



Sub-regional transport plan

North

MAYOR OF LONDON

Transport for London



CONTENTS

Mayoral foreword	3
London Councils foreword	3
Executive summary	4
Chapter 1: Introduction	9
Chapter 2: Supporting economic development and population growth	28
Chapter 3: Enhancing the quality of life for all Londoners	61
Chapter 4: Improving the safety and security of all Londoners	80
Chapter 5: Improving transport opportunities for all Londoners	86
Chapter 6: Reducing transport's contribution to climate change & improving its resilience	94
Chapter 7: Supporting delivery of London 2012 Olympic and Paralympic Games and its legacy	99
Chapter 8: Key places in north sub-region	100
Chapter 9: Delivery of the Plan and sustainability assessment	109
Chapter 10: Next steps	112
Appendices	
Appendix 1: Implementation Plan	114
Appendix 2: List of figures	124



MAYORAL FOREWORD

Following my election in 2008, I set out my desire for TfL to “listen and learn from the boroughs... help them achieve their objectives and... negotiate solutions that will benefit the whole of London”. I therefore asked TfL to embark on a new collaborative way of working with the boroughs, based on sub-regions.

As well as better collaboration, the sub-regional programme has led to an improved analytical capability, which has enabled travel patterns to be better understood and provided for. This collaboration and analysis helped inform my Transport Strategy (MTS), which set out my broad policies and proposals for London. The MTS also set out a commitment to develop the five sub-regional transport plans that would provide more detail about the priorities for each region, which in turn would help better inform the development of Local Implementation Plans.

I am pleased to see the fruition of that joint, collective work. And despite the fact that we are entering into a period of financial constraint, which will impact on our ability to do more in the short term, I am pleased that the sub-regional plans are forging ahead in making the case for more investment in London. The Capital is a vast and disparate city, and I recognise that one size does not fit all, and that there are different priorities that need to be addressed in each sub-region. I also appreciate that these plans are ‘live’ and provide a working framework for TfL, the boroughs and other key stakeholders to amend and fine tune the proposals to ensure the transport system can support London to be the best big city on earth.



Boris Johnson, Mayor of London

LONDON COUNCILS FOREWORD

Boroughs play a key role in delivering the transport that London needs and deserves. However, there are many transport issues that cross borough boundaries and this is where the Sub-regional Transport Plans (SRTPs) are particularly important. The SRTPs fill the gap between the strategic policies and proposals in the Mayor’s Transport Strategy (MTS) and the local initiatives in boroughs’ Local Implementation Plans (LIPs).

We have very much welcomed the Greater London Authority and TfL’s willingness to engage with London Councils and the boroughs on the development of the SRTPs over the last couple of years. The process has allowed boroughs and other stakeholders to agree on the key challenges for each sub-region and the most cost-effective potential solutions and policy options.

Whilst there are some common themes, the specific transport issues faced by each sub-region do vary just as factors such as the existing levels of transport provision and the anticipated growth in population and employment vary across London. Developing the SRTPs has allowed such variations to be taken into account and provided a range of analysis and information on potential solutions which will be useful for the future development of LIPs as well as TfL’s own plans.

The current financial situation is incredibly challenging. Another important function of the SRTPs, particularly in the face of cuts to transport funding, is that we now have agreement on the types of initiatives that will need to be delivered in each sub-region if London’s transport system is to meet the needs of all those who live, work and visit here. This means that we can adopt a co-ordinated approach to delivery and to securing funding for longer-term priorities.

London Councils and the boroughs will continue to work with TfL and the Mayor to develop the most effective package for each part of London and to deliver a more efficient, reliable and attractive transport experience for all Londoners.



**Cllr Catherine West,
Chair, London Councils’
Transport and
Environment Committee**

EXECUTIVE SUMMARY

1. INTRODUCTION

This north sub-regional transport plan (SRTP) addresses the goals and challenges set out in the Mayor's Transport Strategy (MTS) and how they will be met in the sub-region. It identifies planned investment in the shorter and medium term and potential priorities for longer term investment required to deliver transport challenges in the future.

In February 2010, an Interim Report on Challenges and Opportunities was published providing detailed analysis of the transport challenges facing the sub-region. This Plan has been informed by the analysis.

The north London boroughs covered by this Plan are Barnet, Enfield, Haringey, Waltham Forest, Hackney, Camden and Islington. Camden and Islington are in the central sub-region, Hackney is a core part of the east sub-region and the other four boroughs make up the core of the north sub-region. The links to Hertfordshire and Essex are also important and the sub-regional approach seeks to also work with areas outside London.

The Plan is a 'live' document and will need to be responsive to changing circumstances and issues. It forms the starting point for a sub-regional Panel for north London, with representation from TfL, the boroughs and sub-regional partnerships. The Panel will shape the future sub-regional work programme and ensure multi-modal consideration of issues in the sub-region, including capacity on the network, connectivity, emissions and safety.

Planned investment

North London will benefit from planned investment in the Underground to increase capacity and improve journey times on the Jubilee, Victoria, Northern, Piccadilly and Central lines. It will also benefit from enhancements to the London Overground network. Rail schemes benefiting north London include increased capacity on the West Anglia Main Line and Great Northern Line and the Thameslink programme. Other improvements benefiting north London include road and safety improvement schemes such as those at Henlys Corner, Bounds Green and Tottenham Hale gyratory, transport improvements at Brent Cross/Cricklewood and other key regeneration sites, bus provision and regular review of the bus network, Barclays Cycle Superhighways and initiatives to encourage cycling and walking.

LIP funding from TfL allocated to boroughs will be £142m for the year 2011-12, £137m for 2012-13 and £132m for 2013-14, after the Spending Review. The number of different funding streams have been streamlined over the past two years.

Despite the planned investment, more investment will still be needed to plan for the future of a growing city and meet the pressures of population growth and support economic development.

North London

One of the key challenges for north London over the next 20 years will be facilitating the forecast growth and economic development. The four core boroughs are currently home to over one million people and around 400,000 jobs and the sub-region's population and jobs are forecast to grow substantially.

Population growth in the north sub-region will be the second fastest in London (behind the east sub-region) at 16% between 2006 and 2031. This means an additional 172,000 people. Including Hackney, Camden and Islington increases this growth to 18% or an additional 300,000 people. Employment is forecast to grow by 20%, a little faster than the London-wide rate of 18% (employment growth reduces to 10% in the four core boroughs). Much of the growth in the core boroughs will be concentrated in the three opportunity areas, the Upper Lee Valley, Brent Cross/Cricklewood and Colindale/Burnt Oak, and around the metropolitan centre, Wood Green.

Of the trips made in north London, 47% are by car, 22% by public transport, 30% by walking and 1% by cycling. This is broadly consistent with the other outer London sub-regions. There are 1.7m trips on average per day. There are slightly more on Saturdays than on average weekdays and these come with a higher car mode share. The sub-region also has high levels of car ownership compared with the London-wide average. In order to achieve the significant mode shift to more sustainable modes set out in the MTS, in addition to investment in infrastructure there will need to be a focus on behavioural change away from car journeys to walking, cycling and public transport.

North sub-region transport challenges

The following challenges for the north sub-region were agreed through collaborative working between TfL and the north London boroughs.

- Challenge 1: Facilitating and responding to growth, particularly in Brent Cross/ Cricklewood and the Upper Lee Valley
- Challenge 2: Relieving crowding on the public transport network
- Challenge 3: Managing highway congestion and making more efficient use of the road network
- Challenge 4: Enhancing connectivity and the attractiveness of orbital public transport
- Challenge 5: Improving access to key locations and to jobs and services.

To meet the north sub-region's growth and transport challenges, the sub-region will need to make the most of development opportunities and planned investment and identify where future investment is required as well as measures to address congestion, rethinking of some journeys and a shift to more sustainable transport.

2. SUPPORTING ECONOMIC DEVELOPMENT AND POPULATION GROWTH

2.1 Supporting sustainable population and employment growth

The forecast population and employment growth in north London will further increase demand on the transport network. Increased capacity on the transport network will be vital to facilitate this growth. However, given financial, spatial and environmental constraints, it will also be necessary to balance capacity and demand for travel by ensuring future development does not simply bring commensurate growth in trips.

Measures that will address this challenge include the planned investment in the network and the future unfunded schemes which have been identified to address capacity on the public transport network and facilitate growth and regeneration. These include four-tracking of the West Anglia Main Line, the proposed Chelsea Hackney Line and additional suburban rail and Underground enhancements, including a new developer funded rail station at Brent Cross. Investment in interchanges and the urban realm around interchanges to encourage the use of public transport and regular review of the bus network to respond to changes in demand will also be important.

2.2 Improving transport connectivity

Good connectivity to town centres and opportunity areas is important for social and economic development. Generally the best public transport connectivity in the north sub-region is in the radial corridors towards central London. This is due to the highly concentrated flows and the lack of parking at the home and non-home end of the trip. Outside these corridors, public transport journeys tend to take longer than car journeys and road congestion impacts on journey time reliability.

There are a number of priorities that could help meet the challenge of connectivity in the north sub-region. These include improvements to interchange, improvements to bus infrastructure and bus priority, measures to reduce congestion and improve journey time reliability, Barclays Cycle Superhighways, key Walking Routes and Legible London, improved cycling infrastructure and urban realm improvements to encourage a shift from car journeys to walking and cycling and public transport. Other measures include four-tracking of the West Anglia Main Line to allow addition inner suburban stopping services, the potential reinstatement of the Hall Farm Curve, enhanced interchange at Hackney Downs and Hackney Central stations and connections to the proposed HS2 station at Old Oak Common.

2.3 Delivering an efficient and effective transport network for people and goods

Currently many parts of the transport network within the north sub-region experience public transport crowding and highway congestion which has a negative impact on the efficiency and effectiveness of the network. While planned investment will go some way to alleviating this, forecast growth will place increased pressure on the network.

Congested points on the road network in north London include Henlys Corner (A406/ A1), A406 Bounds Green, A10/ A1055 Bullsmoor Lane junction, A10/ Carterhatch Lane junction, A1010/ A1055 Mollison Avenue junction, the A503/ A112 junction and the A5 and A1 corridors in Barnet.

General measures to minimise disruption on the highway network and smooth traffic flow, including a roadworks permit scheme and investment in intelligent traffic control systems will help to reduce congestion and improve journey time reliability. Other measures include school and workplace travel planning, parking provision and charges, freight delivery and servicing plans for town centres, land-use development and the provision of enhanced public transport, including new and extended rail services. Specific road schemes in the north sub-region include Henlys Corner junction improvement, Bounds Green improvements and the removal of the Tottenham Hale gyratory.

Public transport reliability has improved following increased investment in infrastructure renewal and new vehicles on rail and, on buses, the rollout of quality incentive contracts supported by central London congestion charging and bus priority. The planned and future unfunded investment, including to increase capacity on rail and Underground and continued development of bus priority measures will ensure that assets do not deteriorate and that reliability is further improved.

Almost half of journeys originating in the north sub-region are by car and growth in the sub-region is expected to increase the total number of trips originating in the sub-region by 12% by 2031, or an additional 200,000 trips per day. Rethinking travel will therefore be vitally important to sustainably manage growth and deliver an efficient and effective transport network. Measures to rethink travel include promotion of car clubs, parking controls, low or car-free developments, smarter travel initiatives and pricing mechanisms, such as provided by the Congestion Charging scheme. Close integration of land-use planning with transport planning will also be vital and this has been taken forward by the joint development of the new Mayor's Transport Strategy with the draft replacement London Plan.

3 ENHANCING THE QUALITY OF LIFE FOR ALL LONDONERS

3.1 Improving journey experience

Crowding and delays on public transport and poor journey time reliability on the road network lead to a poorer journey experience and reduced customer satisfaction. The planned investment in Underground and rail will improve reliability, resilience and comfort. Measures to improve interchange and reduce station crowding, improved service levels and improved journey information will improve journey experience for rail and Underground users. Measures to improve journey experience for road users include maximising the efficient and reliable operation of the road network by smoothing traffic flow and bus priority.

3.2 Enhancing the built and natural environment

Improvements to the spaces through which people move and spend time can make a journey more pleasant and places more vibrant. In addition to improving the quality of spaces and increasing the economic vitality of places, improvements to the local environment can also increase road safety, improve perceptions of general safety in an area and encourage increased walking and cycling. The scale of improvements can range from a general tidy up and decluttering of streets through to rethinking traffic management and recreating the street. An urban realm case study has been undertaken for Wood Green identifying urban realm issues and potential solutions for a number of areas, including the northern gateway to Wood Green and links to Haringey Heartlands. This approach can be applied to key places of a similar type.

3.3 Improving air quality

Transport is a major cause of exposure to harmful air pollutants. Poor air quality can cause serious health problems and reduces quality of life. Its impacts are most severely felt by vulnerable people including children, older people and those with existing heart and lung conditions.

Air pollutant concentrations in the north sub-region are highest closer to central London and alongside main roads and motorways, in particular the M1, A1, A406, A10 and A5. Concentrations are also higher around the main centres where a mix of traffic, industrial and commerce and residential emissions contribute to elevated air pollutant levels. TfL has identified a number of air quality focus areas where exposure to pollutant levels is higher.

TfL's modelling indicates that the north sub-region will meet the EU targets for particulate matter (PM₁₀) in 2011 at all relevant locations. However, it is forecast there will be a number of locations that may not meet the targets for nitrogen dioxide in 2015, a problem also shared across London, with other major cities in the UK and across Europe.

The Mayor's draft Air Quality Strategy proposes a wide range of policies to reduce harmful emissions from various sectors, including road transport. Measures include the further promotion of work and school travel plans, initiatives to increase walking and cycling, smoothing traffic flow to reduce congestion, focusing on incentivising the adoption of the cleanest vehicles and new technologies such as electric cars and freight delivery and servicing plans.

Other measures may need to be considered to help reduce emissions locally and tackle poor air quality in focus areas. For example, the adjustment or removal of traffic lights, access restrictions, reducing idling when parked, parking management and charging, access controls/ clear zones, local low emission zones, roadside emissions testing, land-use planning, deployment of cleaner buses, effective policing of red route zones and modifications to the London LEZ.

3.4 Improving noise impacts of transport

Noise is a quality of life issue because it can significantly affect health and wellbeing through annoyance, anxiety, sleep deprivation and associated cardiovascular disease. Road noise mapping shows high noise levels along the M1 and M25 corridors in Barnet and Enfield and along the A406. High noise levels extend a significant distance from these roads. Measures to smooth traffic flow, enforcing speed limits and introducing quieter buses can also benefit noise levels.

3.5 Improving health impacts of transport and facilitating an increase in walking and cycling

In north London, walking accounts for 30% of trips. Other trips, often made by car, are of a distance and type that could potentially be walked. Significant clusters of these potentially walkable trips can be seen around the town centres, including Walthamstow and Wood Green (which already have a relatively high level of walking) and Enfield Town, Edgware and North Finchley. Measures to increase walking potential include addressing perceived barriers to walking, urban realm improvements, improved pedestrian crossings, Key Walking Routes and improved wayfinding information including Legible London.

On average, 27,000 trips are made each day in the north sub-region by bike (1% of all trips, which is around 40% less than the London-wide average). Although the cycling rate is lower in north London, the potential for cycling is the same as the London-wide average with around 34% of all mechanised trips being potentially cyclable, of which two-thirds are currently made by car. Areas in the sub-region with a high density of potentially cyclable trips include Wood Green, Enfield Town and Walthamstow. Measures to increase cycling include identifying potential markets for cycling and planning interventions, focusing intensive infrastructure solutions on areas with the highest potential and considering innovative measures to intensify cycling, such as Barclays Cycle Superhighways.

4 IMPROVING THE SAFETY AND SECURITY OF ALL LONDONERS

4.1 Reducing crime, fear of crime and antisocial behaviour

London's transport network is experiencing historically low levels of crime and all modes have experienced reductions in crime. Later in 2010, the TfL will publish 'The Right Direction', a strategy to reduce crime and antisocial behaviour on the public transport network and to increase the confidence in the safety and security of travelling in London.

4.2 Improving road safety

In the north sub-region, almost 40% of accidents where people are killed or seriously injured occur on 30mph A roads. While reductions in speed limits may not be appropriate for these roads, there is scope for targeted enforcement and public information campaigns to improve road user behaviour targeted at priority areas for road accidents. There can also be safety benefits from extending 20mph speed limits to residential roads. The rates for accidents where people are killed or seriously injured are three times higher on 30mph roads than 20mph roads. Other measures to improve road safety include road and junction improvement schemes, such as those proposed for the A406 Bounds Green; speed over distance cameras to enforce speed limits at locations with poor collision records; educating road users, including children, of the measures they can take to avoid injury; improving driver training for HGV drivers on the awareness of cyclists; and advanced stop lines for cyclists at junctions.

4.3 Improving public transport safety

The injury risk to passengers and staff on London's public transport network is already very low and there are no specific sub-regional issues.

5 IMPROVING TRANSPORT OPPORTUNITIES FOR ALL LONDONERS

5.1 Improving accessibility

Physical accessibility of the transport network is generally poorer in inner north London, which is mainly due to the physical nature of the rail network with more underground stations which are make the costs and feasibility of installing step-free access particularly challenging. While the bus fleet is accessible, not all bus stops currently provide easy boarding and alighting which can restrict access to the network for some people. The planned investment in rail and Underground will lead to marginal improvements in accessibility, although it is also assumed that unfunded congestion relief schemes and work on strategic interchanges will increase the number of step-free stations over the next 20 years. Examples could include Finsbury Park, Highbury and Islington, Hackney Downs/ Central, West Hampstead, Seven Sisters and Camden Town Underground stations. In addition, TfL is recommending to the Department for Transport that improvements are made at West Hampstead, Brondesbury, Hampstead Heath, Seven Sisters, Edmonton and Palmers Green rail stations. Development-led step-free access schemes are also planned at Cricklewood rail and Brent Cross Underground stations.

Measures to improve accessibility should focus on three key areas: station access; streets access; and vehicle access. Measures include integrating plans for physical accessibility into station redevelopments; integrating step-free plans with car parking facilities; standardising information and wayfinding across modes; decluttering streets; reducing speed limits; improving the integration of footpath and road; and improvements to bus stops that do not meet accessibility guidance.

5.2 Supporting regeneration and tackling deprivation

The north sub-region has significant areas of deprivation, in particular the Upper Lee Valley. The causes of deprivation are multifaceted; however, transport has a clear role to play. Improving the quality of public transport services and providing better quality walking and cycling routes and facilities in deprived areas provide residents with the opportunity to access jobs, opportunities and services.

While the sub-region generally has good access to public transport, there are a few areas of deprivation with relatively low access to public transport. However, the sub-region generally has very good access to schools and GP surgeries, in comparison with other sub-regions. Access to open spaces is relatively poorer with just under 80% of the population within 15 minutes travel of an open space. Around 90% of the population have access to 10,000 white collar jobs within 30 minutes travel time (which may reflect the good connectivity offered by the radial corridors into central London) although the proportion with access to blue collar jobs is lower at around 60%.

Measures to tackle potential barriers to using the public transport system in areas of deprivation including providing information to highlight opportunities provided by public transport; identifying local barriers to walking and cycling including attitudes and safety and security concerns; a focus on design to increase walking and cycling potential as well as safety and security; and providing information on lowest cost options for transport.

6 REDUCING TRANSPORT'S CONTRIBUTION TO CLIMATE CHANGE AND IMPROVING ITS RESILIENCE

6.1 Reducing CO₂ emissions

1.08 million tonnes of CO₂ are emitted in the north sub-region from ground-based transport in 2008. The majority came from cars (63%), with freight vehicles accounting for a quarter of CO₂ emissions. There are a number of measures already set out in this document that will also reduce CO₂ emissions. Measures include encouraging mode shift to more sustainable modes through rethinking travel, smarter travel initiatives, encouraging Car Clubs, encouraging a shift to walking and cycling and providing better information on the emissions of particular modes to encourage informed travel decision making. Other measures include encouraging a shift to cleaner vehicle technologies, such as electric vehicles. Measures to reduce emissions from freight include a focus on reducing distance travelled, adopting cleaner vehicle technology and freight and delivery servicing plans.

TfL analysis highlights that the greatest future potential in the sub-region for the uptake of electric vehicles in the short to medium term is in Barnet and the western parts of Enfield and Haringey. Electric vehicle charging infrastructure is being incorporated into Brent Cross/ Cricklewood and other major developments in Barnet.

The continued expansion of Car Clubs in the sub-region will also contribute to reduced CO₂ emissions. Barnet has the highest proportion of adults who could potentially become members of Car Clubs, at just over 20%, followed by Haringey, Enfield and Waltham Forest. Car Clubs are planned to be introduced in parts of Brent Cross/ Cricklewood and other major developments in Barnet.

6.2 Adapting to climate change

Ensuring the transport network is more resilient to the risk of flooding and other adverse weather conditions will be necessary for adapting to climate change.

7 SUPPORTING DELIVERY OF THE LONDON 2012 OLYMPIC AND PARALYMPIC GAMES AND ITS LEGACY

The north sub-region borders the Olympic Park and Waltham Forest and Hackney are two of the five host boroughs. The Olympics legacy provides a significant opportunity to address one of the largest clusters of deprivation in England and Wales that runs through the Upper and Lower Lee Valleys. In the north sub-region, transport initiatives that provide additional or improved connectivity to Stratford and the opportunities provided by massive regeneration there will help make the most of the Olympic legacy.

NEXT STEPS

The next phase of work will use the sub-regional Panels to help steer sub-regional engagement, articulate agreed priorities and scope further work to be taken forward within the sub-region. TfL has developed strategic models for each sub-region. The models are expected to be of use to boroughs as well as TfL and developers. TfL aim to make the models available for use by or on behalf of the boroughs subject to a user agreement that will help ensure the models are maintained for future use by the boroughs and others.

CHAPTER 1: INTRODUCTION

1.1: CONTEXT

This north sub-regional transport plan addresses the goals and challenges set out in the Mayor's Transport Strategy and how they will be met in the sub-region. It was developed through joint working between the boroughs, TfL and other stakeholders. This Plan identifies planned investment in the shorter and medium term and potential priorities for longer term investment required to meet transport challenges in the future.

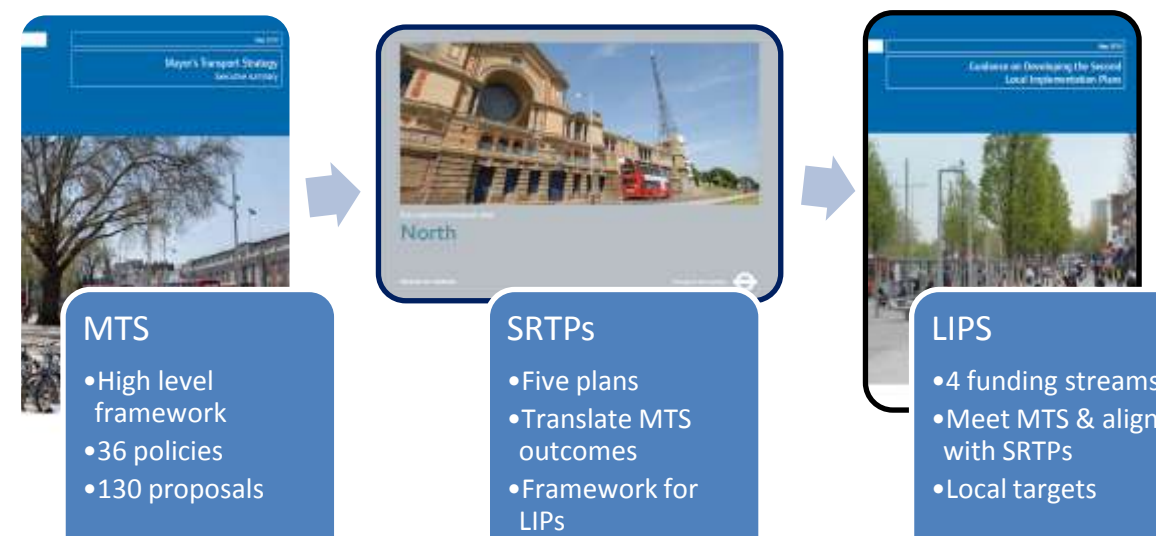
The MTS context

Between 2006 and 2031, London's population and employment are forecast to grow by 1.25 million and 750,000 respectively. The MTS addresses the transport needs of London for the next 20 years in light of this growth. It sets out the Mayor's vision for a transport system for London that 'leads the world in its approach to tackling urban transport challenges' and seeks to achieve the high level goals of:

- Supporting economic development and population growth
- Enhancing the quality of life for all Londoners
- Improving the safety and security of all Londoners
- Improving the transport opportunities for all Londoners
- Reducing transport's contribution to climate change and improving its resilience
- Supporting delivery of the London 2012 Olympic and Paralympic Games and its legacy

Meeting these goals requires close working, in particular between the London boroughs and TfL. The sub-regional approach provides a conduit for borough priorities, as identified through Local Implementation Plans, while providing the context for delivering the London-wide MTS.

