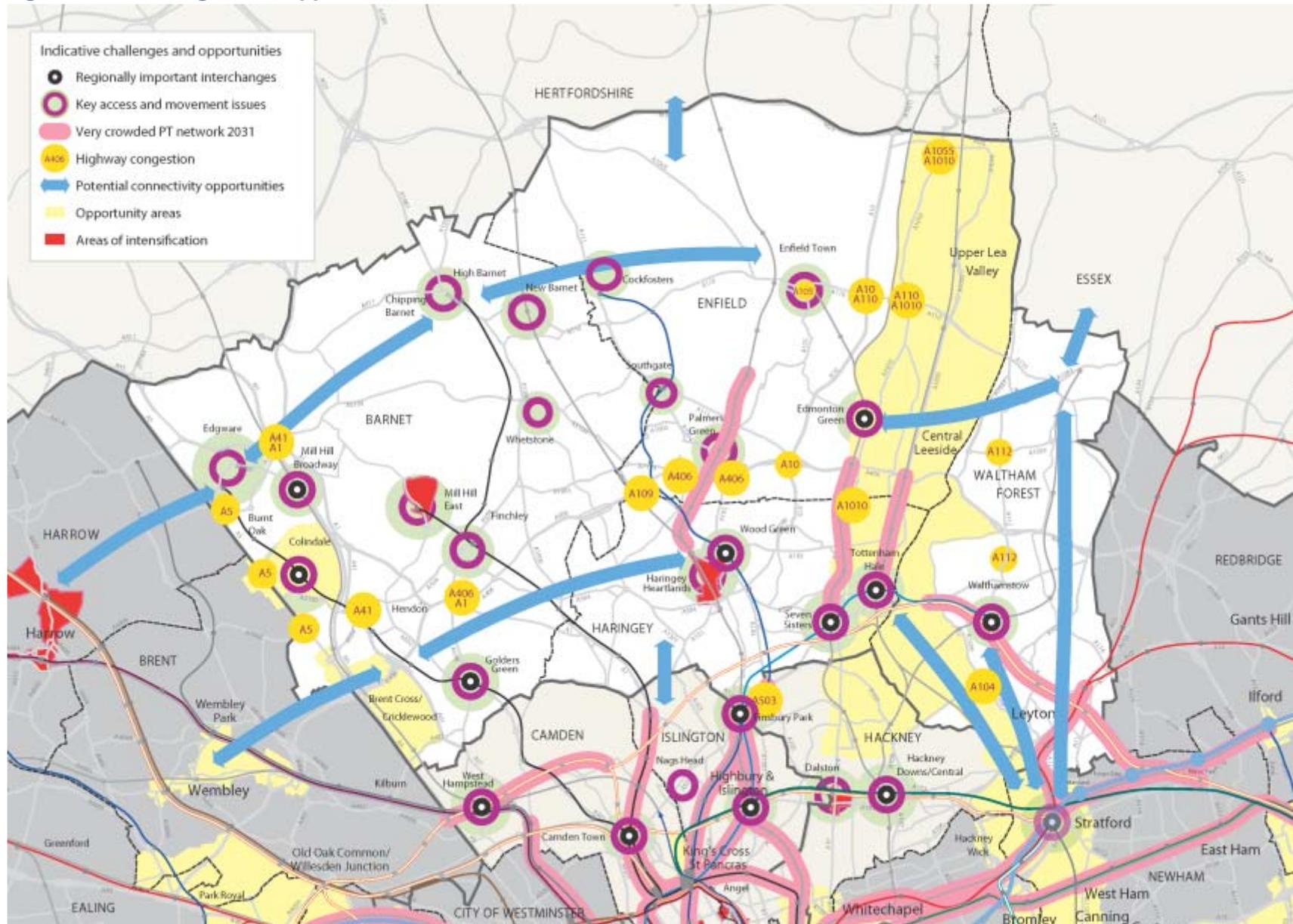


Figure 76: Challenges and opportunities in north London



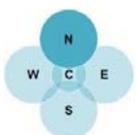
Challenge 1: Facilitating and responding to growth, particularly in Brent Cross/ Cricklewood and the Upper Lee Valley

Contribution to draft Transport Strategy outcomes:

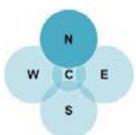
- Balancing capacity and demand for travel through increasing public transport capacity and/or reducing the need to travel
- Improving people's access to jobs
- Improving access to commercial markets for freight movements and business travel, supporting the needs of business to grow
- Improving journey experience
- Enhancing streetscapes, improving the perception of the urban realm and developing a better streets initiatives
- Reducing air pollutant and CO₂ emissions from ground-based transport



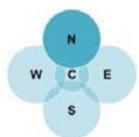
251. Facilitating and responding to growth is considered by the boroughs to be the key transport challenge facing north London to 2031. While population and employment growth is not as high as that in east London, it is significant and is forecast to be concentrated in a number of key areas, including the inner north east boroughs, around Wood Green, Brent Cross/ Cricklewood and Colindale/ Burnt Oak opportunity areas in the North West London to Luton corridor (see Figure 11). Despite the forecast growth, population density will change very little. In terms of new homes, Colindale is forecast in the London Plan to have the highest number with up to 12,500 new homes, followed by Brent Cross/ Cricklewood with 10,000 and the Upper Lee Valley with 9,000.
252. Employment in north London is concentrated in inner London, around the town centres, in particular the metropolitan centre of Wood Green, and around the Brent Cross/ Cricklewood opportunity area (see Figure 14). Similarly to population growth, the strategic density of employment changes very little between 2006 and 2031 and the highest numbers of new jobs are forecast to occur around Wood Green, the Upper Lee Valley, particularly around central Leaside and Tottenham Hale, and around Brent Cross/ Cricklewood opportunity area (see Figure 15). The London Plan sets out that Brent Cross/ Cricklewood is forecast to have 20,000 new jobs to 2031, with 15,000 in the Upper Lee Valley, 2,000 in Colindale and 2,000 in Wood Green.
253. The forecast population and employment growth mostly lies adjacent to existing rail and Underground infrastructure, ensuring that there is adequate transport capacity to sustainably accommodate the forecast population and employment. The challenge remains to provide a combination of road, rail and bus capacity to enable these growth areas to be appropriately served.



254. Brent Cross/ Cricklewood is forecast to accommodate up to 20,000 new jobs and up to 10,000 new homes in the next 20 years. As an area it will benefit from the funded upgrades of the Thameslink line and the northern Line, which both experience severe crowding, and from developer proposals for a new station on the Thameslink line serving the area. However, given the forecast growth in housing and employment, public transport crowding will remain an issue in 2031. Highway congestion is also a significant concern for the area now and in the future. It is located at the junction of the M1, A406 North Circular Road, A41 and A5 and access to the current retail site is predominantly by car.
255. The Upper Lee Valley, including Tottenham Hale, is forecast to accommodate 15,000 additional jobs and 9,000 more homes. While the area will benefit from the upgrade to the West Anglia main line, which will result in 12-car capacity to Stansted and Cambridge and additional capacity on inner services, it is the unfunded proposal in the draft Transport Strategy for four-tracking on the Lee Valley line which will provide more additional capacity for local services. The reservoirs and rail lines in the Upper Lee Valley also create a high degree of severance between Enfield and Waltham Forest and for east-west travel across the sub-region. While the proposed upgrades of the rail lines through the Lee Valley will help to increase access to central London they will also lead to all level crossings being closed and replaced by underpasses and/ or bridges. This would contribute to delays in orbital journeys across the Lee Valley.
256. The level of growth forecast for north London will be accommodated by a combination of improvements to the existing network, new infrastructure and measures to reduce the need for travel, particularly by car. For all of these, integrating land use and transport – ensuring high trip generating developments are located in areas of good public transport accessibility and spare capacity – will play an important medium and longer term role. Furthermore ensuring that the transport requirements of new developments are adequately considered through the planning process is essential. This includes that need for new transport services and infrastructure to secure funding and be delivered in accordance with the phasing of development areas.
257. The employment and population growth of the wider south east and east of England has led to increased in-bound and out-bound travel. Within the context of the expansion of Stansted Airport and growth within the London-Stansted-Cambridge-Peterborough corridor, analysis of forecast growth on the National Rail network has highlighted the need for improved services on the West Anglia rail route through the Lee Valley to Stansted and beyond. Strategic and local government and transport providers will need to work together to secure an agreed priority, timing and specification for the upgrade of this key route. It is notable that this is the major public transport route that can link the London-Stansted-Cambridge-Peterborough corridor to the Thames Gateway corridor.
258. The A1/ M1 corridor is also the focus of considerable growth both within and beyond London. As well as the road corridors there are also the rail corridors of the Thameslink and Midland main line. Future network management for these corridors needs to account for the scale of development anticipated along them.
259. The London Plan, Mayor's Transport Strategy and TfL's Investment Programme identify a number of transport projects serving north London, ranging from regional schemes to those of a more local nature. These projects, of which the principal ones are described in summary below, aim to improve accessibility to, from and within the sub-region, as well as providing the strategic public transport capacity to meet the forecast growth.

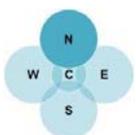


260. National Rail projects being developed include the Thameslink project, which will provide more through services and longer trains on the north-south axis, including a new link so services can run to and from the Great Northern route, improved connections to Gatwick and Luton airports and High Speed 1 (HS1) at St Pancras, and an interchange with Crossrail at Farringdon. The project will increase capacity and accessibility, with up to 24 trains per hour operating through the core central section during peak periods.
261. Proposals by Government to give the Mayor a greater role in specifying fares and services on the National Rail network in London will produce potential benefits from a more integrated public transport network. An initial example of this is the transfer of control to TfL of a number of rail services, collectively termed the north London Railway and including the north London Line and Gospel Oak to Barking line, from autumn 2007 (it now forms part of the London Overground network). The transfer has brought forward investment in new services, information and security measures on the north London Railway network by TfL. It is hoped this will be a first step towards rolling out similar improvements across the London suburban rail network. Further progress has been made with the new southern franchise over which TfL liaised closely with the Department for Transport to ensure that stations and services will be brought up towards TfL's standards. Full Oyster facilities have now been introduced on National Rail services within London; this will help integrate National Rail and Underground services.
262. Even though not directly serving the sub-region, Crossrail will increase accessibility to and from north London via interchanges in central London; at Liverpool Street for West Anglia services, Farringdon for Thameslink services and at Moorgate for Great Northern services. The Crossrail station at Liverpool Street will be 'double-ended' with an entrance at Moorgate. Services are planned to run from Maidenhead and Heathrow in the west via central London to Shenfield and Abbey Wood (via Canary Wharf) in the east.
263. The HS1 scheme delivered significantly enhanced capacity to Stratford and St Pancras, adjacent to the wider sub-region. With new HS1 services stopping at Kent there is increased capacity for commuting at Stratford. HS1 will also provide an important component of public transport capacity to serve the Olympic venue for 2012.
264. In addition there will be significant upgrades to the London Underground network serving north London, through the PPP programme. Planned enhancements to the signalling system on the Northern Line will increase line capacity by over 20 per cent by 2012. Increased capacity will also be achieved through partial separation of the Northern Line, although congestion at Camden Town station will remain an issue. A programme of enhancements is also planned for the Victoria and Piccadilly lines. The bus network will also have to be modified to serve these growth areas and the requirement for bus infrastructure such as bus stations and standing space will have to be fully considered.
265. The most significant highway improvement scheme in the sub-region is on the A406 North Circular between Bounds Green Lane and Green Lanes. This scheme will create a predominantly two-lane dual carriageway with improved traffic flow at junctions and greatly improved facilities for pedestrians, cyclists and bus users. Improvements will include increased road and junction capacity, low noise road surfaces, street level pedestrian crossings, segregated cycle lanes and bus lanes.



266. Another important aspect of facilitating and responding to growth in north London is managing the resulting growth in demand for transport. As set out in Chapter 2, and considered in more detail in the following challenges, north London already experiences public transport crowding and highway congestion. Despite the committed interventions in the draft Transport Strategy, the growth in population and employment will result in growth in demand for transport that outstrips capacity in 2031. Therefore, in addition to interventions that seek to increase public transport capacity or make more efficient use of the public transport and/ or the road network for motorised vehicles, managing the demand for travel must also be a key component of this sub-regional transport plan.
267. The forecast growth, economic development and regeneration in north London provide an opportunity for the sub-region but responding to this growth in a sustainable way is a significant challenge. Further developer contributions may be required to fund additional public transport infrastructure to sustainably support development. In addition, providing enhanced conditions to encourage a shift to walking and cycling will also be required to prevent increasing highway congestion and associated externalities, including increased emissions, and to reduce public transport crowding. The outcomes of this challenge contribute to the draft Transport Strategy goals supporting economic development and population growth and enhancing the quality of life for all Londoners.

[The Final Transport Plan to include ref to]: Tottenham Hale Masterplan, Blackhorse Lane Masterplan, central Leaside AAP, north east Enfield AAP, Brent Cross Masterplan, north London Development Framework, Colindale AAP, northern Olympic Fringe Area Masterplan (future AAP)



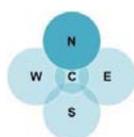
Opportunities to facilitate and respond to growth in north London

Figure 77: Indicative priority list : Growth and development areas

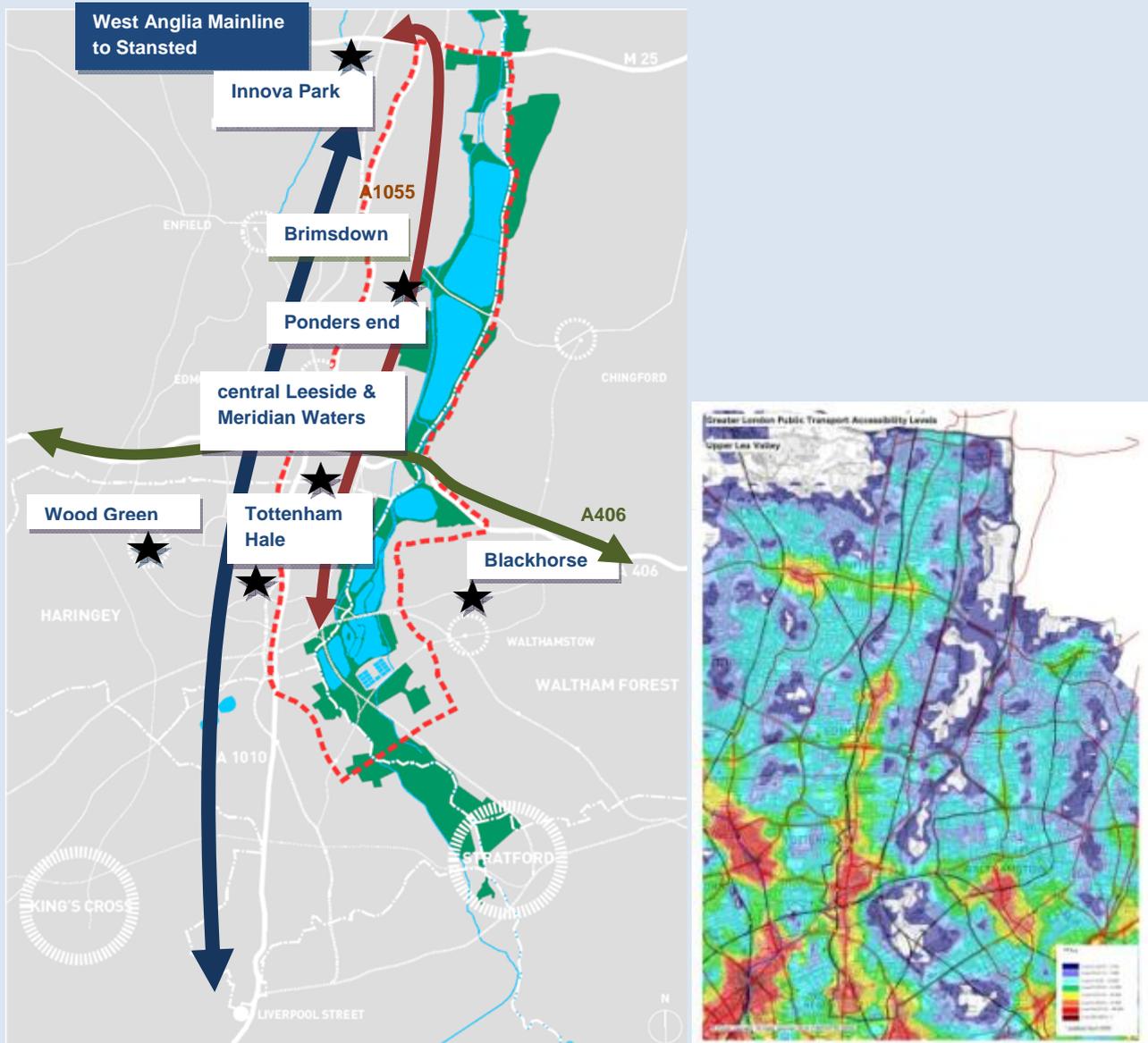
Challenge: Facilitate and respond to growth and economic development, particularly in Brent Cross/Cricklewood and the Upper Lee Valley

Location	Outcomes	Draft MTS (includes a number of example policies/ proposals that are particularly relevant to this challenge)
Upper Lee Valley Area	Maximising benefits of the Opportunity Area	<p>Proposals 2 and 3 supporting the development of rail freight</p> <p>Proposals 19, 20 and 46 delivering capacity and accessibility enhancements on Underground routes and at stations and prioritising improvements to strategic interchanges</p> <p>Proposal 23 keeping the bus network under review</p> <p>Proposal 34 with a criteria based approach to road schemes</p> <p>Proposal 48 that airport operators should pay for road, rail and other transport enhancements required to accommodate expanding airports</p> <p>Proposals 51 and 52 promoting and supporting cycling</p> <p>Proposal 59 encouraging walking</p> <p>Policy 23-support regeneration of Opportunity Areas and Areas for Intensification as described in the London Plan</p> <p>Policy 22- seek to enhance connectivity, reduce community severance , promote community safety , enhance urban realm and improve access to jobs and services in deprived areas</p>
	Improving rail connections for north London to “inner” services	
	Utilising the River Lee Navigation Canal in future freight and waste management strategies	
	Enhancing east-west transport connectivity	
Brent Cross/ Cricklewood Area	Maximising benefits of the Opportunity Area	<p>Proposal 34 with a criteria based approach to road schemes</p> <p>Proposal 48 that airport operators should pay for road, rail and other transport enhancements required to accommodate expanding airports</p>
	Improving connections and journey reliability between the North sub-region, the Brent Cross Cricklewood Opportunity Area and the rest of the north London sub-region	
Stratford Corridor	Enhancing connections between the Stratford growth area and North London sub region	<p>Proposals 51 and 52 promoting and supporting cycling</p>
Colindale/ Burnt Oak Area	Catering for growth in Colindale Burnt Oak Area	<p>Proposal 59 encouraging walking</p> <p>Policy 23-support regeneration of Opportunity Areas and Areas for Intensification as described in the London Plan</p> <p>Policy 22- seek to enhance connectivity, reduce community severance , promote community safety , enhance urban realm and improve access to jobs and services in deprived areas</p>
	Catering for growth in the wider North West London/Luton Corridor	
Haringey Heartlands/Wood Green	Maximising benefits of Intensification areas	<p>Policy 22- seek to enhance connectivity, reduce community severance , promote community safety , enhance urban realm and improve access to jobs and services in deprived areas</p>
Mill Hill East	Maximising benefits of Intensification areas	
West Hampstead	Maximising benefits of Intensification areas	
Dalston	Maximising benefits of Intensification areas	
Tottenham Hale	Enhancing regional and strategic Interchanges	
Northern London Olympic fringe area	Delivering the Olympic Legacy	
Stansted Corridor	Catering for growth in the London - Stansted-Cambridge-Peterborough corridor	

Source: Draft London Plan, LDFs, AAP, Development Frameworks and MasterPlans

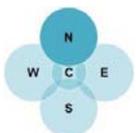


Spotlight on the Upper Lee Valley (opportunity area)



Key challenge: accommodating growth with poor public transport connectivity and highway congestion on key highway arteries

Improving access and movement to, from and within the Upper Lee Valley area is a key issue in north London, particularly if the area is to accommodate the future housing and employment growth, as outlined in the previous section. There are several transport links in the Upper Lee Valley area – the North Circular provides east-west connections, whilst the Lee Valley railway line provides fast services between Stansted and central London. The area also has some good walking and cycling connections running through the Lee Valley Regional Park. However the North Circular road, the Lee Valley railway line, the waterways and reservoirs in the Upper Lee Valley Area all serve to restrict movement between the residential areas to the west, the existing and emerging employment areas and Lee Valley Regional Park in the east. Where crossings do exist, they can be subject to severe delays. The crossings on the main Upper Lee Valley rail line have significant impact on the highway and public transport in the area. Their closures create congestion for road traffic and hamper the reliable operation of bus services.



The Upper Lee Valley includes some of the largest remaining concentrations of industrial land in Greater London, such as Brimsdown industrial estate area. There is a need to understand and cater for current and future emission/air quality issues and congestion on the London side of the J25 of the M25. Congestion and air quality issues generate mostly by freight. Tottenham Hale in Haringey, Blackhorse Lane in Waltham Forest as well as central Leaside and Ponders End in Enfield have been identified in the north London Development and Investment Framework (LDA 2007) as major opportunities locations for attracting inward investment and promoting regeneration. There is a need to investigate the impact of new developments and the displacement of existing activities and what different travel patterns and levels of freight transport and land use activity will generate. The bus network, although fit for purpose for current demand will need to be under continuous review to meet the projected growth in the area.

The example solutions will use central Leaside as the location for this challenge as it is a strategic employment location in the London Plan (and is one of three Preferred Industrial Locations in Enfield). The area benefits from its proximity to the North Circular Road however; there is poor access to public transport at Angel Road station. In recent years, there has been a programme of improvement schemes to individual industrial estates including Eley's, Montagu, Harbet Road and Claverings estates. In addition, retail park development has taken place with a new IKEA and Tesco stores. Maximising the potential for employment growth in central Leaside will help to provide additional jobs for local people, which would help to address the socio-economic deprivation that exists within close proximity.

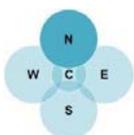
Potential options for facilitating growth and economic development in Central Leaside could include:

Example Option: Traffic Management Measures

Car movements dominate Central Leaside and as a consequence the area suffers from pockets of severe traffic congestion. There is potential for greater understanding of the strategic highway congestion issues around Central Leaside. Particularly its key pinch points along Meridian Way/Watermead Way, the North Circular and Tottenham High Road and ways to enhance its usage by pedestrians, cyclists and public transport users. Potential interventions to manage highway congestion could include “smoothing traffic” and promoting walking, cycling and existing bus services. Feasibility work would investigate the level of intervention required and at what locations in and around the Central Leaside area.

Example Option: Four tracking of West Anglia Mainline /Stansted Corridor from Copper Mills Junction

Whilst many fast trains currently pass through Central Leaside, few stop within the area to serve local resident and the working population. Both the local and long-distance rail services running along the Lee Valley line are restricted by track capacity. There is potential to enhance the West Anglia Main Line in the Lee Valley, including four-tracking north of Coppermill Junction. There is only a single railway line in each direction on the Lee Valley Line; as a consequence both fast non-stop services and slow local rail services share the same track. The proposal would enhance capacity through the Lee Valley area by allowing faster and more frequent services to operate. Additionally a turn-up-and-go service at all stations in the Upper Lee Valley, would help support planned developments by reducing waiting times at stations and encouraging smoother station entry and exit flows. However, work needs to be undertaken to understand the impact of 4-tracking on the resilience and performance of the highway network, specifically its impact on the level crossings in the area.



Example Option: Tottenham Hale Station Interchange

The Department for Transport and National Rail are undertaking feasibility studies in control period four (CP4) 2009-2014 to identify potential 4-track options for implementation post 2015 (see above). There is potential to explore capacity enhancements to the Underground station, catering for growth at Stansted as well as neighbouring areas of population and housing growth such as Wood Green, Central Leaside, Blackhorse and Innova Park. Tottenham Hale station will have significant capacity problems post 2020 due to growth and increase in demand. Options have been developed for improvements to the station interchange including provision of a reconstructed overbridge and improved interchange between London Underground and Rail. Additional options could be explored include increasing the service at the stations in Upper Lee Valley from two to four trains per hour, enabled by upgrading the West London Main Line. This would improve rail connections to key development areas and give passengers a single interchange at Tottenham Hale. The proposal is closely linked to, but not dependant on the expansion of Stansted Airport.

Example Option: Enhancing existing bus services and links to key development areas

Although there are bus routes running south to Tottenham Hale along Meridian Way/Watermead Way, and a number of routes that connect the Central Leaside area with nearby locations, such as Waltham Cross, Edmonton Green and Seven Sisters, no service currently runs north along Meridian Way to Ponders End. Although the demand for such a service might not currently exist at Meridian Waters, planned housing and growth will require bus services to respond to changes in land use and employment. For example, there is potential to connect Ponders End housing growth area with the strategic employment area of Central Leaside, whilst providing access to leisure facilities at Pickett's Lock. There is potential for a bus service linking Meridian Way to Ponders End. Such as service enhancement would be subject to feasibility, consultation and developer funding for infrastructure improvements and delivery.

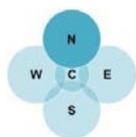
Example Option: Integrating Land-use and Transport

Local Development Frameworks and London Plan development control policies will play a key role in integrating land use and transport planning by ensuring:

- that sustainable transport links are included in developments according to existing, proposed and potential connectivity and capacity
- that large new developments are near to existing public transport networks-which would reduce the need to travel
- that policies encourage public transport, walking, cycling and high quality urban realm
- that policies encourage mixed use developments particularly on larger sites where the scale of development is such that effectively new towns are built for example at Brent Cross
- that planning contributions are sought for transport improvements in opportunity areas such as Upper Lee Valley, Brent Cross /Cricklewood, Colindale /Burnt Oak ; in areas of intensification such as Dalston, Mill Hill East, West Hampstead and elsewhere where appropriate

Example Option: Urban Realm Improvements

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. There is potential to encourage the use of public transport through public realm by improvements to key stations and areas. For example urban realm improvements in areas such as around Meridian Way/ Watermead Way, have the potential to encourage greater use of public transport provisions in and at Angel Road station.



Example Option: Promoting modal shift

Encouraging the use of more sustainable, modes of transport (public transport, cycling and walking; set appropriate parking standards; and, aim to increase public transport, walking and cycling mode share in North London.

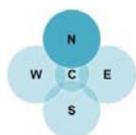
Example Option: Freight Management

The growth in freight movement projected due to the impacts of new developments and the displacement of the existing activity, will generating different patterns and levels of freight (and other transport) activity. There needs to be an understanding as to how projected growth and employment will affect the delivery and provision of goods and services in North London. The London Plan emphasises facilitating the efficient distribution of freight whilst minimising its impacts on the transport network. It emphasises the important to secure and enhance strategic freight provision in London, especially in the Upper Lee Valley. This can be achieving by a combination of different measures:

- Local Development Frameworks and London Plan development control will play a key role in encouraging efficient freight delivery and logistics by ensuring that developments deal with freight issues in transport assessments and travel plans. By safeguarding existing sites and identifying new sites to enable the transfer of freight to rail and water; identifying sites for consolidation centres and 'break bulk' facilities; safeguarding railheads for aggregate distribution.
- Encouraging Freight Framework Delivery and Servicing Plans. These aim to reduce delivery trips (particularly during peak periods) and increase availability and use of safe and legal loading facilities, using a range of approaches including consolidation and break bulk centres as well as out-of-hours deliveries.
- Encourage engagement with Freight Quality Partnerships to help deliver the Mayors Freight Plan by building partnerships at pan-London and sub-regional levels to help coordination between TfL, businesses, operators and boroughs.
- The Transport Strategy recognises that transporting freight (including waste) by water is a less damaging environmental option that should be encouraged. There is potential to use the River Lee Navigation to improve freight distribution by providing modal shift to water based freight (primarily waste). The work required to upgrade the canal to enable (freight by water) to happen has an *indicative cost of £5-10M*.