Figure 1.1: Diagram showing relationship between London-wide, sub-regional and borough level documents



Wider context

This sub-regional transport plan is built upon the London Plan, MTS and Economic Development Strategy. It is also informed by other Mayoral strategies including the draft Air Quality Strategy, Climate Change Mitigation and Energy Strategy, Climate Change Adaptation Strategy, Waste Strategy and Health Inequalities Strategy.

The London Plan Examination in Public has now concluded and the inspector's report is expected by spring 2011. The final version of the plan will be published later in 2011. This will be followed by a series of Supplementary Planning Guidance documents which will be relevant for each sub-region.

Local Implementation Plans (LIPs)

The LIPs are an important mechanism for boroughs to plan and implement key local improvements. They also show how the sub-region's challenges and opportunities, as identified in this Plan and the Interim Report on Challenges and Opportunities, published in February 2010, will be addressed.

The LIP process, as set out in the recently published LIP guidance, has been simplified to provide boroughs with greater ownership of their own programmes and flexibility to reflect local circumstances. This new second round of LIPs becomes effective from April 2011.

LIP funding from TfL will be allocated to boroughs for Corridors, Neighbourhood and Supporting Measures; Maintenance Programmes; and Major Schemes. £146m will be allocated to support boroughs' investment for the year 2011-12, £142m for 2012-13 and £132m for 2013-14.

Boroughs are required to submit their draft second LIP to TfL by 20 December 2010. TfL will review boroughs' LIPs to ensure they meet the core requirements of the MTS and are aligned with the SRTPs.

Rationale for sub-regions and fuzzy boundaries

The MTS includes a commitment for TfL to work closely with boroughs and to make the strategy more relevant at a local level. To this end the Mayor included a policy (28) for the five sub-regional transport plans to be produced.

The boundaries of the sub-regions, as shown in figure 1.2, are intended to be flexible and ‘fuzzy’ as transport challenges do not stop at borough or sub-regional boundaries.

The north London boroughs covered by this plan are Barnet, Enfield, Haringey, Waltham Forest, Hackney, Camden and Islington. Camden and Islington are in the central sub-region, Hackney is a core part of the east sub-region and Barnet, Enfield, Haringey and Waltham Forest make up the core of the north sub-region.

Links beyond London

The links to the areas beyond London, including Hertfordshire and Essex, are also important and the challenges faced do not stop at administrative borders. Central London’s economy depends on access to the wider south east labour market, while local retail centres and employment catchment areas frequently span the boundary between outer London and the Home Counties. The sub-regional programme seeks to achieve better coordination across the GLA boundary, and to strengthen links with London’s neighbours.

Figure 1.2: The ‘fuzzy boundaries’ of the five sub-regions



1.2: Planned investment in London's transport network

1.2: PLANNED INVESTMENT IN TRANSPORT CAPACITY AND CONNECTIVITY IN LONDON

Over the past decade there has been a determination to reverse the previous underinvestment in London's transport network and provide London with the transport system it needs to prosper and grow. In order to achieve the Mayor's vision London will require a transport system that is efficient and integrated but also encourages a shift to more sustainable modes such as walking, cycling and public transport. The transport system should also contribute to improving quality of life and the environment and offer improved opportunities for Londoners. This section sets out the planned investment in London's transport network that will contribute to meeting the Mayor's vision at the sub-regional level.

There is a comprehensive package of planned investment across the network funded by TfL, Network Rail and others. The extent of the substantial planned funded and unfunded investment is shown in figure 1.3. The full list of schemes and priorities affecting the north sub-region is provided in the Implementation Plan at Appendix 1.

This section presents the major funded and unfunded schemes and measures planned across London, identifying those which have are relevant to the north sub-region.

Funding context

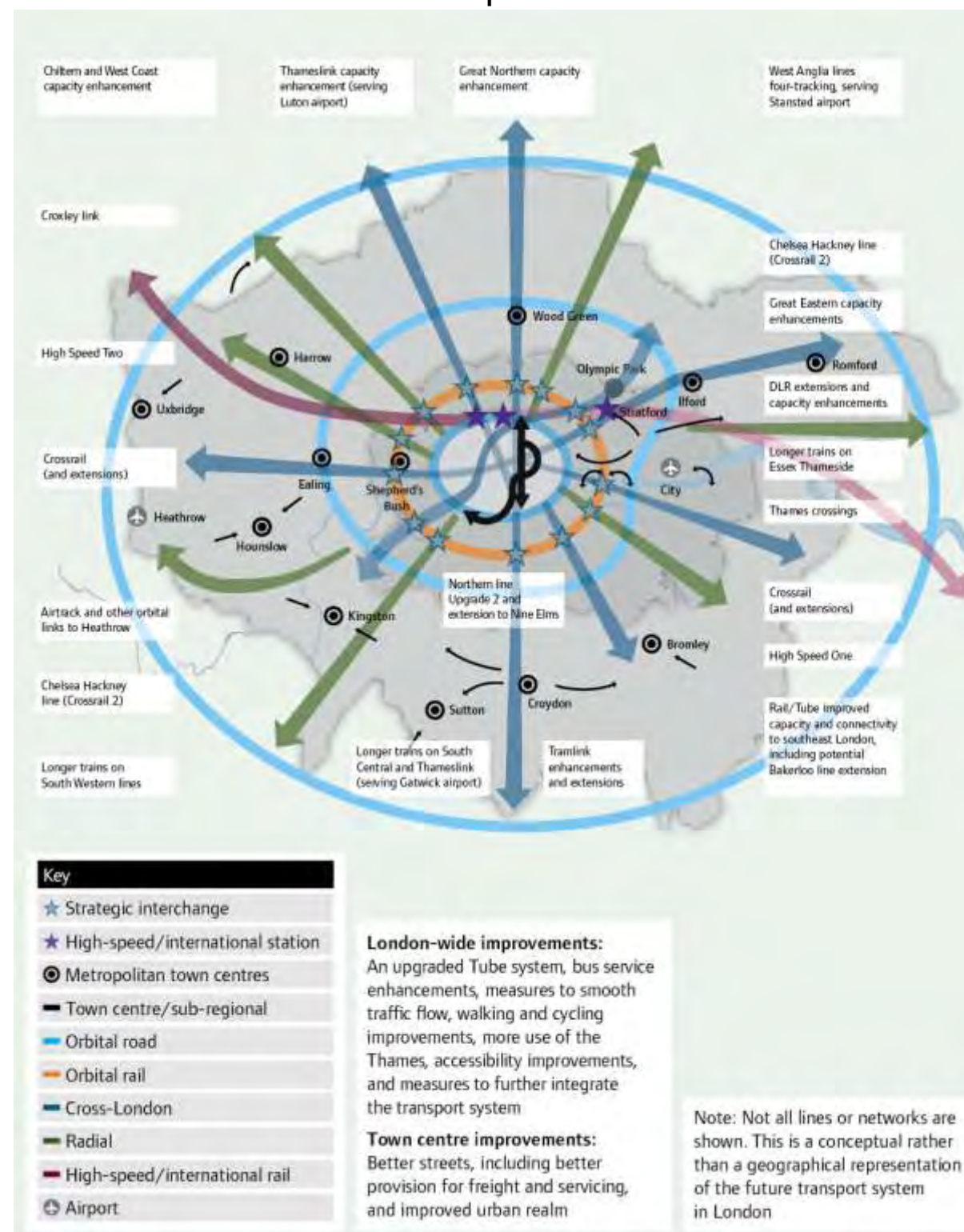
The Government's recent spending review and the Department for Transport's subsequent confirmation of funded schemes in London provide the funding and phasing context. Unfunded schemes will be taken forward when funding becomes available during the course of the plan period.

There is no new funding for this plan, but it informs the priorities for future spend and additional work is needed to investigate these priorities further.

Other funding sources

Whilst this plan will help to develop TfL's investment, there are a number of other funding sources such as section 106, direct funding from the Department for Transport and other third party funding. While the measures included in this plan are mostly sub-regional, some could also be funded by boroughs, for example urban realm or walking and cycling priorities.

Figure 1.3: Enhancements to London's transport infrastructure



1.2: Planned investment in London's transport network

National Rail enhancements

Performance has improved in recent years and patronage is at record levels. Investment in rail will deliver reduced crowding and support growth and regeneration. However, continued demand growth will require additional capacity.

West Anglia train lengthening

Increasing more inner services to 8 cars will reduce crowding, especially into Seven Sisters, Tottenham Hale and Liverpool St and support growth and regeneration in Hackney, Haringey, Waltham Forest and Enfield.

Increasing services to 12 car capability on outer services will reduce crowding, especially into Tottenham Hale and Liverpool Street.



Great Northern Line

Increasing services to 12 car capability on Great Northern outer services (via Finsbury Park) will reduce crowding, especially into Finsbury Park and King's Cross.

Thameslink programme

The Thameslink programme will deliver 12 car trains and 24 trains per hour through central London on the Midlands Main Line. It will reduce crowding, especially along the East Midlands route into St Pancras and Blackfriars, and into Finsbury Park and King's Cross. It will support growth and regeneration in Barnet, particularly the Brent Cross/ Cricklewood opportunity area, and in Wood Green. It will also provide new journey opportunities and improved accessibility. As well as additional capacity, the Thameslink programme will deliver major connectivity, journey time, rolling stock, station and interchange benefits to London.

To maximise the wider benefits of the Thameslink upgrade, TfL will be working with Network Rail (responsible for delivering the project) and the London boroughs to ensure station improvements and urban realm improvements, including better walking and cycling facilities, will support the improvements to the train services that the Thameslink project already delivers

London Overground network enhancements

The London Overground network is the key orbital public transport route for north London providing links to opportunities related to development in Stratford and the Olympics and to west London. The extension of the East London line to Highbury and Islington will connect north London with south London stations to West Croydon, and eventually to Clapham Junction via south London. To maximise the opportunities provided by the Overground network, TfL will be looking to improve interchange.

The completion of the East London line extension, as well as increased frequencies and new trains on Overground services, will lead to reduced crowding and support growth and regeneration in the Thames Gateway and at newly connected stations, including Dalston. It will also provide new journey opportunities and improved accessibility.



1.2: Planned investment in London's transport network

Crossrail

Crossrail is due to open in 2018. Whilst not directly serving north London, Crossrail will greatly improve east-west access across London and it will increase capacity in central London that will benefit the whole of London. In this way, Crossrail will be extremely important to north London businesses and residents alike.



London Underground upgrades

The current programme of upgrades will result in 30% more capacity on the network through the introduction of new trains, signalling and track and enable the network to operate more trains in peak times. However, as population grows, crowding will continue to be a challenge on many parts of the network, including in north London, with the need for further upgrades and investment in the long-term.

Jubilee line upgrade

The Jubilee line has seen dramatic demand growth linked to the developments at Canary Wharf. The line suffers from crowding, particularly between Baker Street and Bond Street and between Waterloo and Canary Wharf. Demand is forecast to continue growing in the future.

The upgrade involves the installation of a new signalling system, which will allow trains to be driven automatically – meaning faster, more frequent services for customers. The Jubilee line upgrade will provide 33% more peak capacity, carrying around 5,000 additional passengers per hour. Journey times will be reduced by 22%.

Victoria line upgrade

The Victoria line is one of the most crowded Underground lines and demand is forecast to grow in the future. The Victoria line upgrade will replace the rolling stock with new trains with improved features including wider doors and gangways for better accessibility and passenger flows. The new trains will be compliant with rail vehicle accessibility regulations and stations will be upgraded to provide level access to the new trains.



The upgrade will allow peak frequencies to increase from 27 to 33 trains per hour. This is enabled by the larger fleet size, faster trains and a new signalling and control centre. To date, 14 new trains are running and the rollout of the rest of the fleet of 47 will progress through 2010 and 2011.

Northern line upgrade

The Northern line is the busiest line on the network with one in six Tube journeys using it. The line is due to be upgraded, with a new signalling and control system by 2014 (subject to review). By providing a faster and more frequent service these improvements will reduce journey times by around 21%, and increase peak capacity 20%. More information on upgrades 1 and 2 is provided in the spotlight in Section 2.1.

Piccadilly line upgrade

The Piccadilly line suffers from severe crowding, particularly from Finsbury Park into central London and demand is forecast to grow in the future. The upgrade will replace the rolling stock, signalling and control systems. It will increase the reliability of assets and will allow the frequency of services to be increased. The new trains will also have a higher capacity and be compliant with rail vehicle accessibility regulations, along with improved customer information and safety features. The upgrade will increase peak capacity of the line by approximately 24% and reduce journey times by around 19%.

Central line upgrade

The Central line was upgraded in the 1990s, with new rolling stock and an automatic train operations signalling system. Crossrail is forecast to relieve crowding pressure on the Central line as it runs in a similar, east-west alignment. In the longer run demand growth will lead to increased pressure on the Central line. This demand growth, coupled with the need to replace assets as they near the end of their reliable life, will be driving forces for the future upgrade of the Central line.

1.2: Planned investment in London's transport network

London Buses

The bus network in London has expanded significantly over the past ten years and has excellent coverage with more than 95% of Londoners within a five minute walk (400m) of a bus stop. At the same time reliability has been transformed with the introduction of quality incentive contracts supported by central London congestion charging scheme and bus priority. Services are kept under regular review. This, with continued priority for buses, will help the network cater for the impact on demand of forecast population and employment growth, particularly around the opportunity and intensification areas and town centres.



Walking and cycling

The north sub-region has three out of the Capital's seven strategic walking routes:

- London Loop
- Capital Ring
- Lee Valley Walk

Three Barclays Cycle Superhighways are set to be installed in the sub-region from 2015:

- CS1 from Tottenham to the City along the A10
- CS11 from West Hendon to Marble Arch along the A5
- CS12 from Muswell Hill/ Hornsey to the City via the A1 (from 2012)

Haringey is a Biking Borough. More detail on walking and cycling potential and measures to increase walking and cycling is provided in Section 3.5.2.

Major section 106 agreements

The development at Brent Cross/ Cricklewood has received planning consent. Transport improvements to support the development include an enhanced Templehoff bridge; bus priority; a new railway station on the Midlands Main Line at Brent Cross; a rail freight facility; waste transfer facility; a new bus station; step-free access at Brent Cross Underground station and forecourt works; new buses and bus routes; new pedestrian and cyclist facilities; and major improvements to the strategic transport network including the A41, A406 and A5.

Despite the planned investment, more investment will be needed

In the current economic and financial climate, with serious pressures on funding, there still remains a need to look ahead and plan for the future in a growing city. The pressures of population growth are set to continue and the economy must be supported to ensure ongoing economic success. Much of the current investment, for example on the Underground, is addressing previous under-investment; meanwhile, the growth pressures are continuing.

The challenges set out for north London in Section 1.5 highlight the importance of continuing action to address specific issues facing the sub-region.

SUB-REGIONAL PLANNING PANELS AND CONTACTS

SUB-REGIONAL PLANNING PANELS

This sub-regional transport plan has been developed in collaboration with the boroughs and stakeholders in the north sub-region. The key sub-regional dialogue at both Councillor and officer level has been with the north London boroughs. Officers from the North London Strategic Alliance have also been involved.

Following publication of the Plan, it will be important to continue this joint working.

TfL proposes that existing sub-regional groupings are used to continue this work, with representation from boroughs, sub-regional partnerships and TfL as a sub-regional Panel. This will allow for the inclusion of additional boroughs, stakeholders and other parts of TfL to discuss the issues as considered appropriate. The Panel will effectively steer sub-regional engagement, articulate agreed priorities and input to the scoping of areas of work to be taken forward. Specific working groups could be tasked with more detailed work on particular projects or issues, however TfL, the boroughs and other partners would retain their existing responsibilities. The panel could also be used as part of wider engagement on projects and service changes where a sub-regional discussion would have merit.

The Plan will form the basis for this work. As live documents they will need to be responsive to changing circumstances and issues.

How the Panel would take this work forward

Using the sub-regional transport plans as the starting point for the work programme, the Panel could:

- Facilitate continued discussion of the sub regional challenges identified in the SRTP and monitor progress on joint sub-regional priorities and projects
- Ensure multi modal consideration of issues (with consideration of benefits and disbenefits across the different modes/ MTS indicators)
- Consider how to deliver particular priorities set out in the MTS and SRTP in the sub-region (for example, improved journey time reliability; mode share, urban realm, safety, emissions) and the priorities related to particular contexts or schemes
- Bring together different relevant interests early in the process to understand aims and implications of options
- Help to integrate transport and land use planning at the strategic level, and
- Provide recommendations of further areas of work to support continued development of SRTPs, with terms of reference for each area of work agreed by the Panel.

The Panel could also add value by considering the long-term operation and development of the sub-region's strategic road corridors, reviewing sub-regional corridor performance at a strategic level and sharing intelligence on the day to day operation along with opportunities to better manage traffic. They could also discuss matters in relation to both the Transport for London Road Network and boroughs' road networks and their interactions.

The Panel could also play a place-shaping role.

Sub-regional contacts

Managing Director of Planning

Michèle Dix

North London Ambassador

Nigel Campbell

North sub-region Team Leader

Joseph Uzoka

If you have any comments on the north Plan, please direct them in the first instance to the Ambassador at NigelCampbell@tfl.gov.uk.

1.3: WORKING SUB-REGIONALLY – ANALYSIS AND MODELLING

Analysis

The sub-regional transport plans have been built on a considerable amount of underlying analysis and evidence. Much of the evidence base used in the production of this Plan was made available to boroughs in TfL's Interim Report on Challenges and Opportunities published in February 2010. Further analysis has been undertaken since then including using both existing travel behaviour and network data, new work such as the central London rail termini study and town centre surveys, as well as incorporating data or findings of studies undertaken in collaboration with boroughs and other stakeholders. Where appropriate the analysis either has been or will be made available to boroughs. TfL will work with the boroughs and other stakeholders to discuss any further areas of work needed and priorities for ongoing work. The sub-regional Panels will be an important mechanism for this.

Sub-regional models

An important aspect of the sub regional work has been the development of a multi-modal computerised transport model for each sub region which has been undertaken in parallel with the production of the plans. These sub regional models complement TfL's London-wide transport models and the more detailed operational models of smaller areas or junctions. The sub regional models represent flows and journey times on the highway and public transport networks as well as changes between modes (modal shift) that might result from, for example, a new transport scheme or significant development. The models can be used to examine the situation in the base year, currently taken as 2008, using data from the 'present day', as well as future years with a given set of assumptions about population and employment growth and planned transport improvements. The 'reference case' forecast is 2031 with the London Plan population and employment forecasts and transport interventions that are funded.

The models have been or are being thoroughly tested to ensure that they can replicate the impacts of major transport schemes that have actually happened on the network and used on a real study to demonstrate that, whilst the models have been designed to capture strategic transport movements, they can quickly and cheaply be adapted to model local effects as well, and provide the basis of local transport models. The North London Model is being used, for example, on the Upper Lea Valley Opportunity Area Planning Framework transport study.



The models represent a significant investment in transport planning in London and it is important that the models are used widely and subject only to the limitations of good practice. They are based on a vast amount of observed data ranging from counts to interviews. TfL is committed to maintaining the sub-regional models and would strongly prefer analysis to be carried out using them where possible, so that the lessons learnt can be captured and made available for later studies.

Therefore, where there are projects that the boroughs wish to pursue, where use of the models may be beneficial, TfL will cooperate in making the model available, subject to ensuring that lessons learnt and information gathered during studies are fed back into the model in a controlled way.

Boroughs who wish to use the models should ask the sub-regional team leader for access to the models and an approved list of suppliers who can develop and run the models. In addition, the models will be useful for developers, including those making significant planning applications, or other organisations who would pay a licence fee, which will enable TfL to maintain and update the models for future applications.

POPULATION AND EMPLOYMENT IN THE NORTH SUB-REGION



Past

North London's population peaked in the 1940s, with Barnet the most populous borough. Suburban development in Barnet was encouraged in the 1920s and 1930s by both the Edgware Tube extension and new arterial roads, particularly the North Circular Road.

Present

The four core boroughs of the north sub-region are currently home to over one million people (around 14% of London's population). Barnet is the most populous borough in the sub-region, followed by Enfield.

Barnet and Enfield also have the largest share of the sub-region's employment. The four core boroughs have over 400,000 jobs (8% of London's employment). Almost half of these jobs are in the services sector with smaller proportions in public administration, education and health, and distribution, hotels and restaurants.

North London also has one of the largest clusters of manufacturing and technology-led industrial estates in London, in the Upper Lee Valley. This is reflected in the higher proportion of manufacturing, transport and communications industries employment in Waltham Forest, Enfield and Haringey.

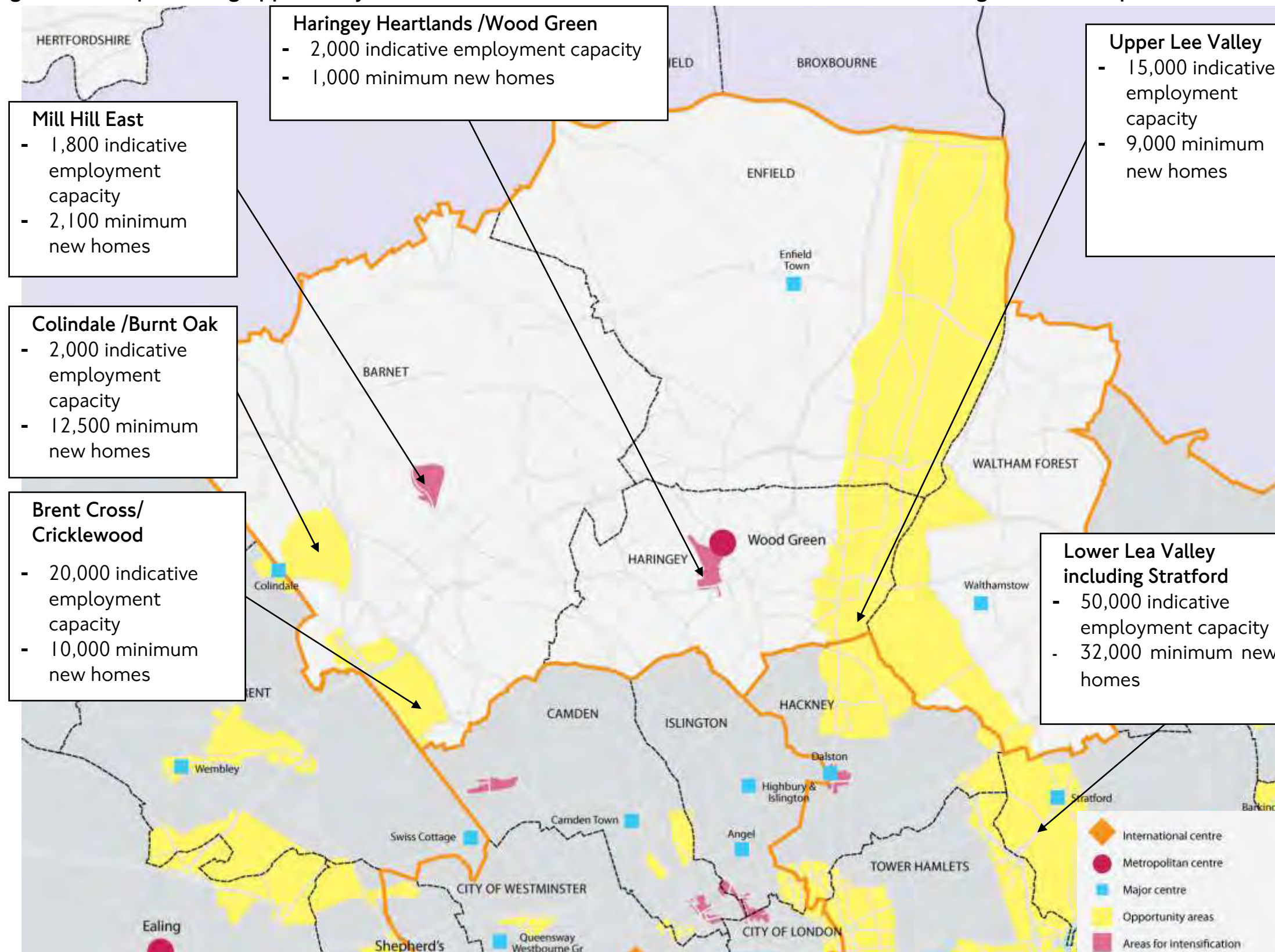


Future

North London's population is expected to grow substantially. Between 2006 and 2031, population growth in the sub-region will be the second fastest behind east the sub-region at 16%. This means an additional 172,000 people. Including Camden, Islington and Hackney increases this growth to 18% or an additional 300,000 people. Employment over this period is forecast to grow by 20%, a little faster than the London-wide average of 18%. Employment growth in the four core boroughs is 10%. The London Plan sets out the premise that much of the growth in the core boroughs will be concentrated in the three opportunity areas and around Wood Green metropolitan centre (including Haringey Heartlands) and Mill Hill East. This growth is shown on the map in figure 1.5 on the next page.

1.4: Overview of the north sub-region

Figure 1.5: Map showing opportunity areas and areas for intensification in north London, including indicative capacities for housing and employment



Note: Given the large size of the Upper Lee Valley opportunity area, rather than being spread evenly across the area, housing and/ or employment growth is forecast to be concentrated in a number of areas including Tottenham Hale, Central Leaside, Blackhorse lane, Brimsdown/ Freezywater, Ponders End and the A1010 Tottenham High Road.

Growth in the sub-region and the opportunity areas

The three opportunity areas in the north sub-region comprise just under 50km², or 25% of the capital's major reservoir of brownfield land with capacity for new housing, commercial or other development. If the opportunity areas were fully built, as set out in the London Plan, with sufficient transport measures in place this would be the equivalent of 70% of the projected population growth and 90% of the projected employment growth to 2031 in the sub region.

By 2031, based on current assumptions, it is forecast that approximately 20% of the additional trips in the north sub-region will originate in the opportunity areas. Therefore, assessment of each opportunity area is required to identify capacity, access and connectivity measures, as well as the urban realm improvements necessary to ensure the areas are sufficiently connected to the transport network. Where possible, measures should be designed into the development to ensure it has minimum impact on the surrounding areas. As far as possible the mode share of new trips should reflect high public transport, walking and cycling.

Working with the GLA, boroughs and other stakeholders, TfL has undertaken transport studies for some opportunity areas that influence proposed land use and identify a phased multi-modal MTS required to implement the planned development as part of the Opportunity Area Planning Frameworks. This provides a strategic assessment and a basis to assess transport requirements and for developer contributions to transport. Currently an exercise is in progress for Upper Lea Valley.

Key issues and opportunities

The three opportunity areas experience different transport issues related to their size and existing transport provision.

- Brent Cross/ Cricklewood experiences considerable severance from the major roads and rail lines bordering it and the Northern line experiences significant crowding. It has several funded investments related to the development, although precise funding and implementation are still to be confirmed. This includes bus priority, segregated cycle lanes and pedestrian enhancement measures and in later phases, a new rail station, rail freight facility and bigger bus station. Improvements are also planned to the Northern line, the strategic road network with improvements for bus priority and the pedestrian and cycling environment. The challenge will be to ensure that the necessary transport interventions keep ahead of demand generated by the development.
- The Upper Lee Valley experiences poor east-west connectivity with severance from the waterways, reservoirs and main line rail. It will benefit from investment in rail and the replacement of the Tottenham Hale gyratory. The Victoria line, serving Tottenham Hale, experiences significant crowding. Four-tracking of the Lee Valley Line would reduce crowding, allow for more local stopping services (necessary for growth at Central Leaside) and increase frequency of services between Tottenham Hale and Stratford. Upgrades to the Victoria line will help address crowding.
- Colindale/ Burnt Oak is well served by the Northern line but lacks sufficient cycling and rail provision. While there is little funded transport improvement planned to cater for population growth, the London Borough of Barnet has aspirational plans to improve interchange at Colindale station.

A summary of the opportunity areas and the areas for intensification, and the key potential issues and opportunities facing each is provided in Chapter 8.

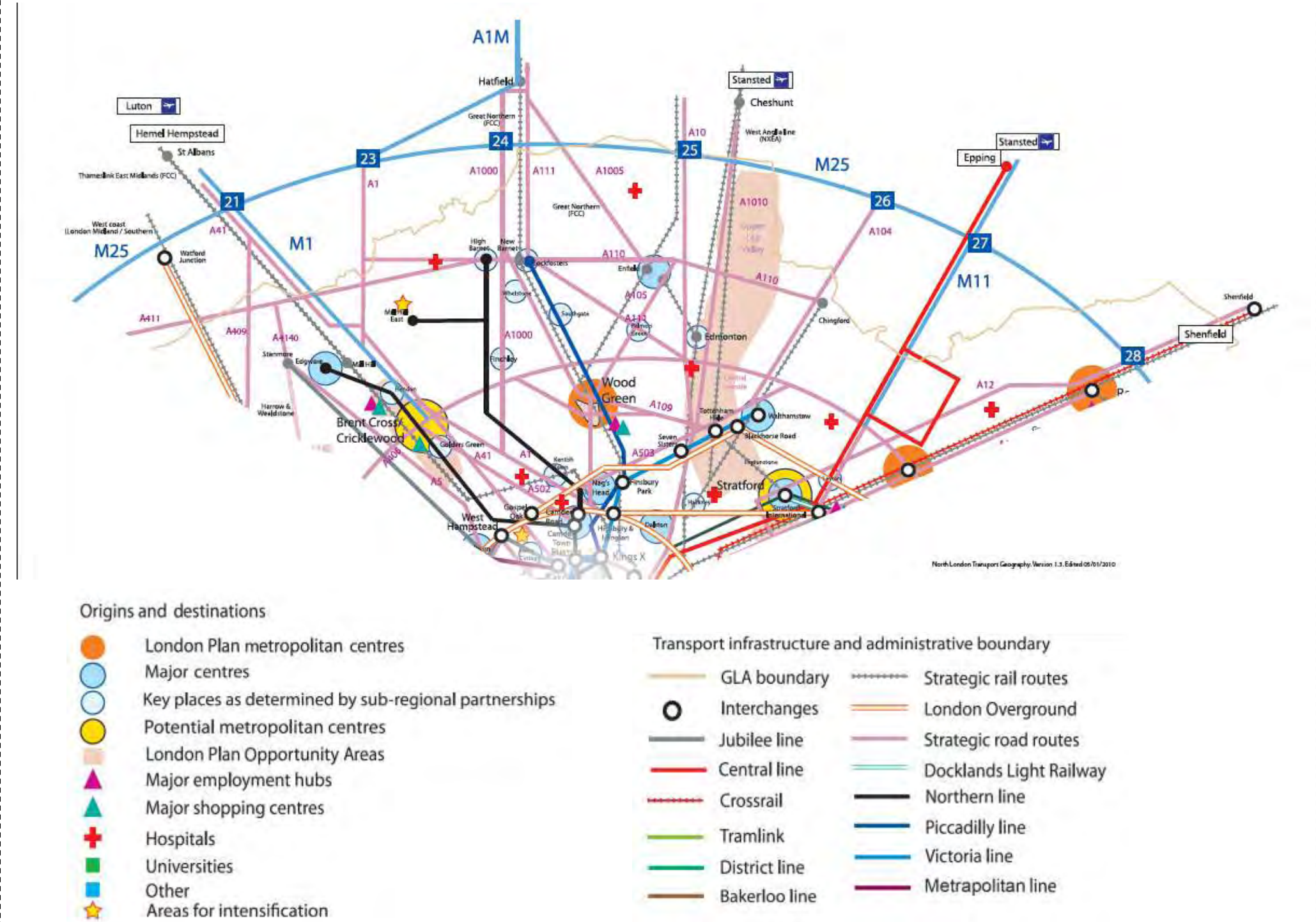
THE TRANSPORT NETWORK IN THE NORTH SUB-REGION

North London is well served in terms of the Underground. Over half the people in north London live within 1km of an Underground or National Rail station. The National Rail network serves 43 stations providing radial travel to central London, the northern Home Counties and Stansted airport. Since TfL took over the London Overground routes in 2007, the service has been transformed with new trains, higher frequencies and refurbished stations. The Underground network consists of 27 stations on the Jubilee, Victoria, Northern, Piccadilly and Central lines.

Towards central London and the town centres, reflecting the areas with higher development density, public transport provision and use is relatively high, while in other parts of outer London densities are lower and the car plays, and will continue to play, a significant role.

The road network is predominantly focused at meeting radial movement with key strategic routes 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.

Figure 1.6: North London transport geography



1.4: Overview of the north sub-region

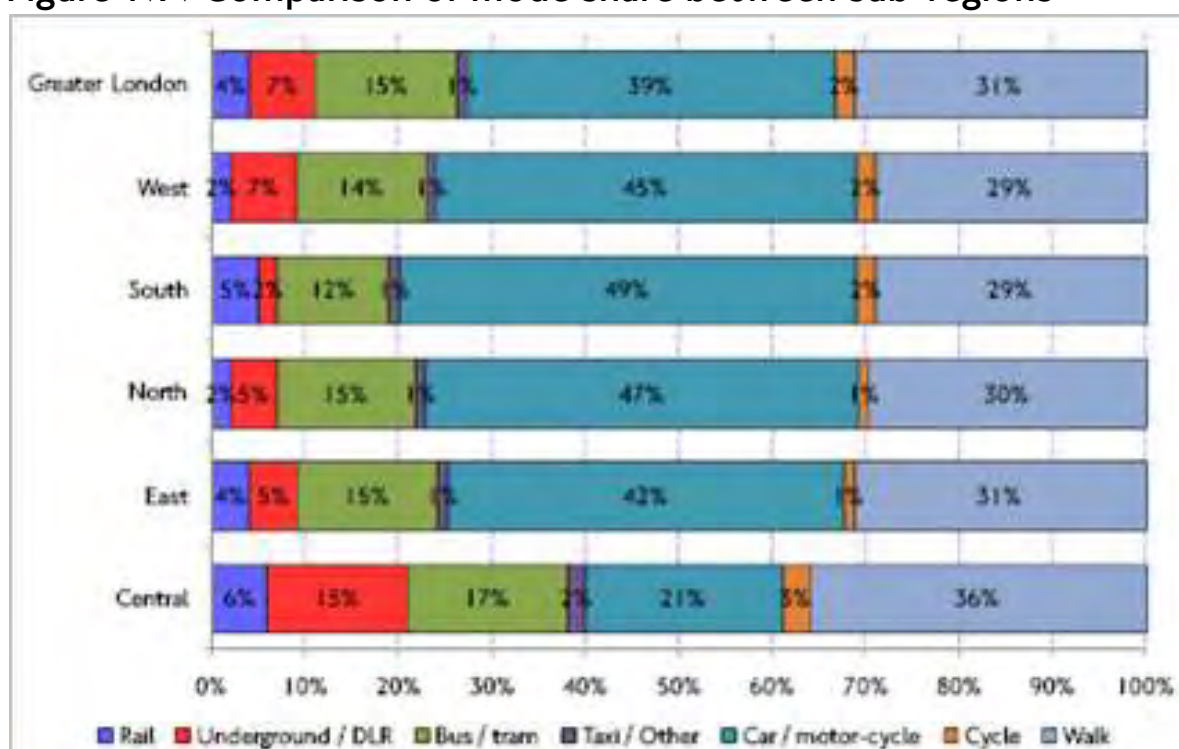
MODE SHARE CHALLENGE FOR NORTH LONDON

North London context

The core north sub-region's population of 1.1m is forecast to grow by 16% to 2031 and jobs are forecast to grow by 10% from 400,000 (London Plan forecasts).

As can be seen in figure 1.7, mode share in the north sub-region is broadly consistent with the other outer London sub-regions with slightly higher bus and car mode share and slightly lower rail and cycle mode shares. The table below shows mode share for trips by London residents originating in each sub-region.

Figure 1.7: Comparison of mode share between sub-regions



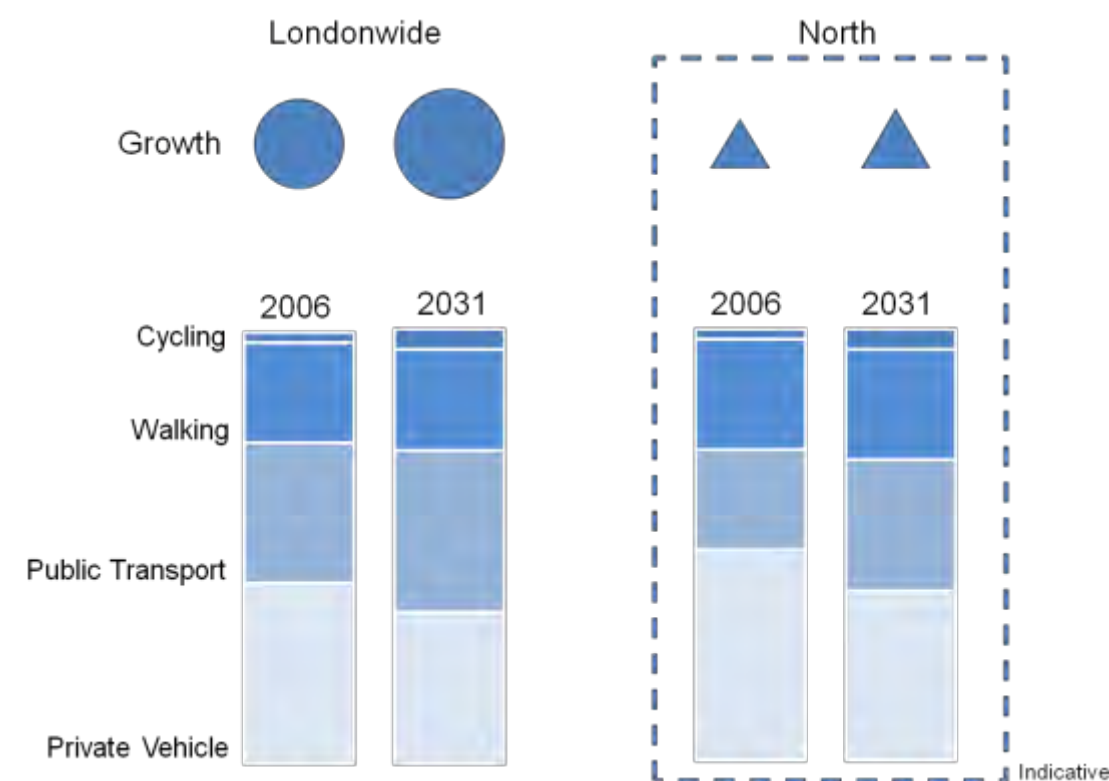
Source: London Travel Demand Survey 2006/07-2008/09

Note: 600,000 trips have been excluded due to missing data or because they do not have an origin in Greater London.

There are slightly more trips in north London on Saturdays than on average weekdays, with higher car mode share. North London also has high levels of car ownership, compared with the London-wide average.

The majority of trips are entirely within the sub-region (60%) with a further 15% to central London and 8% outside of London. Trips originating in north London are forecast to increase by 12% by 2031 with the greatest increase in trips to the east sub-region.

Figure 1.8: Comparison of total trips and indicative mode-share change from 2006 to 2031



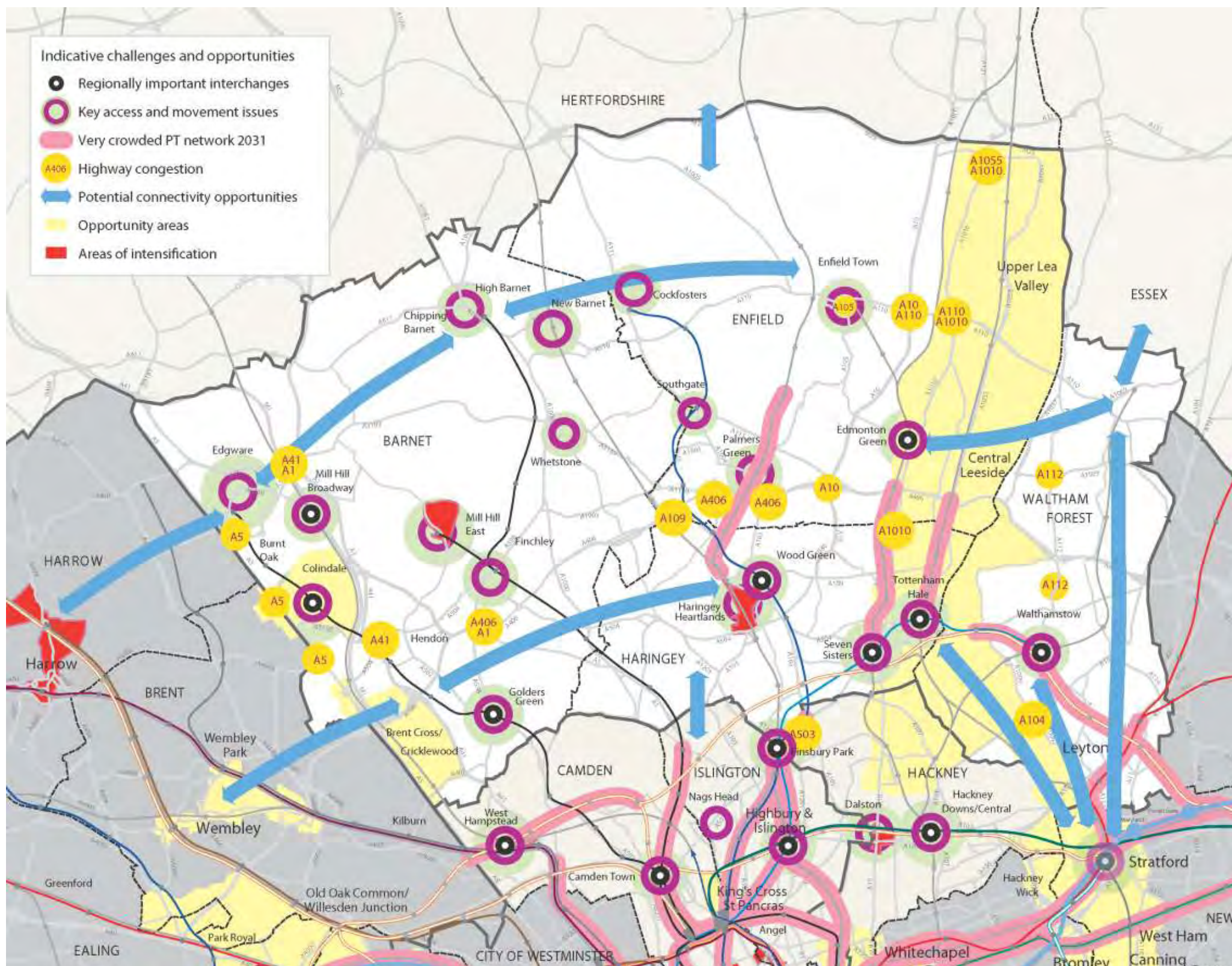
Looking forward, London will have more people and more jobs which will lead to an increase in trips, as shown in figure 1.8. The Transport Strategy sets out the expectation that there will be substantial further mode shift to public transport, walking and cycling. The mode shift figures have been determined using a mix of prediction and targets. This need for mode shift represents a significant challenge which covers all the sub-regions and which the Transport Strategy, London Plan and Economic Development Strategy are aimed at delivering. Boroughs should reflect the need to meet this challenge in their local strategies.

Although growth and development in the north sub-region provide a significant opportunity to encourage mode shift of new journeys, boroughs will need to take action to encourage mode shift amongst existing travellers. In order to achieve this shift to more sustainable modes there will need to be considerable behavioural change in addition to investment in infrastructure. Measures to encourage a shift away from car could include smarter travel initiatives and measures to turn walking and cycling potential into reality. Other measures still allow access to services without having to travel as far, for example through better use of IT and freight consolidation.

1.5: Challenges for north London


1.5: CHALLENGES FOR NORTH LONDON


Figure 1.9: Map showing challenges and opportunities in the north sub-region





The Challenges and Opportunities document published in February 2010 as an interim report during the production of this plan set out a number of transport challenges in the north sub-region, shown on the next few pages, as agreed through collaborative working between TfL and the north London boroughs.


The challenges for north London are:

- 

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

Challenge 2: Relieving crowding on the public transport network
- 

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

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

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

A summary of how the measures in this Plan would contribute to addressing the challenges is provided in Chapter 9.



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. Growth will be considerable and concentrated in a number of key areas, including the Brent Cross/ Cricklewood, Colindale/ Burnt Oak and Upper Lee Valley opportunity areas. Despite forecast growth, population and employment densities will change little between 2006 and 2031. While the forecast growth mostly lies adjacent to existing rail and Underground infrastructure, ensuring there is adequate transport capacity (road, rail and bus) to sustainably accommodate growth remains a significant challenge.

Colindale is forecast in the London Plan to have the highest number of new homes (up to 12,500) followed by Brent Cross (10,000) and the Upper Lee Valley (9,000). The highest number of new jobs is forecast for Brent Cross/ Cricklewood (20,000), the Upper Lee Valley (15,000) and around Wood Green (2,000).



Improving access to, from and within the opportunity areas will be key to accommodating future growth. In the Upper Lee Valley, the West Anglia Main Line provides fast services between London and Stansted but also acts as a form of severance, along with reservoirs and waterways. The high concentration of industrial land highlights importance of catering for growth of road and rail freight. Transport enhancements associated with the development in Brent Cross/ Cricklewood are necessary to support development.



Challenge 2: Relieving crowding on the public transport network

North London experiences significant crowding in the morning peak on National Rail and Underground lines and at stations and interchanges. Morning peak crowding is significant on Great Northern routes into Finsbury Park and central London, on the West Anglia Main Line into Tottenham Hale and Thameslink into West Hampstead. There is also severe crowding on London Overground on Gospel Oak-Barking and Richmond-Stratford lines from Willesden Junction to Gospel Oak and Barking to South Tottenham. Finsbury Park station experiences severe crowding. Despite funded interventions, crowding will worsen on a number of lines, including from Barking to South Tottenham and on inner London services from Finsbury Park.

The most substantial Underground crowding occurs on the Victoria and Piccadilly lines from Finsbury Park station into central London and on the Northern line into and south of Camden Town. The sub-region also experiences substantial station crowding at Finsbury Park, Tottenham Hale, Highbury and Islington and Camden Town. Crowding will remain in 2031 despite planned interventions.



The bus network is kept under regular review, including the balance of capacity and demand. There has been a significant increase in capacity over the last ten years. The busiest points on the network are generally at or near the sub-region's town centres. Demand will change as a result of new rail capacity. Buses will provide critical local capacity for new developments across the area, assisted by effective bus priority.



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

At the area level, congestion is worst in inner London and around town centres. The North Circular, A10 and A406 are the busiest roads in north London.

Highway congestion is forecast to worsen by 2031, despite funded road and public transport interventions. Around half of all journeys in north London are by car and future car mode share is forecast to remain broadly similar.

Indicative priority locations of highway congestion in north London include:

- A406, with pinch points at Henlys Corner and Bounds Green
- A10, with pinch points at Southbury Road, Carterhatch Lane and Bullsmoor Lane
- A1 along Holloway Road
- A5 from Cricklewood bus garage to Kilburn High Road
- A1055 – freight highway connectivity and consequences for local congestion
- A400 along entire route
- A112 approaching Stratford and Walthamstow
- A1010 at approaches to key junctions such as A105 and A110



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

Generally the best public transport connectivity in the north sub-region is in the radial corridors towards central London. This is due to the highly concentrated flows and the lack of parking at the non-home end of the trip. Outside these corridors public transport journeys tend to take longer than car journeys and road congestion impacts on journey time reliability.