Further work /analysis

- Further work on understanding the connectivity issues from/ to and within Upper Lee Valley opportunity areas, intensification areas and other key places
- Further work with key stakeholders to undertake option identification and analysis for the priority locations listed in Figure 77
- Further work on exploring connectivity issues between Central Leaside and key growth areas
- Further work on translating MTS policies into specific sub regional proposals



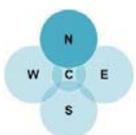
3.2 Challenge 2: Relieving crowding on the public transport network

Contribution to draft Transport Strategy outcomes

- Reducing public transport crowding
- Balancing capacity and demand for travel through increasing public transport capacity and/or reducing the need to travel
- Improving public transport reliability
- Improving public transport customer satisfaction
- Reducing air pollutant and CO₂ emissions from ground-based transport



268. As can be seen in Figure 41 in Chapter 2, crowding in the morning peak is currently significant on the Great Northern routes into Finsbury Park and into central London, the east Anglia routes on the West Anglia Main Line into Tottenham Hale and the Thameslink route into West Hampstead. There is also severe crowding on the London Overground network on the Gospel Oak to Barking and Richmond to Stratford lines from Willesden Junction to Gospel Oak and from Barking to South Tottenham. There is also severe congestion at Finsbury Park station.
269. Figure 42 in Chapter 2 shows that, with the committed interventions in the draft Transport Strategy, crowding improves on some lines in 2031, such as the Thameslink line and on services from Welwyn Garden City. However, in 2031 crowding will worsen on a number of lines in north London, including from Barking to South Tottenham on the London Overground lines. Crowding remains on inner London on services from Finsbury Park. The funded improvements to the West Anglia Lee Valley line to enhance services to Stansted will also lead to limited improvement to inner suburban services through the Lee Valley. In terms of future funding, the draft Transport Strategy prioritises increasing capacity on the West Anglia Main Line and at congested stations including a 12-car service to Stansted and additional capacity on inner suburban services, Lee Valley Line four-tracking and a local service to Stratford.
270. As can be seen in Figure 44, on the London Underground network, the most substantial crowding occurs on the Victoria and Piccadilly Lines from Finsbury Park station into central London. There is also substantial crowding on the northern Line into and south of Camden. In terms of station crowding, there is crowding at the regionally important interchanges between rail and Underground in north London including Finsbury Park, Tottenham Hale and Highbury and Islington and at Camden Town station.
271. The committed interventions in north London will alleviate little of the crowding on the Underground closer to central London when they are completed. As can be seen in Figure 45, the additional demand resulting from the forecast growth will lead to severe crowding in 2031, particularly on the Finsbury Park to central London corridor and on both branches of the northern Line through central London, and on the Jubilee line south of Finchley Road. The challenge remains to ensure that continued renewals allow Underground and rail services to operate reliably and that further capacity improvements as set out in the draft Transport Strategy are funded to ensure that the network can cope with the growing levels of demand.



272. Interchanges, whether locally focused or key transport hubs, are essential to ensuring multi-modal journeys or journeys involving more than one public transport service, are convenient, comfortable, safe and reliable. Interchanges have a crucial role to play in improving the relative attractiveness of public transport to the car and tackling dependency. The sub-regionally important interchanges in north London include Tottenham Hale, Finsbury Park, Highbury and Islington, West Hampstead, Seven Sisters/ South Tottenham, Walthamstow central/ Queens Road and Hackney Downs/ Central. Other regionally important stations that allow interchange with bus services include Brent Cross and Colindale with the northern Line and Cricklewood with National Rail. As set out above, many of these stations experience crowding now and in 2031.
273. The draft Transport Strategy sets out that there are strategic interchanges that have the potential to relieve interchange capacity pressures at London's central rail termini and enhance travel time. The challenge for north London is ensuring there is adequate capacity in the regionally important interchanges to cope with the forecast growth in population and employment. Examples include Tottenham Hale station which will experience growth as a result of any increase in services at Stansted airport and Brent Cross and/ or Colindale due to forecast.
274. Figure 32 shows current bus passenger flows in north London. The busiest corridors in north London are the A10 corridor, particularly from Liverpool Street to Edmonton, and a wider range across inner London. There is potential for bus passenger flows along the A10 corridor to change in the future with the reopening and extension of the east London Line and with any potential future increase in suburban stopping services on the West Anglia Main Line through the Lee Valley. For instance, whilst there may be a decline in demand to the south of Dalston, models show that to the north, as far as Seven Sisters, there may be large increases. East to west travel patterns may alter as more passenger access rail stations using bus services.
275. Another approach to relieving crowding on the public transport network is to reduce the demand to travel. The analysis work on cycling potential in the north sub-region indicates that there are a proportion of car journeys that are potentially cyclable. However, more analysis is needed to determine what proportion of crowded public transport journeys could be reduced in particular corridors by encouraging a shift to cycling. In addition, the cycle superhighways proposed in the draft Transport Strategy (see Figure 37) also provide an opportunity to encourage a modal shift from both car and public transport to cycling, which would have benefits in terms of reducing crowding. In north London, a cycle superhighway is proposed for Tottenham to Liverpool St along the A10 which could help to reduce crowding by encouraging trips away from the bus routes on the A10 and from the rail services from Tottenham Hale to Liverpool St. Cycle superhighways are also proposed for east Finchley to Angel along the A1 and A1000 and from Cricklewood to Marble Arch along the A5 which could both encourage public transport users away from the crowded northern Line.
276. Another option for crowding relief is proximity interchanges where improvements in walking between two interchanges can connect two networks. One such example is between Walthamstow Queen's Road station (London Overground network) and Walthamstow central (National Rail and LUL). As can be seen in Figure 78 below, these stations are less than 300m apart. The proximity interchange uses the Walthamstow central station car park through the new development to more conveniently access Walthamstow Queen's Road station.

Figure 78: Proximity interchange between Walthamstow Queen's Road and Walthamstow central stations



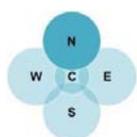
277. There is also a real opportunity to integrate public transport infrastructure with emerging developments and economic growth centres. The scale of development in the Upper Lee Valley and Brent Cross Cricklewood area creates potential for more sustainable developments by limiting car parking, enhancing public transport infrastructure and encouraging walking and cycling for more local trips and enhancing local environments.
278. The transport measures funded and proposed for the future in the draft Transport Strategy, including the upgrade to the Thameslink line and the West Anglia Main Line, also provide an opportunity to utilise the increased capacity provided. There is an opportunity to support growth in key corridors, such as London-Stansted and London-Luton by exploring ways to provide greater capacity on key London Underground and rail routes, such as the Lee Valley Line and the Victoria and Piccadilly Line.
279. The outcomes of this challenge contribute to the draft Transport Strategy challenges of supporting economic development and population growth and enhancing the quality of life of Londoners.

Opportunities to relieve public transport crowding

Figure 79: Indicative public transport crowding priority list

Challenge: Relieving crowding on the public transport network		
Corridors	Crowding issues	Draft MTS (includes a number of example policies/ proposals that are particularly relevant to this challenge)
Finsbury Park - Central London Stations	Crowding from Finsbury Park on the Piccadilly Line	Proposals 8, 9, 11, 14, 15, 18, 19, 22, 23 and 46 delivering capacity and accessibility enhancements on rail, Underground and DLR routes and at stations and prioritising improvements to strategic interchanges
	Crowding on Great Northern services from Finsbury Park to Moorgate	
	Crowding from Finsbury Park on the Victoria Line	
Central London Stations - Camden Town- Finchley Rd & Golders Green	Crowding on the Northern Line into and beyond Camden Town	Proposal 23 keeping the bus network under review
Finchley Road – Central London Stations	Crowding from Finchley Road on the Jubilee Line	Proposal 45 improve customer experience by improving quality of all regional important interchanges
Locations		
North London Line	Crowding between Brondesbury and Gospel Oak	Proposals 51 and 52 promoting and supporting cycling
Gospel Oak - Barking	Crowding on Gospel Oak Barking Line	Proposal 59 encouraging walking
Camden Town Station	Interchange issues at Camden station. Access & egress issues during market times	Policy 4 seeking to maximise public transport connectivity and capacity benefits on the two main east-west and north-south corridors
Finsbury Park National Rail Station	Crowding at Finsbury Park station	Policy 5 improving access to major public transport interchanges for pedestrians, cyclists and by public transport.
Finsbury Park Underground Station	Crowding at Finsbury Park station	
Highbury and Islington Station	Crowding at Highbury and Islington station	
West Hampstead Underground Station	On-street crowding at West Hampstead due to interchange between London Underground, London Overground & National Rail Trains	
West Hampstead Overground Station	Station congestion in ticket hall	
Tottenham Hale Station	Station congestion from interchange at Tottenham Hale	
Seven Sisters Station	Poor network interchange at strategic interchange station	
Hackney Downs and Hackney Central	Poor network interchange at strategic interchange station	

Source: Rail crowding plots 2001, 2016, 2031 and TfL corridor analysis



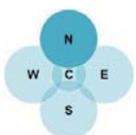
Spotlight on Finsbury Park to central London corridor



Key problems: public transport crowding on Piccadilly line and Victoria line, radial into central London

Population growth in the corridor north of London towards Stansted and Cambridge will increase demand for travel to and through this north east corridor of the region. Interchange at stations such as Tottenham Hale and Finsbury Park onto the Victoria Line is likely to significantly increase and the line will become progressively more crowded into central London. Further congestion at Kings Cross and Euston will arise where demand will increase due to development of the surrounding area as well as from increased National Rail to Underground interchange, itself a result of increased national rail patronage. If Euston becomes the terminus for a new domestic high speed line from Euston to the Midlands and the north then there will be a major uplift in demand for the Victoria Line to access the rest of central London.

Whilst investment in line capacity and rolling stock will increase the overall capacity of the line, the package schemes in the TfL Business Plan (2016/17) provide significant crowding relief to the Victoria Line. However with London's population forecast to grow by 18 per cent additional capacity will be required within the life of this plan. The situation on the Piccadilly line is similar from Finsbury Park south towards central London, and picks up the same issues at Kings Cross.



Potential options for relieving crowding on the public transport corridor from Finsbury Park to Central London could include:

Example Option: Chelsea Hackney Line (CHL) via West Anglia or Great Northern corridors

There is potential for CHL to relieve crowding on the Finsbury Park to Central London corridor. 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. Forecast demand shows that crowding and congestion remains a significant issue in this corridor 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 Mayor supports new rail capacity in the broad southwest to northeast corridor, for example, new lines or services using the Chelsea Hackney line safeguarded alignment. TfL is reviewing the safeguarded route, including additional route options that might provide further benefits and value for money.

Example Option: Capacity increase on Great Northern train service

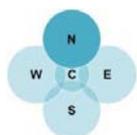
There is potential of increasing capacity on the Great Northern train services and thus providing capacity relief on the Finsbury Park – Central London Rail corridor. Capacity relief would be provided by adding stopping services to Moorgate. This would be achieved through track and station modifications between Alexandra Palace and Finsbury Park, signalling modifications between Finsbury Park and Moorgate and additional rolling stock.

Example Option: Four tracking of West Anglia Mainline /Stansted Corridor from Copper Mills Junction

Whilst many fast trains currently pass through Central Leaside, few stop within the area to serve local resident and the working population. Both the local and long-distance rail services running along the Lee Valley line are restricted by track capacity. There is potential to enhance the West Anglia Main Line in the Lee Valley, including four-tracking north of Coppermill Junction. There is only a single railway line in each direction on the Lee Valley Line; as a consequence both fast non-stop services and slow local rail services share the same track. The scheme would enhance capacity through the Lee Valley area by allowing faster and more frequent services to operate. However, work needs to be undertaken to understand the impact of four-tracking on the resilience and performance of the highway network, specifically its impact on the level crossings in the area.

Example Option: Tottenham Hale Station Interchange

The Department for Transport and National Rail are undertaking feasibility studies in control period four (CP4) 2009-2014 to identify potential 4-track options for implementation post 2015 (see above). There is potential to explore capacity enhancements to the Underground station, catering for growth at Stansted as well as neighbouring areas of population and housing growth such as Wood Green, Central Leaside, Blackhorse and Innova Park. Tottenham Hale station will have significant capacity problems post 2020 due to growth and increase in demand. Options have been developed for improvements to the station interchange including provision of a reconstructed overbridge and improved interchange between London Underground and Rail. Additional options could be explored include increasing the service at the stations in Upper Lee Valley from 2 to 4 trains per hour, enabled by upgrading the West London Main Line, which would improve rail connections to key development areas and give passengers a single interchange at Tottenham Hale. The proposal is closely linked to, but not dependant on the expansion of Stansted Airport.



Example Option: Sub-regional Important Interchanges Improvements

Sub-Regionally Important Interchanges have been defined as those which

- Provide opportunities for orbital public transport services **within** the sub region
- Are of regional importance in terms of :
 - the operation of the network and / or
 - the access / regeneration of town / metropolitan centres

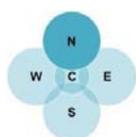
One of the main objectives of strategic interchanges is to provide opportunities to accommodate regional growth in population and employment. This growth could potentially be as a result of new/ planned infrastructure schemes. This will have several inter-related outcomes, such as relieving crowded stations and enabling orbital travel. In the North these include Camden Town, Finsbury Park, Highbury & Islington, Seven Sisters, Tottenham Hale, West Hampstead, Brent Cross, Cricklewood, Colindale, Wood Green, Walthamstow Central / Queens Road and Hackney Downs / Hackney Central. There is the potential to improve public transport links, such as enhanced orbital London Overground services or stopping more radial services at interchange stations between radial and orbital lines to facilitate transfer onto other routes, and also to improve interchanges themselves, such as improved internal circulation and waiting facilities to provide a quality station environment. The current programme of London Overground enhancements in North London in particular offers the potential for improved orbital connectivity between Opportunity Areas and areas of regeneration in north west and north east London avoiding crowded radial National Rail and Underground routes into central London. Feasibility work would investigate the level of intervention required and at what locations.

Example Option: Encouraging sustainable travel and choices

Thameslink is currently undertaking upgrades on the national rail service into London that are set to provide some relief on the Finsbury Park – London corridor. There is potential to encourage modal shift at Finsbury Park by catering for shorter distance journeys through improvements in bus and cycle priority as well as encouraging cycle hire scheme. Ensuring a wider roll out of smarter travel initiatives and better public transport information could reduce crowding levels through encouraging better interchange choices and mode shift to other public transport modes such as buses.

Further work/analysis

- Further work on understanding the public transport connectivity issues from/to and within Growth Corridors, Opportunity Areas and Areas of Intensification
- Further work on Chelsea Hackney line
- Further work on West Anglia four tracking
- Further work on feasibility of encouraging modal shift and smarter travel choices.
- Further work with key stakeholders to undertake option identification and analysis for the priority locations listed in Figure 79
- Further work on translating MTS policies into specific sub regional proposals



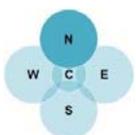
3.3 Challenge 3: Managing highway congestion and making more efficient use of the road network

Contribution to draft Transport Strategy outcomes

- Balancing capacity and demand for travel through increasing public transport capacity and/or reducing the need to travel
- Smoothing traffic flow (managing road congestion and improving journey time reliability)
- Improving road user satisfaction (drivers, pedestrians and cyclists)
- Reducing air pollutant emissions from ground-based transport, contributing to EU air quality targets
- Reducing air pollutant and CO₂ emissions from ground-based transport



280. Analysis of the challenges in the draft Transport Strategy and the data available for north London, in addition to discussions with the boroughs, indicates that highway congestion is a significant transport challenge in north London. At the area level, congestion is worst in inner London and around town centres. It is also a significant issues on the main road corridors in north London, in particular the A5, A1 and A10 and the North Circular Road.
281. Highway congestion in North London is forecast to worsen by 2031. Highway network stress analysis indicates that there are a number of corridors within North London that experience issues with congestion. Figure 36 provides analysis of the key congestion issues on the road corridors in North London and shows that congestion on the North Circular and on junctions with the North Circular is a particular issue.
282. As set out in Chapter 2, around half (46%) of all journeys within the core north London boroughs are by car. This is consistent with the mode share for Outer London journeys. Analysis of future journey mode share indicates that the mode share for cars is likely to remain broadly similar. This suggests that car will remain an important mode of travel within north London into the future. However, analysis of the walking and cycling potential in north London indicates that there is considerable potential to facilitate an increase in non-motorised trips, which would have a beneficial impact on highway congestion, particularly given that the nature of many trips tends to be more local.
283. Other measures included in the draft Transport Strategy to encourage a modal shift away from car travel, which should be considered further in north London, include smarter travel initiatives. This involves a range of initiatives including raising awareness of available travel options through targeted promotions and engaging directly with schools, workplaces and local communities, for example school travel planning. Also included are measures for the smarter transport of freight and services that seek to improve the efficiency and effectiveness of freight operations through the promotion of delivery and servicing plans, construction logistics plans and the Freight Operator Recognition Scheme.



284. There are a number of policies and proposals in the draft Transport Strategy that seek to make more efficient use of the road network, in particular smoothing traffic flow to manage congestion and improve journey time reliability for people and goods movements. Schemes include rephasing traffic signals and working with utility companies to reduce the impact of street works on traffic. However, any measures to smooth traffic for vehicles also need to take into account the impact on other road users, including pedestrians, cyclists and public transport users.
285. The outcomes of this challenge contribute to the draft Transport Strategy challenges of supporting economic development and population growth; enhancing the quality of life of Londoners, in particular improving air quality; and reducing transport's contribution to climate change.

Opportunities to manage highway congestion and make more efficient use of the road network

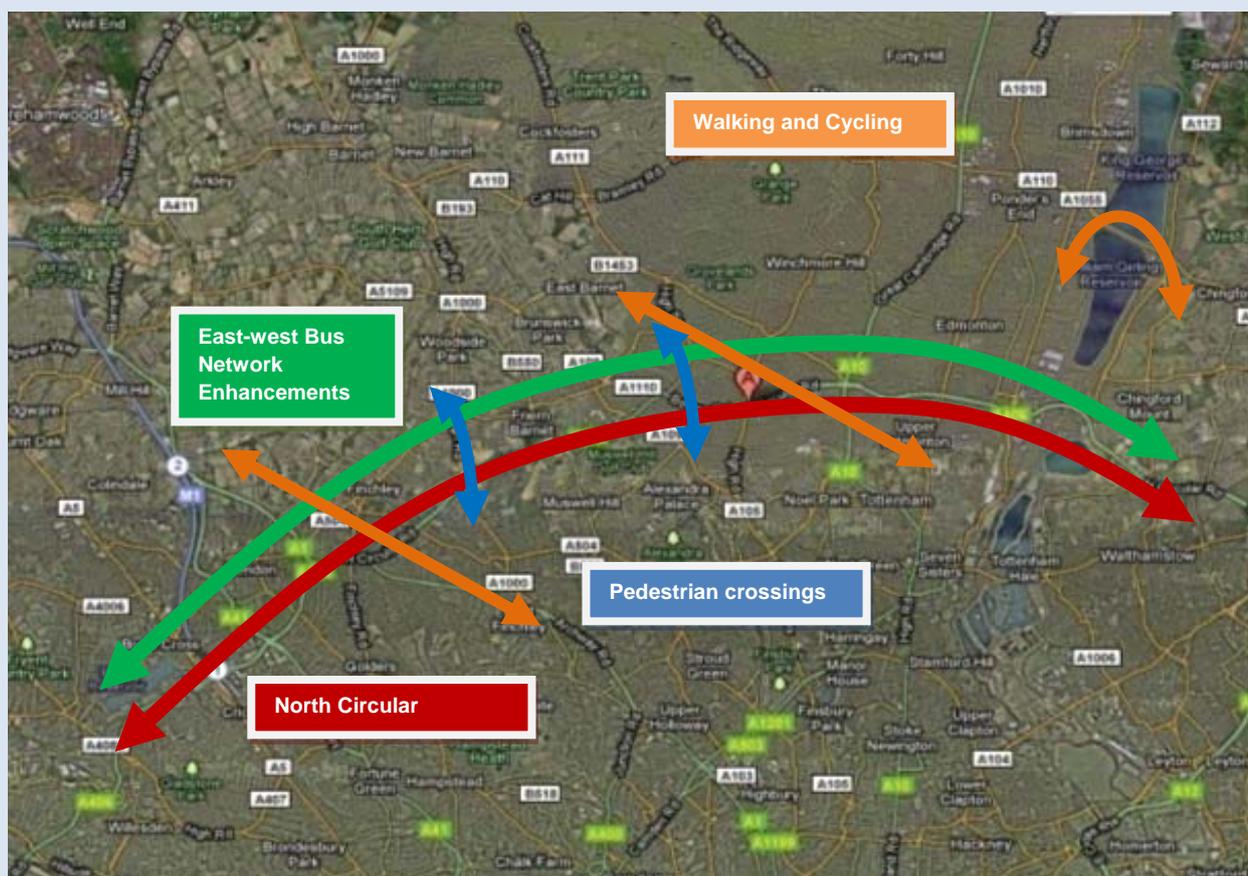
Figure 80: Indicative priority list: Highway congestion

Challenge: Managing highway congestion and making efficient use of the road network		
Indicative Locations	Indicative Congestion Issues	Draft MTS (includes a number of example policies/ proposals that are particularly relevant to this challenge)
A406	Heavily congested between Brent Cross for much of the route in north London, especially approaching Archway. Key pinch points at Henly's Corner & Bounds Green	Proposal 3 supporting the development of a national rail routes for freight, that would help relieve London of rail freight without an origin and destination in the Capital and encourage a shift from road to rail
A10	Heavy congestion from Haringey to M25	Proposals 30 and 101 introducing measures to smooth traffic flows to manage congestion and improve journey time reliability
A1	Congested along Holloway Road	Proposal 34 with a criteria based approach to road schemes
A5	Congestion on A5 from Dollis Hill bus garage to Kilburn High Road	Proposal 38 examining the potential to increase use of the Blue Ribbon network for freight transport
A1055	Freight highway connectivity to the M1 and consequences for local congestion	Proposal 49 seeking to improve access to airports for people and goods to encourage a shift away from road
A400	Entire route heavily congested	Proposal 98 and 118 encouraging more efficient freight movements and supporting introduction of freight consolidation centres
A112	Highly congested approaching Stratford and Walthamstow	Proposal 108 keeping under review road user charging and other demand management measures to encourage mode shift
A1010	Heavy congestion at approaches to key junctions such as A105 and A110	

Source: TfL corridor analysis, TfL modelling data , LTS data

The highway routes listed in the initial priority list in Figure 80 above are only *indicative* of priority locations at this stage. TfL is aware that there are additional locations in north London that experience congestion, the above list is by no means exhaustive.

Spotlight on the North Circular (A406 strategic route)



Key challenge: Managing highway congestion and making efficient use of the North Circular

The key orbital route in north London and London-wide is the A406 North Circular which experiences significant congestion. Poor conditions are exacerbated by a mix of safety issues caused by rat-running in surrounding residential streets, poor pedestrian and cycle facilities and networks within the area and to surrounding communities. There are very few opportunities for pedestrians and cyclists to move through the area off the main road network. Where opportunity is provided, along river networks and green corridors, the footpaths are sporadic, there is lack of surveillance and the environmental quality is in need of improvement.

Potential options for managing highway congestion on the A406 include:

Example Option: Traffic Management Measures

There is potential to extend the existing road safety and non-motorised user improvement scheme between Bounds Green Road and Green Lanes to other key locations along the North Circular. Potential interventions to manage highway congestion could include “smoothing traffic” and promoting walking, cycling and public transport. Feasibility work would investigate the level of intervention required and at what locations in and around the Central Leaside area.

Example Option: East–West Bus Services

There are a number of bus services which provide east-west connections. As land-use changes occur and areas experience increases population and employment, travel patterns will change. The bus network will need to be kept under review to ensure that it is responding to emerging demand. There is potential for buses to deliver modal shift in key corridors and this should be exploited. The proposal would look to enhance services by the provision of clear travel information about bus travel choices and options. Feasibility work will investigate where and/or at what approaches to the North Circular there is potential for enhancements and the level of intervention required.

Example Option: Interchange Improvements

There is potential to encourage further uptake of public transport travel by improving interchanges at key stations along the North Circular (such as New Southgate). The proposal would look to promote more sustainable journeys (rail to bus, bus to walking/cycling around key stations along the A406). Feasibility work would investigate the level of intervention required and at which stations.

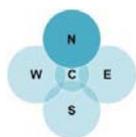
Example Option: Walking and Cycling

There is potential for providing high quality pedestrian and cycle connections on routes to and from key parks and schools along the North Circular (such as Broomfield School, Broomfield Park, and Arnos Park). The proposal would also look at promoting cycle hire and encouraging more sustainable transport modes by providing cycle facilities where appropriate, for example along Pymme's Brook. Feasibility work would investigate the level of intervention required and at what locations.

Example Option: Freight Management

The growth in freight movement projected due to the impacts of new developments and the displacement of the existing activity, will generate different patterns and levels of freight (and other transport) activity. There needs to be an understanding as to how projected growth and employment will affect the delivery and provision of goods and services in North London. The London Plan emphasises facilitating the efficient distribution of freight whilst minimising its impacts on the transport network. It emphasises the importance to secure and enhance strategic freight provision in London, especially in the Upper Lee Valley area. This can be achieved by a combination of different measures:

- Local Development Frameworks and London Plan development control will play a key role in encouraging efficient freight delivery and logistics by ensuring that developments deal with freight issues in transport assessments and travel plans. By safeguarding existing sites and identifying new sites to enable the transfer of freight to rail and water; identifying sites for consolidation centres and 'break bulk' facilities; safeguarding railheads for aggregate distribution.
- Encouraging Freight Framework Delivery and Servicing Plans. These aim to reduce delivery trips (particularly during peak periods) and increase availability and use of safe and legal loading facilities, using a range of approaches including consolidation and break bulk centres as well as out-of-hours deliveries.
- Encourage engagement with Freight Quality Partnerships to help deliver the Mayors Freight Plan by building partnerships at pan-London and sub-regional levels to help coordination between TfL, businesses, operators and boroughs.



Example Option: Integrating Land-use and Transport

Local Development Frameworks and London Plan development control policies will play a key role in integrating land use and transport planning by ensuring:

- that sustainable transport links are included in developments according to existing, proposed and potential connectivity and capacity
- that large new developments are near to existing public transport networks – which would reduce the need to travel
- that policies encourage public transport, walking, cycling and high quality urban realm
- that policies encourage mixed use developments particularly on larger sites where the scale of development is such that effectively new towns are built for example at Brent Cross
- that planning contributions are sought for transport improvements in opportunity areas such as Upper Lee Valley, Brent Cross /Cricklewood, Colindale /Burnt Oak and elsewhere where appropriate
- sustainable construction and servicing , for example through planning conditions specify use of blue ribbon network and uptake of Construction Logistics and Delivery and Servicing Plans.
- that the use of consolidation and break bulk centres is explored, and that any development deals with freight issues in transport assessments and travel plans.

Example Option: Urban Realm Improvements

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. The use of public transport can be encouraged through public realm by improvements to key stations and town centres, service improvements, promotion of smarter travel initiatives and further demand management measures as appropriate.

Example Option: Encouraging sustainable travel and choices

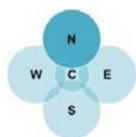
There is potential to encourage modal shift by catering for shorter distance journeys through improvements in bus and cycle priority as well as encouraging cycle hire scheme. Ensuring a wider roll out of smarter travel initiatives and better public transport information could reduce congestion levels through encouraging better interchange choices and mode shift to other public transport modes such as buses.

Example Option: Demand Management Measures

That demand for travel can be managed by various measures; these might involve operational measure such as dynamic route information, physical measures (such as High Occupancy Vehicles lanes), organisational measure (such as sustainable travel planning) or financial pricing (such as road user charging). Although financial pricing can be highly effective in altering travel patterns and can be tailored to support sustainable transport objectives – it is clearly a contentious policy. Therefore any schemes must be carefully designed to fit local conditions if they are to be effective. The draft Transport Strategy identifies various demand management measure for reducing transport's contribution to climate change and improving transport network resilience.

Example Option: Park and Ride

Park and ride is widely promoted in many regional towns and cities as an alternative to city centre parking, primarily in order to reduce congestion. Many of London's rail and tube stations, especially in Outer London, have parking and so informal 'park and ride' is widespread. Local development Frameworks and London Plan development control policies will play a key role in supporting proposed park and ride schemes in Outer London that lead to an overall reduction in congestion, journey times and road vehicle kilometres.