A key orbital rail route in outer London is the London Overground network, of which the Richmond/ Clapham Junction to Stratford and Gospel Oak to Barking lines primarily serve north London. The sub-region also benefits from several key interchanges between the rail modes, particularly at Finsbury Park, Tottenham Hale and West Hampstead.

Buses provide orbital links between all major centres. However journey times on orbital public transport (bus and rail) can be slower than comparable car trips due to the dispersed pattern of origins and destinations. The pattern of residential density coupled with high car ownership and congestion, needs to be clearly understood to address connectivity issues efficiently. Efforts to reduce car use for these trips should focus on journeys where the relative journey times are already reasonably similar and could be improved through such measures as better information, more convenient interchange or bus priority.





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

There is good connectivity to local town centres and towards central London. Longer orbital journeys can be more time-consuming by public transport than by car, including to some key sites, such as Stratford. Ensuring reasonable access to key locations and to jobs and services is a priority for the sub-region. The Olympics and Paralympics provide some opportunities to improve access to jobs.

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 and Paralympics provide an important opportunity for the north sub-region, in terms of accessing jobs and services to the east.

Public transport access to jobs and services is fastest and most convenient for shorter local trips and, for longer trips, 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. Longer orbital journeys can be more time-consuming by public transport than by car due to the dispersed pattern of trip origins and destinations which means that interchange is often needed and service frequencies are lower. Often there is also free parking available at the non-home end of the trip, which is generally not the case for journeys to central London. One such example is Brent Cross, which has a lower mode share for car than similar centres in other cities but is nonetheless more accessible by car. It has free parking and there is limited pedestrian and cycle access as a result of severance caused by the major roads (A406, M1, A5, A41) bordering the site.

Access to healthcare also presents challenges. All the general hospitals in the sub-region are served by extensive bus links and some are also close to stations. The NHS wishes to move certain specialist services into fewer centres while at the same time expanding the range of more routine treatments which can be carried out in GP surgeries and other more local facilities. This tends to reduce the need for travel overall as the volumes for routine treatment are much higher. However it can create a sense of severance from the more rarely-used but higher profile specialist treatments.



Summarising north London's challenges

Responding to North London's challenges of crowding and congestion on the transport network, significant forecast population and employment growth for the next 20 years, dispersed orbital travel demands, improving access to key locations, and reducing emissions, will require improved capacity to central London, ongoing review of public transport services and improved conditions for walking and cycling within the region. There is a need in north London to make the most of planned investment in the Underground and National Rail services and reduce the reliance on private vehicles as well as improve the air quality along key corridors and local hotspots.

1.6: INTRODUCING THE SUB-REGIONAL TRANSPORT PLAN

The rest of this Plan is structured around the six goals and 16 challenges in the Transport Strategy which set out how the Mayor will achieve his vision of a more sustainable transport system for London.

Recent investment and additional planned investment over the next 10 years deliver significant benefits for north London and contribute to improvements across the different MTS outcomes. But there is more to do to deliver the outcomes set out on the previous page and address the specific challenges identified by boroughs for the region.

The Plan therefore sets out a range of measures or potential options to help meet the north sub-region's ambitions as well as providing a framework for how the Mayor's vision will be implemented in the region.

MTS goals and challenges

- Supporting economic development and population growth (Chapter 2)
 - Supporting sustainable population and employment growth
 - Improving transport connectivity
 - Delivering an efficient and effective transport system for people and goods
- Enhancing the quality of life for all Londoners (Chapter 3)
 - Improving journey experience
 - Enhancing the built and natural environment
 - Improving air quality
 - Improving noise impacts
 - Improving health impacts
- Improving the safety and security of all Londoners (Chapter 4)
 - Reducing crime, fear of crime and antisocial behaviour
 - Improving road safety
 - Improving public transport safety
- Improving transport opportunities for all Londoners (Chapter 5)
 - Improving accessibility
 - Supporting regeneration and tackling deprivation
- Reducing transport's contribution to climate change and improving its resilience (Chapter 6)
 - Reducing CO₂ emissions
 - Adapting to climate change
- Supporting delivering of the London 2012 Olympics and Paralympic Games and its legacy (Chapter 7)

CHAPTER 2: SUPPORTING ECONOMIC DEVELOPMENT AND POPULATION GROWTH

Transport Strategy goal: Supporting economic development and population growth

The population and economy of London are growing rapidly, and are expected to continue to do so over the next two decades. Transport will play a key role in supporting this growth, ensuring that people and goods can move from place to place conveniently and efficiently and allowing communities and the economy to develop in a sustainable and stable manner.

It is vital that the transport network has sufficient capacity to accommodate growing numbers of trips, and TfL and boroughs should also take steps to encourage more sustainable travel wherever possible, for instance through providing better facilities for walking and cycling. Service patterns and public transport priority must be kept under review. TfL and other stakeholders will strive to ensure that travel by both public and private transport is as efficient as possible.

This goal is comprised of three challenges:

- 2.1: Supporting sustainable population and employment growth**
- 2.2: Improving transport connectivity**
- 2.3: Delivering an efficient and effective transport system for people and goods**



2.1: Supporting sustainable population and employment growth

2.1: SUPPORTING SUSTAINABLE POPULATION AND EMPLOYMENT GROWTH

Population and employment growth can be supported sustainably by balancing capacity and the demand for travel through increasing public transport capacity and/ or reducing the need to travel.

The forecast population and employment growth in north London will further increase demand on the transport network. The result is likely to be a 40% increase in demand for peak hour public transport by 2025, particularly on radial routes into central London.

This increase in demand will be met to some extent by investment in the rail and Underground to increase capacity and regular service reviews of the bus network. Increased capacity on rail, Underground and bus is considered further in this section. However, there is also a need to balance increases in public transport capacity with reducing the need to travel. Potential measures that could reduce the need to travel include more flexible working, such as working from home and teleconferencing, and freight logistics and consolidation centres to reduce the distance travelled by freight. Measures to rethink travel are considered further in section 1.3.

Making the most of what is there

It will be important to ensure that we are maximising the benefit of the existing transport network and the investment that is being made. This includes improvements to interchanges and areas around stations so that public transport continues to be a reliable and attractive choice for people.

Funded capacity improvements

As set out in Chapter 1, north London will benefit from significant investment in rail and Underground that will lead to improvements in service and capacity. Without these schemes, severe levels of crowding would worsen, particularly given forecast for demand growth.

Buses

The bus network in London has expanded significantly over the past 20 years and has excellent coverage, with more than 95% of residents of the north sub-region within a five minute walk (400m) of a bus stop. The bus network will continue to support the development of the north sub-region by linking key places and interchanges with their surrounding areas, and by providing sustainable transport options for new developments, such as the growth anticipated at Brent Cross/ Cricklewood and Colindale.

Town centres and key places in the sub-region will continue to have a through flow of buses and there will be a need to improve bus infrastructure, both in and around the town centres. Measures to improve reliability and journey times on radial routes into the town centres will be necessary, although in some cases different bus priority schemes may be needed.



Other improvements

- Smarter Travel measures can be used to help maximise value for money from investment in infrastructure, for example cycle superhighways.
- Information also has a key role to play in informing people of their new travel choices and providing them with the opportunity to make the most sustainable and efficient choices. With the correct wayfinding information, for example Legible London, people may be find more direct and pleasant routes to walk and cycle.
- Measures can be targeted at specific network challenges, such as crowding on particular public transport routes, or congestion at key times and places.
- A number of unfunded capacity enhancements have also been considered in drawing up this plan. This includes West Anglia Main Line four-tracking to help with economic development in the Upper Lee Valley and the Chelsea Hackney Line.

LONDON UNDERGROUND UPGRADES TO SUPPORT POPULATION AND EMPLOYMENT GROWTH

London Underground upgrades

The Tube has never been so important to London's economic, social and cultural life. In the last year, the network carried more than a billion passengers for the fourth year in succession – almost as many passengers carried as the entire National Rail network. However, much of the infrastructure the railway relies on to meet the demand is very old, with some of it dating back to the 1860s. The Tube is the oldest Underground system in the world (in 2013 it will celebrate its 150th anniversary) and, with a legacy of underinvestment, it is vital that the network is rebuilt to ensure that it can deliver for the future. Detail of the London Underground upgrades affecting the north sub-region is provided in Section 1.2.

Crowding on the Underground network

Around 5% of trips originating in north London use the Tube. The most substantial crowding occurs on the Victoria and Piccadilly lines from Finsbury Park station into central London, on the Northern line from Archway into and south of Camden Town and on the Jubilee line south of Finchley Road. In terms of station crowding, Finsbury Park, Tottenham Hale, Camden and Highbury and Islington all experience significant crowding.

The planned upgrades to the Underground network will make a difference to capacity and crowding but further population and employment growth will also lead to more trips. Therefore, despite the funded upgrades, severe crowding is forecast beyond 2017. Crowding would be even worse if it was not for the upgrades and the forecasts of crowding in the future point to the long term need for further upgrades and investment in the public transport network.



SPOTLIGHT: NORTHERN LINE UPGRADE

The Northern line as it exists today is one of the most operationally challenging of all Underground lines. This is due partly to the age of its assets and partly to the design of the service which requires operation to and from multiple ‘branches’. The complexity of the Northern Line design is exemplified by the fact that a train starting its journey at Morden has the choice of travelling to three different destinations (Edgware, High Barnet or Mill Hill East) via two different routes (Charing Cross or Bank). Junctions at Kennington and Camden Town allow this to happen but at the cost of limiting service frequency and reducing service reliability. Adding to the complexity, the Northern Line is also extremely busy – indeed, the busiest line on the network – with around one in every six Tube journeys being made using the line. As a result, the line experiences some of the worst crowding on the network and, with demand set to grow, it will require a considerable increase in capacity if this crowding is not to worsen in the future.

The line is due to be upgraded, with a new signalling and control system. By providing a faster and more frequent service these improvements will reduce journey times by around 21% and increase peak capacity by 20%. This signalling upgrade is referred to in this report as Northern line upgrade I (NLU I).

However despite this improvement, expected growth in population and employment will result in heavy levels of crowding returning to parts of the line by 2031. Further improvements beyond that provided by NLU I are constrained by two factors; the complexity of the service pattern – which requires inter-operation across the various branches – and the size of the Northern line fleet.

The objective of the Northern line upgrade 2 (NLU II) is to unlock the full potential of NLU I to deliver journey time and capacity improvements through a simplification of the service pattern combined with a small increase in fleet size. This could deliver a relatively large improvement for a modest level of investment. Under the proposed option for NLU II, the Northern Line will be fully separated at Kennington with counter peak separation at Camden Town. This means all Morden branch trains will serve the Bank branch and all Charing Cross branch trains will start at Kennington. Morden branch passengers will need to interchange at Kennington in order to travel to Charing Cross branch destinations. Trains on the Edgware and High Barnet branches will continue to serve both the Charing Cross and Bank branches in the peak direction (e.g. southbound during the am peak) but not in the counter-peak direction.

The Northern line Bank branch currently has 20 trains per hour southbound and 22 trains per hour northbound in the morning peak. Upgrade I would lead to 24 trains per hour in both directions. Partial separation would allow 28 trains per hour to run southbound during the morning peak and 32 trains per hour to run northbound (and vice versa for the evening peak).

Figure 2.1: Northern line morning peak hour frequencies (trains per hour per direction)



LONDON OVERGROUND UPGRADES TO SUPPORT POPULATION AND EMPLOYMENT GROWTH

Substantial investment has been made in the London Overground network since TfL took over the running of it in November 2007. By May 2011, the improvements will increase capacity and frequency of the service, provide refurbished stations and better customer information.

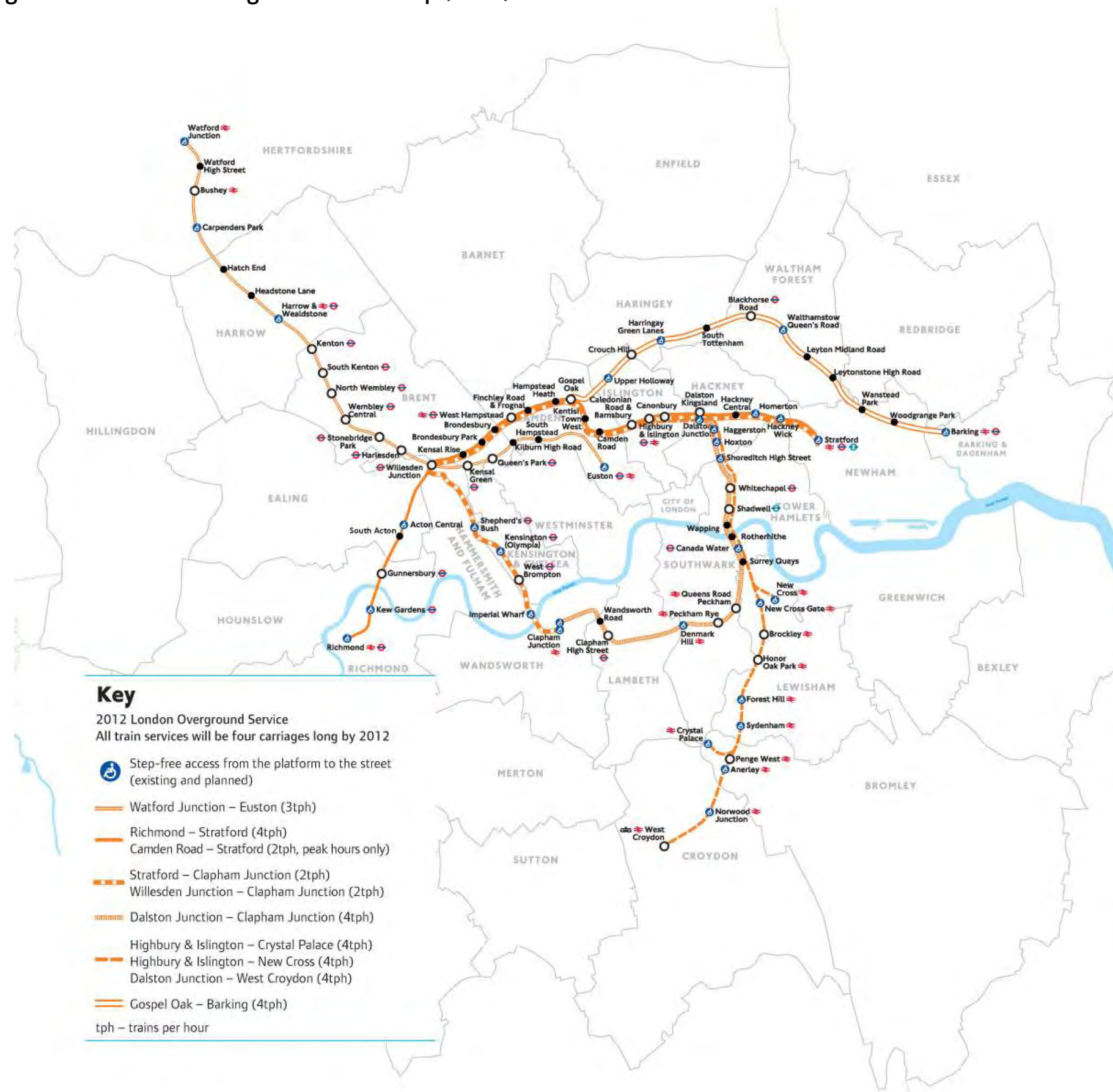
The Overground in north London currently experience severe crowding (over 4 passengers standing per sq m) on the Richmond/ Clapham Junction to Stratford lines between Willesden Junction and Gospel Oak with less severe crowding on this line between Gospel Oak and Highbury and Islington. Despite the current and planned investment, some of this crowding will remain in 2031.

Investment in the Richmond/ Clapham Junction to Stratford line will lead to increased capacity with longer and more frequent trains including trains every 10 minutes from Willesden Junction to Gospel Oak and every 7-8 minutes between Camden Road and Stratford.

From May 2011, the West Croydon to Dalston line will run to Highbury and Islington where it will connect with the Overground to Stratford and the Victoria line. From May 2011, the Gospel Oak to Barking line will have trains every 15 minutes at all times, rather than during peak times as currently.

The increased frequency of services and the resulting increased capacity will support sustainable population and employment growth in the north sub-region by supporting orbital connectivity and interchange with the remainder of the transport network.

Figure 2.2: London Overground route map (2012)



2.1: Supporting sustainable population and employment growth

NATIONAL RAIL IMPROVEMENTS THAT WILL SUPPORT POPULATION GROWTH AND REGENERATION AND RELIEVE CROWDING

Around 2% of trips originating in the north sub-region use rail. This is relatively low compared with other sub-regions, but is balanced by a relatively higher mode share for Underground and bus journeys, reflecting the transport network in north London. Section 1.2 provided detail of the investment in rail that will benefit the north sub-region, including upgrades to the West Anglia Main Line and Great Northern Line and the Thameslink Programme.

The Network Rail station improvement programme will also affect north London with improvements at stations including: Bush Hill Park; Finsbury Park; Haringay; Hatfield; Kentish Town; Mill Hill Broadway; Potters Bar; Seven Sisters; Waltham Cross; West Hampstead; Welwyn Garden City; and Wood Street.

Figure 2.3: Further National Rail upgrades to support growth

National Rail corridor priorities (post HLOS I)	Why are improvements needed?
<p>St Albans to St Pancras corridor additional capacity enhancement, including:</p> <ul style="list-style-type: none"> • More 12-car in shoulder peaks 	<p>Continued demand growth means more capacity is needed to avoid worsening crowding though London Underground provides much of the capacity in this corridor. Growth likely to be especially strong given opportunity areas in this corridor, including: Colindale, Brent Cross/Cricklewood and West Hampstead Interchange intensification area. Without further investment in new capacity beyond HLOS I, this corridor becomes severely stressed again by 2031.</p>
<p>Hertford North and Potters Bar to Kings Cross and Moorgate corridor additional capacity enhancement, including:</p> <ul style="list-style-type: none"> • 4tph extra inners to Moorgate • 2tph extra semi fast to King Cross • Deliver Chelsea Hackney Line • Investigate potential to lengthen platforms on the Great Northern Moorgate branch 	<p>Continued demand growth means more capacity is needed to avoid worsening crowding, though London Underground provide much of the capacity in this corridor. Growth likely to be especially strong given Haringey Heartlands/Wood Green intensification area, and serving Wood Green metropolitan centre. Without further investment in new capacity beyond HLOS I, this corridor becomes severely stressed again by 2031.</p>
<p>Cheshunt and Enfield to Liverpool Street corridor additional capacity enhancement, including:</p> <ul style="list-style-type: none"> • Four-track Lea Valley line to add paths • Deliver Chelsea Hackney Line • Investigate potential for new platforms at Stratford for through West Anglia services 	<p>Continued demand growth means more capacity is needed to avoid worsening crowding, though London Underground provides much of the capacity in this corridor. Growth likely to be especially strong given Upper Lea Valley opportunity area. Without further investment in new capacity beyond HLOS I, this corridor becomes severely stressed again by 2031.</p>

SPOTLIGHT: WEST ANGLIA MAIN LINE ENHANCEMENT

The West Anglia routes are already amongst the most crowded in the country and they urgently require significant additional capacity. The local service is irregular and has a low frequency. Committed investment, aimed at meeting relatively short-term capacity requirements to 2013/14, mainly on longer-distance services, include 120 new carriages and platform lengthening work. However, further challenges remain with the quality, frequency and performance of existing services. Specifically, the two track main line constrains both frequency and capacity and interchange facilities are inadequate at some stations, particularly Seven Sisters and Tottenham Hale. Strategic interchange at Hackney Downs and Hackney Central provides an opportunity to link orbital services and reduce trips into London termini.

The forecast population and employment growth in the Upper Lee Valley will lead to increased travel demand. Within the opportunity area, Tottenham Hale is projected to have an additional 5,000 new jobs and 5,000 homes by 2031, Central Leaside an additional 2,500 jobs and 5,000 homes and Blackhorse Lane and additional 1,200 jobs and 2,000 homes. The West Anglia Routes can help support this growth and the major planned regeneration in the opportunity area.

TfL and other stakeholders have been working together to lobby for a range of improvements, such as:

- Minimum service of four trains per hour to all stations throughout the day and into the night, including the route north from Stratford
- Refurbishment and/or replacement of existing rolling stock so that it meets customer expectations
- Station improvements to reduce congestion, increase accessibility, enhance safety and security and improve station facilities to standards commensurate with those seen elsewhere in London.



Even as the Government makes difficult decisions about where to prioritise investment in the coming years, there are opportunities to secure investment. Initially there is the re-franchising of the West Anglia Routes, the specification for which could readily include relevant enhancements from the list above.

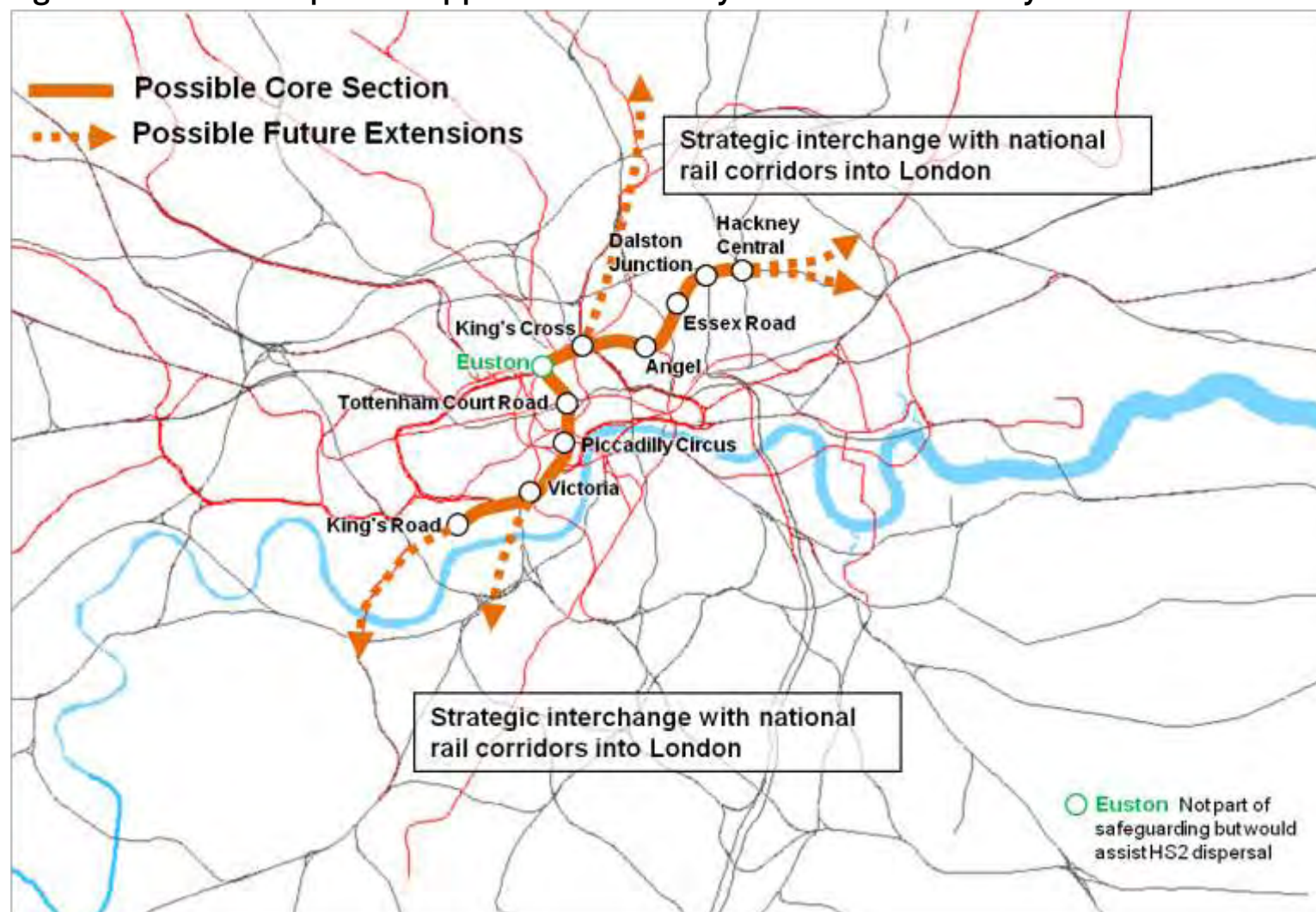
Thereafter, there is a need for additional investment in rail infrastructure if the West Anglia Routes are to meet the capacity, frequency, journey time and reliability standards being set elsewhere in London. This will require investment in track signalling, rolling stock and power supply, as well as finding solutions to problems caused by the series of level crossings in the area. TfL and other stakeholders will need to work together to continue making the case for the Department for Transport and Network Rail to look at developing phased, lower cost solutions which can be delivered in the next railway 'control period', from 2014 to 2019.