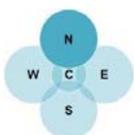
Example Option: Smoothing traffic

There is potential for better traffic management and street works coordination which could lead to reductions in traffic congestion by;

- Maximising the efficient and reliable operation of the road network, through such measures as number and rephasing of traffic signals
- Minimising the impact of planned interventions such as road works
- Better managements and review of parking and loading arrangements
- Achieving modal shift away from car based traffic movements towards more sustainable modes to reduce traffic growth pressures

Further work/analysis

- Further work on understanding the crowding issues at key pinch point on the North Circular
- Further work with key stakeholders to undertake option identification and analysis for the priority locations listed in Figure 80.
- Further work on east-west bus connectivity enhancements
- Further work on translating MTS policies into specific sub regional proposals



Challenge 4: Enhancing connectivity and the attractiveness of orbital public transport

Contribution to draft Transport Strategy outcomes

- Balancing capacity and demand for travel through increasing public transport capacity and/or reducing the need to travel
- Improving people's access to jobs
- Improving access to commercial markets for freight movements and business travel, supporting the needs of business to grow
- Improving access to services
- Improving the physical accessibility of the transport system
- Reducing air pollutant and CO₂ emissions from ground-based transport



286. The north sub-region generally has very good connectivity in the radial rail transport corridors into central London. However, public transport journeys outside of these transport corridors generally take much longer.

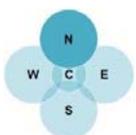
Strategic and Regional Orbital Connectivity

287. The key orbital public transport rail route in Outer London is the London Overground network. The north London parts of the line are the Richmond to Stratford Line (north London line) and the Gospel Oak to Barking Line. The sub-region benefits from several key interchanges between the rail modes, particularly at the regionally important interchanges of Finsbury Park, Tottenham Hale and West Hampstead. Public transport trips, other than bus journeys, across the sub-region will often require travel on the radial-centric rail corridors into central London.

288. Outside of the key orbital routes, demand and supply of orbital connectivity by public transport focuses on journeys to local centres, facilities and interchanges, with comparably slow journey speeds. The key orbital highway route in north London is the A406 North Circular, which experiences significant congestion.

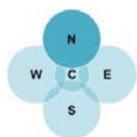
289. The draft Transport Strategy provides for an opportunity for enhanced connectivity by increasing interchange with the London Overground network from other National Rail lines. Providing opportunities to interchange with the Gospel Oak to Barking or Richmond to Stratford lines would allow more orbital trips to be made without the need to interchange at already crowded stations, such as Finsbury Park. Reducing journey times would contribute to enhancing the attractiveness of orbital public transport.

290. The draft Transport Strategy seeks to maximise the use of existing networks and planned developments. In north London, the Chingford to Liverpool Street line provides a passenger service from several stations to the City of London. However, the connection between the Chingford to Stratford and the Lee Valley line (the Hall Farm Curve) was removed several years ago. There is no rail service currently possible between Chingford station and the Olympics site at Stratford. Connecting Chingford to Stratford growth and employment area would not only provide opportunities to carry on the Olympic Legacy but also provide additional journey possibilities on the DLR and a strategic link to the orbital Overground network via north London Line. However, such a scheme would have to undergo careful engineering feasibility analysis to resolve any conflicts of track usage at Stratford station



Local Orbital Connectivity

291. Boroughs and key stakeholders have through sub regional engagement, expressed specific concerns that the needs of Outer London in terms of travel greatly differ from those residing and travelling in Inner London. The pattern of residential density and employment opportunities coupled with high car ownership and severe congestion on key orbital routes such as the North Circular needs to be clearly understood to address connectivity issues efficiently.
292. Bus services in north London provide connections to longer-distance orbital rail links, as well as to local centres, schools and hospitals. Examples of orbital journeys where only a small proportion of demand are for longer journeys are routes 230 or route 210 in north London. Route 230 provides east-west orbital links from Upper Walthamstow to Wood Green via Walthamstow and Tottenham Hale, but only 14% of journeys are from Walthamstow central and areas east to areas west of Tottenham Hale. Route 210 provides east-west orbital links from Finsbury Park to Brent Cross via Archway and Golders Green, but only 15% of journeys are from Archway and areas east to Golders Green and areas west.
293. As can be seen from the example above, in many cases the demand for orbital journeys is low. However there are orbital corridors which do have good levels of bus provisions. There is a need for the provision of better more transparent information about these services.
294. north London boroughs are keen to explore bus-based transit schemes or even express bus routes. In terms of longer distance express routes, the experience of the X26 pilot express from Croydon to Heathrow in south London has indicated insufficient demand to provide a positive business case for similar schemes.
295. The draft Transport Strategy makes it is clear that the availability of public funds might well restrict the development of schemes which envisage new infrastructure. TfL's current budget for bus service provision does not allow for further investment in this area and any additional subsidy requirement would need to be met through either the provision of further funds or a reallocation of subsidy from existing or planned uses. Nonetheless where sufficient demand and growth necessitates a change or enhancement of services, TfL will work with boroughs and key stakeholders to develop multimodal solutions to connectivity and orbital transport issues.
296. The outcomes of this challenge contribute to the draft Transport Strategy challenges of supporting economic development and population growth and improving transport opportunities for all Londoners.



Opportunities to enhance connectivity and the attractiveness of orbital public transport

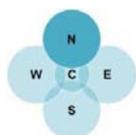
Figure 81: Indicative priority list: Enhancing connectivity and attractiveness of orbital public transport

Challenge: Enhancing connectivity and attractiveness of orbital public transport		
Locations/Corridors	Outcomes	MTS (includes a number of proposals that will contribute to this challenge)
A406 (within north London boroughs)	Improving journey reliability and managing highway congestion on the North Circular	Proposals 14, 15 and 16 providing extra capacity to assist orbital movements on the Overground extending the DLR and improving station accessibility Proposal 23 keeping the bus network under regular review Proposals 45 and 46 using Best Practice Guidelines to improve interchange schemes and improving interchange to provide opportunities for orbital public transport Policy1 Improving transport connectivity
Gospel Oak - Barking	Increased connectivity, faster journeys and crowding relief on a key north London orbital route	
North London Line	Increased connectivity, faster journeys and crowding relief	
Stratford - Chingford	Better connections between Stratford and Chingford.[this link is orbital to Central Activity Zones but radial to Canary Wharf]	
Connections across the River Lee	Better connectivity and journey reliability for journeys across the limited number of points connecting River Lee	
Brent Cross - Ealing	Better connections between Brent Cross Opportunity Area and west London	

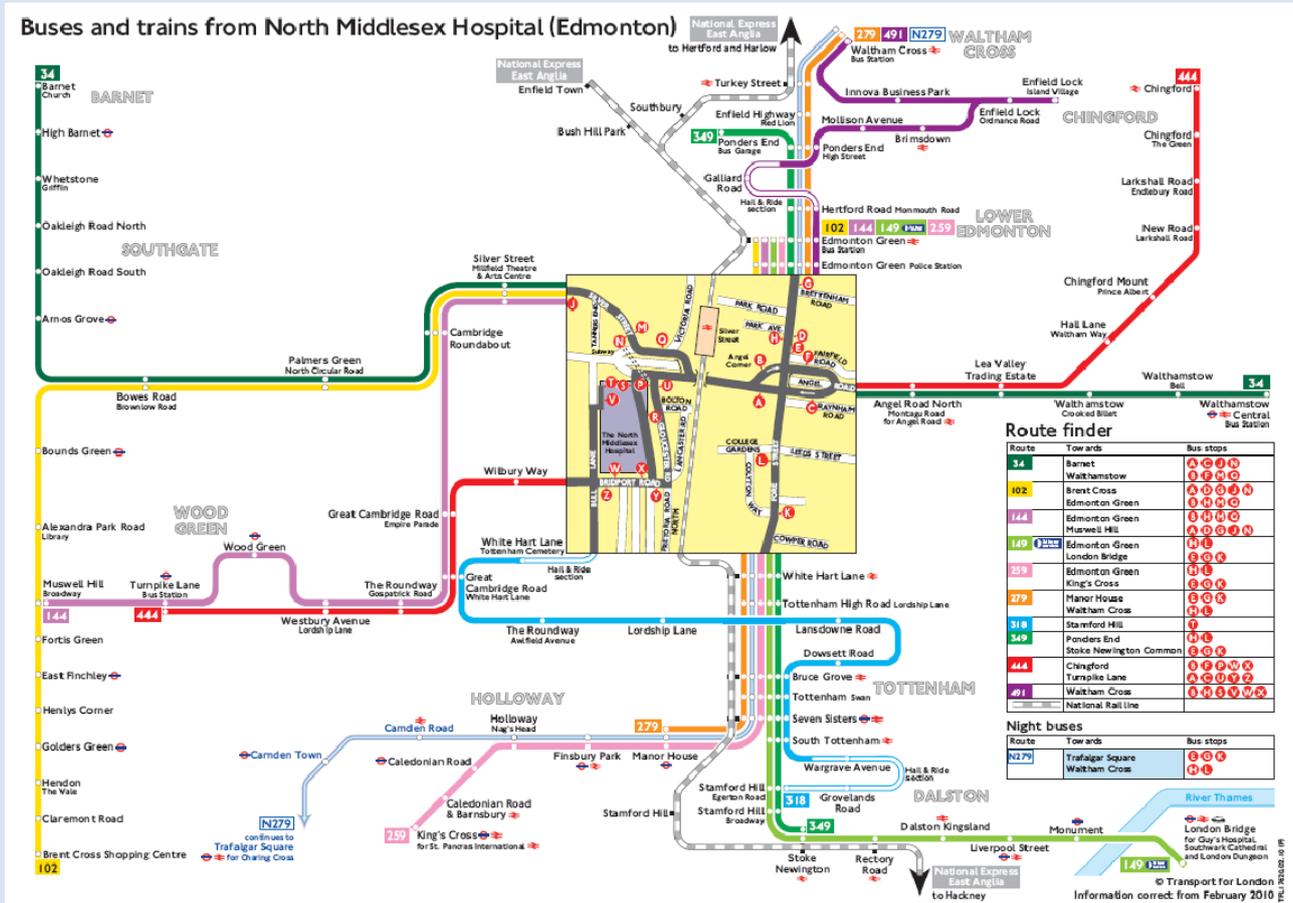
Source: TfL corridor analysis, Rail plan plots

The highway route, rail connections/lines listed in the initial priority list above are only *indicative* of priority locations at this stage. The above list is by no means exhaustive. It is highly unlikely that one option will solve all of the problems identified by each challenge and it may be that a package of measures/ interventions is the most effective way of addressing key corridor issues.

All priorities are subject to value for money test as set out in the introduction to Chapter 3. TfL will also look further at the demand and aspirations for improved orbital connectivity alongside existing connections.

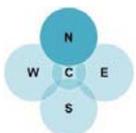


Spotlight on North Middlesex Hospital



Although this challenge refers to several locations in the north the potential proposal will focus on connectivity to and from north Middlesex Hospital. North Middlesex Hospital is located in the south of Enfield borough, beside the A406 and close to the Haringey border. It serves patients from the boroughs of Enfield, Haringey, Barnet, Waltham Forest and surrounding areas and draws staff from across London and beyond. The hospital is currently undergoing expansion and redevelopment work for completion in 2010/11, when an increase in outpatient care will mean more day trips to and from the hospital.

Public transport connections to the hospital are predominantly by bus. The nearest rail stations are Silver Street station (across the A406) and, further away, White Hart Lane station, on the north-south radial line into central London. There is no Underground station in the vicinity. Although the bus network is frequent and comprehensive from the site, there are parts of the hospital's catchment that do not have a connection. The hospital has also in the past requested connections to its partner hospital at Chase Farm, north of Enfield. The hospital is in an area of relatively low cycle use and pedestrian access to the site is of varying quality. The ease of access onto the TLRN and other main roads mean that travel to the hospital by car is an attractive proposition for the visitors and staff, coming from a widely-dispersed area. However, this means that travel to the hospital contributes to the road capacity issues on the A406 and is not as accessible by other modes as some others in London. The potential for more of the different trips here, both for visitors and staff, to be made by sustainable transport modes could be investigated. This interlinks with many of the other challenges discussed in this document, such as highway issues on the A406 and improving radial rail services.



Potential Options:

Example Option: Promoting modal shift and enhancing public transport awareness

There is potential to promote a shift to sustainable modes by both local and longer-distance orbital journeys in this area. The proposal would look at trips to/from Hospital and considers each car trip and identifies what sustainable modes and smarter travel measures might be attractive to enhance connectivity and orbital public transport trips while efficiently reducing that journey impact on congestion. These could include:

- Promotion of walking and cycling (way finding, urban realm/footway improvements, health promotions, cycle parking, safety and security)
- Car-sharing and car club schemes – employee based options, internet schemes, advantages and disadvantages – means of promotion to drivers
- Possible ways of serving unconnected areas by bus (or bus and rail)
- Taxis and private hire

Feasibility work would investigate the level of intervention required.

Example Option: Integrating Land-use and Transport

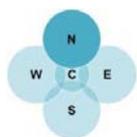
Local Development Frameworks and London Plan development control policies will play a key role in integrating land use and transport planning by ensuring:

- that sustainable transport links are included in developments according to existing, proposed and potential connectivity and capacity
- that large new developments are near to existing public transport networks – which would reduce the need to travel
- that policies encourage public transport, walking, cycling and high quality urban realm
- that policies encourage mixed use developments particularly on larger sites where the scale of development is such that effectively new towns are built for example at Brent Cross
- that planning contributions are sought for transport improvements in opportunity areas such as Upper Lee Valley, Brent Cross /Cricklewood, Colindale /Burnt Oak and elsewhere where appropriate
- sustainable construction and servicing , for example through planning conditions specify use of blue ribbon network and uptake of Construction Logistics and Delivery and Servicing Plans.
- that the use of consolidation and break bulk centres is explored, and that any development deals with freight issues in transport assessments and travel plans.

Example Option: Freight Management

The growth in freight movement projected due to the impacts of new developments and the displacement of the existing activity, will generating different patterns and levels of freight (and other transport) activity. There needs to be an understanding as to how projected growth and employment will affect the delivery and provision of goods and services in North London. The London Plan emphasises facilitating the efficient distribution of freight whilst minimising its impacts on the transport network. It emphasises the important to secure and enhance strategic freight provision in London, especially in the Upper Lee Valley area. This can be achieving by a combination of different measures:

- Local Development Frameworks and London Plan development control will play a key role in encouraging efficient freight delivery and logistics by ensuring that developments deal with freight issues in transport assessments and travel plans. By safeguarding existing sites and identifying new sites to enable the transfer of freight to rail and water; identifying sites for consolidation centres and 'break bulk' facilities; safeguarding railheads for aggregate distribution.



- Encouraging Freight Framework Delivery and Servicing Plans. These aim to reduce delivery trips (particularly during peak periods) and increase availability and use of safe and legal loading facilities, using a range of approaches including consolidation and break bulk centres as well as out-of-hours deliveries.
- Encourage engagement with Freight Quality Partnerships to help deliver the Mayors Freight Plan by building partnerships at pan-London and sub-regional levels to help coordination between TfL, businesses, operators and boroughs.

Example Option: Urban Realm Improvements

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. The use of public transport can be encouraged through public realm by improvements to key stations and town centres, service improvements, promotion of smarter travel initiatives and further demand management measures as appropriate.

Example Option: Encouraging sustainable travel and choices

There is potential to encourage modal shift by catering for shorter distance journeys through improvements in bus and cycle priority as well as encouraging cycle hire scheme. Ensuring a wider roll out of smarter travel initiatives and better public transport information could reduce congestion levels through encouraging better interchange choices and mode shift to other public transport modes such as buses.

Example Option: Smoothing traffic

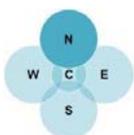
There is potential for better traffic management and street works coordination which could lead to reductions in traffic congestion by;

- Maximising the efficient and reliable operation of the road network, through such measures as number and rephasing of traffic signals
- Minimising the impact of planned interventions such as road works
- Better managements and review of parking and loading arrangements
- Achieving modal shift away from car based traffic movements towards more sustainable modes to reduce traffic growth pressures

Further work/ analysis

- Further work on understanding the connectivity issues with orbital travel
- Further work with key stakeholders to undertake option identification and analysis for the priority locations listed in Figure 81 as well as evaluating what other locations should be investigated.

Further work on translating MTs policies into specific sub regional proposals



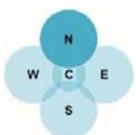
Challenge 5: Improving access to key locations and to jobs and services

Contribution to draft Transport Strategy outcomes

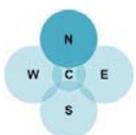
- Balancing capacity and demand for travel through increasing public transport capacity and/or reducing the need to travel
- Improving people's access to jobs
- Improving public transport customer satisfaction
- Improving access to services
- Improving the physical accessibility of the transport system
- Improving access to commercial markets for freight movements and business travel, supporting the needs of business to grow
- Reducing crime rates (and improving perceptions of personal safety and security)
- Reducing air pollutant and CO₂ emissions from ground-based transport
- Contributing to a successful 2012 Games and its legacy



297. In addition to enhancing connectivity and the attractiveness of orbital public transport, improving access to key locations and to jobs and services is a significant transport challenge for the sub-region. The Olympics provides an important opportunity for the north sub-region, particularly in terms of access to jobs and services. There is also a key opportunity to facilitate walking and cycling in north London as a means of improving access to key locations.
298. As can be seen in Figure 30, access to town centres and opportunity areas in north London by public transport is relatively fast and convenient along the radial rail corridors into central London. For example, Wood Green is well served by the Piccadilly Line, Edgware by the northern Line and Walthamstow by the Victoria Line. However, public transport connectivity across the sub-region and between town centres and the opportunity areas is relatively poorer and considerably more time consuming. One such example is Brent Cross, which is predominantly accessed by car with limited pedestrian and cycle access as a result of the severance caused by the major roads (A406, M1, A5, A41) bordering the site.
299. The majority of journeys (70 per cent) by north London residents are entirely within north London and nearly half (46 per cent) of these are by car, with one quarter by public transport. The challenge in north London is therefore to improve access to town centres, particularly from outside the radial-centric rail corridors, using more sustainable modes, such as walking, cycling and public transport, rather than by car. Public realm improvements are one such means of encouraging walking and cycling.
300. Given the planned commitments in the draft Transport Strategy, the greatest improvements in accessibility are likely to occur along the radial-centric rail and road corridors, around the North Circular and around Brent Cross/ Cricklewood.
301. Access to hospitals has been identified by the north London boroughs as a key challenge. The catchment pool for specialist services at hospitals and health centres has changed with NHS restructuring. This has an impact on access to health services where public transport systems were designed to support a particular catchment area which has since changed. Many patients have to travel beyond their local hospital to access some services.

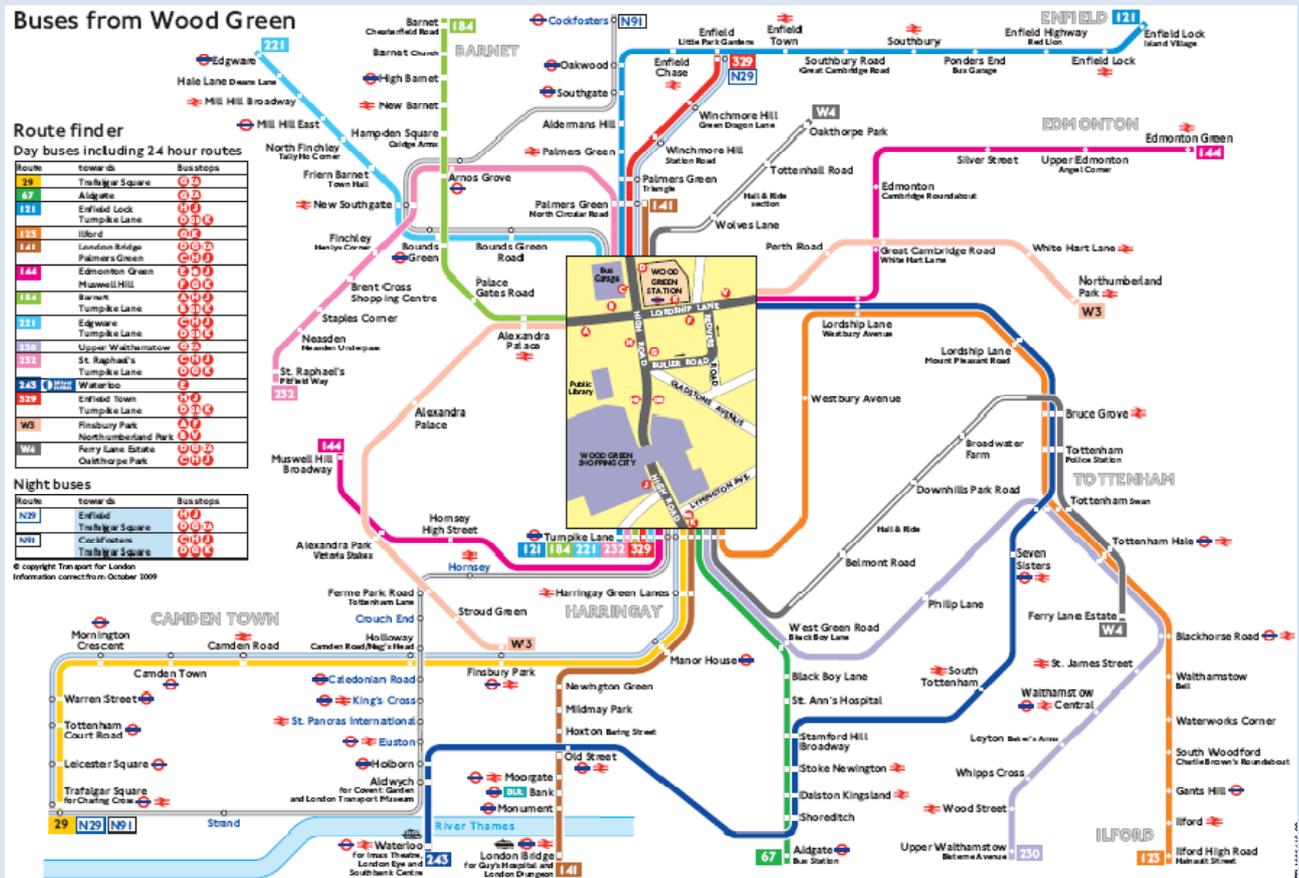


302. The massive regeneration and development happening in Stratford, including that for the Olympics, provides an opportunity for the north sub-region in terms of accessing jobs, particularly for the north east boroughs. The draft Transport Strategy includes a proposal to investigate the feasibility of extending the DLR north of Stratford International, which would provide further accessibility for residents of the London Borough of Waltham Forest to access Stratford.
303. In addition, the opportunity areas at Brent Cross/ Cricklewood and the Upper Lee Valley also provide an opportunity for people within and outside of the north London sub-region to access the opportunities provided by the growth in employment in these areas.
304. The outcomes of this challenge contribute to the draft Transport Strategy challenges of supporting economic development and population growth; improving transport opportunities for all Londoners; enhancing the quality of life of Londoners; and improving the safety and security of all Londoners.



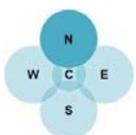
Opportunities to improve access to key locations and jobs and services

Spotlight on Wood Green (metropolitan centre)



Key Challenge: Improving access to/from Wood Green and surrounding key places

Wood Green is the sub-region's only Metropolitan town centre. It is defined in the London Plan as an Intensification Area with a range of development opportunities on the railway and former industrial lands to the south-west of Wood Green town centre, with significant potential for improvement building on the area's industrial heritage. It is a major employment centre for north London with significant shopping and educational activities. It is serviced by Wood Green and Turnpike Lane stations on the Piccadilly Line and Alexandra Palace on National Rail line to Welwyn Garden City and Hertford. The tube and rail trains on these lines are crowded in peak times. Wood Green also has issues with a congested highway network, particularly on the High Road (A105).



Potential Options include:

Example Option: “Better Town Centre” improvements

This proposal is currently being developed by TfL and the London Borough of Haringey. London Borough of Haringey has established a vision for Wood Green town centre. TfL is currently working in partnership with the Borough to investigate the potential of delivering MTS policies and objectives to support the Borough vision and the initial stages of this is initiating a pilot town centre study of Wood Green. The study will identify how transport can support the economy and therefore ongoing viability and growth of Outer London town centres. Transport concerns will include, cycling, walking, strategic interchange inclusive of bus access and the urban realm as set out within the Better Streets guidance.

Example Option: Walking and Cycling

There is potential to look at providing high quality pedestrian and cycle connections with a particular focus on routes to and from key leisure, employment locations and schools. The proposal would look to promote cycling through the provision of cycle parking facilities, additional cycle routes, cycle hire schemes and encourage walking through improvements in signage such as Legible London Walking. Feasibility work will investigate the level of intervention required.

Example Option: Potential Policy Options

The draft Transport Strategy includes a number of proposals that will contribute improving access to town centres and to jobs and services. These include:

- Policy1 Improving transport connectivity
- Proposal 15 investigating the feasibility of extending the DLR north of Stratford International
- Proposal 23 keeping the bus network under review
- Proposal 30 introducing measures to smooth traffic flows to manage congestion and improve journey time reliability
- Proposal 49 seeking to improve access to airports, relevant to access opportunities at Stansted and Luton airports
- Proposals 82 and 83 introducing ‘better streets’ initiatives

Example Option: Integrating Land-use and Transport

Local Development Frameworks and London Plan development control policies will play a key role in integrating land use and transport planning by ensuring:

- that sustainable transport links are included in developments according to existing, proposed and potential connectivity and capacity
- that large new developments are near to existing public transport networks – which would reduce the need to travel
- that policies encourage public transport, walking, cycling and high quality urban realm
- that policies encourage mixed use developments particularly on larger sites where the scale of development is such that effectively new towns are built for example at Brent Cross
- that planning contributions are sought for transport improvements in opportunity areas and areas of intensifications such as Wood Green/Haringey Heartlands and elsewhere where appropriate
- sustainable construction and servicing, for example through planning conditions specify use of blue ribbon network and uptake of Construction Logistics and Delivery and Servicing Plans.
- that the use of consolidation and break bulk centres is explored, and that any development deals with freight issues in transport assessments and travel plans.

Example Option: Freight Management

The growth in freight movement projected due to the impacts of new developments and the displacement of the existing activity, will generate different patterns and levels of freight (and other transport) activity. There needs to be an understanding as to how projected growth and employment will affect the delivery and provision of goods and services in North London. The London Plan emphasises facilitating the efficient distribution of freight whilst minimising its impacts on the transport network. It emphasises the importance to secure and enhance strategic freight provision in London, especially in the Upper Lea Valley area. This can be achieved by a combination of different measures:

- Local Development Frameworks and London Plan development control will play a key role in encouraging efficient freight delivery and logistics by ensuring that developments deal with freight issues in transport assessments and travel plans. By safeguarding existing sites and identifying new sites to enable the transfer of freight to rail and water; identifying sites for consolidation centres and 'break bulk' facilities; safeguarding railheads for aggregate distribution.
- Encouraging Freight Framework Delivery and Servicing Plans. These aim to reduce delivery trips (particularly during peak periods) and increase availability and use of safe and legal loading facilities, using a range of approaches including consolidation and break bulk centres as well as out-of-hours deliveries.
- Encourage engagement with Freight Quality Partnerships to help deliver the Mayor's Freight Plan by building partnerships at pan-London and sub-regional levels to help coordination between TfL, businesses, operators and boroughs.

Example Option: Urban Realm Improvements

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. The use of public transport can be encouraged through public realm improvements to key stations and town centres, service improvements, promotion of smarter travel initiatives and further demand management measures as appropriate.

Example Option: Promoting modal shift

Encouraging the use of more sustainable modes of transport (public transport, cycling and walking; set appropriate parking standards; and, aim to increase public transport, walking and cycling mode share in North London. enhancing public transport awareness

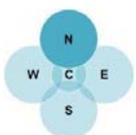
Example Option: Smoothing traffic

Better traffic management and street works coordination could lead to reductions in traffic congestion by

- Maximising the efficient and reliable operation of the road network, through such measures as number and rephasing of traffic signals
- Minimising the impact of planned interventions such as road works
- Better management and review of parking and loading arrangements
- Achieving modal shift away from car based traffic movements towards more sustainable modes to reduce traffic growth pressures

Further work/ analysis

- Further work on understanding connectivity/access issues in key places
- Further work with key stakeholders to undertake location identification
- Further work on translating MTS policies into specific sub regional proposals



Linking north London’s transport challenges to the Mayor’s Transport Strategy

305. The five north London transport challenges and the potential options to address these, also contribute to meeting the six goals set out in the draft Transport Strategy, as can be seen below in Figure 82.

Figure 82: Summary table linking North London’s transport challenges to the MTS goals

Region’s challenge / opportunity	Mayor's Transport Strategy goals
Facilitating and responding to growth and economic development	     
Relieving crowding on the public transport network	     
Managing highway congestion and making efficient use of the road network	     
Enhancing connectivity and the attractiveness of orbital public transport	     
Improving access to town centres and to jobs and services	     
Reducing emissions of CO ₂ and improving air quality	     

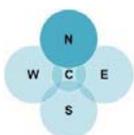
Pan-London MTS proposals and link to north London

306. This section provides an analysis of the extent to which the sub-region might want to adopt the policies and proposals contained in the Transport Strategy in order to address the north London transport challenges.