ADDITIONAL PUBLIC TRANSPORT CAPACITY TO SUPPORT GROWTH – CHELSEA HACKNEY LINE

Background

In 1989, the Central London Rail Study proposed a new line across London, taking a north-east to south westerly alignment. A route connecting the Central line branch to Epping with the District line branch to Wimbledon via a new tunnel beneath central London was safeguarded in 1991 and forms the base alignment for the proposed new rail line across London, the Chelsea Hackney Line (CHL, sometimes referred to as Crossrail 2).

Figure 2.4: Possible phased approach to delivery of Chelsea Hackney Line



The Department for Transport has asked the Mayor of London to review the CHL scheme, including considering if the safeguarded route is still the right alignment to be developed in more detail, or if an alternative might better meet London's needs now and in the future. The review will focus on a number of key areas, including alleviating crowding; improving termini dispersal; improving connectivity; supporting growth and regeneration; reducing CO₂ emissions; and ensuring value for money.

Until a decision has been made, the safeguarded route will remain in place.

A strategy is emerging that might see a CHL scheme delivered in a number of phases. The first phase would address the key demands of High Speed 2 and London Plan growth by increasing public transport capacity and dispersing passengers from the main London termini. Future phases could include extensions to help address issues of poor accessibility and further reduce the pressure on central London termini. The effect would be to create a series of strategic interchanges where movement between radial and orbital rail routes and CHL would be possible.

Depending on the final route(s) chosen, CHL could also offer benefits in reducing journey times to a range of locations across London, by offering new fast direct links to places as far afield as Kingston, and Croydon.

Potential benefits of CHL to north London

The safeguarded alignment passes through several stations in Camden, Islington, Hackney and Waltham Forest and could provide additional public transport capacity to support population and employment growth across north London. CHL has the potential to reduce crowding on the Victoria, Piccadilly and Northern lines in north London, subject to the alignment chosen. It could also assist with dispersal of arriving passengers at a number of central London termini including King's Cross, and potentially Liverpool Street, as well as delivering new capacity to accommodate growth in demand at Euston, if High Speed 2 were to terminate there.

Next steps

TfL is undertaking a review of the alignment of CHL. The review includes a continued programme of engagement with interested parties and stakeholders. The first phase of the review will conclude with a report on the shortlist of alternatives to be presented to the Mayor.

THE ROLE OF THE BUS NETWORK IN SUPPORTING GROWTH IN NORTH LONDON

Role of buses

Access to jobs/ services: for many people, buses provide the means of accessing their local jobs, schools, shops and services across the sub-region

Access to Town Centres: The network of town and local centres dispersed across north London generates significant bus demand with a network of services focusing on each of these centres. This includes services that operate beyond the London boundary from centres such as Enfield. Many of the services also provide orbital links between centres within and beyond the sub-region.

Connectivity: buses provide connectivity to and from public transport network across the whole of the sub-region, including for longer trips by interchange.

Interchange/ feeder: act as a “hub and spoke” network between town and local centres as well as bringing passengers to rail/Tube stations in north London.

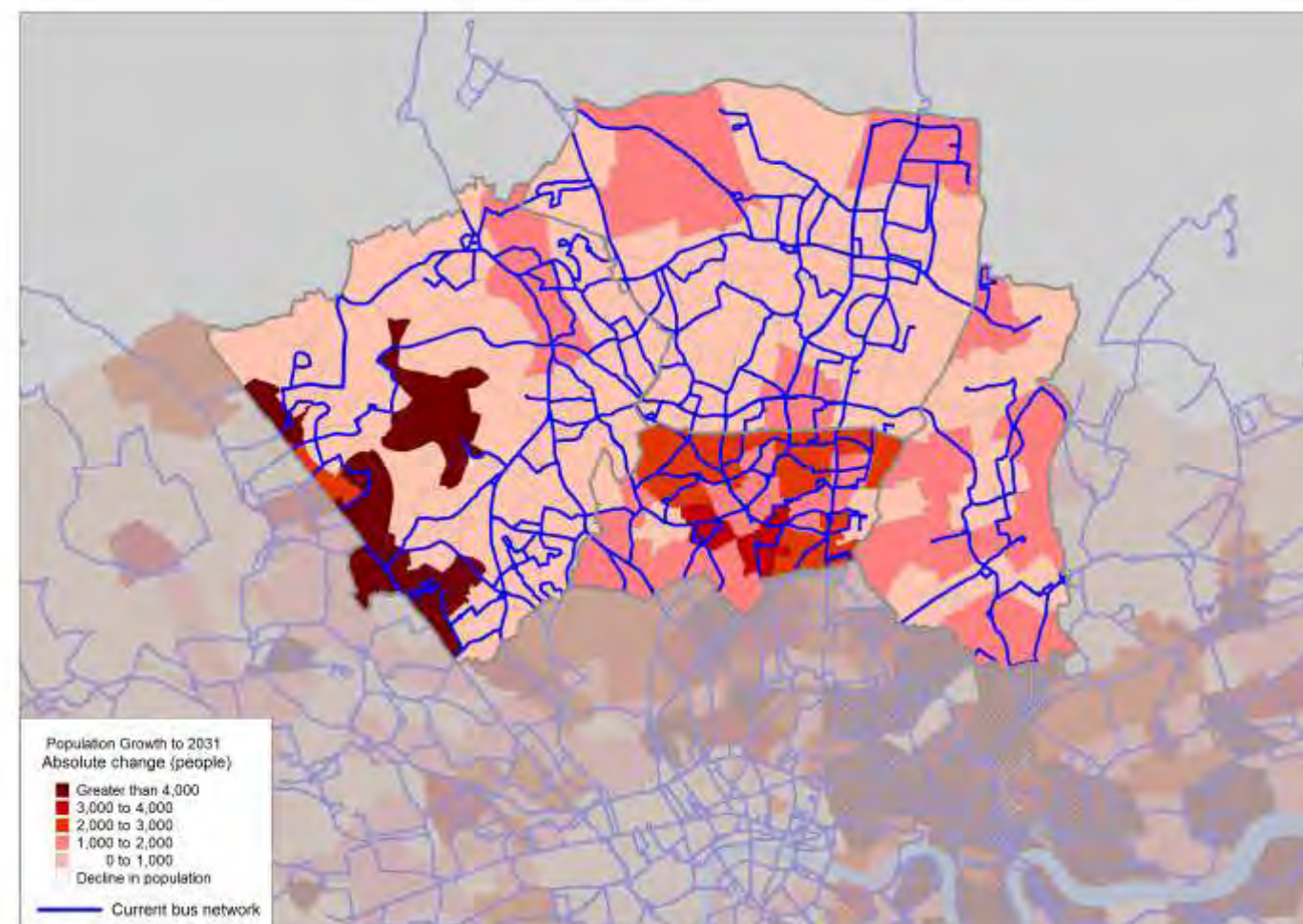
Current demand

Over the last 10 years bus usage across London as a whole has increased by around 60%. Buses play a key role in north London – they account for 14% of all trips originating in the sub-region made by London residents (2006/9, 7 day week) while seven of every 10 public transport trips in the sub-region are made by bus.

Bus demand is spread throughout the area with density increasing from outer to inner areas and with concentrations in the town centre “hubs” and along key corridors. Services correspond to demand, covering the entire area and focused on town centres. There are thus busy bus corridors approaching each hub. Within the larger town centres, demand is typically spread across a number of busy locations, rather than being concentrated in one or two places.

Bus mode shares vary within the sub-region. The share of trips starting in each borough for which bus is the “main” (that is, longest) mode is highest in Haringey at 21%. For Enfield and Waltham Forest this is 15% and 13% respectively, falling to 11% in Barnet. This spread is typical of that seen in other sub-regions, reflecting levels of car ownership and the types of trips being made.

Figure 2.5: Current bus routes and population growth to 2031



The map in figure 2.5 shows population growth by output area. However, the expected population growth is not expected to be spread out evenly across the areas as shown, but instead is likely to be concentrated in a smaller area. One such example is Mill Hill East, where the growth is set to be concentrated in identified areas for redevelopment around the Underground station.

2.1: Supporting sustainable population and employment growth

How provision is being improved

The TfL bus network is subject to a continuous review process which involves:

- Structured engagement with stakeholders
- Extensive market research
- Monitoring of performance

This enables key changes in population and employment to be picked up and reflected in the bus network. Changes are driven by user priorities in consultation with stakeholders. Regular research consistently shows that the reliability and duration of overall journey times (including waiting time) are the main priority for bus users and potential users.

Bus Infrastructure

The development of the network also requires planning of the infrastructure to support provision of the services. This includes, for example, bus garages; bus stops; bus priority to improve accessibility and protect buses from traffic congestion; and bus stands so that service intervals can be properly regulated. The provision of bus infrastructure is a shared responsibility between TfL, local authorities, bus operators and other agencies.

Forecast change in demand

It would be expected that there would be an increase in bus demand on north to south corridors. Improvements to rail services, such as upgrades to the Underground, would increase demand for buses serving feeder stations but reduce demand on bus services parallel to the routes.

It would be anticipated that an increase in bus demand would be seen on routes serving new developments and opportunity areas within the north sub-region although this would vary from area to area. The nature of increase will depend on many factors within each, including its size and concentration of development and the balance of land use. For example, a relatively concentrated site with a heavy retail presence such as Brent Cross will experience a different level and spread of demand through the day compared to a more dispersed area with a greater residential balance, such as the Upper Lee Valley.

Implications for bus infrastructure

Services will respond to changes in demand through the process of continuing consultation and review. New or expanded bus infrastructure across this sub-region will be desirable.

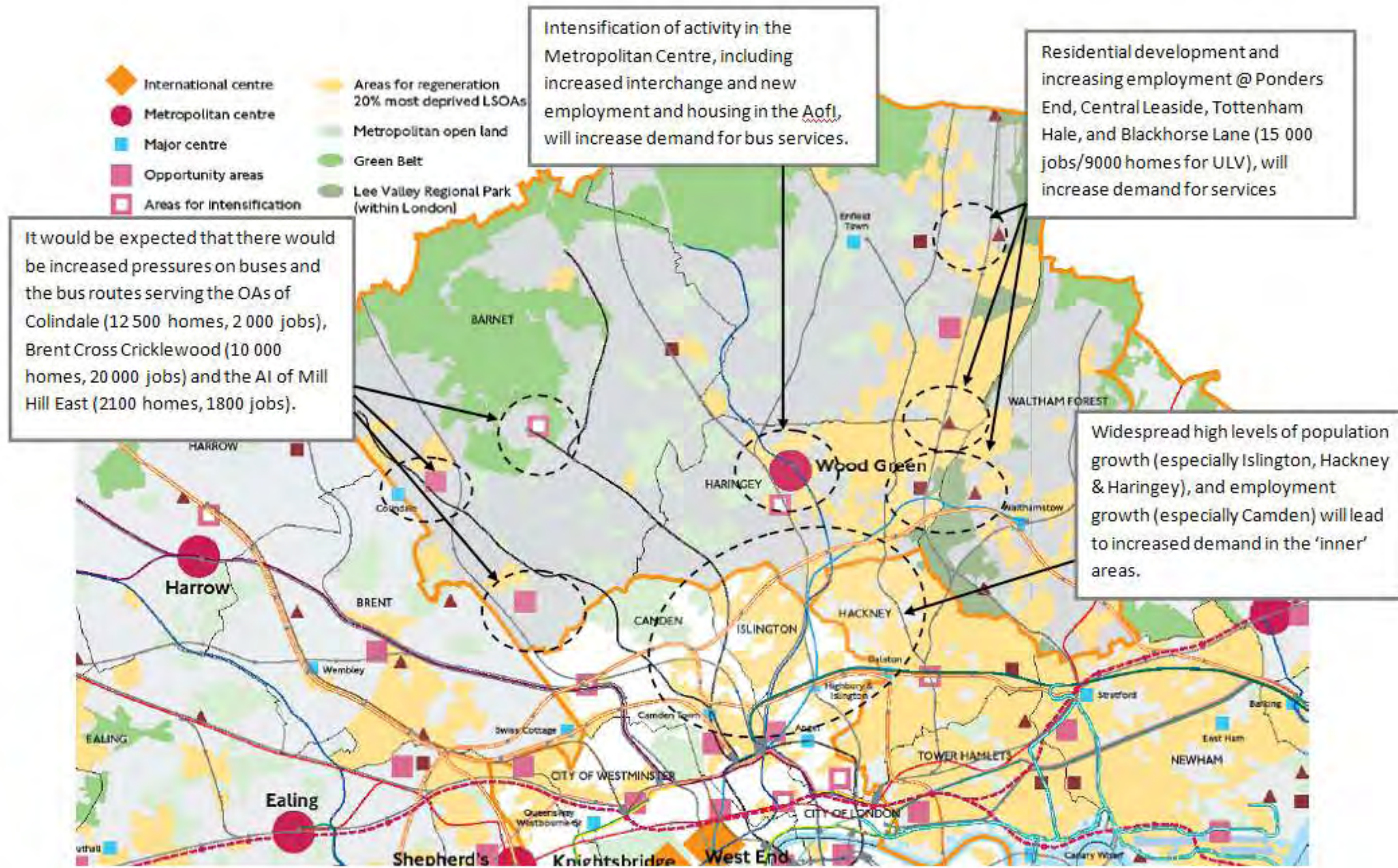
Measures to maintain bus reliability and journey times will still be needed to avoid the impact of growing congestion across the sub-region. As now, these will need to be designed to complement measures for pedestrians, cyclists, smoother traffic flows and the urban realm.

The Mayor and TfL will keep the development of the bus network under regular review to ensure it caters for growth in employment and population. This includes reviews of the strategic priorities underlying the process approximately every five years.



2.1: Supporting sustainable population and employment growth

Figure 2.6: Growth pressures for buses in the north sub-region



2.2: MEASURES TO IMPROVE TRANSPORT CONNECTIVITY IN NORTH LONDON

Improving people's access to jobs and improving access to commercial markets for freight movements and business travel as well as supporting the needs of business to grow will all support improved transport connectivity.

Improving connectivity is a key priority for metropolitan and town centres and opportunity areas, where accessibility for business, retail opportunities and freight, as well as education, health and other services is important for social and economic development. Generally the north sub-region has good connectivity in the radial corridors into central London. However, public transport journeys outside of these corridors, including between town centres and growth areas, generally take much longer and are often less convenient than the equivalent road journey. This section looks at measures to address the connectivity challenges in selected corridors in the north sub-region and measures to improve connectivity more generally, including improving interchange.

There are a number of priorities that could help meet the challenge of connectivity in north London. These include:

- Interchange improvements
- Improvements to bus infrastructure and bus priority
- Barclays Cycle Superhighways and improved cycling infrastructure
- Urban realm improvements to increase walking & cycling
- West Anglia four-tracking
- HLOS 2 additional capacity

BUS PRIORITY

The bus network relies on the infrastructure provided with TfL's partners to deliver reliable and fast passenger journeys, in a pleasant and safe environment, while keeping operational costs as low as possible.

As London continues to grow there is a need to ensure that appropriate measures are taken to maintain attractive and reliable bus services. Bus priority measures can help improve reliability of bus services and reduce journey times as well as improving the efficiency of the network. Across north London there will be opportunities to identify locations for bus priority measures where bus passengers represent a significant proportion of all road users. This includes the major town centres but also the growth areas.



NATIONAL RAIL

In addition to planned rail improvements under HLOS 1, there are opportunities to improve interchange and rail services, including Tottenham Hale station and four-tracking on the West Anglia Main Line. However, the lack of available track and platform capacity at Stratford constrains further enhancement, including the operation of direct services between the Chingford branch and Stratford, through using a re-instated Hall Farm Curve. If a workable scheme can be found to allow the introduction of such services, then it could be considered for delivery during HLOS2 or beyond. To fully address the issues with operating more trains to/via Stratford, one option may be to deliver additional platforms at Stratford (either elevated or in tunnel) to allow the "diversion" of some West Anglia services via Stratford in order to provide improved connectivity and additional capacity.

HS2

The proposed high speed line from London to the West Midlands (HS2) would provide additional connectivity for north London via the proposed Old Oak Common station from the London Overground network and from proposed passenger services over the Dudding Hill freight line.

DLR

TfL assessed 20 potential DLR extensions against the MTS goals. Ten options were initially shortlisted. The two extensions affecting the north sub-region (Stratford International to Walthamstow and Stratford International to Tottenham Hale) were not among the shortlisted routes. Further analysis was undertaken and the four strongest routes were recommended for further work: Bank to Euston; Bank to Victoria; Gallions Reach to Dagenham; and Lewisham to Forest Hill.

CONNECTIVITY CHALLENGES WITHIN THE NORTH SUB-REGION

Figure 2.7: Map showing corridors within the north sub-region with connectivity challenges

[TO BE UPDATED FOR LAYOUT VERSION]

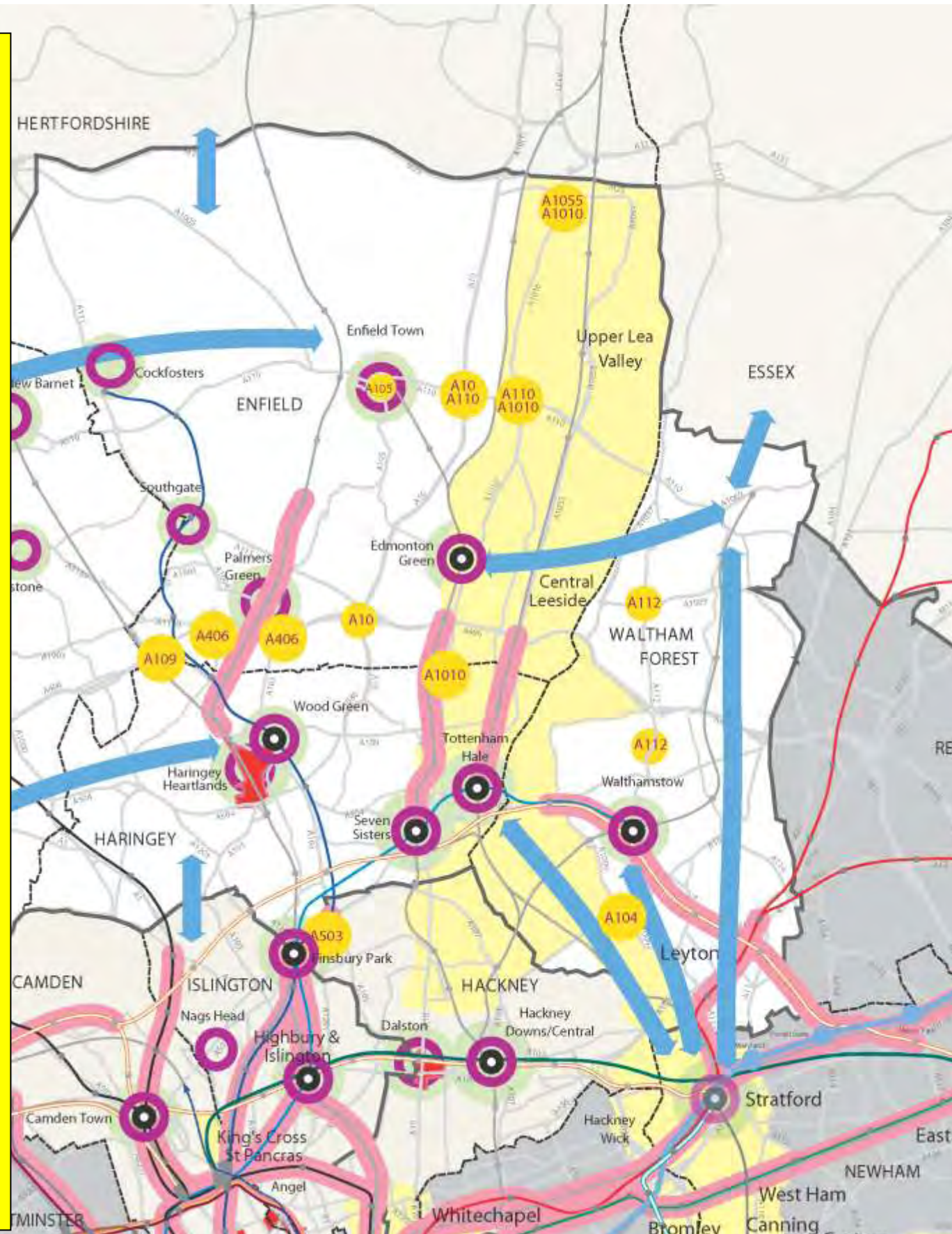
Use base map and show following corridors:

Selected corridors (IN RED):

- Brent Cross/ Cricklewood opportunity area – Wood Green
- Chingford – Stratford
- Tottenham Hale– Stratford

Unselected corridors (IN BLUE):

- Finchley Road – Camden
- Gospel Oak – Barking
- Colindale/ Burnt Oak opportunity area – Finchley
- Colindale/ Burnt Oak opportunity area – Harrow
- Colindale/ Burnt Oak opportunity area – Wembley
- Colindale/ Burnt Oak opportunity area – Kilburn
- Finsbury Park – Haringey Heartlands
- West Hampstead – Camden Town
- West Hampstead – Willesden
- Chingford – Edmonton Green
- Edgware – High Barnet
- Edgware – Harrow
- Enfield – High Barnet
- Haringey – Muswell Hill



Analysis was undertaken on the corridors identified in the Challenges and Opportunities document to identify corridors to be selected for further analysis. The initial analysis identified key places of importance in the sub-region and looked at the existing public transport options, the directness of the public transport options, the distance between the locations, the competitiveness of public transport against highway and the level of demand. The analysis also looked at levels of public transport crowding and highway congestion and considered population and employment growth and future demand in the corridors. The corridors are shown in figure 2.7. Three corridors were selected in north London.

These corridors refer to all connections between two points. They do not refer to individual roads or routes. While some people will travel the whole of the corridor, in many cases it is more likely to be used to access one of the end places.

SUMMARY OF HOW TO ADDRESS CONNECTIVITY ISSUES IN SELECTED CORRIDORS

Brent Cross to Wood Green

Corridor is an orbital link of 9km between two important transport hubs with an imbalance between car and public transport accessibility. Existing demand is expected to increase with significant forecast growth in both centres. The corridor experiences highway congestion and the direct bus route suffers from long journey times.

Short term:

- Improvements to bus facilities in Wood Green town centre
- Walking improvements including Legible London type wayfinding
- Potential to convert short public transport and car journeys into Wood Green to cycling and walking
- Road management (A406)

Medium term:

- Improve interchange between Brent Cross Underground station, Brent Cross shopping centre and the Opportunity Area

Tottenham to Stratford

Corridor is an orbital link of 6km and is forecast to have high demand taking into account expected growth in both centres. The corridor experiences congestion and the bus journey takes more than an hour. There is a direct but infrequent rail link. There is also potential to make the most of the Olympic Park and legacy.

Short term:

- Measures to speed up bus journeys
- Local cycling and walking enhancements (such as Legible London, Key Walking Routes)
- General environs improvements to Stratford town centre and Tottenham Hale including gyratory

Medium term:

- Stratford and Tottenham Hale Interchange Improvements
- Measures to speed up bus journeys
- Improved interchange at Stratford and Tottenham Hale
- Hackney Interchange (Hackney Downs to Hackney Central)
- West Anglia Main Line four tracking
- Road Management (A12, A10, A104 and A503)

Chingford to Stratford

Corridor is an orbital link of 10km and is important in terms of local connectivity. While public transport is relatively competitive compared with car, there are no direct links, instead requiring a bus and Tube journey. The corridor experiences congestion and long bus journey times.