Improving air quality and reducing CO₂ emissions

307. Both the draft Transport Strategy and the Mayor’s Air Quality Strategy include proposals to reduce air pollutant emissions from transport. While these are relevant at the London-wide level, draft Transport Strategy proposal 91 is also relevant to the sub-region and includes measures to reduce emissions from the public fleet through the electrification of the Gospel Oak-Barking line and by encouraging the introduction of cleaner public vehicles. Proposal 93 seeks to tackle air quality ‘hotspots’ by targeting local measures to reduce emissions. The North Circular, the M1 and the main roads in inner north London including the A10 and A41, all experience annual mean concentrations of the two main pollutants from ground-based transport, nitrogen dioxide (NO₂) and particulate matter (PM₁₀), that exceed the EU limit values.

308. Proposals 96 and 97 seek to reduce CO₂ emissions by promoting more sustainable modes of transport and supporting the expansion of car clubs with low carbon vehicles. Proposal 104 supports the development of low carbon vehicles, including through delivering infrastructure for the expansion of electric vehicles.



Further rail and station capacity

309. The draft Transport Strategy includes a number of proposals (8, 9, 11, 15, 19 and 22) that seek further rail and station capacity. The proposals include: prioritising upgrades to the London Overground and West Anglia main line; improved capacity at Finsbury Park and congestion relief at strategic Tube interchanges; the partial separation of the Northern line; a DLR extension north of Stratford International and additional services between Stratford and Chingford (facilitated by the reinstatement of the Hall Farm Curve). Additional rail and station capacity would help to relieve crowding on the transport network and could facilitate growth and economic development in north London. In addition, extra capacity on the Overground and the proposed DLR extension would enhance connectivity and the attractiveness of orbital transport.

Step-free access

310. TfL will continue to improve Tube station accessibility over the next 20 years (proposal 18). While there is some accessible changing between London Underground line and with National Rail, however few other north London stations are fully accessible. Increasing step-free access will contribute to improving access to town centres and to jobs and services for mobility impaired people. Regionally important interchanged experience various accessibility issues, at:

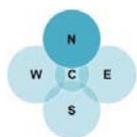
- Finsbury Park the only step-free interchange is between the Victoria and Piccadilly Lines in the same direction with no step-free from the street or between London Underground and National Rail
- Highbury & Islington the only step-free interchange is between the Victoria Line and Great Northern services in the same direction with no step-free from the street or between London Underground/ Great Northern and the Overground, and
- Tottenham Hale only the London Underground station is step-free

Interchanges

311. Proposals 45 and 46 in the draft Transport Strategy relate to improving interchanges, including applying the principles set out by TfL's Interchange Best Practice Guidance and prioritising improvements that will provide opportunities for orbital transport and interchange outside of central London. Improved interchange also includes improved walking and cycling facilities at, and on routes to, public transport interchange. Increasing station capacity to cope with current and forecast demand and continuing improvements to station accessibility are means by which north London could seek to improve access to town centres and to jobs and services, as well as relieving crowding on the transport network.

Managing the road network

312. The proposals in the draft Transport Strategy on managing the road network are relevant to north London, with safety improvements works at Bounds Green and Henly's Corner junction and the removal of the Tottenham Hale gyratory funded in the Business Plan. Proposal 30 refers to measures to smooth traffic flows to manage congestion and improve journey time reliability by a number of means including implementing a targeted programme of road network improvements to improve traffic flow and to improve conditions for all road users. Proposal 34 refers to a criteria-based approach to road schemes taking into account the contribution to development and congestion reduction and how the schemes can improve the environment, safety and conditions for pedestrians, cyclists, public transport users, freight and local residents. Proposals for managing the road network would contribute to reducing congestion and improving access to town centres. Smoothing traffic flows would also reduce emissions from transport.



Keeping the bus network under review

313. Proposal 23 will keep the development of the bus network under regular review to cater for growth in demand and ensure good interchange with other services. This could contribute to four the north London challenges by responding to growth, relieving transport crowding, improving access to town centres and enhancing connectivity and the attractiveness of orbital public transport.

Access to airports

314. Proposals 48 and 49 support the government's position that airport operators should be responsible for paying to upgrade transport corridors to airports and seek to improve access to airports. Proposal 48 could contribute to facilitating economic development in the North West London to Luton and London-Stansted corridors. Proposal 49 could contribute to reducing congestion by better management of the road network for freight.

Rail freight

315. The draft Transport Strategy includes proposals (2 and 3) that support the development of rail freight terminals and national rail freight routes. While the rail freight proposals deal with the transport of freight across London, there is some potential to encourage a modal shift of freight from road to rail, with a proposal for a new rail freight hub in Brent Cross/ Cricklewood and a new link to allow freight trains to more directly transfer between the Gospel Oak to Barking Line and the west Coast Main Line, without limiting capacity for passenger trains. This could contribute to the north London challenges of facilitating and responding to growth and managing highway congestion and making more efficient use of the road network. In addition, any modal shift of freight from road to rail could also lead to reductions in emissions from transport.

Making better use of the Blue Ribbon Network

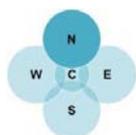
316. As can be seen in figure 4.1, north London has a number of canals and waterways that could be further developed and better integrated into the overall transport network. The draft Transport Strategy includes a proposal (38) to examine the potential to increase the use of the Thames and London's canal network for waterborne passenger and freight services. Any modal shift of freight from road to water could contribute to reducing congestion.

Bringing about the cycling revolution

317. Proposals 51 and 53 seek to bring about the Mayor's 'cycling revolution' by improving cycling infrastructure, training, safety and awareness and by supporting boroughs. Many of the parts of this proposal would help north London in seeking to increase cycling mode share. In particular, cycle superhighways, cycle hire schemes, increased secure cycle parking and road enhancements to make cycling easier. The proposals to increase cycling could help to facilitate sustainable economic development, reduce public transport crowding by encouraging mode shift and potentially reduce emissions from transport.

Making walking count

318. Proposal 59 seeks to provide a safe, comfortable and attractive street environment to encourage greater walking. Many parts of this proposal would help north London in encouraging walking for short journeys rather than car or public transport or to encourage walking into and around town centres. In particular, providing more convenient pedestrian crossings, street audits to identify pedestrian needs, enhancing pavement space for pedestrian, better managing car access in residential areas and supporting high street revitalisation through better design. The proposals to increase walking could help to facilitate improve access to town centres, reduce public transport crowding by encouraging mode shift and potentially reduce emissions from transport.



Improving road safety

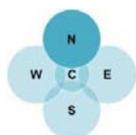
319. Proposals 66, 70 and 72 seek to improve road safety by educating road users, road safety engineering and speed limit enforcement. Mapping of collisions on north London roads indicates the highest proportion of collisions along the busiest roads, including the A10 and A1010 through Islington, Haringey and the Upper Lee Valley, the A1000 through Barnet, the A105 through Haringey and around junctions on the North Circular including Henly's Corner and Great Cambridge Junction. Sub-regional proposals to improve road safety would seek to target solutions to those areas and to those road user types with the highest number of killed or seriously injured (KSI) incidents. Solutions could include information to improve road user behaviours or better enforcement of speed limits. One such example is new traffic light timings in Camden in support of a trial of a 20 mile per hour zone that aims to stop drivers with red lights who are speeding with the aim of reducing the number of KSI incidents and to smooth the traffic flow. Road safety engineering is already being used to improve the safety of the Henly's Corner junction and the sub-region could seek to prioritise for future funding other junctions or sections of road with a high proportion of KSI incidents.

Improving London's environment through 'better streets' proposals

320. The draft Transport Strategy includes proposals (82, 83, 84) that seek to improve London's environment through the application of 'better streets' principles to town centres. Applying 'better streets' principles can range from more short-term improvements with minimal design and implementation processes, such as tidying up and decluttering streets, to longer-term improvements which require more detailed planning and implementation, such as relocating traffic management options and creating more 'shared' spaces. The aim of the better streets principles is to create balanced streets by better managing the interactions of all road users. Therefore, such proposals can also help to form part of the solution to other transport related challenges. For example, an improved environment could contribute to regeneration and economic development by bringing people in, encourage people to walk and cycle more thereby improving their health and reducing emissions from private vehicles or could improve road safety by reducing accidents. Potential projects in north London include Tottenham Hale, Highbury and Islington station, Golders Green, Walthamstow and Finsbury Park station.

Managing the demand for travel and smarter travel

321. Proposal 90 seeks to encourage behavioural change to reduce vehicle emissions by providing drivers with information to make smarter choices on alternative modes or lower-emission vehicles, including promoting car clubs. Example of Richmond Smarter Travel encouraging use of car clubs, rather than private vehicles.



4 Next steps

322. As explained in the introduction, this document is only a “staging post” on the way to the production of a first “final” draft in summer 2010 (See Box 2). It has set out the analysis and key challenges facing north London and how this relates to the issues outlined in the draft Mayor’s Transport Strategy. Examples of potential scheme and policy options have been outlined in Chapter 3 to address the challenges, which reflect some of the existing proposals in the draft Transport Strategy and discussions with stakeholders.

Box 2: Potential “triggers” for SRTP revisions

“Live” documents

It is envisaged that the Sub-regional transport plans (SRTPs) should be “live” documents. This means that whilst they set the “current” position with regards to translating the MTS Policies and Proposals to a more local level, they should be revised when a significant “trigger” is activated. Whilst this is likely to be specific for each individual sub-region, there are likely to be some common circumstances under which this is likely take place.

Potential “triggers”

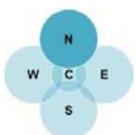
Under the following circumstances it may be likely that a revision to an SRTP would be considered necessary:

- A significant development is proposed within the sub-region
- An OAPF has been prepared
- Funding allocations are confirmed by Government and/or TfL (e.g. HLOS2, revised Business Plan)
- Significant revisions to population and employment projections
- Significant changes in Government policy e.g. housing, health, education, regeneration
- Others recommended by London Councils/boroughs

Analysis

323. There are some issues which are emerging as a challenge in one sub-region which may have implications for other sub-regions. These will need to be considered in further work.

324. Analysis and discussions with stakeholders have identified a range of key issues, challenges and opportunities contained within this report. A programme of further analysis will be developed to underpin the development of the sub-regional transport plans, which will be discussed with boroughs. Some potential areas for further analysis have been identified through Chapter 3. This may require additional data collection and further interpretation, such as survey work in town centres. There will also be links to other work being undertaken across TfL, for example in relation to opportunity areas; HLOS2; specific projects and air quality.



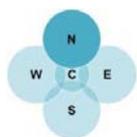
325. Different tools will be used in further assessment and precise methodologies will need to be developed to meet requirements. As part of the sub regional programme a series of multi-modal models are being developed with highway assignment models being produced for all sub regions. Programming of work going forward will take account of the delivery of each model.
326. The north London model was delivered to TfL in October 2009. It is currently being subjected to a range of realism tests. When this work is complete, the model will be used to analyse the Transport Strategy funded reference case in the forecast years of 2016, 2026 and 2031. This will complete by the end of March. The first application of the model will be to analyse the wider highway impacts of the proposed Wood Green bus priority scheme.

Needs assessment and development and assessment of options

327. One of the key elements of the Sub-regional transport plans is to identify and develop these potential opportunities, generating options and priorities for enhancing the transport network in central London. As new challenges and opportunities arise, the Sub-regional transport plans will continue to develop.
328. Some challenges and specific issues are already well understood. Others require further investigation to understand the potential need and requirement to intervene. Feasible scheme and policy options that could potentially address these issues, challenges and opportunities will be investigated further.
329. Once the need for a policy or scheme intervention is established, further work will assess the costs, impacts and benefits of a range of suitable options. This will initially focus on those challenges and locations identified in this Challenges and Opportunities document but will also consider other key issues as they emerge. All feasible options will be considered in the assessment to understand how they address the specific challenge and support the Transport Strategy outcomes.
330. Short, medium and long-term priorities will be identified. Continued engagement with all stakeholders will remain essential to delivering the best possible interventions, given likely funding availability, and infrastructure and service priorities.

Key Questions/ Issues for Discussion (for boroughs)

331. The next steps section has highlighted how this Challenges and Opportunities document is only the first step in the process of working with stakeholders to agree a common set of challenges and opportunities for north London. Boroughs can use the information presented here in preparation of their LIPs, and there will be further collaboration between TfL and stakeholders on the issues explored within this document. The final draft of the sub-regional transport plan will go on to include an outline of priority solutions for north London.
332. In advance of producing the next drafts of the sub-regional transport plan, there are a number of questions set out below which it would be useful for stakeholders to focus on. However, TfL also recognises that there will be limited opportunity to provide additional material in the time available prior to final LIP submissions in December 2010.



333. There will also be an opportunity to discuss the documents and to focus on the development of the Plans at the joint TfL/London Councils sub-regional workshop being held on 23 February 2010. For more detailed discussion, please can you provide any overview comments by 31 March 2010. In addition to TfL discussions with stakeholders, more detailed comments should be sent to the following e-mail address: northlondon@tfl.gov.uk.

Key questions:

Useful aspects: which aspects of this document do you find most useful?

Less useful aspects: which aspects of this document do you find least useful?

Local concerns: how much does the document reflect your local strategic concerns?

Analysis: what additional analysis/scenarios do you think could be considered in developing the sub-regional transport plans?

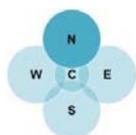
Gaps: what else would you like to be included in the final sub-regional transport plan document drafts in the summer?

MTS translation: what else would help you in the translation of the Mayor's Transport Strategy to a local level and the development of LIPs?

Cross-boundary working: does the document sufficiently reflect the issues which cross sub-regional boundaries within London / beyond London?

Revision: under what circumstances do you think the "live" sub-regional transport plan documents should be revised? What do you consider to be key "triggers"?

Ambition: how far do you think the sub-regional transport plan should set out a target or level of ambition for the sub-region? What should these be?



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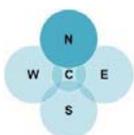


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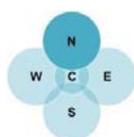


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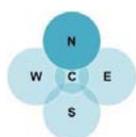


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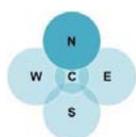
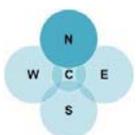


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Appendix B: Sources of data

DMAG: GLA's Data Management and Analysis Group

LTDS London Travel Demand Survey: Annual sample survey of 8,000 randomly selected households in London and the surrounding area. The survey design and methodology are similar to the LATS 2001 household survey.

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

Central Area All Day Count (CAADC): TfL undertook an extended CAPC count in spring 2009 to cover the whole of the working day

Trafficmaster: TfL (as do all local authorities) has detailed speed and congestion data from a company called Trafficmaster through a Department for Transport contract. The data is obtained from vehicles fitted with GPS devices and provide average speeds and delay (expressed in minutes per kilometres over and above nominal free flow conditions) for a pre-defined network of interest.

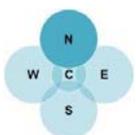
LATS London Area Transport Survey 2001: Interviewer-administered sample survey of 30,000 London households, carried out for TfL between January 2001 and April 2002. The survey included a one-day travel diary to collect data on London residents' weekday travel patterns. The data have been expanded to represent the household population of Greater London as measured by the 2001 Census of Population.

Central area speed survey: Moving car observer survey covering a pre-defined network of central London roads. TfL is undertaking the survey on a bi-monthly frequency as part of the monitoring programme of the congestion charging scheme.

TfL Congestion Charging monitoring programme: A programme of survey work TfL has been running since the introduction of congestion charging in central London in order to understand and assess the impacts of the schemes. This includes traffic and speed surveys. More information included in the Annual Monitoring Reports:

<http://www.tfl.gov.uk/roadusers/congestioncharging/6722.aspx>

TfL manual traffic surveys: 14-hour manual counts (volumes by vehicle type) undertaken using the '6 in 15 minutes' method.



Access to opportunities and services (ATOS): Access to opportunities and services is an indicator measuring access to essential services and employment by public transport and/or walking. It includes access to employment (average journey time to the nearest 10,000 low qualified and high qualified jobs), Education (average journey time to the nearest three primary schools, secondary schools and further education colleges), health services (average journey time to the nearest three General Practice/Doctors surgeries), quality food shopping (journey time to the nearest town centre or supermarket), open spaces (walking time to the nearest publicly accessible open space). Journey time is calculated using TfL's CAPITAL model with the exception of access to employment for which the LTS model is used. The results are calculated at Census Super Output Area level (or Output Area in less dense areas) at the area's population-weighted centroid. Access to employment is calculated for LTS zones.

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

LTS: London Transportation Studies

CLoHAM: Central London Highway Assignment Model

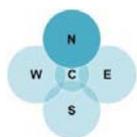
Public transport customer satisfaction surveys (CSS): TfL carries out customer satisfaction surveys for most public transport modes and details of the surveys for principal public transport modes are presented below. It is not possible to disaggregate the data at a sub-regional level.

- London Buses CSS - continuous survey consisting of 9,600 face to face interviews each year with passengers alighting from buses between 7.30am and 9pm, seven days a week.
- London Underground CSS - continuous survey consisting of 8,800 face to face interviews each year in stations across the network between 7am and 10pm, seven days a week.
- DLR CSS – first wave carried out in 2008/9 consisting of 1,000 face-to-face interviews with passengers on-board or alighting DLR trains during operational hours, seven days a week.
- London Overground CSS - quarterly survey consisting of 700 face to face interviews carried out over a four week period each quarter (2,800 per year) with passengers on board trains across operational hours, seven days a week.
- Tramlink CSS – continuous survey consisting of 880 face to face interviews carried out each year with passengers alighting from trams between 7.30am and 9pm at a sample of stops.

Road user customer satisfaction surveys (CSS):

- Streets Management CSS - annual survey carried out each February consisting of 1,000 telephone interviews with a representative sample of London residents.
- Transport for London Road Network CSS - annual survey carried out each September consisting of 2,000 on-street surveys with people at various locations along the TLRN.

TfL Perceptions of the environment survey: Annual survey carried out each November consisting of 1,000 telephone interviews with a representative sample of London residents. Topics include perceptions of journey experience, noise and the urban realm and the survey was conducted for the first time in November 2009.



Public attitude survey (in the safety section): Metropolitan Police Public Attitude Survey – Quarterly public attitude survey

Canary Wharf employees: This survey was commissioned by Canary Wharf Group to help plan future transport services. It continues the series of biennial surveys which have taken place since 1997. The surveys allow trends in travel behaviour, employee profile and home location to be monitored. The 2009 survey was carried out in June/July, as in previous years. Some 93,000 employees now work at Canary Wharf (June 2009) compared with 90,000 employees in 2007, 73,000 in 2005, 53,000 in 2003, 40,000 in 2001, 25,000 in 1999 and 15,000 in 1997. Over this 12 year period, Canary Wharf employment has been increasing on average at 17% per annum. Some businesses distributed a self-completion questionnaire on paper while others arranged for staff to complete the questionnaire via the internet. Responses were received from 169 businesses, of which 79 were retailers (representing 2.7% of responses) and 90 office tenants (representing about 97.3% of responses). Employees were asked to describe how and when they travelled to work, where they lived and a number of other transport related matters. 9,121 valid survey responses were received – this equates to about 10% of all employees at Canary Wharf. There is a 19 out of 20 probability that the results for all employees are within +/-1%. This means that where a proportion of, for example, 50% is indicated, we can be reasonably sure that the true answer lies between 49% and 51%.

Rail and London Underground crowding: Railplan modelling for **Mayor's Transport Strategy Public Draft** (October 2009).

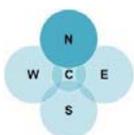
NO₂/PM10 concentration base maps: prepared for the Mayor's Air Quality Strategy by Kings College's Environmental Research Group.

CO₂ emissions: Data is sourced from the London Atmospheric Emissions Inventory 2008. This includes information about the location and estimates of the quantity of specific pollutants emitted into the air within and around the Greater London area. This inventory therefore does not include emissions from electricity generated outside of London but consumed within. CO₂ as reported in the London Energy and Greenhouse Gas Inventory 2008 does capture the London attributable emissions from electricity generation regardless of where that electricity was generated.

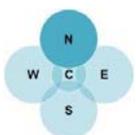
Safety maps: Strategic Assessment (2009), TfL Community Safety, Enforcement & Policing (CSEP).

Road casualties: London Road Safety Unit - Data presented is for personal injury road traffic collisions occurring on the public highway, and reported to the police, in accordance with the *Stats 19* national reporting system.

Line loadings: LUL line loading produced from 2008 Rolling Origin Destination Survey (RODS) and Overground line loadings produced from London Rail's Spring 2009 Manual Passenger Counts.

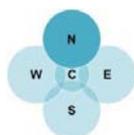


Isle of Dogs Cordon Survey: The Isle of Dogs and Canary Wharf Cordon Survey has counted all trips into and out of the Isle of Dogs and Canary Wharf between 0500 and 2300 hours annually since 1988. The 2008 surveys took place on Tuesday 25 November. The cordon survey reports trips that have an origin or destination within the Isle of Dogs and cross the cordon boundary. Through trips on the Jubilee Line and DLR and interchange trips between the two rail modes that do not start or end in the Isle of Dogs are excluded. Interchange surveys carried out on the same day have enabled the latter movements to be extracted. Internal trips within the Isle of Dogs, such as Island Gardens to South Quay, are also excluded. Similarly, trips to/from Canary Wharf are recorded and are reported separately below.

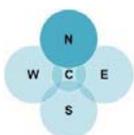


Appendix C: Planned committed interventions in north London

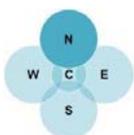
Scheme	Description and Outcome	Scheme Cost	Anticipated Completion
Rail			
London Overground	Expansion and enhancement of services, including new orbital service through Inner London and new, longer trains. Will help regenerate north London, connect 20 of the 33 boroughs and provide increased capacity	M	2010-2012
West Anglia	Platform and train lengthening to 12-car on outer services to Cambridge & Stansted. Strengthening of remaining 4-car inner services to 8-car (HLOS CP4)	L	2010-2012
Great Northern	Platform and train lengthening to 12-car on outer Great Northern services (HLOS CP4)	L	2010-2012
West Coast	Train lengthening to 12-car on some outer services (HLOS CP4)	L	2010-2012
Thameslink	12-car capability on some mainline and 16 trains per hour through core	H	2010-2012
Thameslink	24 trains per hour through core, expanded network	H	2013-2020
National Rail step-free access station programme	DfT's Access for All to increase number of step-free rail stations in London to 160 (47 per cent) by 2015, from around 100 today	M	2013-2020
Common service standards on London's	Including staff presence at stations over the entire traffic day who can provide assistance if required	L	2013-2020
Tube			
Jubilee line	Jubilee line upgrade in delivery phase, involving full replacement of the signalling and train control system. Will provide a 33 per cent increase in capacity and reduce journey times by around 22 per cent	M	2010-2012
Northern Line	Phase 1: Northern line upgrade in delivery phase, involving new signalling and new dedicated control centre to provide a 20 per cent increase in capacity and improve journey times by 18 per cent by the end of 2012	M	2010-2012
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	2013-2020
Victoria line	Victoria line upgrade in delivery phase including new rolling stock and signalling to provide a 19 per cent increase in capacity, a 16 per cent improvement in journey times, improved accessibility and more trains during peak times by early 2012	M	2010-2012
Piccadilly line	Piccadilly line upgrade to include new signalling, rolling stock and control centre to increase capacity by 25 per cent and reduce journey times by around 19 per cent by 2014	M	2013-2020
Station refurbishment/modernisation programme	Continuing programme of refurbishment/ modernisation of all stations. Involves improvements to accessibility features, installation of CCTV and passenger help points and renewal/replacement of all lifts and escalators. Capacity in some stations will also be increased. Accessibility improvements include tube platform to train-level access, wide-aisle ticket gates and step-free travel information	H	2013-2020
Cooling the Tube programme	Enabling operation of services post line upgrades and improved passenger comfort	M	2013-2020
Energy-saving initiatives	Initially, a programme of trials to include low energy lighting, smart electricity metering at stations and low loss conductor rails	L	2013-2020
Regenerative braking and automatic train control	To be implemented as an integral part of the Tube upgrade programme. Regenerative braking recycles energy, thereby reducing carbon emissions.	M	2013-2020
New Tube and rail rolling stock	New rolling stock will be Rail Vehicle Accessibility Requirements compliant	M	2013-2020
Continuing roll out of step-free access schemes on the Underground	Continuing programme of station step-free access schemes. By end of Business Plan period 29 per cent of LU stations will be step-free.	M	2013-2020
Buses and Bus Transit			
Bus network development	Regular review of bus network 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	2013-2020
Development of a New Bus for London	Pilot to create a new iconic bus for London with the key requirements that it should incorporate green technology and include enhanced accessibility design features	L	2010-2012
Phasing out of 'bendy' buses	Anticipated by the end of 2011	L	2010-2012
Low emission buses	Intention that all new buses entering London's fleet post 2012 be low emission (initially diesel hybrid) . More than 300 low-emission buses in service in 2012. Roll-out of hybrids expected to contribute to an 11 per cent reduction in CO ₂ emissions by 2015 compared with 2006/07.	M	2013-2020
Enhanced realtime service information	Delivery of Countdown 2; enhanced realtime information at stops, on internet and mobiles	L	2010-2013
Bus priority	Implementation of bus priority measures to maintain service reliability	M	2013-2020
Bus stop accessibility	Improved accessibility of bus stops, for example, through removal of street clutter. Current forecasts anticipate that more than 75 per cent of bus stops will be accessible by the end of the plan period	L	2013-2020



Cycling			
Additional cycle parking	Around 66,000 additional cycle parking spaces in London to encourage cycling	L	2010-2012
Cycling initiatives in Outer London town centres	Including potential radial cycle highways, additional parking, cycle hire schemes, etc	L/M	2013-2020
Walking and Urban Realm Enhancements			
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 to encourage an increase in walking and cycling mode shares	M	2013-2020
Targeted initiatives to improve urban realm	London-wide better streets initiatives to improve pedestrian connectivity and urban realm eg by removing obsolete street furniture and improving pavements and crossings	M	2013-2020
Improved wayfinding	Targeted introduction of on-street wayfinding specifically designed for pedestrians, for example Legible London	L	2013-2020
Increased tree and vegetation coverage	Additional 10,000 trees on London's streets by 2012 (funded), with a target of an additional two million trees in London by 2025.	L	2013-2020
Accessible crossings programme and urban realm improvements	Improvements to 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	2013-2020
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	2013-2020
Permit scheme for road works	Introduction and development of a permit scheme and lane rental system aimed at utility companies undertaking road works	L	2013-2020
Bounds Green (A406)	Safety and environmental improvements along A406 Telford Road, Bowes Road and North Circular Road between Bounds Green Road, Station Road and Chequers Way. Features include a two-lane dual carriageway to improve traffic flows at junctions, an improved pedestrian crossing facilities and a dedicated cycleway.	L	2010-2012
Henlys Corner junction works	A junction improvement scheme to improve safety at the junction, reduce accidents and improve vehicle flow.	L	2010-2012
Removal of Tottenham Hale gyratory	Existing one-way system to be converted to two-way, contra-flow bus lane removed and replaced with continuous two-way bus lanes, improved pedestrian crossing and cycling facilities and traffic on Broad Lance restricted to buses, cyclists and local access. This will relieve congestion and improve traffic flow.	L	2013-2020
Achievement of state of good repair of road infrastructure	Ongoing programme of maintenance	M	2013-2020
Support development of intelligent speed adaptation	Continue trials of intelligent speed adaptation technologies	L	2013-2020
Average speed camera technology	Encourage further implementation of average speed camera technology	L	2013-2020
Car club support	Support expansion of car clubs	L	2013-2020
LEZ	Further LEZ enhancements and vehicle coverage	L	2013-2020
Provision of infrastructure to support low emission road vehicles	Introduction of electric vehicle recharging points by 2015	L	2013-2020
Light Emitting Diode (LED) traffic signals	LED traffic signals at 300 junctions across London	L	2013-2020
Continue to work with Government on road pricing feasibility programme	Review the option of road user charging and/ or regulatory demand management measures to influence a shift to more CO2 efficient road vehicles and lower carbon travel options such as walking, cycling and public transport	L	2013-2020
Promote emission-based parking charges	Boroughs and car park operators to be encouraged to expand coverage of parking charges that vary not only by duration of stay, but emissions of vehicle	L	2013-2020



Staffing Measures			
Staff availability	To ensure staff are available to provide assistance, information and reassurance throughout service hours	L	2013-2020
Staff training	To ensure the needs of disabled passengers are understood by all frontline staff	L	2013-2020
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	2013-2020
Enhanced travel planning tools	Ongoing programme of enhancements to TfL Journey Planner, including information availability on the move	L	2013-2020
Low emission taxi programme	Develop a low emission taxi for London	L	2013-2020
Transport system climate change adaptation	Develop a strategy to improve transport system resilience and safety to the impacts of climate change	L	2013-2020
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	2013-2020
Increased use of travel plans	Increased use and power of travel plans for workplaces, schools and individuals	L	2013-2020
Continued development and roll out of TfL Freight Plan initiatives	Town centre and area-based DSPs, CLPs, promotion of collaborative approaches such as consolidation centres and/or break-bulk	L	2013-2020
Promotion of freight best practice	Development and incentivisation of membership of the FORS and develop functionality of the freight information portal	L	2013-2020
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	2010-2012
Tackling antisocial behaviour	Programme of initiatives to tackle antisocial behaviour, including preventative and enforcement measures	L	2013-2020
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	2013-2020
Attitudes of staff and travellers	Stakeholder, staff and public initiatives to improve staff and traveller attitudes and raise awareness of travellers' accessibility needs	L	2013-2020
Travel information	Improve the availability, quality, quantity and timeliness of accessibility-related travel information	L	2013-2020
Enhanced Dial-a-Ride service	New Dial-a-Ride fleet and review of operations	L	2010-2012
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	2013-2020



Appendix D: Policies and proposals from the London Plan and EDS and link to north London

The translation of the draft Transport Strategy goals to a sub-regional and local level has been covered extensively in Chapter 2 of this report. However, in developing the key transport challenges and opportunities for north London consideration has also been given to other Mayoral strategies, particularly the Mayor's draft London Plan and Economic Development Strategy.

The sections below provides a summary of those policies that are considered to be particularly relevant to the north London sub-region.

London Plan policies

The draft replacement London Plan provides an overall framework for development within London. The document has undergone consultation which ended on 12 January 2010, with the next stage being Examination in Public (EiP) which is expected to occur in the summer 2010 with adoption in late 2011. Until then, the London Plan (2008) will continue to be the statutory planning document for all land use planning decisions in London, although consideration should however be given to the emerging replacement London Plan, as it will help provide context for future development in London and the sub regions.

A review of the policies was carried out and those considered relevant to the north London sub-region transport plan are listed below.

Policy 1.1 (Delivering the Strategic Vision and Objectives for London)

This policy promotes growth and change in London. The policy sets out a number of objectives, these include:

- A city that meets the challenges of economic and population growth; (1.1B1) and
- A city where it is easy, safe and convenient for everyone to access jobs, opportunities and facilities. (1.1B6)

Policy 2.3A (Growth Areas and Co-ordination Corridors)

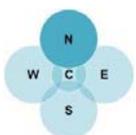
This policy promotes developing linkages across growth areas, such as the London-Stansted-Cambridge-Peterborough] Growth Area. These areas will have transport infrastructure, open space, educational and other services being made available to secure optimum development for the growth area. (2.3Aa)

This policy promotes co-ordinating planning and investment in corridors of city region importance, such as the London-Luton-Bedford Corridor which connects London with the wider city region. This will be done through providing appropriate resources including transport infrastructure to secure optimum development for the Coordination Corridor. (2.3Ab)

Policy 2.4 (The 2012 Games and their Legacy)

The policy promotes developing & implementing a sustainable legacy from the Olympic and Paralympics Games, to deliver fundamental economic, social and environmental regeneration in east London. The policy sets out a number of other objectives, these include:

- Establishing a new & enhanced north-south and east-west walking and cycling connections within and around the Olympic Park; (2.4Cc)



- Supporting a media & creative industry cluster at Hackney Wick, with the possibility of providing for global businesses; (2.4Ce) and
- Promoting the Olympic Park and it's venues as an international visitor's destination for sport, recreation and tourism. (2.4Cd)

Policy 2.5 (Sub-Region)

The policy encourages the most effective cross boundary working arrangements to address specific regional issues. (2.5A)

Policy 2.7 (Outer London: Economy)

The policy promotes addressing a number of constraints to economic growth in Outer London. The policy sets out a number of objectives, these include:

- Improving accessibility to competitive business locations, particularly in Town Centres by making the most of existing and new infrastructure, encouraging walking, cycling and public transport use to these areas; (2.7Ah) and
- Providing strategic and local coordination's within development corridors, to enhance the competitive advantages and to build synergies from clusters of related activities in these areas. (2.7Ac)

Policy 2.8 (Outer London: Transport)

The policy promotes a number of transport strategies in Other London, these include;

Enhancing accessibility by improving links to and between town centres and other key locations by different modes of transport; (2.8Aa)

- Ensuring a more integrated system, along with improve public transport to Metropolitan Centres; (2.8Ab)
- Support Park and Ride Scheme's where appropriate; (2.8Ad)
- Encouraging greater use of cycling and walking in Outer London; (2.8Af) and
- A more active traffic management schemes, including demand management to address local congestion. (2.8Ag)

Policy 2.10 (Central Activities Zone – Strategic Priorities)

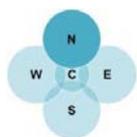
The policy seeks to enhance the strategically vital linkages between CAZ and labour markets within and beyond London. (2.10Ah)

Policy 2.13 (Opportunity Areas and Intensification Areas)

This policy will encourage boroughs to progress and implement planning frameworks to realise the potential of opportunity and intensification areas.

The policy also encourages the Borough's to realize the scope for development associated with existing or proposed improvements in public transport accessibility, and promotes inclusive access to town centre's through cycling and walking. Furthermore when developing Opportunity & Intensification areas, support should be given to the wider regeneration objectives, especially when sites are surrounded by areas of regeneration (as designated by the London Plan (2009) Map 2.5). (2.13Cd)

The London plan gives an indicative estimate on the number of jobs and homes, along with a strategic policy direction for each opportunity and intensification areas. This is found in Annex 1, 213-235pg.



Policy 2.14 (Area for Regeneration)

The policy states that area of regeneration (as designated by the London Plan (2009) Map 2.5) will be prioritised for neighbourhood based action and investment, with the boroughs providing framework to coordinate this investment. (2.14A)

Policy 2.15 (Town Centres)

This policy overall seeks to make town centres the main focal point beyond the Central Activities Zone for commercial development and intensifications including residential development. Town centres should be supported by good accessibility, particularly by public transport, cycling and walking. (2.15Aa, Ab)

Policy 2.16 (Strategic Outer London Development Centres)

The policy advises that the Mayor will promote strategic development centres (Metropolitan Centres) in Outer London with one or more strategic economic functions, through improving London's access to new employment opportunities. (2.16Ad)

Policy 3.3 (Increasing Housing Supply)

The policy advises that the mayor will seek an annual average of 33,500 additional homes across London, mostly through intensifications of housing in Town Centres. The policy also sets a 10 year housing delivery target for each borough from 2011-2021, of which:

- LB of Barnet will deliver 22,550 (2,255 houses a year)
- LB of Camden will deliver 6,650 (665 houses a year)
- LB of Enfield will deliver 5,600 (560 houses a year)
- LB of Hackney will deliver 11,600 (1,160 houses a year)
- LB of Haringey will deliver 8,200 (820 houses a year)
- LB of Islington will deliver 11,700 (1,170 houses a year)

Policy 6.2 (Providing Public Transport Capacity and Safeguarding land for Transport)

The policy will seek to increase the capacity of public transport in London over the plan period, by securing funding for and implementing the transport improvement schemes, along with safeguarding land, sites & routes for future schemes. (6.2Aa, Cb)

Policy 6.4 (Enhancing London's Transport Connectivity)

This policy in general supports the expansion of the public transport system and advocated a number of other approaches, these include;

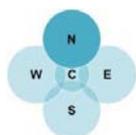
- Developing an efficient cross-boundary transport service, including exploring high speed rail services across London and in a wider south-east region; (6.4a)
- Implementing Crossrail, high frequency national rail services, extending and expanding London Overground orbital rail network; (6.4Bb)
- Completing the Thameslink programme, and developing the Chelsea Hackney line (Crossrail 2); (6.4Bf) and
- Enhancing the docklands light railway and Tramlink networks, along with providing new river crossings.(6.4Bj)

Policy 6.7 (Buses, Bus Transits, Trams)

The policy seeks to allocate road space and providing high level of priority on existing routes, along with good access to and within the areas served by the Bus Network. (6.7Ba, Bb)

Policy 6.8 (Coaches)

The policy supports the objective to find a series of new hubs for coach station facilities, while ensuring the new stations have good access to central London. (6.8A)



Policy 6.9 (Cycling)

The policy supports a significant increase of cycling in London, by implementing the Cycle Hire and Cycle Superhighway Scheme, along with increasing cycle parking facilities. (6.9Ab,Cd)

Policy 6.10 (Walking)

This policy advocates the importance facilitating walking by promoting more simplified streetscapes by decluttering and expanding the legible London Scheme, along with encouraging the use of shared space. (6.10Cb,Cc,Ce)

Policy 6.11 (Smoothing Traffic Flow and Tackling Congestion)

This policy supports a number of coordinated initiatives to reduce congestion. These initiatives include promoting local services and reduce to need travel longer distances, improving the quality and extent of pedestrian & cycle routes, and promote and encourage car sharing and car clubs. (6.11Bb,Bd,Bg)

Policy 6.12 (Road Network Capacity)

This policy supports limited improvements to London's road network, whether it is in improving or extending the existing capacity or providing new links to address clearly identified with significant strategic or local need. (6.12A)

Policy 6.13 (Parking)

This policy seeks to strike an appropriate balance of parking provision in local centres to avoid excessive parking provision which can undermine cycling, walking and public transport use. (6.13Eb, Ec) The policy also supports more generous parking provisions in Outer London boroughs Town Centres. (6.13Ed)

Policy 7.25 (Increasing the use of the Blue Ribbon Network for Passengers and Tourism)

This policy seeks to encourage increased use of the Blue Ribbon Network and the River Thames by commuters. (7.25Bb)

Economic Development Strategy policies

334. The purpose of the Economic Development Strategy is to set out the Mayor's ambitions for the economic development of the capital whilst providing strategic organisations with a clear vision and policy direction for achieving these ambitions.

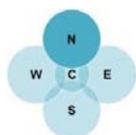
335. The EDS document does not make reference to any places or sub-regions, however a review of the proposals was carried out and those considered relevant to the north London sub-regional transport plan are summarised below.

Proposal 4F – Extending opportunity to all Londoners (pg66-67, Para 4.48 – 4.51)

336. In terms of new housing, Proposal 4F advocates that the "mayor will work with partners to ensure there is a sufficient and suitable housing to meet the needs of London's growing population". The proposal identifies the London boroughs as one of the mayor's partners, and draws attention to the London Plan housing target of 33,400 new homes needed each year, of which 4,395 will be built in the core north London Sub Region.

Proposal 5D – Investing in London's future (pg73, Para 5.23 – 5.27)

337. In terms of where the new housing will be located, Proposal 5D seeks to identifying capacity to accommodate large-scale employment and housing development in opportunity areas or development corridors in the north sub region such as the London-Luton-Bedford Corridor and London-Stansted-Cambridge-Peterborough Corridor. This will be achieved by coordinating the planning system, transport proposals and investment support.



Proposal 5G – Investing in London’s future (pg75-76, Para 5.35 – 5.44)

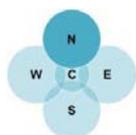
338. Furthermore Proposal 5G supports the coordination of homes and the workplace, especially along improved public transport routes, ensuring that the full economic benefits of employment growth is captured.

Proposal 5A – Investing in London’s future (pg70-71, Para 5.9 – 5.16)

339. In terms of development in Outer London, Proposal 5A advocates that the “Mayor will work with partners to strengthen the economy across London, including removing barriers to Outer London fulfilling its potential, and to support the development of town centres in outer and inner London as hubs for their communities and local economies”. An idea the proposal highlights as a possible approach is the “hub and spoke” model. This is when surrounding areas benefit from access to a strong economic centre. The document will also seeks to ensure outer centres are more readily accessible from surrounding areas by public transport, ideally through developing an orbital transport system to facilitate the anticipated growth of these centres, such as Wood Green.

Proposal 5E – Investing in London’s future (pg74, Para 5.28 – 5.30)

340. Where areas are defined as Opportunity Areas or Regeneration Areas in the London Plan, Proposal 5E endeavours to support local regeneration work led by the boroughs, by considering how local transport and environmental improvements can best support the redevelopment of the area. Where Opportunity Areas are located near regeneration areas in places such as the Upper Lee Valley, development in these areas should act as a driver for regeneration in the surrounding area.



Annex 1: Supplementary data

The data and analyses presented in this Annex have been included to provide more detailed information to underpin the interim report on challenges and opportunities in North London. The information is mostly supplementary to that within this document, principally in Chapter 2, and should provide useful reference material for the preparation of Local Implementation Plans.

Please note that in some instances, and for clarity, the data and tables presented in the document are repeated in this Annex.

The contents have been sub-divided into five headings, identifying which sections of the document each piece of analysis is considered most relevant. The broad issues included for North London are:

- Economic development and population growth
- Delivering an efficient and effective transport system for people and goods
- Improving journey experience

A. Travel demand

Introduction

This section aims to describe the nature of travel in the North sub-region. In the first instance, this section will describe the travel patterns of residents of the sub-region, and the possible impacts of population growth on this. Secondly, the section will describe trips currently made to and from the sub-region, by residents of London and elsewhere. This will include a summary of the types of trips being made, and the origins and destinations of trips. This analysis will help to identify key links between the North sub-region and elsewhere, as well as highlighting specific challenges presented by current travel patterns. Finally, the section will present modelled estimates of growth in travel to and from the North sub-region, and describe the possible impacts of such growth on travel patterns.

Travel by residents of the North sub-region

There are close to one million residents aged over 5 resident in the core boroughs of the North London sub-region. North Londoners make up 14% of London residents and make the same proportion of trips: on average, North sub-region residents make around 2.6 million trips per day, a trip rate of 2.6 trips per person per day. The table below shows that the number of trips undertaken per person per day is about average for London. Moreover, travel distance when considered per person per day is also about average for London and higher than that for both Central and East London.

Trip rates in Enfield, Haringey and Waltham Forest are close to the London average, at 2.4 to 2.5 trips per person per day. However, trip rates in the London borough of Barnet are considerably higher than average, at 3.1 trips per person per day. Residents of Barnet make 35% of the North London residents' total trips, but make up only 31% of the population. This can perhaps be explained by the fact that residents of the outer boroughs, particularly Barnet, have, on average, higher incomes than the inner boroughs, Total distance travelled per person per day is slightly higher for the outer boroughs which can be explained by the fact that commuting journeys might, on average, be longer given the greater distance to jobs in central London and by higher levels of car ownership and use.

Figure A 1: Trips and Travel distance, totals and per person per day, by residents of the region and borough, London residents 2006-9

Trips and travel distance, totals and per person per day, by residents of the region and borough, London residents 2006-9					
Area	Population aged 5 and over (000s)	Trips per day (000s)	Total distance travelled per day (000km)	Trips per person per day	Travel distance travelled per person per day (km)
Central	1,242	3,199	15,398	2.6	12.4
East	1,892	4,301	24,875	2.3	13.1
North	980	2,591	14,989	2.6	15.3
<i>Barnet</i>	299	914	4,697	3.1	15.7
<i>Enfield</i>	265	658	4,228	2.5	16
<i>Haringey</i>	212	525	3,055	2.5	14.4
<i>Waltham Forest</i>	204	494	3,009	2.4	14.7
South	1,512	4,219	26,760	2.8	17.7
West	1,345	3,571	22,114	2.7	16.4
Greater London	6,971	17,881	104,137	2.6	14.9

Source: London Travel Demand Survey 2006/9

Note: total distance travelled refers to straight line 'crow fly' distance

The mode share of trips made by residents of the North sub-region is generally typical of the Greater London average. 44% of trips made by North London residents are made by car or motorcycle, 27% by public transport and 30% by walk and cycle.

The car mode share in the North sub-region is slightly higher than the Greater London average of 41%, but is lower than average for Outer London, where 50% of trips are made by car. In total, residents of North London make more than 1.1 million trips by car or motorcycle every day. Just over a quarter of trips are made by public transport. Of these, most are made by bus (14%) and Underground (9%), with relatively few made by rail. This reflects the transport network coverage in the sub-region. The mode share for cycling is particularly low in the North sub-region, at only 1%. This is discussed in greater detail later in the report.

The car mode share is particularly high in Barnet and Enfield, at 50% and 49% respectively. This is of some concern, given that Barnet has a particularly high level of projected population growth to 2031, at +30%. If the new residents behaved in the same way as existing residents, we could expect around 40,000 more cars in the borough and perhaps as many as 150,000 car trips generated. The high per person trip rates in the borough give this regional importance.

Haringey has a mode share more typical of inner than Outer London, with 37% of trips made by public transport and only 31% by car or motorcycle. Nearly one in five trips are made by bus, and one in seven by rail or Underground. Mode shares across the other boroughs are fairly similar to the profile for the region as a whole, and for Outer London.

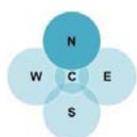
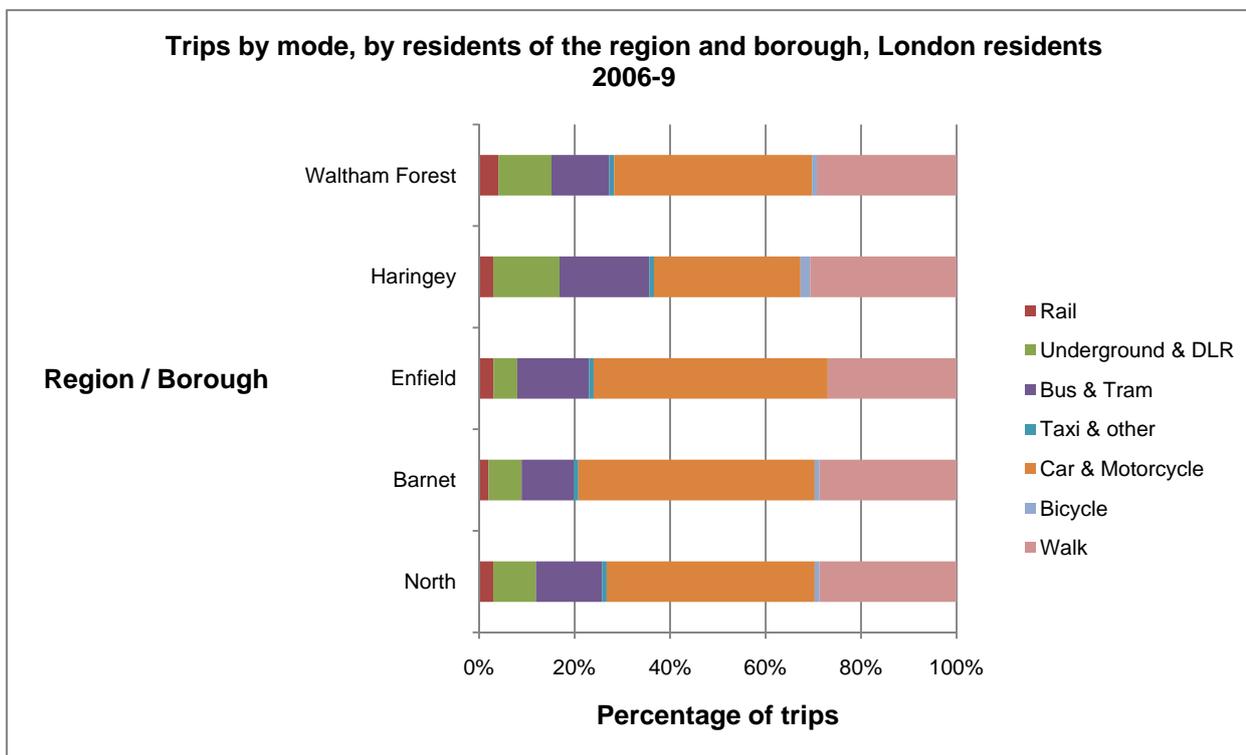


Figure A 2: Trips by mode, by residents of the region and borough, London residents 2006-9

Trips by mode, by residents of the region and borough, London residents 2006-9								
Area	Trips per day (000s)	Rail	Underground & DLR	Bus & Tram	Taxi & other	Car & Motorcycle	Bicycle	Walk
Central	3,199	3%	10%	19%	2%	23%	3%	39%
East	4,301	5%	6%	15%	1%	42%	1%	30%
North	2,591	3%	9%	14%	1%	44%	1%	29%
<i>Barnet</i>	914	2%	7%	11%	1%	50%	1%	29%
<i>Enfield</i>	658	3%	5%	15%	1%	49%	<1%	27%
<i>Haringey</i>	525	3%	14%	19%	1%	31%	2%	31%
<i>Waltham Forest</i>	494	4%	11%	12%	1%	41%	1%	29%
South	4,219	7%	3%	11%	1%	47%	2%	28%
West	3,571	2%	9%	14%	1%	45%	2%	28%
Greater London	17,881	4%	7%	14%	1%	41%	2%	31%

Source: London Travel Demand Survey 2006/9

Figure A 3: Trips by mode, by residents of the region and borough, London residents 2006-9



Source: London Travel Demand Survey

Daily trip purpose patterns for residents of North London largely mirror those of other sub-regions. The largest proportion of trips, around a third, are made for shopping and personal business. Leisure also accounts for a significant proportion of trips in North London, as with the other sub-regions, with more than a quarter of trips undertaken for leisure pursuits. A similar proportion of trips, 23%, take place for work purposes, including commuting and travel on work business.

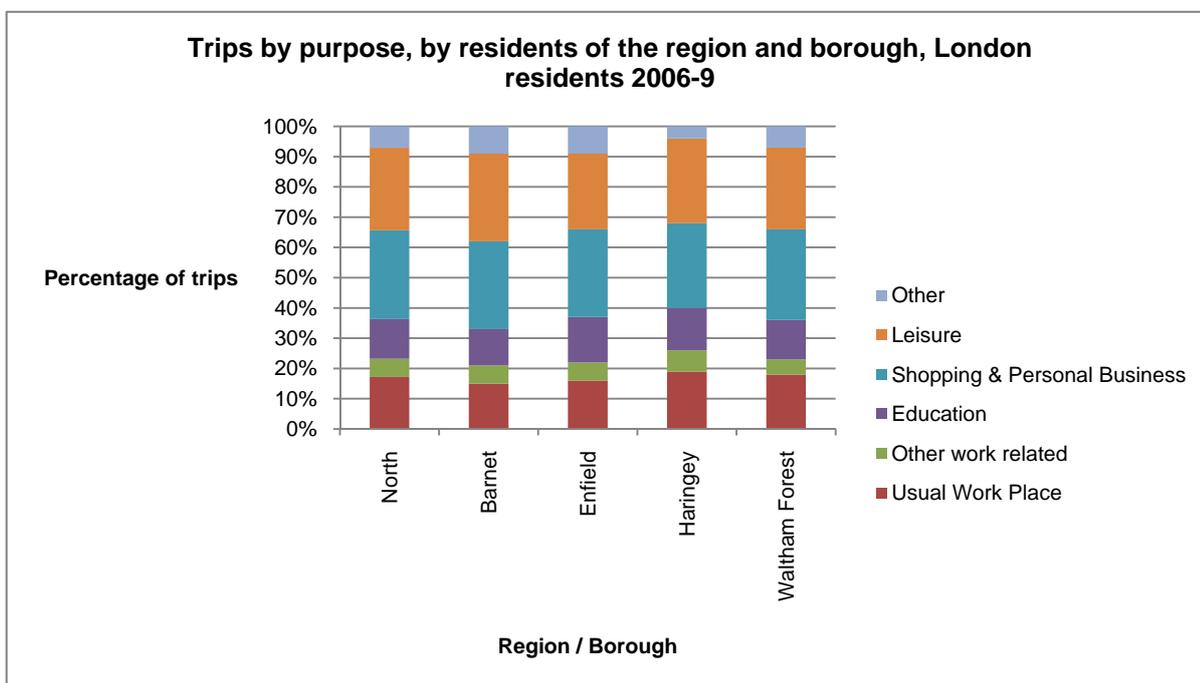
The profile of trips by purpose at borough level largely reflects the patterns observable at a sub-regional level, with the highest proportion of trips being undertaken for shopping and leisure purposes. The share of work related travel is somewhat higher than average in Haringey, where 26% of trips are made for this purpose compared to 23% across the region as a whole.

Figure A 4: Trips by purpose, by residents of the region and borough, London residents 2006-9

Trips by purpose, by residents of the region and borough, London residents 2006-9							
Area	Trips per day (000s)	Usual Work Place	Other work related	Education	Shopping & Personal Business	Leisure	Other
Central	3,199	16%	6%	13%	32%	27%	6%
East	4,301	18%	6%	15%	31%	23%	6%
North	2,591	17%	6%	13%	29%	27%	7%
<i>Barnet</i>	914	15%	6%	12%	29%	29%	9%
<i>Enfield</i>	658	16%	6%	15%	29%	25%	9%
<i>Haringey</i>	525	19%	7%	14%	28%	28%	4%
<i>Waltham Forest</i>	494	18%	5%	13%	30%	27%	7%
South	4,219	17%	6%	12%	28%	30%	7%
West	3,571	17%	6%	14%	30%	27%	7%
Greater London	17,881	17%	6%	13%	30%	27%	7%

Source: London Travel Demand Survey 2006/9

Figure A 5: Trips by purpose, by residents of the region and borough, London residents 2006-9



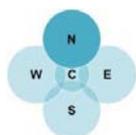
Source: London Travel Demand Survey 2006/9

An ageing population can be expected to change the profile of travel somewhat. Older people make fewer trips overall, and are more likely to travel outside the peak periods. In particular, whilst the mode profile for younger retired people is fairly similar to other adults, those aged 75 plus tend to make fewer trips by car and more by public transport, and particularly bus (23% of trips by London residents over 75 are made by bus, compared to 15% of trips by people of all age groups).

Travel by region of origin – introduction

There are approximately 2.3 million trips per day made by London residents which originate in the North London region. When compared to all the other regions this is the lowest by some distance, reflecting in large part the small size of the region. In comparison, central London has the greatest number of trips by region of origin, followed by East, South and West London respectively.

This section describes the nature of this travel in terms of the mode, purpose, time of day, day of week, and length of the trips made.



It should be noted that only those journeys originating in North London which are made by Greater London residents are included in these figures.

Travel by region of origin - mode share

The table below shows that the mode share for trips originating in North London broadly reflects that of the other sub-regions, with car (47%) and walking (30%) being by far the most commonly used modes of transport, followed by bus with relatively low proportions of total trips using rail or underground. Combined rail and underground use is slightly below the Greater London average, reflecting local network coverage and high car use. The mode share for all trips originating in each of the boroughs generally follows the North London average with only a few exceptions. Haringey has a significantly smaller percentage of trips by car originating in the borough (34%) this is offset by a slightly larger proportion of trips by bus originating in the borough (21%). Haringey has a particularly high bus mode share in comparison with the other boroughs in the region, whereas Barnet and Enfield have much higher car mode shares than the rest of the region with 53% and 50% trips made by car respectively. Barnet in particular has a very low bus mode share with only 11% trips originating in Barnet made by this mode.