Short term:

- Measures to speed up bus journeys
- Stratford Town Centre Improvements (including gyratory)
- Local cycling and walking enhancements (such as Legible London, Key Walking Routes)

Medium and long term:

- Stratford Interchange Improvements
- Tottenham Hale Interchange Improvements
- Hackney Interchange (Hackney Downs to Hackney Central)
- Hall Farm Curve (see case study on corridor overleaf)
- West Anglia Main Line four tracking
- New platforms at Stratford station for through West Anglia services
- Traffic Smoothing (A12 & Blackwall Tunnel Approach)
- New Thames Crossing at Silvertown

Sub-regionally important interchanges in the selected corridors

Improvements to Hackney Central/ Downs, Finsbury Park, Tottenham Hale, Walthamstow Central/ Queen's Road and West Hampstead will play an important role in the selected corridor solutions.

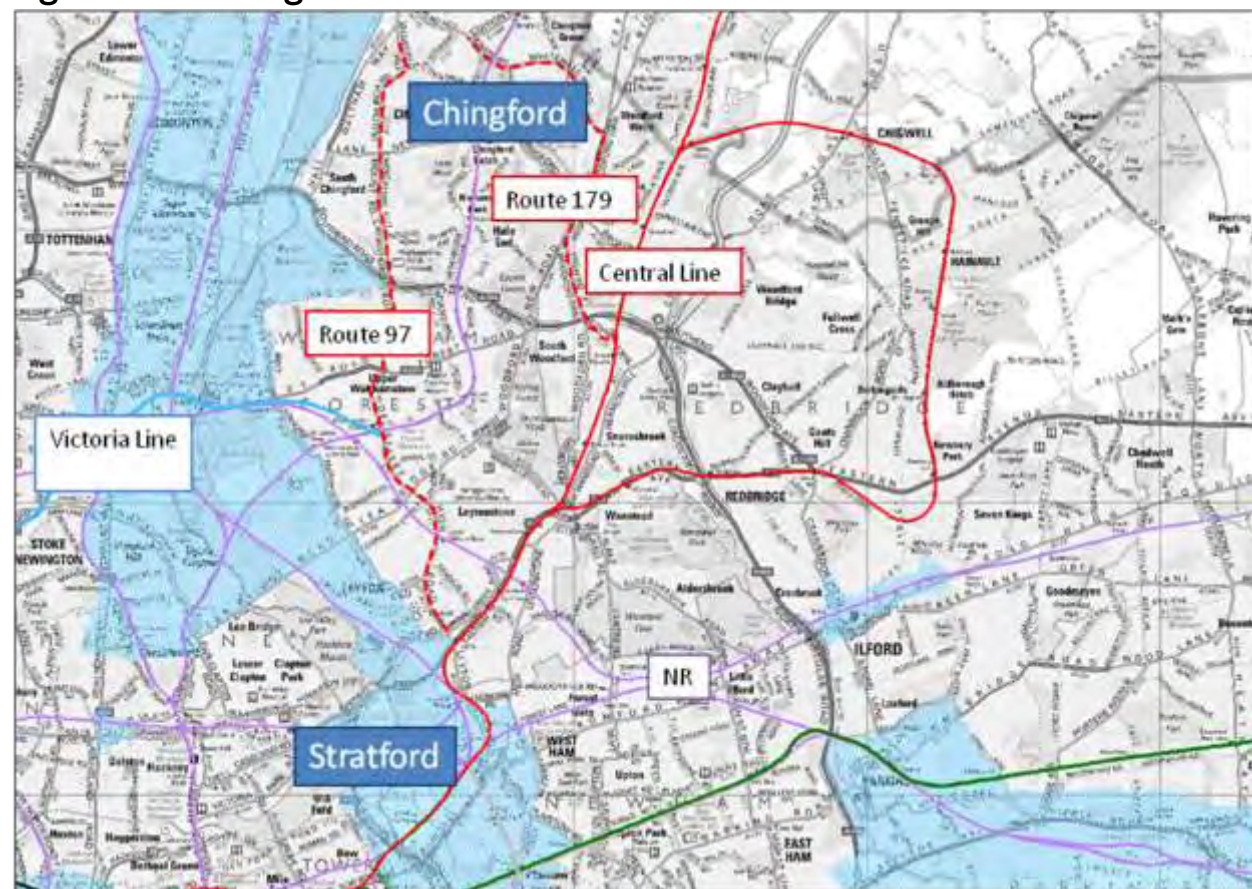
CASE STUDY: IMPROVING CONNECTIVITY ON CHINGFORD TO STRATFORD CORRIDOR

The diagram below shows the Chingford to Stratford corridor. It is an orbital corridor with no direct rail link, although it is possible to access the two centres using the Central Line from South Woodford station and a relatively short bus ride from Chingford. The corridor experiences highway congestion along the A112 and the bus journey takes more than an hour to travel the 10km between the two centres.

The corridor was selected for more detailed assessment because it has significant existing demand with just under 20,000 people wishing to travel within it. The corridor is also in an area of growth, with some 50,000 new jobs forecast for the Lower Lee Valley, including Stratford, over the next 20 years and 32,000 new homes forecast in the Lower Lee Valley over the same period.

Stratford is a major centre in the Lower Lee Valley opportunity area and has the potential to become a metropolitan centre. It is the site of the Olympic Park and is seeing high levels of population and employment growth. Other key attractors will include the new Westfield shopping centre, which will be the largest in London.

Figure 2.8: Chingford to Stratford corridor



Key objectives

- Increase the proportion of journeys made by rail/ Underground
- Maximise the use of walking/ cycling for appropriate trips – a large proportion of the trips from the corridor to the centres are already by walking and this can be built on
- Reduce highway congestion on the primary road network in the local area, particularly along the A112, a key traffic artery
- Improving bus priority on key north-south bus roads like the A112 and further improving key interchanges for north-south travellers such as Walthamstow bus station
- Assist development and opportunities for growth in both areas in order to accommodate forecast growth, such as the Lower Lee Valley regeneration plan
- Enhance Stratford's connectivity so that it can grow to become a metropolitan centre

In addition to the objective set out above, there are a number of potential options for improving connectivity between Chingford and Stratford. Reinstating the Hall Farm Curve is an option. However before this option can be regarded as deliverable, issues such as funding and the capacity at Stratford station with its potential impacts/conflicts on the proposed four-tracking of the Lee Valley Line, which will also require capacity at Stratford station, would need to be fully understood. Other alternatives such as improving the interchange between Hackney Downs and Hackney Central could also enable improved connectivity between Chingford and Stratford. Currently neither of these options have full funding but remain possibilities.

SPOTLIGHT: HS2 AND IMPROVED CONNECTIVITY FROM NORTH LONDON

Background to High Speed 2 (HS2)

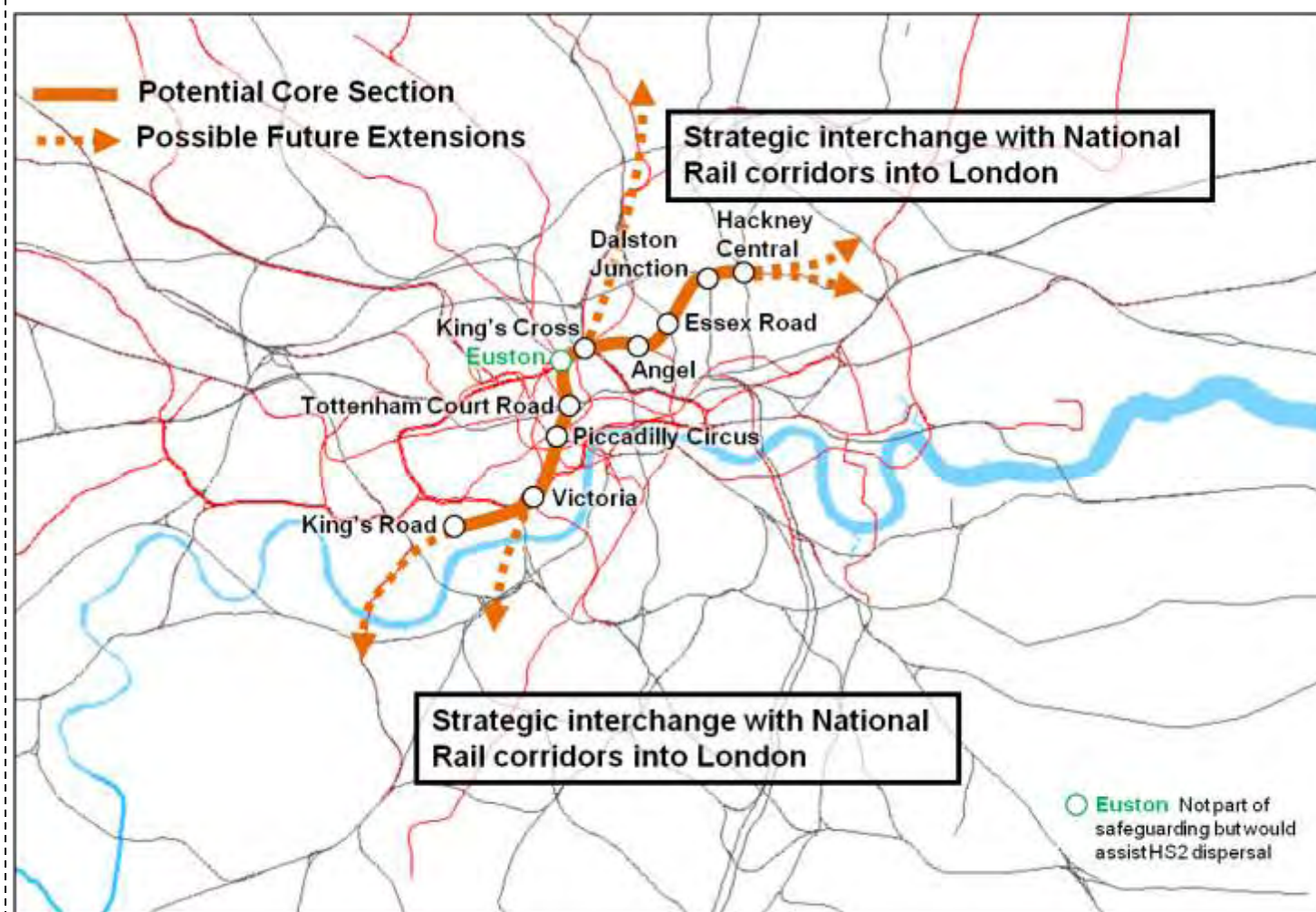
The Government set up a company, HS2 Ltd, to consider the case for new high speed rail services between London, the West Midlands and beyond. The Government has been presented with information on the feasibility, business case, route alignment and terminus points of the London to Birmingham section. TfL worked closely with HS2 Ltd to identify potential terminus and hub locations. TfL recommends Euston as its preferred location. The next stages are:

- Reviewing options around serving Heathrow
- Connections between HS2 and High Speed 1 (St Pancras to the Channel Tunnel)
- A public consultation (early 2011)

London Euston and Old Oak Common

London Euston has been chosen as the central London terminal location for High Speed 2. Sending all HS2 passengers to Euston however will create serious challenges for capacity at Euston and onward dispersal. In an attempt to counter this problem, the Department for Transport proposals recommend an interchange with Crossrail before reaching central London, at Old Oak Common, providing an alternative route to the West End, City and Docklands. Under these proposals, Heathrow would be less than 15 minutes away by Heathrow Express. The Government, however, is reviewing options around serving Heathrow directly as part of HS2.

Figure 2.9: HS2 Old Oak Common station potential links



How connectivity to HS2 and Old Oak Common could benefit north London?

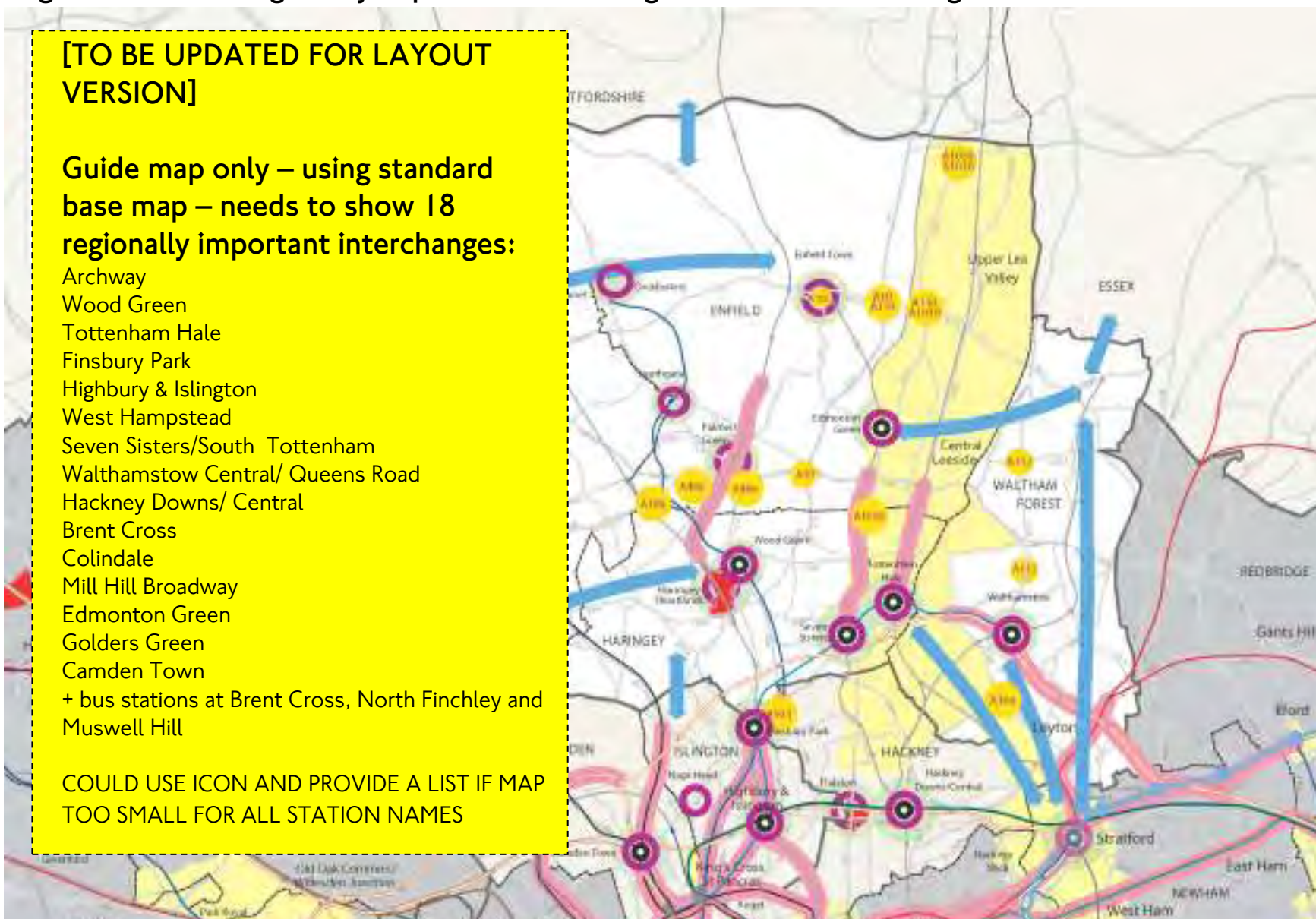
- Analysis has shown that Old Oak Common could provide interchange for up to a third of HS2 passengers – potentially reducing morning peak passenger arrivals at Euston by around 10,000 to 38,000.
- North London residents could potentially have access to Old Oak Common via the London Overground network, and via the proposed link from Cricklewood using the Dudding Hill freight line
- The north sub-region would benefit from the additional connectivity and improved journey times from Old Oak Common to the Midlands and destinations in west, south and east London, including Heathrow Airport and other places served by Crossrail
- Commuters from the north sub-region using the Victoria and Northern lines from Euston station would also benefit from Old Oak Common station if the strategic interchange helped reduce the impact of onward dispersal from Euston on current and forecast rail and station crowding.

IMPROVING CONNECTIVITY: BETTER INTERCHANGE

Interchanges link different public transport and feeder services together and vastly expand the accessibility and services offered by London's transport system. Good, convenient interchange supports better and wider travel opportunities and has a key role to play in supporting population and employment growth. Interchanges also play a crucial role in ensuring the resilience of the wider network, by offering alternative routes at times of disruption.

Sub-regionally important interchanges are those that provide opportunities for orbital public transport within the sub-region, are of regional importance in terms of the operation of the network and/or access to town centres and provide opportunities to accommodate forecast population and employment growth.

Figure 2.10: Sub-regionally important interchanges in the north sub-region



One challenge for north London is ensuring there is adequate capacity in the sub-regionally important interchanges to cope with forecast growth. One option for crowding relief is improvements to proximity interchanges, where improvements in information and walking conditions between two interchanges can connect two networks. South Tottenham (London Overground) and Seven Sisters (Underground and National Rail) is one such example.

The Interchange Plan, which is to be published shortly, will provide a ranking of the relative importance of interchange locations and an initial consideration of the perception of quality across London. It will help inform TfL's priorities for the development and implementation of particular interchange proposals.

Interchange Toolkit

The toolkit for improving interchange focuses on four key areas - capacity, connectivity, quality and efficiency

The [Interchange Best Practice Guidelines](#) provides advice and guidance for the planning and operation of multi-modal interchanges. They provide a framework to evaluate the quality and efficiency of existing and proposed interchanges. The evaluation framework considers

- Efficiency of operations and movements
- Usability, accessibility, safety and security
- Understanding, wayfinding and permeability
- Quality of built design and urban realm and perception

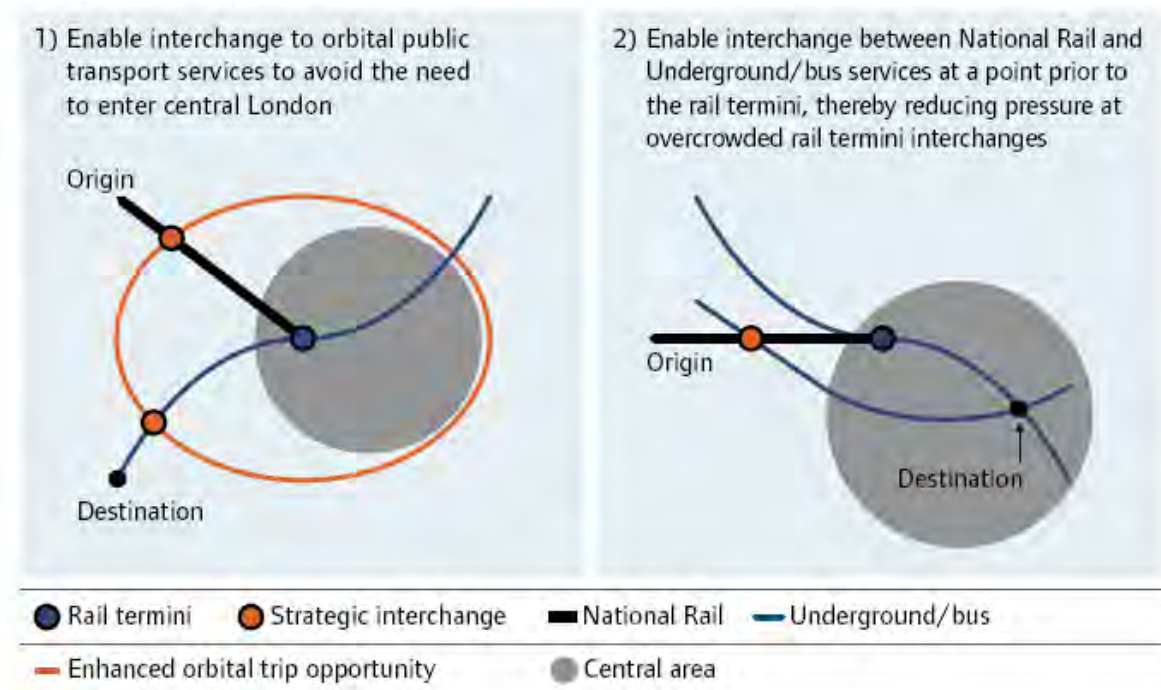
IMPROVING CONNECTIVITY: STRATEGIC INTERCHANGE

Strategic interchange in north London

The concept of strategic interchanges is defined in the MTS as follows: *Strategic interchanges are primarily radial to orbital interchanges. They have the potential to improve orbital public transport travel opportunities, in particular links between outer London town centres, and to remove the need for passengers to interchange in central London.*

Figure 2.11: Strategic interchange concept

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



There is also a role for buses as 'feeders' to strategic interchanges or sub-regionally important interchanges where bus to bus and Tube interchange is important, such as Hackney, Archway, Angel and Brent Cross.

There are a number of strategic interchanges in north London which have the potential to improve connectivity across the sub-region:

- Finsbury Park
- Hackney Downs/ Central
- Highbury and Islington
- Seven Sisters/ South Tottenham
- Tottenham Hale
- Walthamstow Central/ Queens Road
- West Hampstead

Each of these interchanges has its own potential to improve access across north London. For example, the stations at Hackney Downs and Hackney Central provide interchange between the London Overground between Stratford and Richmond or Clapham Junction and the National Express East Anglia services out of Liverpool Street to Enfield Town, Chingford and Hertford East.

The interventions needed to unlock the benefits of the strategic interchanges will vary by location. This could include physical improvements to the stations as well as changes to service patterns. Network Rail, the Department for Transport and train operating companies would be key to delivering these benefits.

In terms of strategic interchange, Finsbury Park station has significant potential to influence travel behaviour. It already acts as a key interchange between Underground lines and National Rail services to/ from Peterborough, Cambridge, Stevenage and Welwyn Garden City, avoiding the need to change in central London. Finsbury Park is considered in more detail on the next page.

CASE STUDY: INTERCHANGE IMPROVEMENTS AT FINSBURY PARK

Finsbury Park is one of the busiest London interchanges outside zone one and provides links to central and north east London on the Piccadilly and Victoria lines and National Rail services to King's Cross and the City southwards and to Cambridge and Stevenage northwards. It is both a sub-regionally important interchange and a strategic interchange. The station has three entrances, with bus services at each entrance. It is served by 12 bus routes. There is a taxi rank at the eastern entrance.

Current activities/ key issues

TfL completed the first phase of interchange improvements in 2007 with a new station frontage scheme at Station Place and enhancements to the bus stations on Wells Terrace and Station Place.

Further phased improvements including installing lifts for step-free access and ticket gates are on hold pending funding. The Department for Transport's *Better Rail Stations* report identifies the National Rail station as potentially requiring special management attention and TfL are leading a pilot trial into coordinated management at the interchange in 2010/11.

Potential solutions

Short term:

- Identify complementary measures
- Improve wayfinding, such as Legible London
- Pilot trial of coordinated management

Medium term:

- Station upgrade including installing lifts for step-free access and ticket gates (although unlikely to be implemented before 2018).
- Improve wayfinding, such as Legible London

Long term:

- Strategic rail, Underground and interchange improvements to relieve central London congestion



2.3: Delivering an efficient and effective transport system for people and goods

2.3: DELIVERING AN EFFICIENT AND EFFECTIVE TRANSPORT SYSTEM FOR PEOPLE AND GOODS

An efficient and effective transport system for people and goods can be delivered by:

- *Making improvements on the road network, including managing delay, improving journey time reliability and resilience*
- *Improving public transport reliability and reducing operating costs*
- *Making the most of what already exists, by bringing and maintaining all assets in a state of good repair, and*
- *Enhancing use of the Thames for people and goods*

Currently, many parts of the transport network within the north sub-region experience public transport crowding and highway congestion. While the planned investment in the network will go some way to alleviating this, the forecast population and employment growth, and resulting increase in trips, will lead to further pressure on the network. Delivering an efficient and effective transport system for the movement of people and goods will become more important in the future. In addition to further investment in the public transport and road networks, there is also a need to rethink travel to encourage the use of more sustainable modes and to better integrate land use and transport planning.