Figure A 6: Londoners' Trips by region/borough of origin: trips per day and shares by main mode, 2006-9 average, 7 day week

Londoners' Trips by region/borough of origin: trips per day and shares by main mode, 2006-9 average, 7 day wee								
Percentage of trips by main mode								
	Trips per day (000s)	Rail	Underground / DLR	Bus	Taxi / other public	Car / motorcycle	Cycle	Walk
Central	4167	6%	15%	17%	2%	21%	3%	36%
East	3938	4%	5%	15%	1%	42%	1%	31%
North	2252	2%	5%	15%	1%	47%	1%	30%
<i>Barnet</i>	800	1%	5%	11%	1%	53%	1%	29%
<i>Enfield</i>	572	2%	3%	15%	1%	50%	<1%	28%
<i>Haringey</i>	451	2%	9%	21%	1%	34%	2%	31%
<i>Waltham Forest</i>	429	2%	7%	13%	1%	43%	1%	32%
South	3681	5%	2%	12%	1%	49%	2%	29%
West	3256	2%	7%	14%	1%	45%	2%	29%
Total	17294							

Source: London Travel Demand Survey 2006/9

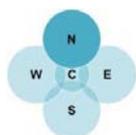
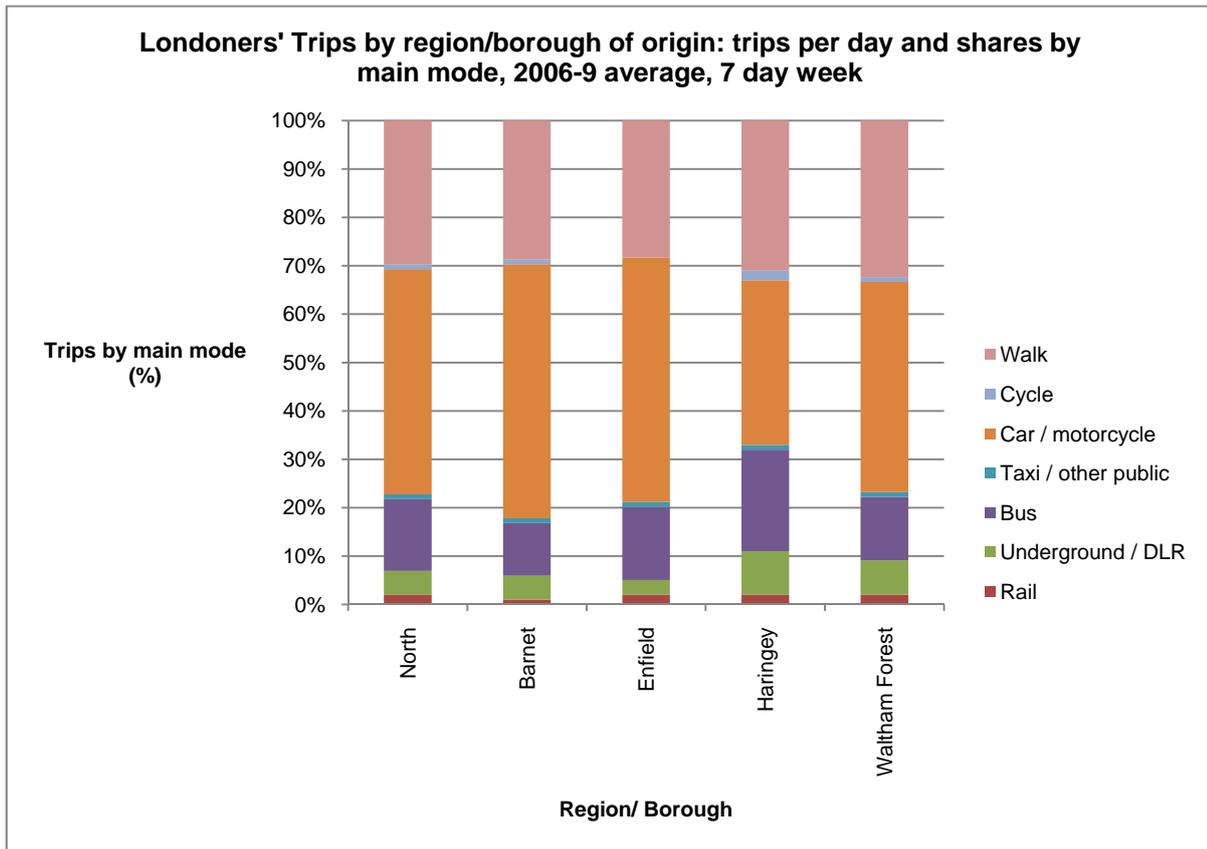


Figure A 7: Trips by mode, by residents of the region and borough, London residents 2006-9



Source: London Travel Demand Survey 2006/9

Travel by region of origin – journey purpose

Daily trip purpose patterns for trips originating in North London largely mirror those of other sub-regions. The largest proportion of trips is for shopping and personal business at around roughly a third. Leisure also accounts for a significant proportion of trips in North London, as with the other sub-regions with 27% trips undertaken for leisure pursuits. Work accounts for nearly one in five trips originating in the sub-region and education for 15%.

The profile of trip purpose breakdown by borough is similar for that of the sub-region as a whole, although it is notable that the proportion of trips undertaken for work purposes, including commuting, is slightly higher for Haringey and Waltham Forest than for Barnet and Enfield and that the proportion of trips in Enfield which are for education purposes is slightly above the regional average. It should also be noted that the North London region is a net exporter of workers, (i.e. that there are more North London residents travelling outside their home region to work than there are residents of other regions travelling to jobs in North London). This would tend to exaggerate the proportion of work trips made when comparing work trips by borough of residence against those by borough of origin.

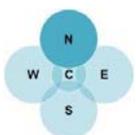
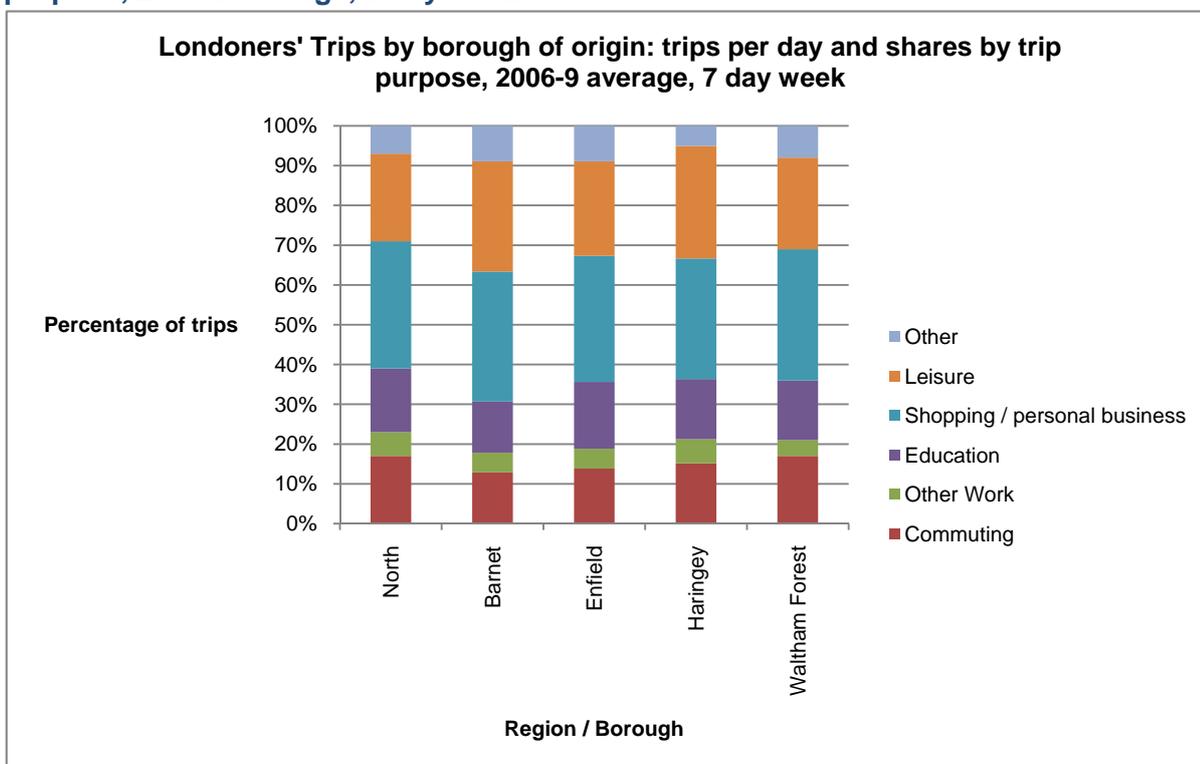


Figure A 8: Londoners' Trips by region/borough of origin: trips per day and shares by trip purpose, 2006-9 average, 7 day week

Londoners' Trips by region/borough of origin: trips per day and shares by trip purpose, 2006-9 average, 7 day week							
	Trips per day (000s)	Trip Purpose					
		Commuting	Other Work	Education	Shopping / personal business	Leisure	Other
Central	4167	20%	7%	12%	29%	26%	6%
East	3937	17%	6%	16%	32%	22%	7%
North	2252	17%	6%	16%	32%	22%	7%
<i>Barnet</i>	800	13%	5%	13%	33%	28%	9%
<i>Enfield</i>	572	14%	5%	17%	32%	24%	9%
<i>Haringey</i>	451	15%	6%	15%	30%	28%	5%
<i>Waltham Forest</i>	429	17%	4%	15%	33%	23%	8%
South	3681	15%	5%	14%	30%	29%	7%
West	3256	16%	5%	14%	31%	26%	7%
Total	17293						

Source: London Travel Demand Survey 2006/9

Figure A 9: Londoner's Trips by region/borough of origin: trips per day and shares by trip purpose, 2006-9 average, 7 day week



Source: London Travel Demand Survey 2006/9

Travel by Region of Origin – by time and day

Following the standard pattern, the number of commuting journeys made is reflected in high numbers of trips during the am and pm peaks. Most trips originating in North London occur during the inter-peak period, partly reflecting the longer duration of this period but also reflecting the fact that most shopping and personal business trips take place during this time as well as work related trips other than commuting. The afternoon school run also takes place during the inter-peak. As would be expected, fewer journeys take place after 7pm with very few after 10pm and in the early hours of the morning.

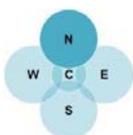


Figure A 10: Total trips and trips by time of day by region/borough of origin

Total trips and trips by time of day by region/borough of origin								
	Trips per day (000s)	% London total trips	Early am (0400 - 0659)	am Peak (0700 - 0959)	Inter Peak (1000 - 1559)	pm Peak (1600 - 1859)	Evening (1900 - 2159)	Night (2200 - 0359)
Central	4,167	24%	47,000	605,000	1,734,000	1,118,000	445,000	217,000
East	3,938	23%	106,000	848,000	1,870,000	694,000	307,000	113,000
North	2,252	13%	54,000	471,000	1,018,000	421,000	219,000	69,000
<i>Barnet</i>	800	5%	14,300	155,100	355,800	160,100	87,700	27,100
<i>Enfield</i>	572	3%	16,100	132,500	256,000	103,300	49,600	15,100
<i>Haringey</i>	451	3%	11,100	94,600	203,800	87,500	36,800	16,900
<i>Waltham Forest</i>	429	3%	12,700	88,600	202,700	69,800	45,000	10,200
South	3,681	21%	85,000	788,000	1,633,000	718,000	342,000	116,000
West	3,256	19%	88,000	682,000	1,395,000	655,000	313,000	123,000
Total	17,294	100%	380,000	3,394,000	7,650,000	3,606,000	1,626,000	638,000

Source: London Travel Demand Survey 2006/9

Figure A 11: Total Trips and trips by time of day by region/borough origin (%)

Total Trips and trips by time of day by region/borough of origin (%)								
	Trips per day (000s)	% London total trips	Early am (0400-0659) (%)	am Peak (0700 - 0959) (%)	Inter Peak (1000-1559) (%)	pm Peak (1600 - 1859) (%)	Evening (1900 - 2159) (%)	Night (2200 - 0359) (%)
Central	4,167	24%	1%	15%	42%	27%	11%	5%
East	3,938	23%	3%	22%	47%	18%	8%	3%
North	2,252	13%	2%	21%	45%	19%	10%	3%
<i>Barnet</i>	800	5%	2%	19%	44%	20%	11%	3%
<i>Enfield</i>	572	3%	3%	23%	45%	18%	9%	3%
<i>Haringey</i>	451	3%	2%	21%	45%	19%	8%	4%
<i>Waltham Forest</i>	429	3%	3%	21%	47%	16%	10%	2%
South	3,681	21%	2%	21%	44%	20%	9%	3%
West	3,256	19%	3%	21%	43%	20%	10%	4%
Total	17,294	100%	2%	20%	44%	21%	9%	4%

Source: London Travel Demand Survey 2006/9

In the am peak, around four in ten trips are made by car, just over a quarter by walking and the remainder by public transport, particularly bus (14%) and underground (12%). In the inter-peak, the proportion of trips made by car is similar, but a higher proportion of trips are walked or made by bus, and a much lower proportion are made by rail and underground. This reflects the radial nature of many commuting trips compared to the more local nature of many of the shopping and leisure trips made during the inter-peak period. It also reflects the profile of travellers, as commuters to central London will have a higher value of time and be prepared to travel by the more expensive, faster public transport modes.

In the pm peak and later in the evening, a higher proportion of trips are made by car (53% in the pm peak) and relatively few trips are made by underground. Overnight, very few trips are walked, and the mode share is fairly evenly split between car and public transport.

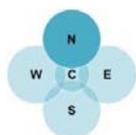


Figure A 12: Number of trips by mode by time of day originating in the North Sub-Region

Number of trips by mode by time of day originating in the North Sub-Region						
Mode	Early am (0400 - 0659)	am Peak (0700 - 0959)	Inter peak (1000 - 1559)	pm Peak (1600 - 1859)	Evening (1900 - 2159)	Night (2200 - 0359)
National rail / Overground	5,000	19,000	8,000	5000	0	0
Underground / DLR	10,000	57,000	32,000	18000	6000	1000
Bus / tram	8,000	67,000	169,000	53000	25000	8000
Taxi / Other Public	1,000	2,000	6,000	3000	3000	2000
Car / Motorcycle	25,000	193,000	447,000	224000	118000	42000
Cycle	1,000	5,000	5,000	5000	1000	1000
Walk	5,000	127,000	349,000	112000	65000	14000
Other	-	1,000	1,000	0	1000	0
Total	55,000	471,000	1,017,000	420,000	219,000	68,000

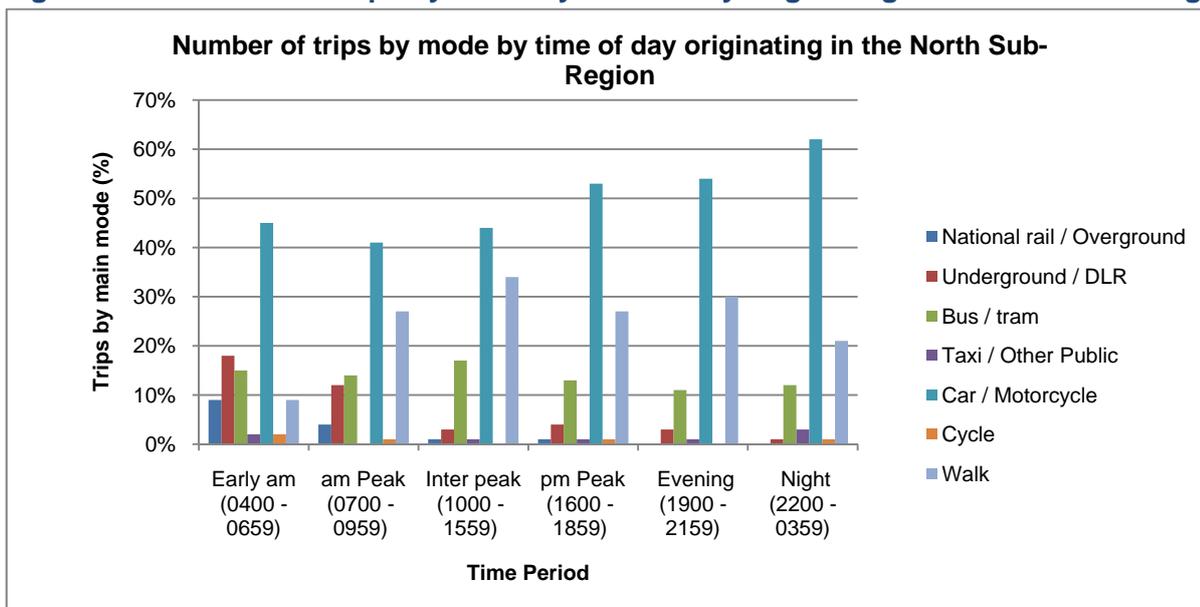
Source: London Travel Demand Survey 2006/9

Figure A 13 Number of trips by mode by time of day originating in the North Sub-region

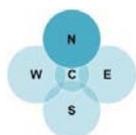
Number of trips by mode by time of day originating in the North Sub-Region						
Mode	Early am (0400 - 0659)	am Peak (0700 - 0959)	Inter peak (1000 - 1559)	pm Peak (1600 - 1859)	Evening (1900 - 2159)	Night (2200 - 0359)
National rail / Overground	9%	4%	1%	1%	<1%	<1%
Underground / DLR	18%	12%	3%	4%	3%	1%
Bus / tram	15%	14%	17%	13%	11%	12%
Taxi / Other Public	2%	<1%	1%	1%	1%	3%
Car / Motorcycle	45%	41%	44%	53%	54%	62%
Cycle	2%	1%	<1%	1%	<1%	1%
Walk	9%	27%	34%	27%	30%	21%
Other	<1%	<1%	<1%	<1%	<1%	<1%
Total	100%	100%	100%	100%	100%	100%

Source: London Travel Demand Survey 2006/9

Figure A 14: Number of trips by mode by time of day originating in the North Sub-Region



Source: London Travel Demand Survey 2006/9



Day of week (weekday/Saturday/Sunday) by mode by region of origin (2006/9)

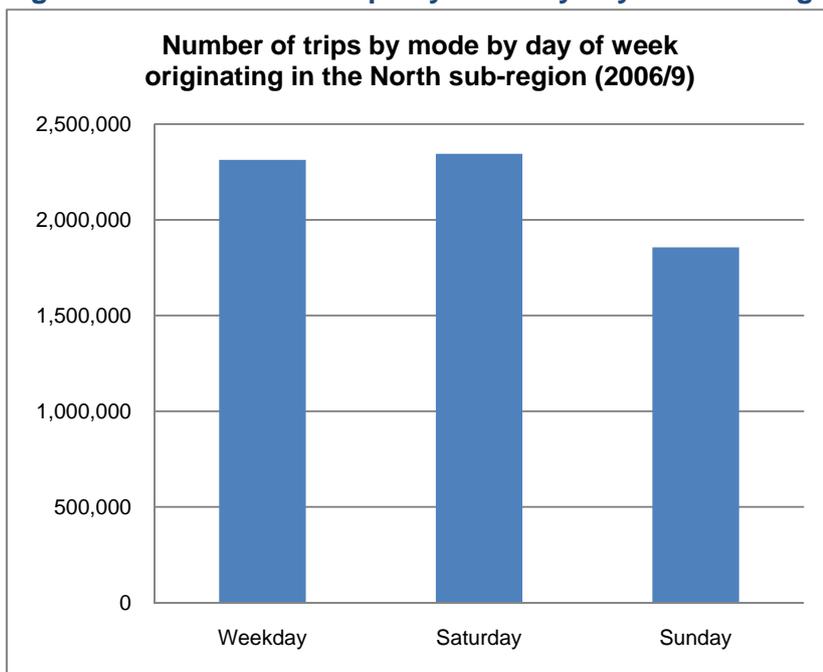
In North London, fairly similar numbers of trips are made on weekdays and Saturdays (around 2.3 million), with around three quarters as many trips made on an average Sunday. In most regions, fewer trips are made on a Saturday than a weekday.

Figure A 15: Number of trips by mode by day of week originating in the North Sub-Region

Number of trips by mode by day of week originating in the North Sub-Region (2006/9)			
Mode	Weekday	Saturday	Sunday
Total	2,313,000	2,344,700	1,856,500

Source: London Travel Demand Survey 2006/9

Figure A 16: Number of trips by mode by day of week originating in the North Sub-Region



Source: London Travel Demand Survey 2006/9

At the weekend, a higher proportion of trips are made by car, at 54% and 58% on Saturdays and Sundays respectively, compared to 43% of trips on an average weekday, This means that nearly 300,000 more trips are made by car in the region on a Saturday than on an average weekday and the number of trips made by car on a Sunday is broadly the same as that on an average weekday, despite lower overall trip volumes on Sundays. The share for all public transport modes is reduced at the weekend, as is the walk mode share, so clearly users of all modes tend to move towards greater car use at the weekend.

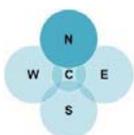


Figure A 17: Number of trips by mode by day of week originating in the North Sub-region

Number of trips by mode by day of week originating in the North Sub-Region						
Mode	Weekday	Mode share %	Saturday	Mode share %	Sunday	Mode share %
National rail / Overground	44,800	2	22,300	1	14,400	1
Underground / DLR	142,500	6	97,700	4	55,800	3
Bus / tram	373,700	16	255,600	11	185,500	10
Taxi / Other Public	17,800	1	20,000	1	15,300	1
Car / Motorcycle	1,000,400	43	1,277,200	54	1,072,800	58
Cycle	21,400	1	7,500	<1	13,600	1
Walk	707,700	31	664,400	28	499,100	27
Other	4,700	<1	-	-	-	-
Total	2,313,000	100	2,344,700	100	1,856,500	100

Source: London Travel Demand Survey 2006/9

Travel by region of origin – journey length

Three quarters of trips less than 1km are walked and most of the remainder are made by car, equivalent to 172,600 car journeys under 1km per day, 16% of all trips made by car.

For mid-length trips of between 1 and 10km, six in ten are made by car and between a quarter and a fifth by bus. A relatively low proportion of trips between 1 and 5km are walked or cycled (14%), a similar proportion of trips between 6 and 10km are made by rail and underground (16%). Nine in ten rail and underground trips are longer than 5km; for the longest trips (over 20km), rail is more commonly used than underground. For trips between 10 and 20km, as many trips are made by rail and underground (44%) as are made by car (46%). For longer trips, car once again becomes the dominant mode, with 73% of trips over 20km made by car and most of the remainder by rail or underground (26%).

Figure A 18: Journey length by mode originating in the North Sub-Region (2006/9)

Journey length by mode originating in the North sub-region (2006/9)						
Mode	Under 1km	1-5km	6-10km	10-20km	More than 20km	Total
National rail/Overground	0	2,900	10,300	16,000	8,000	37,200
Underground/DLR	100	10,300	41,200	67,400	4,600	123,600
Bus/tram	22,300	231,900	61,300	13,500	1,000	330,000
Taxi/Other Public	2,300	9,200	4,300	1,500	500	17,800
Car/Motorcycle	172,600	557,000	194,400	86,500	39,600	1,050,100
Cycle	6,000	8,900	2,600	800	0	18,300
Walk	556,000	107,900	3,700	2,200	500	670,300
Other	900	1,500	900	100	0	3,400

Source: London Travel Demand Survey 2006/9

Figure A 19: Journey length by mode originating in the North Sub-Region (2006/9)

Source: London Travel Demand Survey 2006/9

Note: Percentage by length, column percents

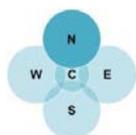


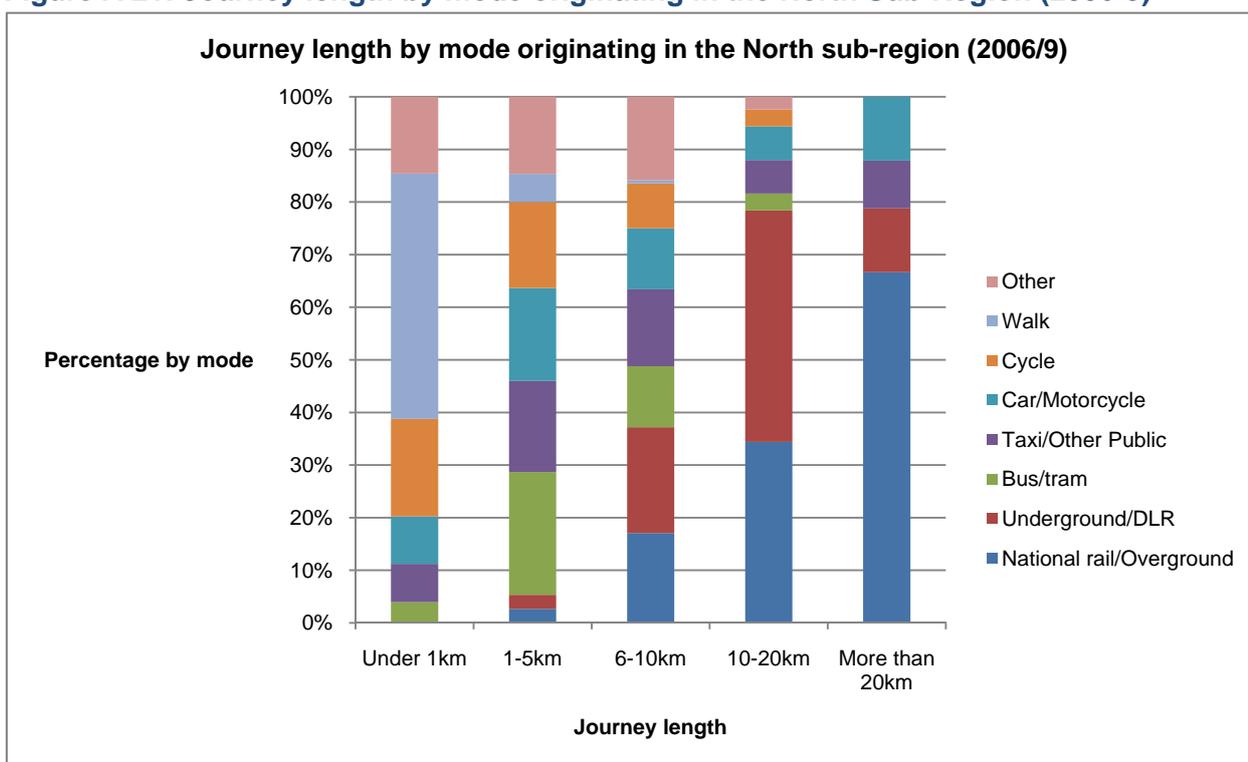
Figure A 20: Journey length by mode originating in the North Sub-Region (2006/9)

Journey length by mode originating in the North sub-region (2006/9)					
Mode	Under 1km	1-5km	6-10km	10-20km	More than 20km
National rail/Overground	<1%	8%	28%	43%	22%
Underground/DLR	<1%	8%	33%	55%	4%
Bus/tram	7%	70%	19%	4%	<1%
Taxi/Other Public	13%	52%	24%	8%	3%
Car/Motorcycle	16%	53%	19%	8%	4%
Cycle	33%	49%	14%	4%	<1%
Walk	83%	16%	1%	<1%	<1%
Other	26%	44%	26%	3%	<1%

Source: London Travel Demand Survey 2006/9

Note: Percentage by mode, row percents

Figure A 21: Journey length by mode originating in the North Sub-Region (2006-9)



Source: London Travel Demand Survey 2006/9

Origin and Destination of trips made by London Residents

Three quarters of all trips made by London residents are wholly contained within a sub-region, so have an origin and destination within the same sub-region. A further 15% of trips take place between the Central sub-region and elsewhere, whilst only 10% of trips take place between the other sub-regions.

Figure A 22: Origin and destination of trips by Sub-Region, London residents, 2006-9

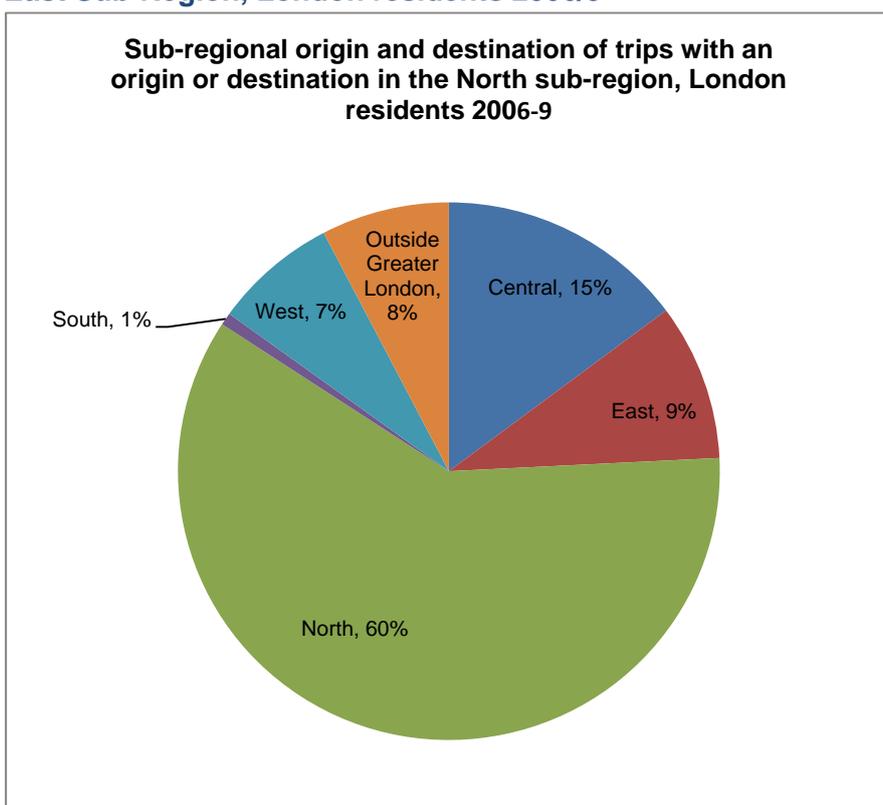
Origin and destination of trips by sub-region, London residents, 2006-9						
Area	Central	East	North	South	West	Outside Greater London
Central	16%	2%	1%	2%	2%	1%
East	2%	18%	1%	1%	0%	0%
North	1%	1%	10%	0%	1%	1%
South	2%	1%	0%	16%	1%	1%
West	2%	0%	1%	1%	14%	0%
Outside Greater London	1%	0%	1%	1%	0%	n/a

Source: London Travel Demand Survey 2006/9

Note: 44,000 trips excluded due to missing origin and/or destination data (0.2% of total); only trips with an origin or destination in Greater London are included in the dataset.