Measures to deliver an efficient and effective transport system for people and goods

- Smarter travel initiatives and school and workplace travel planning
- Using parking provision and charges to discourage car journeys
- Freight delivery and servicing plans
- Better linking land-use planning with transport planning to encourage use of more sustainable modes
- Asset renewal to ensure reliability of rail, Underground and bus services
- Regular reviews of public transport services
- Encouraging modal shift of freight transport away from road, including to rail and better utilising the River Lee Navigation
- Freight Quality Partnerships
- Freight consolidation centres
- Working from home, teleconferencing and improved use of technology to reduce the need to travel



The following pages show problems and potential interventions on the road network; address freight in north London; identify the potential for enhancing the use of London's waterways; identify measures for improving public transport reliability; identify measures to help rethink travel, particularly to encourage a shift to more sustainable modes; and identify the role of land-use planning in improving efficiency.

2.3.1: MANAGING THE ROAD NETWORK

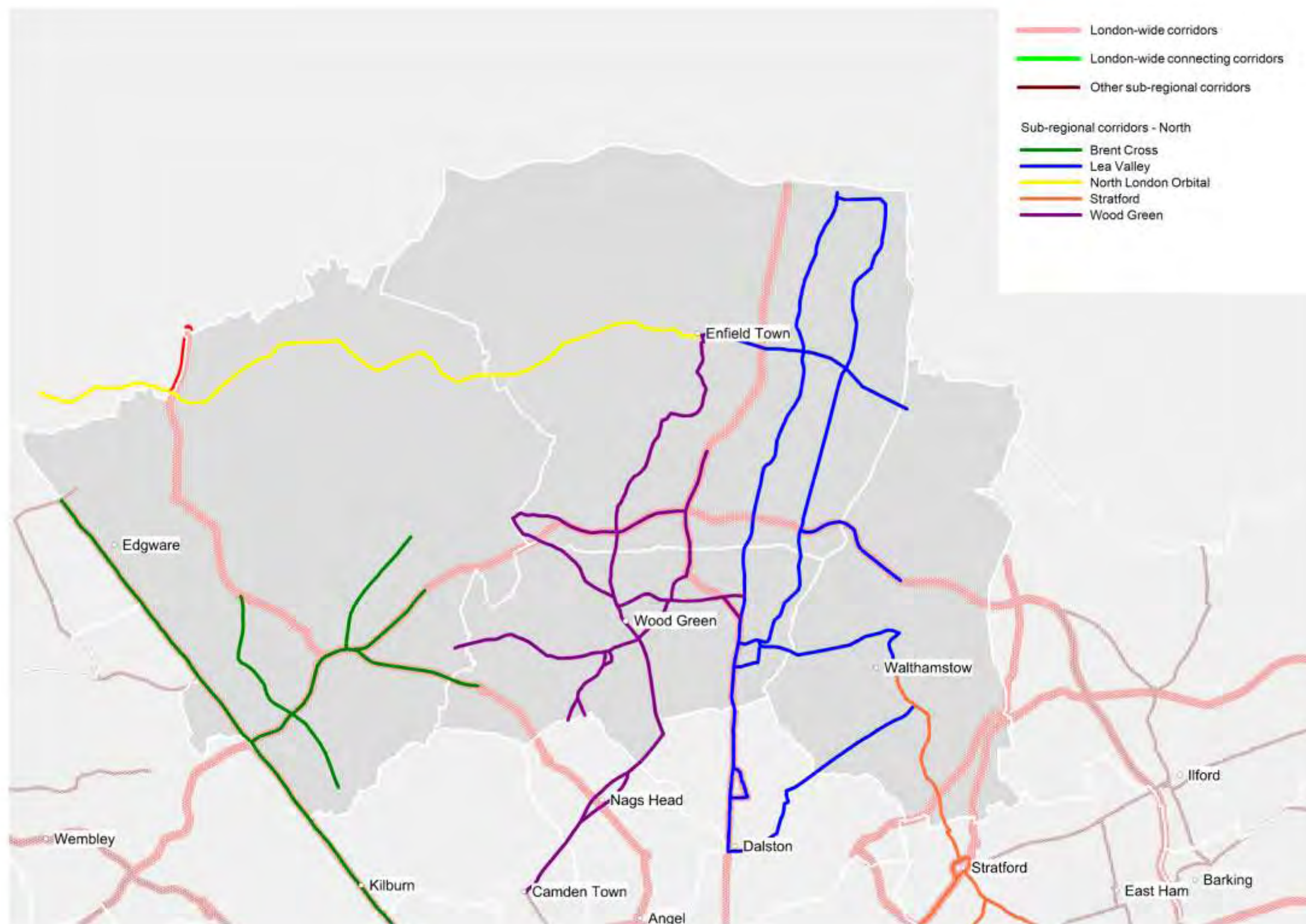
The way the road network is managed underpins much of the MTS. There is scope for further demand management measures to encourage mode shift in particular areas or corridors, particularly those where public transport enhancements are being made. There are also opportunities for improvements in specific locations to improve conditions for all road users, including pedestrians and cyclists.

Managing the road network in north London

The MTS sets out a corridor approach to managing the road network. Corridors are defined by their strategic significance, primarily on the connectivity they provide. Both TfL and the boroughs have roles and responsibilities in managing these corridors. The next steps for these activities will be taken forward by the Sub-regional Panels.

Using a corridor approach better enables the strategic function - for example in providing London-wide or sub-regional connectivity - to be understood and considered alongside local functions in both planning and managing the road network.

Figure 2.12: Map showing London-wide and sub-regional corridors in north London



ROAD CONGESTION

Currently, existing parts of road network across the north sub region operate at capacity, with the inner areas being particularly affected. There has been substantial mode shift from car to public transport, walking and cycling across London over the last decade, with continuing investment in further mode shift. However, with population and employment growth it is likely there will be further demand pressure on the road network (although less than public transport trips), and with an increasing share of light goods vehicles (LGVs).

Without the right measures in place this would affect the resilience of the network which will translate into poor journey time reliability and increase overall journey times.

Average speeds in the North sub-region are 33, 34 and 30 kph in the morning, interpeak and evening peak periods respectively. These compare somewhat favourably with the average speeds in outer London for the equivalent time periods.

The map on the next page identifies congestion hotspots at locations where weekday morning peak speeds are below 10kph and delay exceeds 2 minutes/km. There are clusters of congestion hotspots on the North Circular Road (A406) and the A10 as well as at numerous other locations.

Further analysis suggests that congestion on weekdays is worse during the evening peak period. On weekends congestion is worse during the evening peak period followed by the interpeak. The A406 and the A10 are particularly congested across all days and time periods.

The hotspot mapping allows identification of areas for targeted solutions that may include safeguarding of capacity, forward planning of road and utilities works, better management of incidents and optimisation of the networks.

Understanding the nature of the trips in the most congested areas will help encourage mode shift to sustainable modes and release pressure on the network by managing demand. For strategic routes long term demand management measure and land use planning along the corridors can be identified in advance.

Indicative results of this analysis are presented for example locations on the next page, and this process could be applied to priority sites to reach tailored solutions.

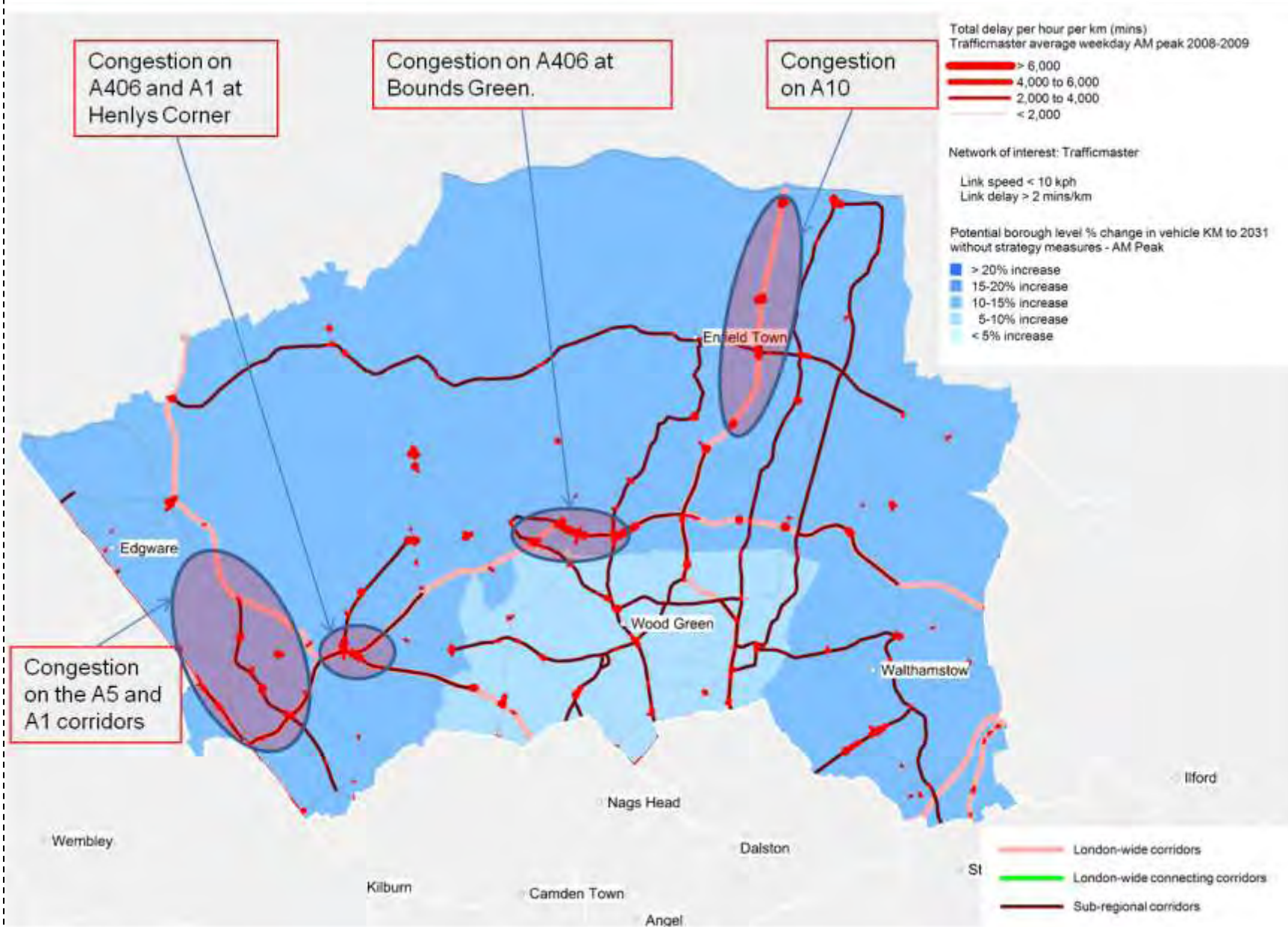


CONGESTION ON THE ROAD NETWORK IN NORTH LONDON

Henlys Corner (in LB Barnet)

The characteristics of traffic at the Henlys Corner hotspot vary with traffic on the A1 covering relatively long distances (35km on average) and flows exceeding capacity, compared with lighter flows over shorter distances on the A598 (12km on average). A significant proportion of trips are for work/business purposes which could be targeted through workplace travel plans. Origins and destinations of traffic on the A598 are located mainly in the central and north sub-regions. Origins and destinations of traffic on the A1 are more dispersed, reflecting the longer distances travelled. The majority of vehicles at the hotspot have single occupancy. There is potential to reduce congestion by shifting car trips to cycling trips, principally on the A598 where almost 50% of trips each period are between 2km and 8km – on the A1 only approximately 10% of trips are between 2km and 8km.

Figure 2.13: Map showing congestion on the road network in the north sub-region



Note: map shows congestion hotspots in the AM Peak (7:00-10:00) defined as links with delay over 2mins/km and speed under 10kph

A10 / A1055 Bullsmoor Lane (near M25 junction 25, (in LB Enfield))

Most vehicles on the A1055 are single occupancy cars. Average trip lengths are relatively long (30km) and the most frequent trip length is greater than 20km. Work trips are the most frequent purpose in all time periods and are unusually high during the inter peak. These trips could potentially be targeted through workplace travel plans. Since short trips (less than 2km) make up almost 10% of all trips in the inter peak and the PM peak, there could be scope to alleviate congestion through mode shift from car to walking. There is potential to ease congestion in all time periods through shifting car trips to cycling trips.

A10/ Carterhatch lane (in LB Enfield)

Most vehicles on Carterhatch Lane are single occupancy cars. Trips are 18km on average though distance travelled varies considerably across the day (AM peak trips are 20km shorter than PM peak trips). Origins and destinations of traffic are located closely together in the AM peak, reflecting the short distances travelled during that period. Approximately 45% of car trips across the day are between 2km and 8km, indicating that shifting trips to cycling could have potential for easing congestion at this hotspot. Additionally, since approximately 15% of car trips are less than 2km in length, there is also scope for easing congestion by shifting car trips to walking. The majority of trips in the AM and PM peak periods are for work purposes which could be targeted through workplace travel plans.

POTENTIAL TARGETED INTERVENTIONS ON THE NORTH LONDON ROAD NETWORK

Across the sub-region (and London as a whole), congestion will be managed and reliability and resilience will be improved through better traffic control systems, better management of planned events, and better management of unplanned incidents. In addition, there are more specific opportunities for targeted interventions such as to encourage mode shift to public transport, walking and cycling, or to improve the road network's contribution to other Mayoral goals such as improving air quality and reducing CO₂ emissions

In terms of tackling congestion, the priorities for further targeted mode shift are:

- Inner north London
- Metropolitan and other town centres

Effective initiatives in the short term include:

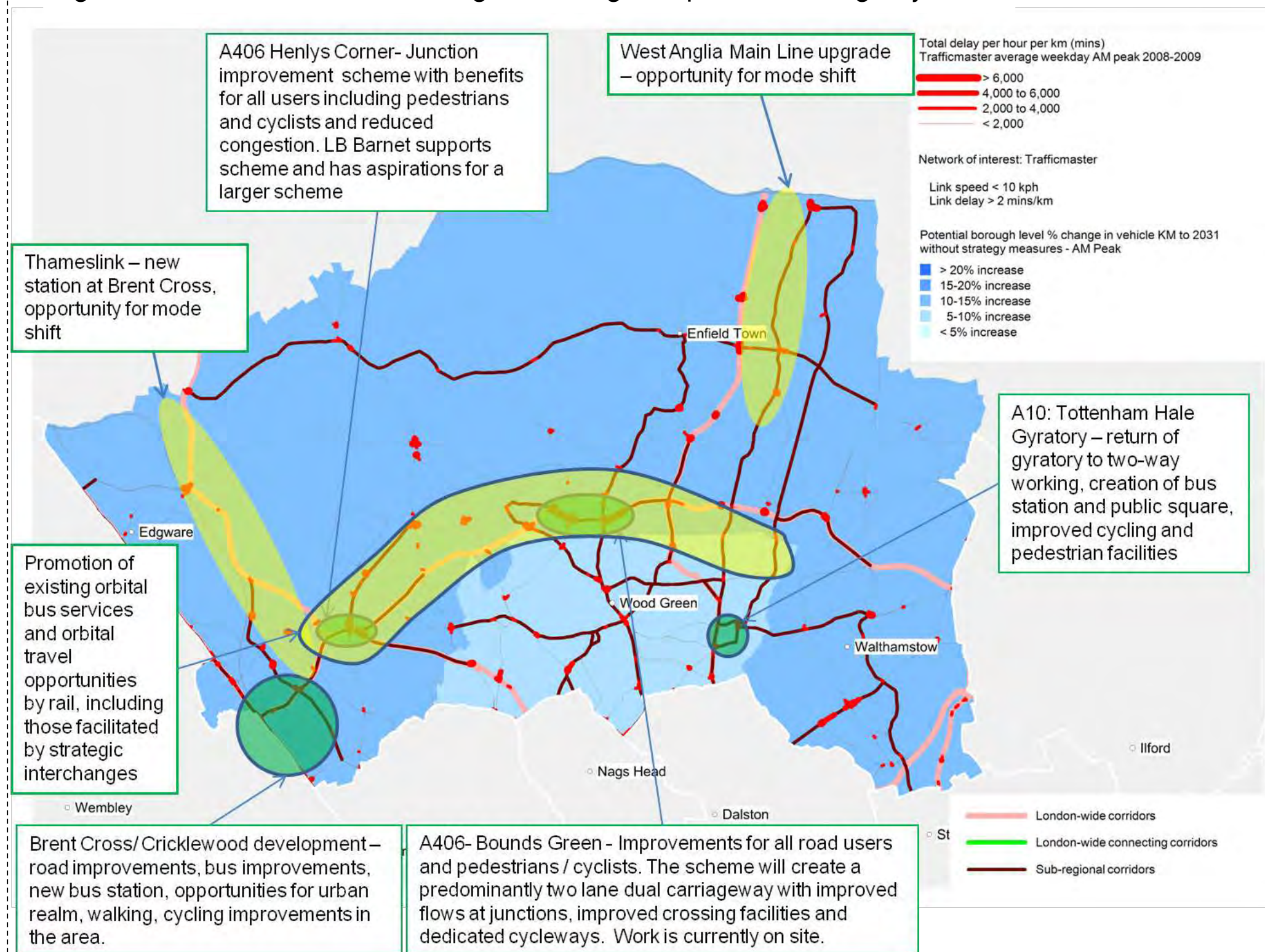
- School and workplace travel planning
- Parking provision and charges
- Freight delivery and servicing plans for town centres

These initiatives will be more effective if accompanied by improvements to walking and cycling facilities, the urban realm, and road safety. These can be delivered as part of town centre redevelopment and regeneration initiatives.

In the longer term there are further opportunities for mode shift through:

- Land-use development with a location, density and mix of uses that encourages access by public transport, walking and cycling
- Provision of enhanced public transport, including new and extended rail services

Figure 2.14: Potential interventions targeted at congested points on the highway



SPOTLIGHT ON A406 HENLYS CORNER JUNCTION IMPROVEMENT SCHEME

Henlys Corner is the junction of the A406 North Circular and A598 Finchley Road/ Regents Park Road. The £8m improvement scheme creates signalised pedestrian and cyclist crossings, while making improvements to the operation of the junction in order to smooth traffic flow and improve journey times. Renewed signage, lighting and the planting of trees will improve the appearance of the street scene and provide safer crossing facilities for the local community.

Both roads experience heavy traffic with congestion impacting on motorists and bus users. In peak periods, traffic demand exceeds capacity, resulting in traffic congestion on all approach roads. Traffic volumes are approximately 90,000 vehicles per day with typical queues on the A406 westbound approach in excess of 1,500m in the morning peak. The junction has no controlled pedestrian crossings and a poor safety record.

TfL has confirmed that funding remains in place following the Government's spending review. TfL has completed detailed design for the scheme and tenders for the work are currently being assessed. Preparatory works are set to begin in early 2011 with main works starting in spring 2011 and completion before the 2012 Olympics. The scheme is supported by the London Borough of Barnet, who still have aspirations for a larger scheme in the future.

The larger scheme would be similar to the previous Highway Agency tunnel proposal, which took which took some A1, and A406 through traffic, underneath the Henlys Corner junction. The current proposal does not prejudice the implementation of a tunnel should it be required at a later date. Any future scheme will need to meet policy requirements and be subject to securing the necessary funding.

Figure 2.15: Map showing Henlys Corner junction improvement scheme



2.3.2: FREIGHT IN NORTH LONDON

Freight and servicing

North London generates its own freight activity but also accommodates freight passing through the sub-region, either into central London or across the sub-region using the A406 North Circular or M25. There are concentrations of freight in the key industrial locations in the Upper Lee Valley, including Brimsdown, and Blackhorse Lane and Leyton ‘industrial villages’, which comprise one of the largest clusters of manufacturing and technology-led industrial estates in London. Other freight sites include Brunswick Road in Barnet. There is also servicing associated with the major town centres.

Rail freight

Virtually all rail routes in North London are used to a greater or lesser degree by freight, but the highest flows occur on the North London Line and the Barking to Gospel Oak line, which are both used by rail freight traffic that has an origin and destination outside London. Full support is being given by TfL to a project to create a freight link from Felixstowe to the West Coast mainline at Nuneaton that would reduce the need for some trans-London movements, and hence reduce the conflict between passenger and freight services. Freight depots have been lost to developments and so adequate strategically located facilities need to be safeguarded going forward to unlock the potential for rail freight.

River

The River Lea Navigation is the only waterway in North London capable of freight activity. It is not widely used, with limited access and capacity, but has significant potential, running through the largest concentration of freight generating activities in North London. It provides an excellent opportunity, especially in relation to bulkier and waste products.



Freight priorities

There are a number of freight priorities for north London

- Maximising opportunities for development by incorporating freight and servicing provision to prevent conflicts of servicing on traditional High Streets
- Encouraging modal shift of freight from road, including using the River Lee Navigation for waste transport
- Smoothing traffic flows to manage congestion hot spots in key areas used by freight including the A406, A10, A1010
- Extending the application of Freight Quality Partnerships beyond that for Brimsdown and consider for the Brent Cross/ Cricklewood opportunity area
- Use of delivery and servicing plans and construction logistics plans

Upper Lee Valley

The Upper Lee Valley opportunity area is subject to major growth plans with a forecast 15,000 jobs and 9,000 new homes over the next 20 years. It benefits from extensive clusters of manufacturing and technology-led industrial estates and is well connected to trunk roads and the rail network, with good connections outside London. Areas suitable for higher density development include the growth points at Tottenham Hale, Blackhorse Lane, Central Leaside and Ponders End. However, the West Anglia Main Line, the waterways and the extensive reservoirs in the area serve to restrict movement across the opportunity area. The Barking to Gospel Oak Line is also non-electrified and a strong case for electrification exists which would avoid the inefficiency of diesel trains running under electric wires and allow freight trains to be electric-hauled over longer distances. Four-tracking of the West Anglia Main Line will be important to unlock development capacity, particularly at Central Leaside. Any new development and infrastructure brought forward in this area must avoid adverse effects on any European site of nature conservation importance.

2.3.3: Enhancing the use of London's waterways

2.3.3: ENHANCING THE USE OF LONDON'S WATERWAYS

Using the waterways for passenger transport

The North sub-region is located some distance from the Thames. However, the River Lee (or Lea) passes through Enfield (and Waltham Forest) en route from Hertfordshire to the confluence with the Thames. There are also a number of canal connections from the Hertford Union and Grand Union in to the River Lee Navigation as well as the Regents Canal in Camden and Islington.

The opening of the Three Mills Lock means connections can be made more easily to the Thames. Besides a few summertime pleasure cruises on the River Lea and the Regents Canal, there are no regular scheduled services on North London's waterways.

There are a significant number of leisure facilities on North London's waterways, including rowing clubs and private hire marinas. Any passenger or freight operations would need to accommodate the needs of these current users.

Using the waterways for freight transport

In north London, there is potential to increase water-based freight transportation activity using the London Blue Ribbon Network. In particular, the River Lee Navigation 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. The only wharf in North London in use (occasional) is on the River Lee Navigation at Edmonton, and is used for municipal and commercial waste/recyclates.

Enfield has identified that the majority of industries which require bulk freight movement are to the east of the borough. There are key routes along Mollison Avenue, Meridian Way and Cambridge Road where freight can be carried by road, rail and water but the majority is carried by road.



2.3.4: Improving public transport reliability

2.3.4: IMPROVING PUBLIC TRANSPORT RELIABILITY

Rail reliability

Rail based public transport reliability has been improving over the last ten years as investment in infrastructure renewal and new vehicles has generally increased service reliability. However, major incidents such as signal failure and power problems can still cause disruption. Train Operating Companies (TOCs) in the region have above average reliability: First Capital Connect (Thameslink and Great Northern), National Express East Anglia, and London Overground all run over 90% of services within 5 minutes of their scheduled times.

The sorts of measures that could make a difference include increased capacity (through train lengthening) and frequency on key lines, such as:

- Richmond/Clapham to Stratford: Lengthened platforms at seven stations increasing capacity with new, longer and more trains. Increasing frequency of trains to every seven to eight minutes on the core section from Camden Road to Stratford.
- Barking to Gospel Oak: New and more frequent trains mean increased capacity on the line. From January 2011, trains will run every 15 minutes Monday to Saturday until late evening and every 30 minutes on Sundays. From May 2011, trains will run every 15 minutes, all day every day.

Underground reliability

London Underground 'excess wait time' reliability measure has been successfully reducing year on year, to 7.8 minutes from a high in 2002/03 of 9.7 minutes. The Underground upgrades will lead to the replacement or renewal of many assets which will improve their reliability resulting in fewer delays from failed assets, such as trains and signalling. The 'excess wait time' should continue to improve. Furthermore, extra capacity will relieve crowding in the short term which can lead to fewer passenger incidents and therefore greater reliability.