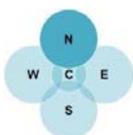
In the North sub-region, six in ten trips made by London residents have both an origin and destination in the region. The pie chart presented below shows the relationship between the North sub-region and other regions, showing the proportion of trips with an origin or destination in North, and an origin or destination elsewhere. As would be expected, the region has a stronger relationship with the adjacent boroughs and with outside Greater London than with the South sub-region. As with all regions, a significant proportion of trips are made to and from the Central sub-region.

Figure A 23: Sub-Regional origin and destination of trips with an origin or destination in the East Sub-Region, London residents 2006/9



Source: London Travel Demand Survey 2006/9

Of the 2.8 million trips made in the North sub-region, 1.7 million trips are made wholly within the North sub-region; just over half a million trips are made travelling from the North to elsewhere; and a similar number from elsewhere to the North sub-region. The table below summarises the relationships between the boroughs and elsewhere in terms of trips made with an origin or destination in the borough.



Only four in ten trips made in Haringey were wholly contained within the borough, compared to around half of trips in each of the other North sub-region boroughs. One in five trips with an origin or destination in Haringey involved travel to or from another North London borough, with the strongest relationship being with the London borough of Enfield; 12% of trips with an origin or destination in Haringey had an origin or destination in Enfield. 37% of trips with an origin or destination in Haringey had an origin or destination elsewhere in London, and particularly Central London; 23% of trips with an origin or destination in Haringey had an origin or destination in the Central sub-region. Comparatively few trips were made between Haringey and outside London, at only 3%.

Half of the trips made in Barnet were wholly contained within the borough, and a further one in ten trips were made between Barnet and the other North sub-region boroughs. Around a third of trips with an origin or destination in Barnet had an origin or destination elsewhere in London, and particularly West and Central London, which account for 16% and 14% of trips with an origin or destination in Haringey respectively.

The London Borough of Enfield had the highest proportion of trips in North London which were wholly contained within the borough, at 54% and also the highest proportion of trips which were wholly contained within the sub-region, at 76%. Trips with an origin or destination in Enfield were also the most likely to have an origin or destination outside Greater London, at 7% of trips. Only one in six trips with an origin or destination in Enfield had an origin or destination in the other London sub-regions, of which 8% involved travel to and from Central London, and 6% travel to and from East London.

Half of the trips made in Waltham Forest were wholly contained within the borough. There was very little travel between Waltham Forest and the other North sub-region boroughs, accounting for only 7% of trips with an origin or destination in Waltham Forest. 5% of trips were made between Waltham Forest and outside Greater London, and the remainder, nearly one in four, involved travel between Waltham Forest and other sub-regions. The majority of these involved travel to and from East London (25%) and Central London (11%).

Figure A 24: Origin and destination of trips by borough, London residents 2006/9

Origin and destination of trips by borough, London residents 2006/9					
Area	Total trips	% trips wholly contained within borough	% trips between other North boroughs	% trips travelling elsewhere in London	% trips travelling outside London
<i>Haringey</i>	646,500	39%	21%	37%	3%
<i>Barnet</i>	1,056,900	52%	11%	32%	5%
<i>Enfield</i>	743,700	54%	22%	17%	7%
<i>Waltham Forest</i>	573,000	50%	7%	38%	5%
North	2,789,100	-	61%	33%	5%

Source: London Travel Demand Survey 2006/9

Note: 44,000 trips excluded due to missing origin and/or destination data (0.2% of total); only trips with an origin or destination in Greater London are included in the dataset.

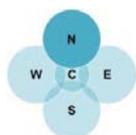


Figure A 25: Origin and destination of trips, Sub-Region and North London boroughs, London residents 2006/9

Origin and destination of trips, sub-region and North London boroughs, London residents 2006/9												
Origin	Destination											
	North	North				East	West	South	Central	Outside GLA	Total	
		<i>Haringey</i>	<i>Barnet</i>	<i>Enfield</i>	<i>Waltham Forest</i>							
North	1,714,200	320,700	607,100	481,400	305,000	135,400	105,100	10,300	213,000	72,500	2,250,500	
<i>Haringey</i>	322,700	252,700	24,300	39,300	6,400	29,800	11,200	3,600	74,100	8,900	450,300	
<i>Barnet</i>	604,300	24,400	546,700	30,900	2,300	11,000	82,300	3,300	75,500	23,600	800,000	
<i>Enfield</i>	481,700	36,600	34,400	399,100	11,600	23,000	8,200	1,300	31,200	26,600	572,000	
<i>Waltham Forest</i>	305,500	7,000	1,700	12,100	284,700	71,600	3,400	2,100	32,200	13,400	428,200	
East	133,300	29,100	10,800	23,600	69,800	3,157,900	34,200	120,600	365,500	120,600	3,932,100	
West	106,300	9,700	84,500	7,100	5,000	37,700	2,564,600	138,300	302,000	103,200	3,252,100	
South	10,900	3,500	3,200	1,600	2,600	118,600	139,200	2,918,100	319,100	170,300	3,676,200	
Central	209,900	77,000	72,300	29,700	30,900	361,600	296,100	321,800	2,935,300	37,700	4,162,400	
Outside GLA	78,200	8,900	25,700	27,400	16,200	128,700	115,300	187,300	53,600	n/a	563,100	
Total	2,252,800	448,900	803,600	570,800	429,500	3,939,900	3,254,500	3,696,400	4,188,500	504,300	17,836,400	

Source: London Travel Demand Survey 2006/9

Note: 44,000 trips excluded due to missing origin and/or destination data (0.2% of total); only trips with an origin or destination in Greater London are included in the dataset.

Figure A 26: Proportion of trips with a destination in each Sub-Region and North London borough, by origin of trip, London residents, 2006/9

Proportion of trips with a destination in each sub-region and North London borough, by origin of trip, London residents 2006/9												
Origin	Destination											
	North	North				East	West	South	Central	Outside GLA	Total	
		<i>Haringey</i>	<i>Barnet</i>	<i>Enfield</i>	<i>Waltham Forest</i>							
North	76%	14%	27%	21%	14%	6%	5%	0%	9%	3%	2,250,500	
<i>Haringey</i>	72%	56%	5%	9%	1%	7%	2%	1%	16%	2%	450,300	
<i>Barnet</i>	76%	3%	68%	4%	0%	1%	10%	0%	9%	3%	800,000	
<i>Enfield</i>	84%	6%	6%	70%	2%	4%	1%	0%	5%	5%	572,000	
<i>Waltham Forest</i>	71%	2%	0%	3%	66%	17%	1%	0%	8%	3%	428,200	
East	3%	1%	0%	1%	2%	80%	1%	3%	9%	3%	3,932,100	
West	3%	0%	3%	0%	0%	1%	79%	4%	9%	3%	3,252,100	
South	0%	0%	0%	0%	0%	3%	4%	79%	9%	5%	3,676,200	
Central	5%	2%	2%	1%	1%	9%	7%	8%	71%	1%	4,162,400	
Outside GLA	14%	2%	5%	5%	3%	23%	20%	33%	10%	n/a	563,100	
Total	2,252,800	448,900	803,600	570,800	429,500	3,939,900	3,254,500	3,696,400	4,188,500	504,300	17,836,400	

Source: London Travel Demand Survey 2006/9

Note: 44,000 trips excluded due to missing origin and/or destination data (0.2% of total); only trips with an origin or destination in Greater London are included in the dataset

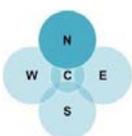
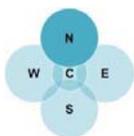


Figure A 27: Proportion of trips with an origin in each Sub-Region and North London borough, by destination of trips, London residents, 2996/9

Proportion of trips with an origin in each sub-region and North London borough, by destination of trip, London residents 2006/9											
Origin	Destination										Total
	North	Haringey	Barnet	Enfield	Waltham Forest	East	West	South	Central	Outside GLA	
North	76%	71%	76%	84%	71%	3%	3%	0%	5%	14%	2,250,500
<i>Haringey</i>	14%	56%	3%	7%	1%	1%	0%	0%	2%	2%	450,300
<i>Barnet</i>	27%	5%	68%	5%	1%	0%	3%	0%	2%	5%	800,000
<i>Enfield</i>	21%	8%	4%	70%	3%	1%	0%	0%	1%	5%	572,000
<i>Waltham Forest</i>	14%	2%	0%	2%	66%	2%	0%	0%	1%	3%	428,200
East	6%	6%	1%	4%	16%	80%	1%	3%	9%	24%	3,932,100
West	5%	2%	11%	1%	1%	1%	79%	4%	7%	20%	3,252,100
South	0%	1%	0%	0%	1%	3%	4%	79%	8%	34%	3,676,200
Central	9%	17%	9%	5%	7%	9%	9%	9%	70%	7%	4,162,400
Outside GLA	3%	2%	3%	5%	4%	3%	4%	5%	1%	n/a	563,100
Total	2,252,800	448,900	803,600	570,800	429,500	3,939,900	3,254,500	3,696,400	4,188,500	504,300	17,836,400

Source: London Travel Demand Survey 2006/9

Note: 44,000 trips excluded due to missing origin and/or destination data (0.2% of total); only trips with an origin or destination in Greater London are included in the dataset.



Travel by non-London residents

The National Travel Survey describes trips made to, from and within London in the wider context of travel in the UK as a whole. This shows that:

- 12% of trips had a destination in Greater London – of these, 92% had originated in London, 5% in the South East and 3% in the Eastern region.
- Only 8% of car (as driver) trips had a destination in Greater London, but 14% of these had an origin elsewhere, primarily the South East (8%) and East (6%) regions.
- More than four in ten rail trips made in the UK had a destination in Greater London, of which around two thirds were within London, 17% came from the South East, 11% the East and a small proportion from elsewhere in the UK.

These figures suggest that non-Londoners make up a fairly significant proportion of those making trips in London, and particularly for 'longer distance' modes such as car and rail.

Note that London residents will make some trips with an origin elsewhere and a destination in London, and that non-Londoners will make trips wholly contained within London, so where the trip is made is not a perfect proxy for where the person is resident. However, this data can indicate the level and nature of travel between London and elsewhere. Also note that the survey excludes international tourists and business travellers.

Trips to London from outside London were more likely to have a destination in outer than inner London. Car was the mode most commonly used to travel to Outer London, whilst rail was the most commonly used mode for travel to inner London. Two thirds of all trips with a destination in London (and an origin elsewhere) made by residents of the South East were to Outer London, whereas residents of the Eastern region in 2002-06 were equally likely to be travelling to inner or Outer London (49% and 51% of London trips respectively).

At around six in ten, the majority of trips into London on a weekday were for commuting or business purposes, with around one in three trips made for shopping or leisure. At the weekend, most trips were made for shopping or leisure purposes. The profile of trips made into and out of inner and Outer London by residents of the South East and Eastern regions was quite different, with around seven in ten trips to inner London and four in ten trips to Outer London being for commuting and business purposes.

During the week, around six in ten trips into London were made by car or van, and around three in ten by rail. In comparison, at the weekend, more than 80% of trips into London from the South East and Eastern regions were made by car.

The mode split was sharply differentiated by whether visitors were travelling to inner or Outer London. Around nine in ten trips to Outer London were made by car, whereas around 60% of trips to inner London were by rail. Whilst in London, visitors were more likely to make shopping, leisure and personal business trips (for example, a lunchtime shopping trip or after-work drinks), and tended to travel by car or on foot.

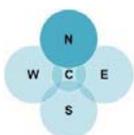
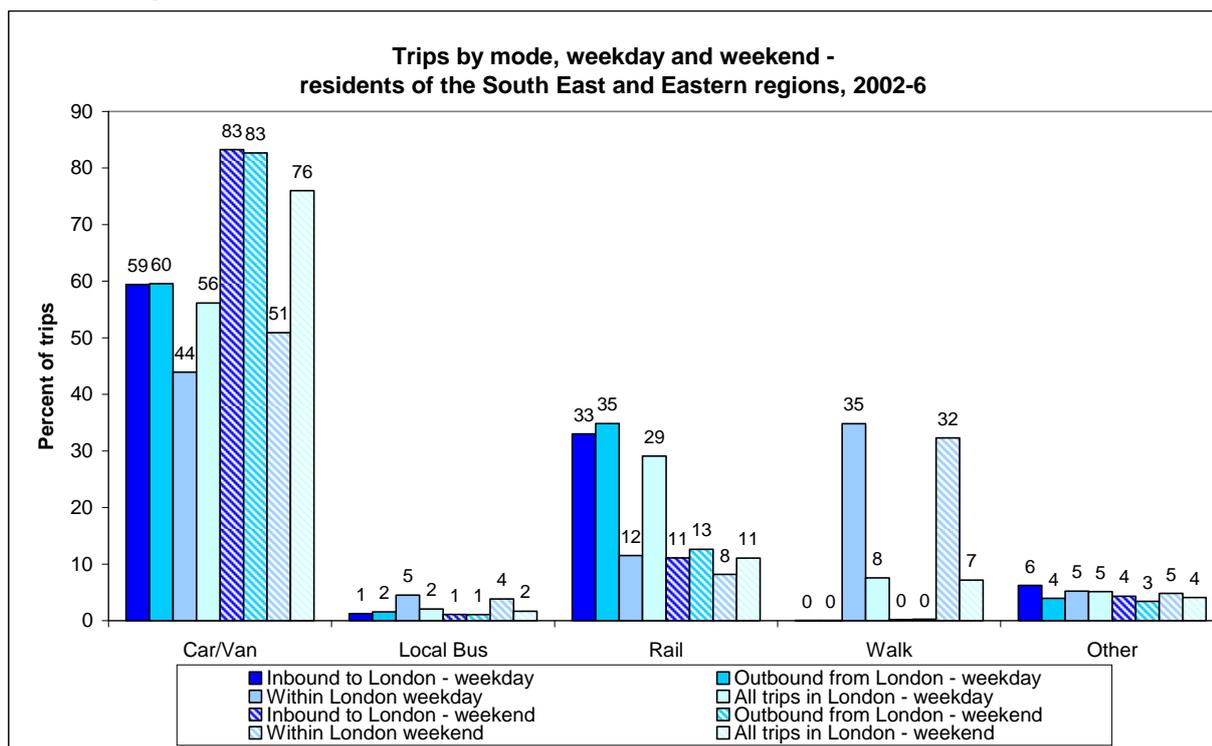


Figure A 28: Trips by mode, weekday and weekend – residents of the South East and Eastern regions, 2002-6



Source: National Travel Survey 2002-2006 (DfT)

Future Travel Projections – by time of day

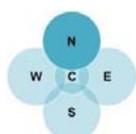
By 2031, the total number of trips originating in Greater London, by both London residents and non-residents is expected to increase by around 16%, an overall addition of over three million trips a day. Within London, the East region will both generate and receive a significantly greater increase in trips than any of the other regions. Conversely the lowest increase in total trips will come from the South region, followed by the West. This follows the trends seen in the population and employment forecasts presented earlier in this document.

Of all the individual movements between regions, those between the East and West experience the greatest increase (an increase of over 100% in both directions). This increase is due to both the relatively low flows between these regions currently and Crossrail making travel from East to West significantly easier by public transport. The single greatest increase is within the East region, of more than 640,000 trips between 7am and 7pm. This is almost twice as large as the next highest increase, trips within the central region, which will increase by just over 340,000.

Figure A 29: Percentage change in total trips to 2031 from each region

Percentage change in total trips to 2031 from each region						
	Total Trips	To Central	To East	To North	To South	To West
Central	18%	17%	35%	14%	11%	17%
East	28%	38%	25%	32%	27%	127%
North	12%	14%	35%	8%	35%	25%
South	8%	11%	27%	37%	5%	11%
West	10%	16%	115%	23%	11%	6%
Greater London	16%	18%	28%	12%	7%	10%

Source: LTS model



The total number of trips originating in North London is expected to increase by approximately 12% by 2031. This represents over 200,000 additional trips between 7am and 7pm and is a reflection of the expected increase in population and employment over the same time period. Movement from the North region to the East region represents the greatest percentage increase in inter regional trips, although in actual terms the increase is similar to that into the Central Region from the North Region. Internal trips within North London are forecast to increase at a similar level to trips to the Central and North regions, an increase of nearly 100,000 trips a year.

The number of trips originating in Greater London in both the morning and evening peaks is forecast to mirror the overall increase and grow at a similar rate. For example morning peak trips are expected to increase by around 16%, and evening peak trips by around 17%, additions of over 800,000 and one million trips respectively. As with total trips, the East region will again experience the greatest increase during the peak periods, with the lowest increase coming in the south region. The greatest individual percentage increases will be between the East and West regions, whilst trips wholly within the East region represent the largest absolute increase in trips in both peak periods.

Figure A 30: Percentage change in total am peak trips to 2031 from each region

Percentage change in total am peak trips to 2031 from each region						
	Total Trips	To Central	To East	To North	To South	To West
Central	18%	13%	42%	13%	16%	19%
East	30%	37%	26%	28%	26%	98%
North	14%	15%	42%	7%	33%	33%
South	8%	10%	32%	31%	4%	8%
West	10%	14%	116%	12%	12%	5%
Greater London	16%	14%	29%	9%	7%	8%

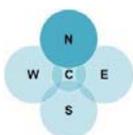
Source: LTS model

Figure A 31: Percentage change in total pm peak trips to 2031 from each region

Percentage change in total pm peak trips to 2031 from each region						
	Total Trips	To Central	To East	To North	To South	To West
Central	17%	19%	29%	15%	10%	17%
East	28%	41%	25%	39%	29%	139%
North	10%	12%	28%	7%	30%	16%
South	8%	17%	22%	32%	5%	14%
West	10%	20%	99%	28%	10%	6%
Greater London	17%	21%	28%	14%	9%	11%

Source: LTS model

The number of trips in the am peak originating in north London is expected to increase by approximately 14% by 2031, whilst trips in the pm peak are only expected to increase by around 10%. This represents approximately 80,000 additional trips in the am peak and just under 50,000 addition trips in the pm peak. The greatest percentage increase in inter regional trips is to the East and then South regions in the am peak and the South and then East regions in the pm peak, however in both cases the absolute increase is significantly greater heading to the East region than the South region. As in all regions, the greatest absolute increase in trips is internal to the region.



B. Population and employment

Figure B 1: North London Population and Employment Growth 2006-31

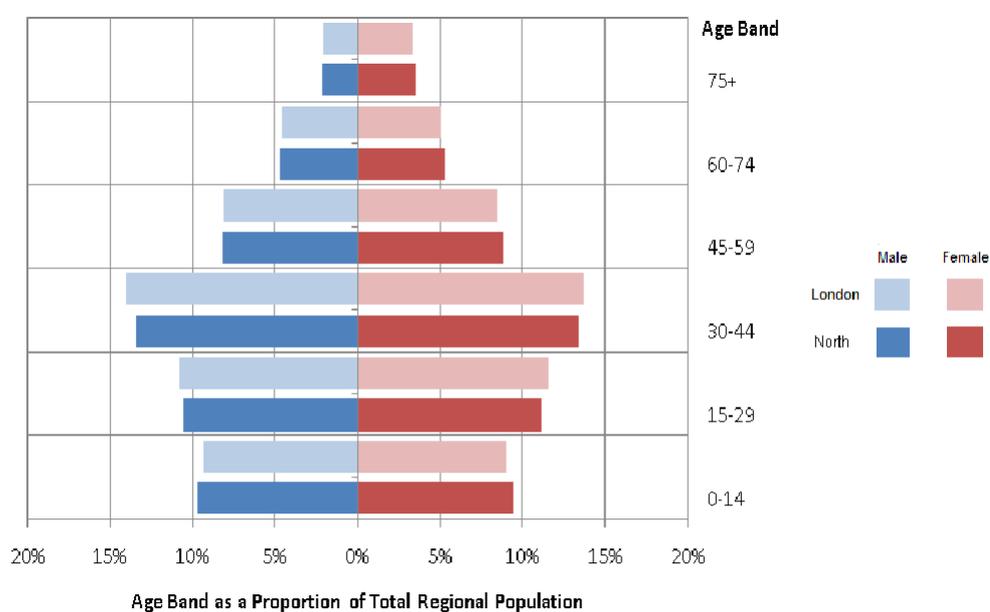
	Population			Employment		
	2006	2031	% growth	2006	2031	% growth
Barnet	324,000	421,000	29.9%	134,000	149,000	11.2%
Enfield	288,000	302,000	4.9%	111,000	121,000	9.0%
Haringey	230,000	264,000	14.8%	82,000	98,000	19.5%
Waltham Forest	223,000	250,000	12.1%	73,000	73,000	0.0%
North London sub-region total	1,065,000	1,237,000	16.2%	400,000	441,000	10.3%
North London as proportion of London's total	14.1%	13.9%	-0.2%	8.6%	8.1%	-0.5%
Camden	203,000	223,000	9.9%	283,000	362,000	27.9%
Islington	189,000	243,000	28.6%	182,000	243,000	33.5%
Hackney	218,000	269,000	23.4%	90,000	111,000	23.3%
Wider North London sub-region total	1,675,000	1,972,000	17.7%	955,000	1,157,000	21.2%
Wider North London as proportion of London's total	22.3%	22.2%	-0.1%	20.6%	21.2%	0.6%
All London	7,526,800	8,886,100	18.1%	4,632,000	5,452,000	17.7%

Source: GLA London Plan Forecasts (2009)

Age profile

The figures below show the age profile for the boroughs in the core North London sub-region, with the highest proportion in the 30-44 age range, and a comparison of the North London profile with the London profile and that of the other sub-regions.

Figure B 2: North London sub-region age profile, 2006



Source: GLA Data Management and Analysis Group (November 2006)

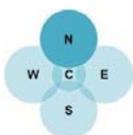
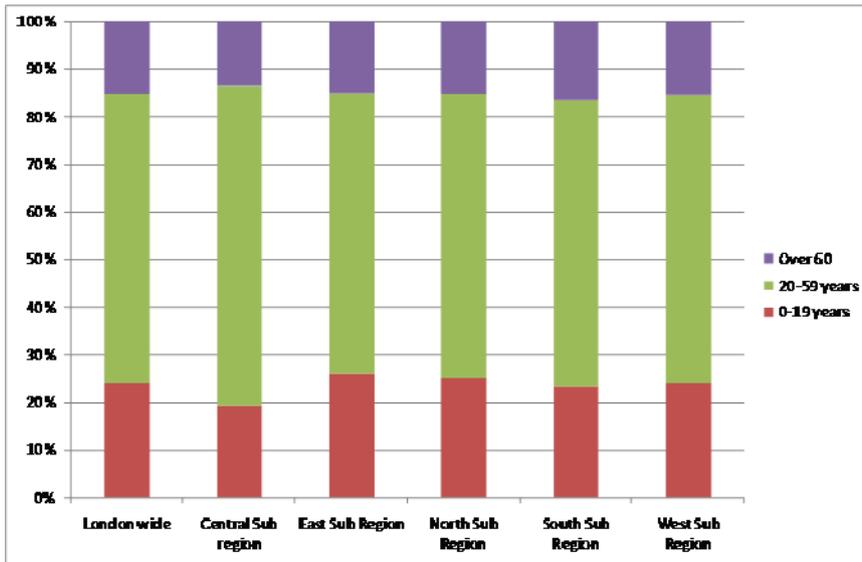


Figure B 3: Comparison of age groupings across the sub-regions, 2006



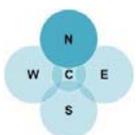
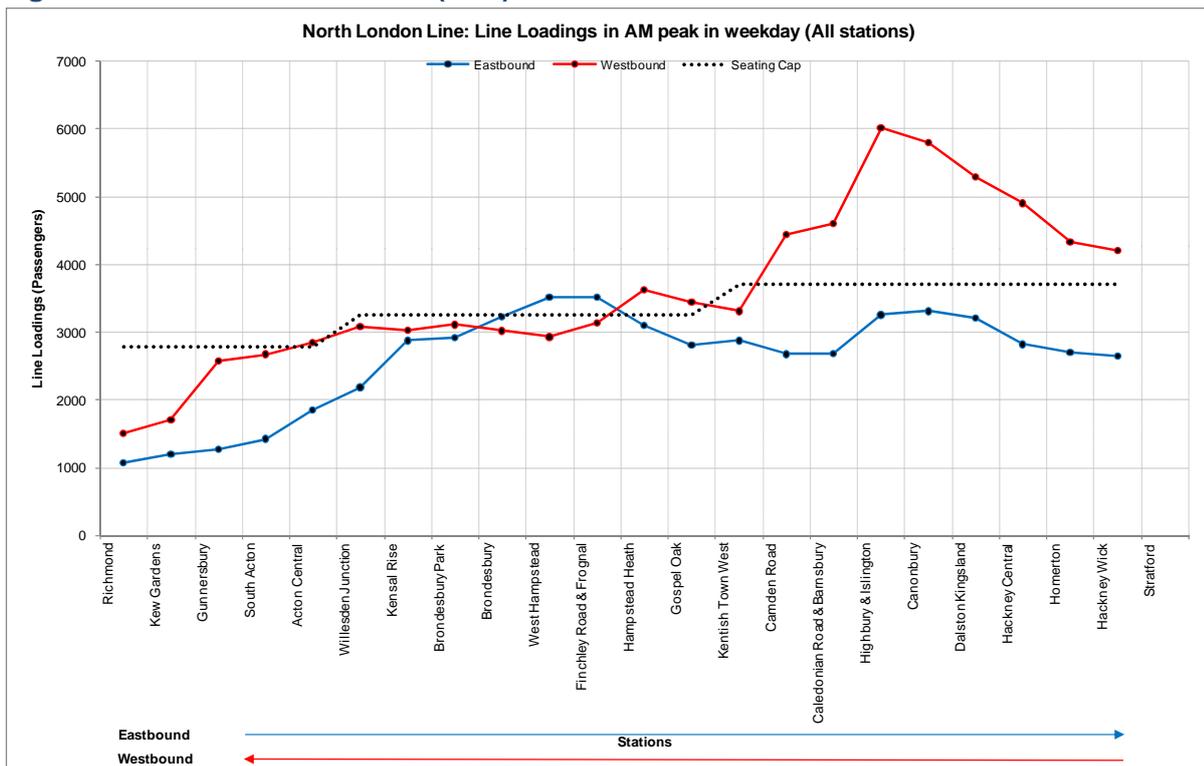
Source: GLA Data Management and Analysis Group (November 2006)

C. Further analysis of public transport crowding

North sub-region London Overground Line Loadings and Interpretation

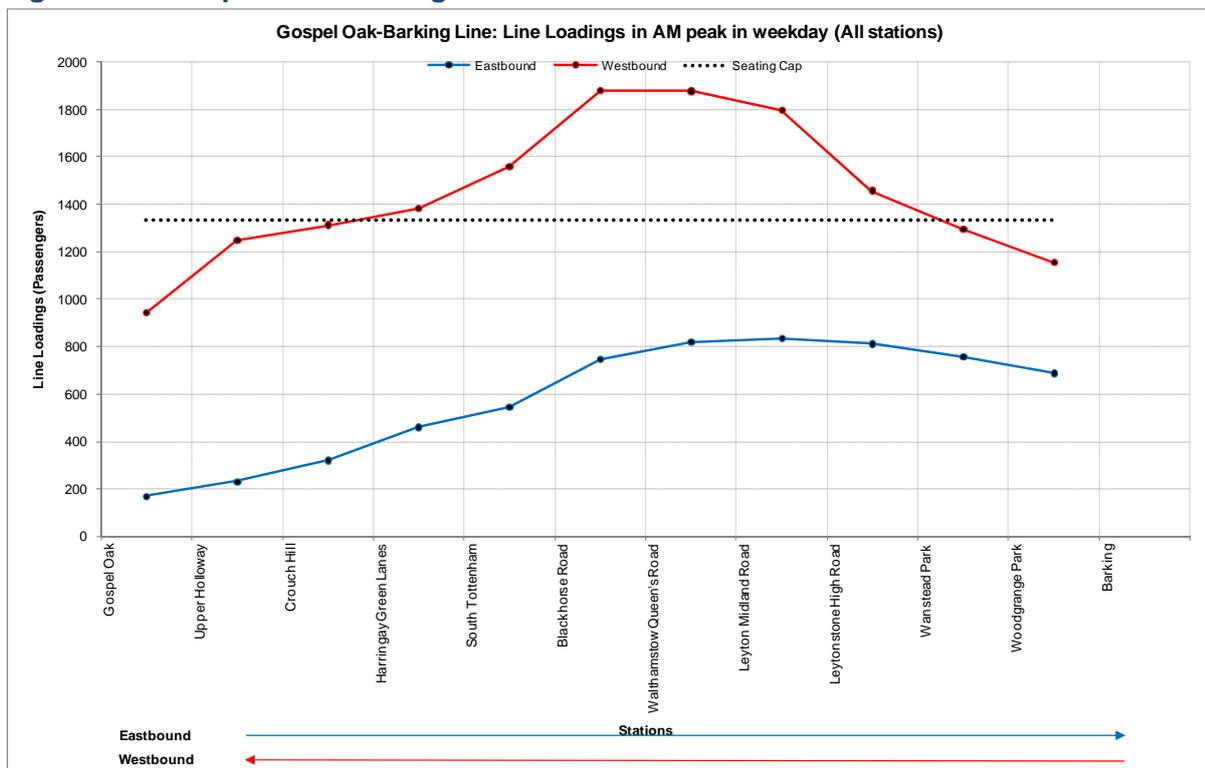
In November 2007 the North and West London Lines were integrated into the London Underground network, rebranded as London Overground, with TfL assuming responsibility for operation from Department of Transport. Operating under a new TfL London Rail Concession, London Overground services will also run on the East London Railway when it opens in 2010, following TfL's £1bn extension of the existing East London Line. The continuity provided by integration under the TfL banner aims to deliver a safe, secure metro-style service that forms an important orbit rail link for London.

Figure C 1: North London Line (NLL)



The North London Line (NLL) provides a significant and continuous orbital connection between Richmond in the south and Stratford in the east and runs roughly along the perimeter of London Underground Zone 2. The graph above describes the flow of passengers in the AM peak (7am-10am). In the eastbound direction the NLL enters the North sub-region from the west just before West Hampstead where the highest flow of passengers is seen on the route, and the only point where seating capacity is exceeded. Trains leaving from Stratford in the westbound direction are twice as full as those arriving and can be observed to exceed seating capacity, increasing steadily until its peak at the North's sub-regionally important interchange Highbury & Islington, where the level of crowding begins to fall, dropping below seating capacity by the time Kentish Town West is reached. This level of crowding is then maintained throughout the rest of the NLL in the North sub-region.

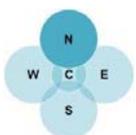
Figure C 2: Gospel Oak-Barking Line



The Gospel Oak-Barking Line originates at the Gospel Oak terminus in the North sub-region and terminates at Barking in the East sub-region. Again, the graph above describes the flow of passengers in the AM peak (7am-10am). In the eastbound direction, seating capacity is never exceeded as the number of passengers increases slowly along the route, peaking between Leyton and Leytonstone. The line is more heavily used in the westbound direction, as seating capacity is exceeded between Wanstead Park and Haringay Green Lanes. In both directions it is this section of the line, on the boundary of the North and East sub-regions, which is the most used and crowded. As with the North London Line, this is probably due to the lack of London Underground infrastructure in this area of London.

NB: It should be borne in mind that these plots show demand and capacity over the 3 hour AM peak (07:00 – 10:00), whereas the Railplan crowding plots in MTS show peak hour only (i.e. 3 hour peak multiplied by 0.54). RAILPLAN plots to describe crowding. Line loadings to show usage.

Source: TfL London Rail – Spring 2009 Manual Passenger Count data



North sub-region London Underground Line Loadings

Figure C 3: Northern Line (City & High Barnet Branches)

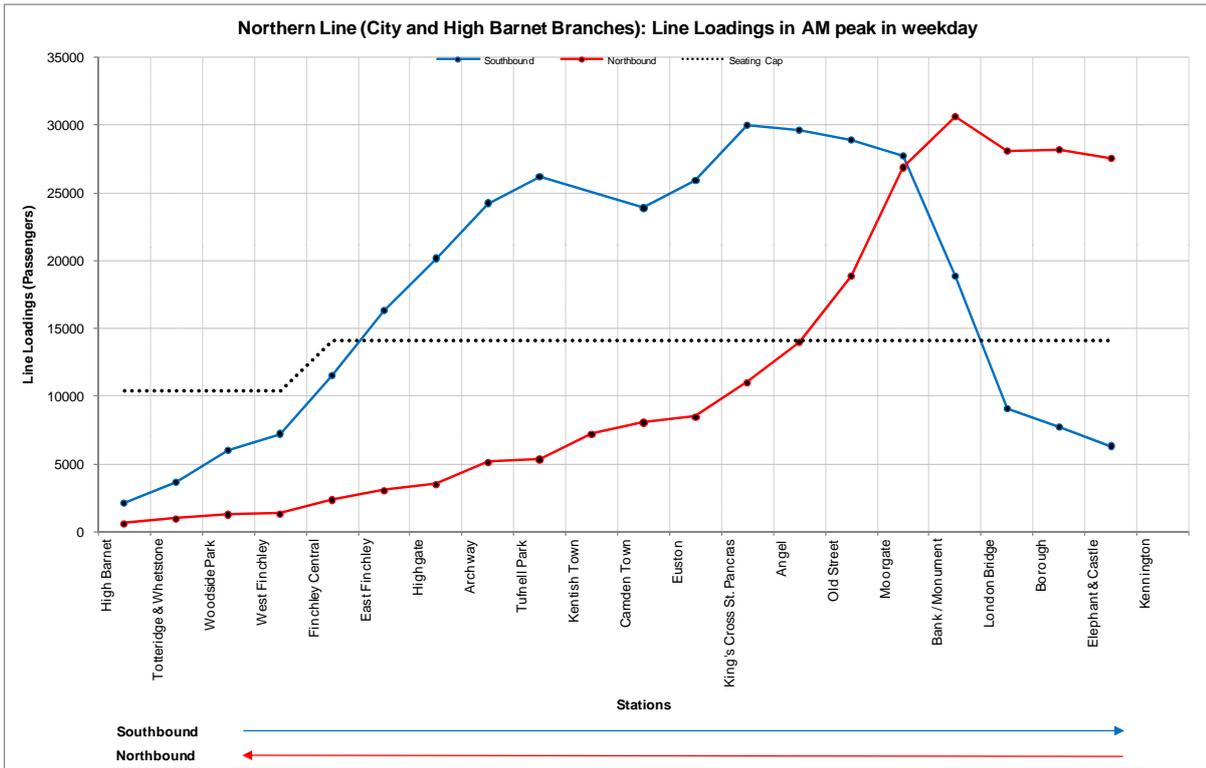


Figure C 4: Northern Line (Charing Cross & Edgware Branches)

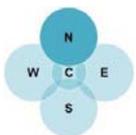
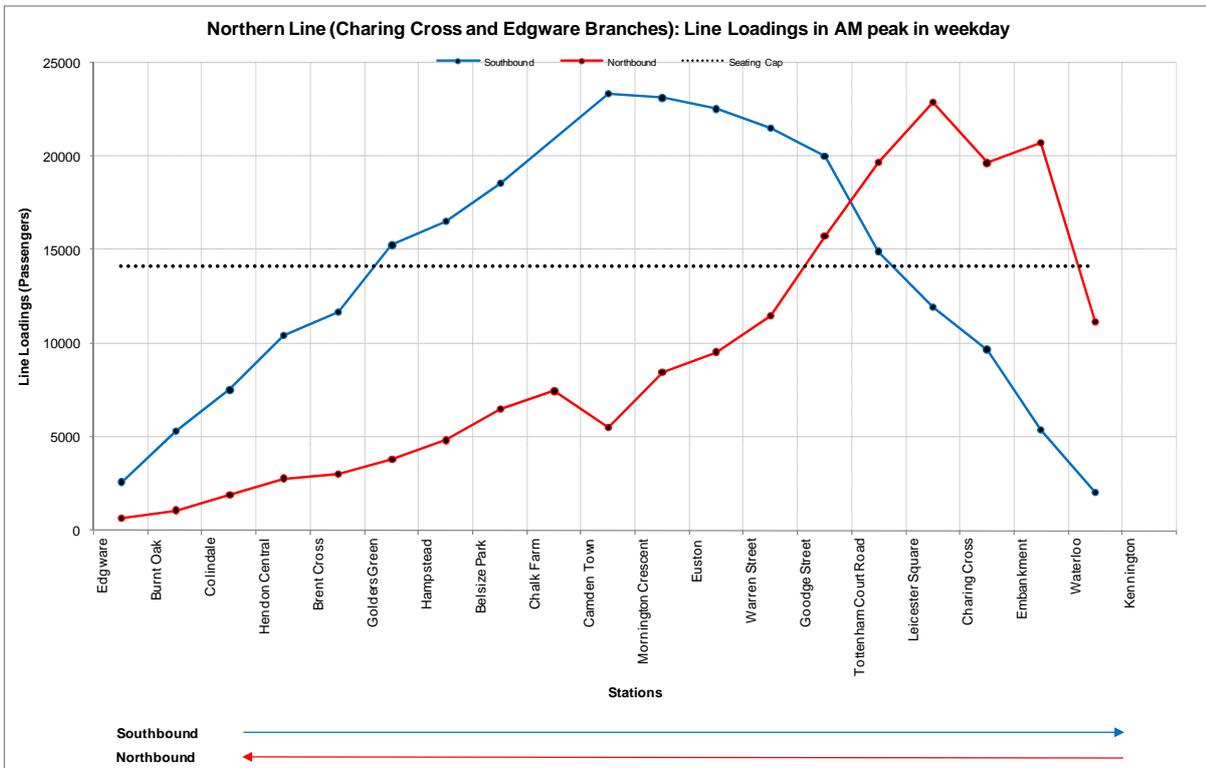


Figure C 5: Piccadilly Line – (Heathrow Branch)

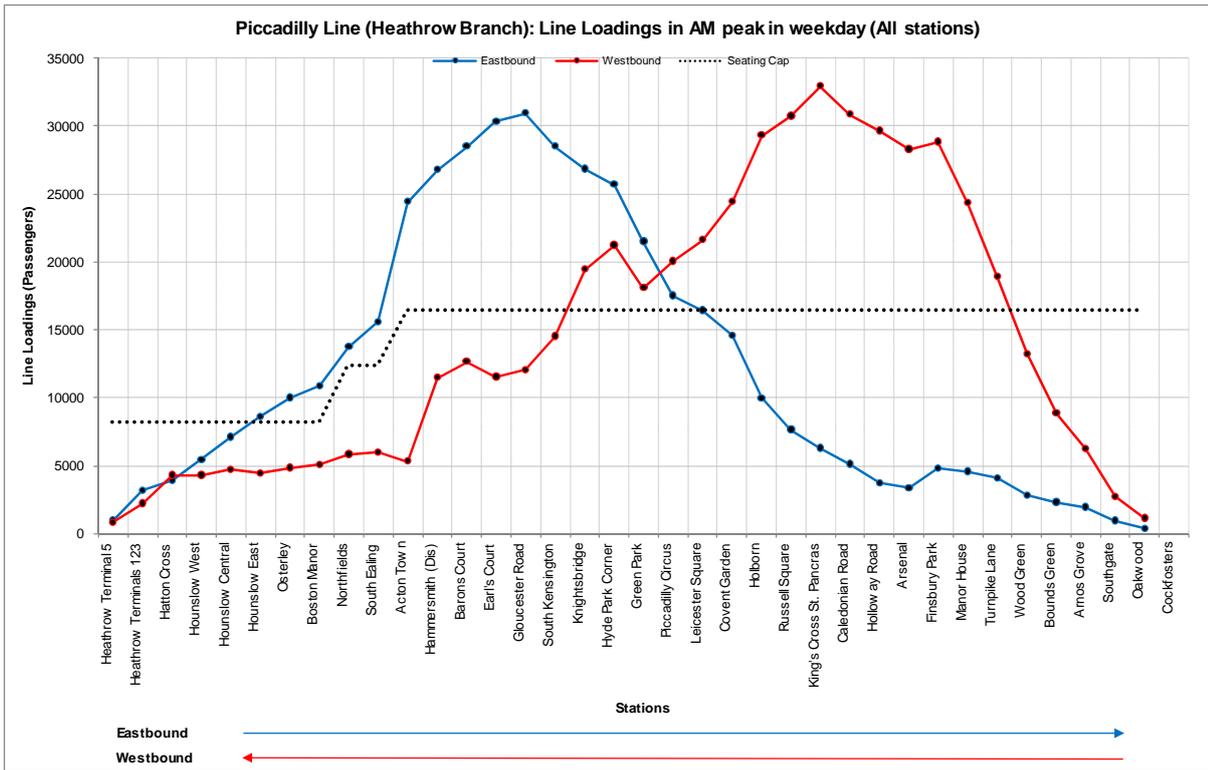


Figure C 6: Piccadilly Line – (Uxbridge Branch)

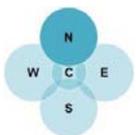
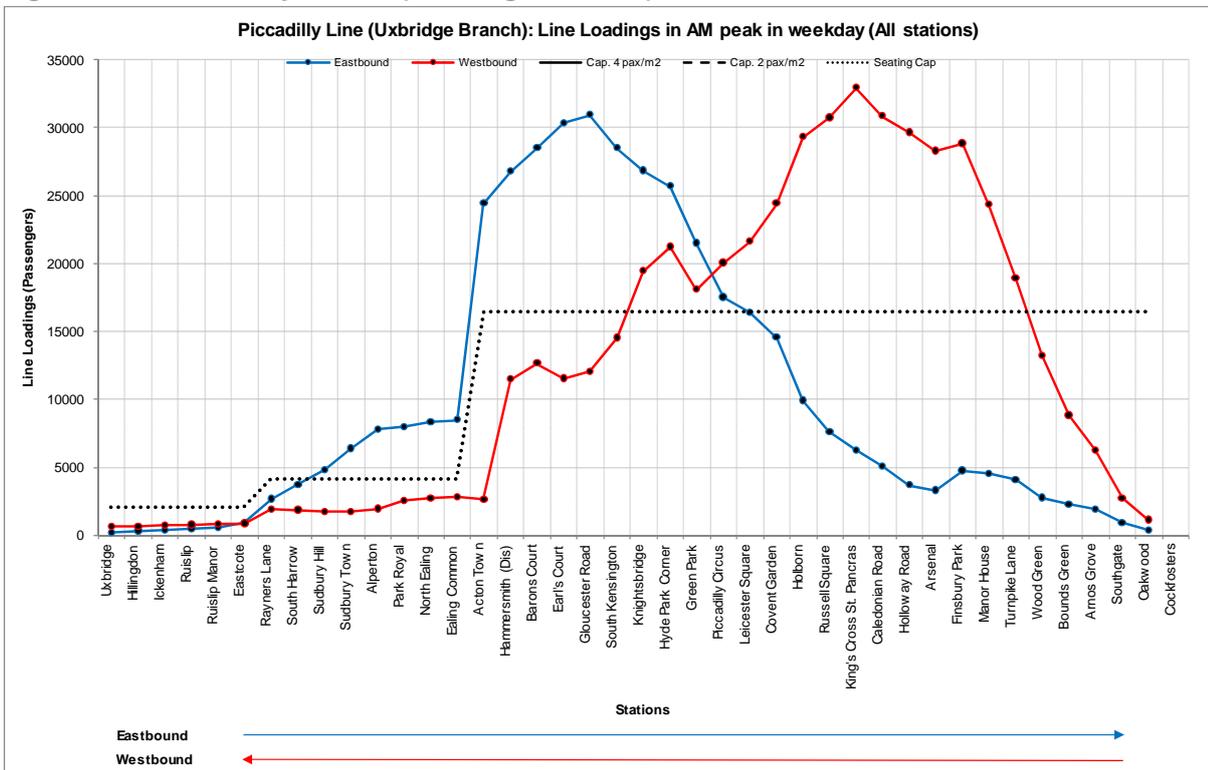


Figure C 7: Victoria Line

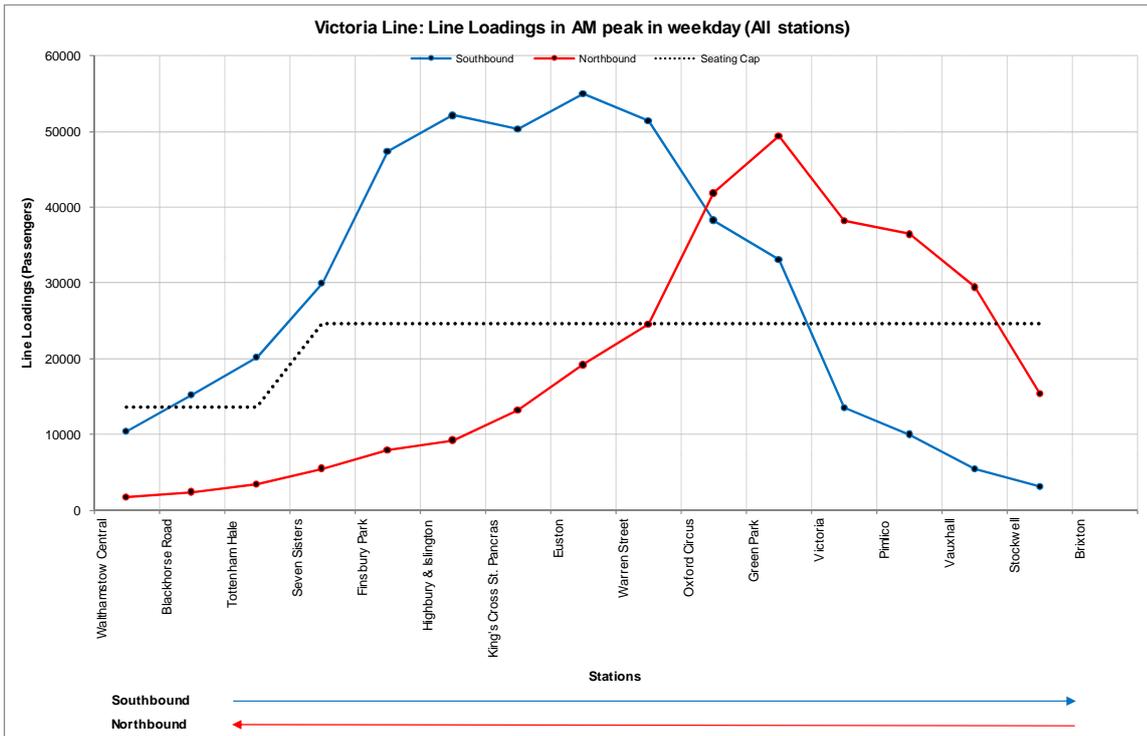
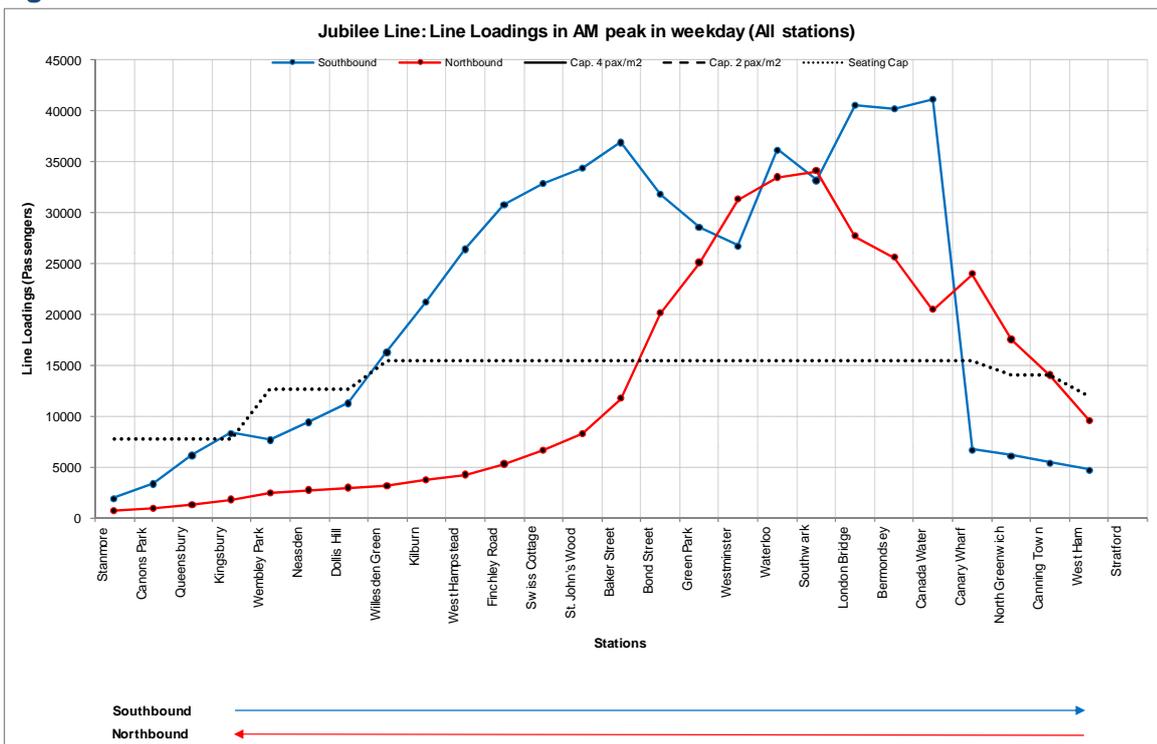


Figure C 8: Jubilee Line



Source: London Underground Rail Origin and Destination Survey 2008

NB: It should be borne in mind that these plots show demand and capacity over the 3 hour AM peak (07:00 – 10:00), whereas the Railplan crowding plots in MTS show peak hour only (i.e. 3 hour peak multiplied by 0.54). RAILPLAN plots to describe crowding. Line loadings to show usage.

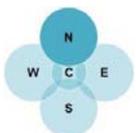
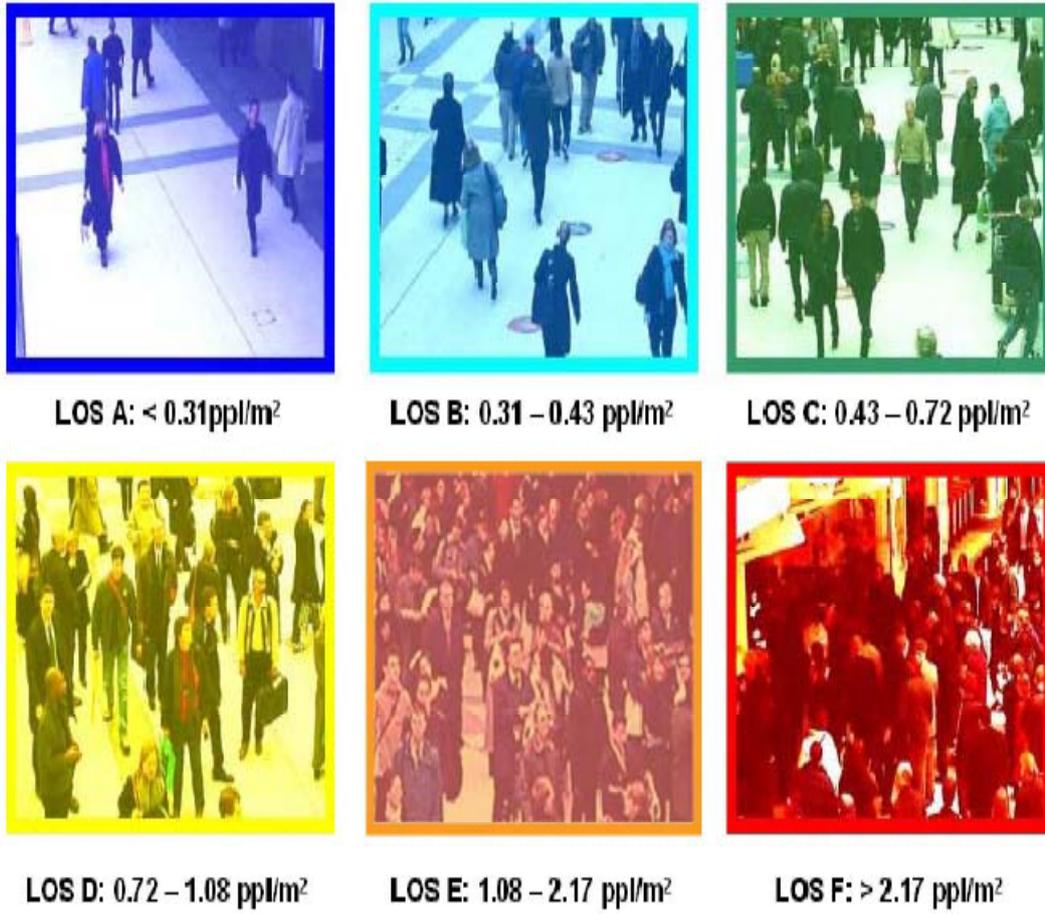


Figure C 9: Station Crowding Levels



Source: London Underground

D. Average Bus Speeds in North London

The following data indicates the trend in bus speeds for each borough between 2005 and 2008 along route segments, aggregated into sub regions. The data was originally created as part of the LIPs process to provide an indicator of speed variations. The graphs show the number of bus route segments surveyed which show increasing, decreasing and stable speeds between 2005 and 2008 during the AM peak, inter-peak and PM peak. A threshold of ± 0.5 kph was chosen to define faster, slower and stable average speeds. It should be noted that this data provides a snapshot of surveyed route segments rather than an overall picture. It is collected on a borough-by-borough basis and does not include route segments which travel along or cross the TLRN.

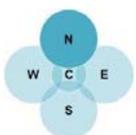


Figure D 1: North London Bus Speeds by Period

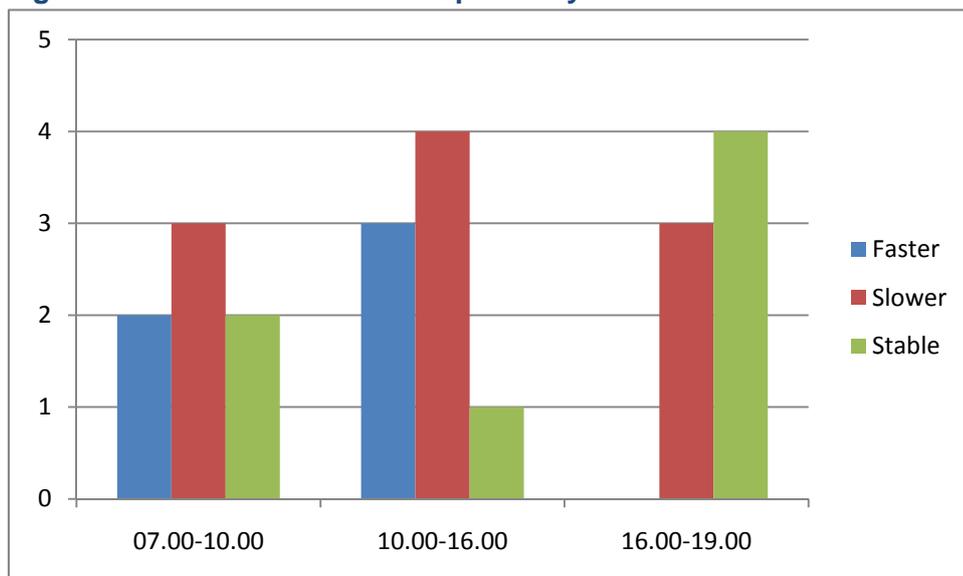


Figure D 2: North London Bus Speeds by Borough

Borough	AM Peak Route Segments			Inter-Peak Route Segments			PM Peak Route Segments		
	Faster	Slower	Stable	Faster	Slower	Stable	Faster	Slower	Stable
2005-2008 Change									
Barnet	2	1	0	1	2	1	0	1	2
Enfield	0	1	0	0	1	0	0	0	1
Haringey	0	0	1	1	0	0	0	1	0
Waltham Forest	0	1	1	1	1	0	0	1	1

The trend for bus speeds in the North sub-region is mixed. In the AM peak and inter-peak, a similar number of buses have seen increasing and decreasing average speeds, however in the PM peak the trend has generally been decreasing speeds. It should be noted that these trends are based on a sample of only seven bus routes. Speeds within boroughs vary; speeds along route segments in Barnet for example range from 14kph to 19kph.

Source: TfL Surface Strategy Development