It is important for the long-term reliability of the network that future upgrades are planned and delivered so that assets are not allowed to deteriorate. Investment is also required to ensure the balance between demand and capacity does not impact on the reliability of services.

The sorts of measures that could make a difference including upgrades to the:

- Victoria line: new trains, track and signals which means faster, smoother and more reliable journeys by 2013: peak capacity increase 21%; journey time reduction 16%
- Northern line: peak capacity increase by 20%; journey time reduction of 18%, with completion date under review.
- Piccadilly line: improved timetable resilience already reduced waiting time by 25%; further enhancements with peak capacity increase of 24% and journey time reduction of 19%

Bus reliability

The bus network is currently the most reliable it has been since statistics were first collected over thirty years ago. In recent years, Quality Incentive Contracts for bus operators, central London congestion charging, improved bus priority and better service control have mitigated against the negative effect of traffic congestion. Bus excess waiting time has reduced by between 32% and 52% in the north sub-region boroughs in the past decade.

There will need to be continued review and development of bus priority measures, both on the highway and within new development sites.

The sorts of measures that could make a difference including

- Network planning
- Quality Incentive Contracts
- Bus Priority measures
- iBus delivering service control improvements



2.3.5: RETHINKING TRAVEL AND ENCOURAGING A SHIFT TO MORE SUSTAINABLE MODES

Rethinking travel incorporates a range of measures that seek to encourage a shift to more sustainable modes, including smarter travel initiatives, and to encourage opportunities to reduce the need to travel or make better use of the transport network, for example encouraging contra-peak flow travel. The first thing to understand is the nature of trips in London and the north sub-region.

Trips in north London

There are close to one million residents aged over five in the core boroughs of the north sub-region. North Londoners make up 14% of London's population and make 14% of London's trips, on average around 2.6 million trips per day, which is the lowest of any sub-region. The north London trip rate of 2.6 trips per person per day is equivalent to the London-wide average.

North London residents travel on average 15.3km per day, which is further than the London-wide average but less than south or west London residents. Total distance travelled per day is higher for the outer boroughs.

Car ownership is higher than the London-wide average in north London and it is forecast to have an additional 62,000 cars by 2031, the highest of all sub-regions, bar east London. Managing for this growth in car ownership is a significant transport challenge for north London.

Mode share in north London is generally typical of the London-wide average with 47% by car or motorcycle, 22% by public transport and 31% by cycling or walking. Cycling mode share in north London is low (1%) compared with the London-wide average (1.7%), although it is higher in Haringey at close to 2%. Car mode share is highest in the outer London boroughs of Barnet and Enfield, at around 50%. Given that Barnet also has a high level of projected growth (30%), this could be of concern if new Barnet residents had car ownership and travel habits akin to existing residents, leading to a forecast of 300,000 new trips, 40,000 extra cars and 137,000 extra car trips per day. Haringey is more typical of an inner London borough with higher public transport mode share (37%) and only 31% of trips by car. Mode share proportions for individual boroughs were provided in the Interim Report on Challenges and Opportunities

The total number of trips originating in north London is expected to increase by around 12% by 2031, with an additional 200,000 trips (between 7am and 7pm). Movement from the north to the east represents the greatest increase in inter-sub-regional trips, although in actual terms the increase is similar to that into the central sub-region.

Rethinking travel will therefore be vitally important to sustainably managing the forecast population and employment growth in north London and to achieving the mode shift challenge set out in the MTS.



RETHINKING TRAVEL TO SUPPORT SUSTAINABLE POPULATION AND EMPLOYMENT GROWTH

Smarter travel initiatives

Smarter Travel initiatives bring behaviour change techniques together with the transport planning of small-scale infrastructure schemes, designed to reduce the pressure on transport networks by influencing how, where and when people travel. Principal amongst those techniques, available to authorities, are workplace and residential travel plans which should be secured through the planning process (as required by the replacement London Plan). These provide the basis from which developers and occupiers can deliver behaviour change amongst residents, employees and visitors to new communities and workplaces from occupation. The targets and measures of these plans can be designed to reflect the opportunities and challenges presented by the specific location and the wider sub-region.

The Upper Lee Valley, Brent Cross/ Crickelwood and Burnt Oak/Colindale opportunity areas provide ideal opportunities for such activity.



Car-free and low-car development

In locations with high public transport accessibility and good connections to walking and cycling routes car-free and low-car housing developments can provide a feasible option. These are supported by on-street parking controls and restricting residents from on-street parking permits.

Encouraging further use of Car Clubs can help reduce this even more. TfL will be working with local authorities to support the further development of Car Clubs, including in the piloting of car clubs in non established locations and the promotion of low emission vehicles. To this end, TfL has worked with boroughs to finance the development of Car Club bays across London and to disseminate best practice. There is more detail on the potential for uptake of Car Club membership in terms of reducing CO₂ emissions in Chapter 6.



School travel programme

TfL's school travel programme makes a positive contribution to reducing peak road congestion at the AM peak, increasing mode shift to walking and cycling and reducing crowding and dwell times on the bus network serving schools. The programme is highly valued by schools and local communities. The 'school run' is a major contributor to congestion, particularly in the morning peak period. The programme has achieved significant mode shift amongst pupils (average 6.5% reduction in proportion of car journeys to school and with those in TfL's Accreditation scheme achieving up to 12.4% reduction in the proportion of car journeys).

Continued engagement with school children can additionally contribute to improvements in road safety and health, complementing road safety education and training and promoting active travel.



Other initiatives

Other established smarter travel initiatives such as promoting sustainable travel within businesses or providing scheme-specific travel information can be tailored and geographically targeted in order to:

- Add value to specific small-scale improvements to infrastructure, such as road safety engineering schemes;
- Help make best use of London's limited road space, helping authorities meet their Network Management Duties; or
- Reduce the scale, delay the timing, or remove the requirement for major transport infrastructure investment.

The targeted provision of smarter travel initiatives as supporting measures to the Barclays Cycle Superhighways provides an example of smarter travel adding value to small scale infrastructure projects. These initiatives were specifically designed to break down the barriers to cycling among the Superhighways' potential users and included free bike servicing, cycle training and cycle storage at commuters' places of work and homes in proximity to the routes.

Rethinking travel includes rethinking *why* we travel, and whether we need to make some trips at all. Encouraging people to switch to more active modes, for example to walk to the supermarket, could relieve pressure on busy public transport and road routes. However, this is not always feasible, and in these cases increasing use of online work and shopping opportunities could help relieve pressure on the north sub-region's busy transport network.



2.3.6: ROLE OF LAND-USE PLANNING IN IMPROVING EFFICIENCY

Role of land-use planning in improving efficiency

Integrating land use and transport infrastructure is an essential part of planning efficient and successful development. It is vital to ensure that necessary transport capacity and connectivity is provided in advance of or concurrently with new development in order to allow development to proceed. The location, scale, mix, phasing and design will impact on the relationship between demand and capacity and in doing so will influence the mode share and mode shift, trip generation and distribution, patterns of movement and accessibility by different modes. Investment in transport infrastructure increases the value and marketability of development while encouraging sustainability and successful place shaping.

Assessing the impact of new development on the transport network is an essential part of the planning process. Developers are required to prepare a robust up to date transport assessment and travel plan as part of their planning application submission. To assist in this process TfL has produced *Transport assessment best practice guidance (April 2010)* which is available on the TfL website. TfL has also prepared guidance on travel planning, freight, delivery and servicing and cycle parking to supplement advice to developers. It is important to engage in pre application discussions with local planning authorities, the Greater London Authority and TfL specifically on strategic developments to scope out the effects of development.

Planning permission will only be granted where the impacts of the development are adequately mitigated by the applicant in transport terms. A distinction may need to be made between referable and non-referable applications which may not be considered by the Mayor of London but may have strategic transport implications such as works close to the Transport for London controlled Road Network or Crossrail. Once a development has been robustly assessed it may be necessary or appropriate to include planning conditions and section 106 obligations including financial contributions by developers. TfL has an ongoing role with the local planning authority in managing the effects of development and this should be reflected in these control mechanisms.

The phasing of development and transport infrastructure is an important consideration in planning successful development. The effects of individual phases of development should be considered as this will assist in the effective management of demand and capacity of transport.

For larger developments or where there is significant growth expected the London Plan has identified a number of opportunity areas and intensification areas. It will be essential to assess how developments in these areas will integrate into the existing urban fabric and operate efficiently to minimise transport impacts. The London Plan highlights minimum homes and indicative job targets for each of these areas and in response a number of transport studies and supplementary planning documents are to be prepared by the Greater London Authority, local planning authorities and TfL.



2.3.6: Role of land-use planning in improving efficiency

The London Plan, borough Local Development Frameworks and associated supplementary guidance set out the level of planned future housing and employment growth. This must be accompanied by an infrastructure delivery plan which provides the evidence base to justify the level of growth proposed. Promoting mixed use development that reduces the need to travel and encourages walking and cycling as well as public transport must be central to preparation of transport policies. The following objectives should be applied which are reinforced by policies in the London Plan:

- Concentrating high density and high trip generating development where there is existing transport capacity, connectivity and accessibility, close to stations and existing centres
- Phasing development with transport infrastructure
- Requiring preparation of transport assessments and travel plans.
- Working with service providers to plan new services to support users
- Enhancing public realm and place shaping
- Having regard to all forms of public transport and interchange
- Encouraging walking and cycling by, for example, designing permeable routes through development and integrating these with existing walking and cycling networks
- Improving information for transport services and information within development sites for example, Countdown and SCOOT
- Promoting green travel planning measures including car clubs or car sharing
- Preparing delivery and servicing plans and construction management plans and maximising opportunities for sustainable freight distribution
- Ensuring land for transport is safeguarded
- Applying maximum car parking standards; meeting cycle parking standards; providing infrastructure for electric vehicles, disabled parking; and where appropriate supporting low-car or car-free development
- Securing financial contributions for transport improvements where appropriate



CHAPTER 3: ENHANCING THE QUALITY OF LIFE FOR ALL LONDONERS

Transport Strategy goal: Enhancing the quality of life for all Londoners

Transport can have a powerful direct and indirect effect on people's quality of life. Travelling can range from an enjoyable experience of speed and comfort to a frustrating one of crowding and delays. Since so much of the urban landscape is designed around the need to travel, including walking and cycling, thinking carefully about the design and architecture of transport interventions can improve the experience of travelling in the city.

Our travel can also have an impact on other people's quality of life: noisy or polluting vehicles can degrade the environment, while on the other hand by choosing sustainable modes or low emission vehicles we benefit the wellbeing of ourselves and others. The interactions between these issues are complex, but in many case solutions for one problem will benefit another.

This goal is comprised of five challenges:

- 3.1: Improving journey experience
- 3.2: Enhancing the built and natural environment
- 3.3: Improving air quality
- 3.4: Improving noise impacts
- 3.5: Improving health impacts



3.1: Improving journey experience

3.1: IMPROVING JOURNEY EXPERIENCE

Journey experience can be improved by reducing public transport crowding, improving public transport customer satisfaction and improving satisfaction for all road users, including drivers, passengers, pedestrians and cyclists.

3.1.1: IMPROVING JOURNEY EXPERIENCE FOR RAIL AND UNDERGROUND USERS

Forecast population and employment growth will put greater pressure on a public transport network that is already under strain. Overcrowding and delays can result in London becoming a less attractive prospect to employees, visitors and potential customers. In addition, crowding affects journey experience and hence people's quality of life. Despite the investment to increase public transport capacity, renew assets and improve reliability, problems will remain on the network, particularly on National Rail services with crowding on the Overground network from Barking to South Tottenham and on inner suburban services from Finsbury Park. Crowding will also remain on the Victoria and Piccadilly lines from Finsbury Park and on the Northern line into and south of Camden Town. Station crowding remains a problem at Finsbury Park, Tottenham Hale, Highbury and Islington and Camden Town. Bus passengers are considered in the next section under road users.



Potential measures to improve public transport journey experience

There are a range of measures in the MTS that seek to make the experience of travelling on public transport more pleasant, including better information provision, measures to make the journey more comfortable such as cooling the Tube, and measures to reduce crowding. Other measures that are relevant to the north sub-region including:

- Additional capacity and infrastructure improvements on rail and Underground services to reduce crowding and improve reliability
- Asset renewal, including new trains, to improve reliability and comfort
- Improved interchange and improvements to reduce station crowding
- Seamless journey information for all modes and options and integrated transport network planning
- Improved service levels, seven day railway (through infrastructure improvements and changes to maintenance practices on National Rail services)
- Improved customer service

3.1: Improving journey experience

3.1.2: IMPROVING JOURNEY EXPERIENCE FOR ROAD USERS, INCLUDING BUS PASSENGERS

On average, north London residents make around 2.6 million trips per day, of which 47% are by car or motorcycle, 15% by bus, 31% by walking or cycling and 7% by rail. Congestion and poorly maintained roads are uncomfortable and hazardous for pedestrians, cyclists and motor vehicle occupants. In addition, unreliability and delays waste time and cause frustration for car and bus users and freight. Measures to manage the road network and improve the urban realm and air quality will help make using north London's roads a more pleasant experience for all users.



Measures to improve road user journey experience, including bus passengers

- Encouraging people to use public transport, walking and cycling for short trips currently made by car to help alleviate congestion – smarter travel planning initiatives and supporting borough initiatives (see Sections 3.5.1 and 3.5.2)
- Other measures to smooth traffic including more SCOOT technology, minimising the impact of planned works and unplanned events and developing the road network where appropriate to contribute to more effective management of the road network. Also supporting boroughs with aspirations for traffic calming measures
- Measures to improve reliability and the provision of live information to help improve road user satisfaction
- Smoother traffic flow as a result of road and junction improvements at Henlys corner and Bounds Green (see sections 2.3 and 4.2)
- Information to improve journey experience (as part of short term commitments through iBus, real time information, 3rd party technology apps)
- Bus priority and other measures to improve bus journey times and increase bus user journey experience, including information provision

3.2: Enhancing the built and natural environment

3.2: ENHANCING THE BUILT AND NATURAL ENVIRONMENT

Enhancing the built and natural environment will require measures to enhance streetscapes, improve the perception of the urban realm and develop 'better streets' initiatives, as well as protecting and enhancing the natural environment.

The role of the built and natural environment in transport

The built and natural environment is often something which is overlooked with regards to transport, particularly in a city. Yet improvements to the spaces through which people move and spend time can make a journey more pleasant and places more vibrant. For instance, there are strong links between the quality of the built environment and levels of walking, cycling and public transport use.

In addition to improving the quality of spaces and increasing the economic vitality of places, improvements to the local environment can also increase levels of road safety and improve perceptions of personal safety in an area.

The scale of improvement can range from the general tidy up and decluttering of streets across north London to rethinking the traffic management in an area and recreating the street.

Improving north London's town centres

Working with the boroughs, MTS aims to develop locally agreed improvements that:

- Enhance the vitality of outer London, including improved accessibility to, and between, metropolitan town centres and a greatly improved urban environment within town centres
- Better integrate transport in town centres with local conditions

As with the rest of London, the places in north London are diverse and each will have differing needs for improvement and change. The typology of places in north London is shown over the page.

Whilst many of the measures will be determined locally by boroughs, there are some areas where numerous factors will need to be taken into account in determining how the "place" should operate, for example impacts on traffic, buses, taxis, retail etc. The Sub-regional Panels would enable consideration of strategic place issues and recommendations for future work.

Natural environment

The natural environment in north London ranges from residential gardens through to parks and wild spaces. North London benefits from extensive green space, particularly the Upper Lee Valley, Alexandra Palace and Hampstead Heath. Open spaces provide opportunities for exercise and relaxation and therefore contribute to health and wellbeing. The Strategic Walk Network, including the three Strategic Walking routes in the north sub-region, provides an excellent opportunity for access to green spaces.

Access to open spaces is vital to enhance quality of life. This is considered in more detail in Section 5.2.

The natural environment also provides opportunities for cycling for pleasure, with a number of Greenways in north London and canals, towpaths and waterways paths suitable for cycling.



URBAN REALM 'KEY PLACES' – TYPOLOGIES

TfL's Urban Design Department has embarked on an urban realm project to develop programmes of works for improving and transforming the urban realm of town centres across London. To date, three centres have had plans drawn up into urban realm case studies: Wood Green, Romford and Kingston.

A typology of places has been developed so that the treatment set out in these case studies can be targeted to centres with similar characteristics. The typologies reflect both the physical form of the place, and current transport provision, as set out in figure 3.1. The typologies and case studies will help boroughs by providing a toolkit for urban realm and identifying lessons that can be learnt from locations with a similar typology.

Wood Green is type A2 (a linear centre accessed by tube, bus and car) and is representative of issues facing London's local high streets. The other two case study centres, Romford and Kingston are both C1 types (constrained centres accessed by rail, bus and car) though each has different issues to solve.

In the north sub-region, other type A2 places, for which the recommendations at Wood Green could be applied include High Barnet, Cockfosters, Colindale/ Burnt Oak, Edgware, Finchley, Mill Hill East, Whetstone and Angel. Enfield Town is a type C1 place and may benefit from lesson identified in the Romford and Kingston case studies.

The work undertaken realises that not all type A, B and C places are the same. The next three case studies will consider type B examples. These will be made available to boroughs. This will be of advantage to type B places, including Archway and Tottenham Hale, in identifying urban realm improvements and schemes such as the removal of one-way gyratories.

Better Streets

Better Streets outlines a generic approach applicable within all key places, delivering urban realm improvements in a phased viable way ('The Golden Thread'). This 'long term vision' approach utilises both maintenance and other public/private funding as and when it becomes available. The key principles of Better Streets are

1. Understand the current and future function of the place.
2. Imagine the place as a blank canvas to remove perceived barriers to the vision.
3. Reflect the character of the place
4. Go for quality of materials and workmanship. Do smaller parts of the project better by delivering gradually.
5. Define the degree of separation realistic for a safe future function.
6. Avoid over elaboration the majority of solutions don't need to draw attention.

Figure 3.1: Typologies of place and transport

Form	Transport
A Linear	1 Rail/ bus/ car
B Confluence	2 Tube/ bus/ car
C Constrained	3 Rail/ bus/ walk
	4 Bus/ car/ walk
	5 Tube/ bus/ walk
	6 Rail/ Tube/ car
	7 Rail/ car/ tram
	8 Rail/ tube/ bus
	9 Tube/ bus/ taxi

Figure 3.2: Distribution of typologies of places in London



Stage 0: street today



Stage 1: tidy-up



Stage 2: de-clutter



Stage 3: relocate/
merge



Stage 4: re-think
priorities



Stage 5: recreate the
street

CASE STUDY: WOOD GREEN URBAN REALM IMPROVEMENTS

Wood Green has historically been a major retail and commercial hub for north London. It is in competition with the shopping centre at Brent Cross and major centres in the sub-region, including Enfield Town. Haringey Heartlands is a key regeneration scheme, adjacent to Wood Green town centre, which will result in further demand for primary services such as transport, health, education and employment. The main focus of is activity centred on the High Road from Wood Green to Turnpike Lane. The Underground station is identified as a sub-regionally important interchange. A number of sites with specific problems were identified and the northern gateway to Wood Green and links to Haringey Heartlands are considered below.

Northern gateway

The area is dominated by a major signalised junction and Wood Green Underground station (picture 1 and 4 below), with little to orient visitors on leaving the station. It has a proliferation of pedestrian guard-rails and bollards and experiences congestion problems caused by narrow footpaths and clutter from street furniture. Wide carriageways also encourage high vehicle speeds and traffic dominates the space. There is also little cycle parking, which discourages cycle trips, and leads to bikes parked in inappropriate places. The public space in front of the Hollywood Cinema is underutilised. There is a lack of seating in public areas so people are not encouraged to spend time there and a lack of trees and vegetation creates a bleak and hard landscape.

Solutions

Pavements could be widened following a tidy-up, declutter and merging of street functions, including introducing shared car parking with additional bike parking. Vehicle speed could be reduced by reduced corner radii and tabling the junction, utilising a change in carriageway material/ colour to emphasis a change in priority and place, but also respecting vehicle loads. Finally, innovative ways of blending the required furniture should be investigated.

Heartland links

There is currently a circuitous and undefined pedestrian route from Haringey Heartlands to the High Road. The potential pathway is poorly lit and unwelcoming. There is also a lack of arrival space at the High Road adjacent to public services.

Solutions

A prioritised, level and legible pedestrian route could be created from the High Road to Haringey Heartlands. The use of green walls of planting would help to soften the environment and make it more welcoming. Finally, the route could be linked to a new space in front of the library for meeting and allowing rest points. Informal seating could be considered for this area.



SPOTLIGHT: TOTTENHAM HALE TRANSPORT IMPROVEMENT SCHEME AND URBAN REALM IMPROVEMENTS

The Tottenham Hale Masterplan identifies a number of improvements to the natural and built environment necessary to maximise the potential for regeneration and to take full advantage of opportunities presented by planned rail investment. The redevelopment of Tottenham Hale gyratory is a critical part of the works here.

The Tottenham Hale transport improvement scheme would make the area more pleasant, and create a safer environment for passengers, pedestrians, cyclists, road users and the local community. It would change Tottenham Hale's one-way traffic system to a two-way traffic system, and create a new public square and bus station outside Tottenham Hale station. It aims to reduce the impact of traffic on the local area and allow for future traffic demands. This will enable the regeneration of the area, as outlined in Haringey Council's Unitary Development Plan and the London Plan.

The existing one-way system has high volumes of traffic and few pedestrian crossings. This can cause difficulty for residents to access their property within the one-way system. The Tottenham Hale bus station is at capacity and not all buses can stop there. Bus stops on the roads are not currently positioned in the most convenient place because of the one-way system.

The scheme is not just a road scheme. It will also provide better facilities for pedestrian and cyclists and improved footways on the road. The new bus station and public square would be at the heart of the proposed new urban centre for Tottenham Hale. The scheduled completion date is 2014. The transport improvement scheme is separate to any proposals for Tottenham Hale Underground and National Rail station.

A funding package was in place prior to the Government's spending review announcement and the removal of the London Development Agency's budget. Discussions on funding are underway.

Figure 3.3: Maps showing current and proposed lay out for Tottenham Hale gyratory



3.3: Improving air quality

3.3: IMPROVING AIR QUALITY

Reducing air pollutant emissions from transport will improve air quality and contribute to meeting EU air quality targets.

Why is air quality important?

Transport is a major cause of exposure to harmful air pollutants. Poor air quality can cause serious health problems and reduces quality of life. Its impacts are most severely felt by vulnerable people including children, older people and those with existing heart and lung conditions.

Two pollutants cause most concern within London: particulate matter (PM₁₀) and nitrogen dioxide (NO₂). PM₁₀ can aggravate existing respiratory and cardiovascular conditions such as asthma whilst high concentrations of NO₂ can cause inflammation of the airways, and long term exposure may affect lung function, aggravate other respiratory conditions and increase asthma symptoms. The health impacts of NO₂ are less well understood than those of PM₁₀.

While road transport contributes a large proportion of emissions in London (40% of emissions of oxides of nitrogen and 60% of PM₁₀ emissions), there are many different sources in London in addition to pollution from outside the region. However, local conditions, such as traffic mix and congestion, road layout, buildings and meteorology are all important factors. Additional action at the local level is therefore important in addition to action at the London-wide and national level.

Air quality in north London

Air pollutant concentrations are highest closer to central London, and alongside the main roads and motorways, in particular the M1, A1, A406, A10 and A5, but also around many of the main centres where a mix of traffic, industrial and commerce, and residential emissions, contribute to the elevated air pollutant levels. Growth and development in the opportunity areas present challenges in terms of balancing air quality management with economic and transport aspirations. In addition, strategic industrial areas in the north including Tottenham Hale, Blackhorse Lane and Great Cambridge Road may result in higher movements of HGVs and LGVs, or increased industrial emissions – the potential air quality impacts associated with these increases need to be sustainably managed.

Figure 3.4: Predicted annual mean PM₁₀ concentrations in north London in 2011



Figure 3.5: Predicted annual mean NO₂ concentrations in 2011

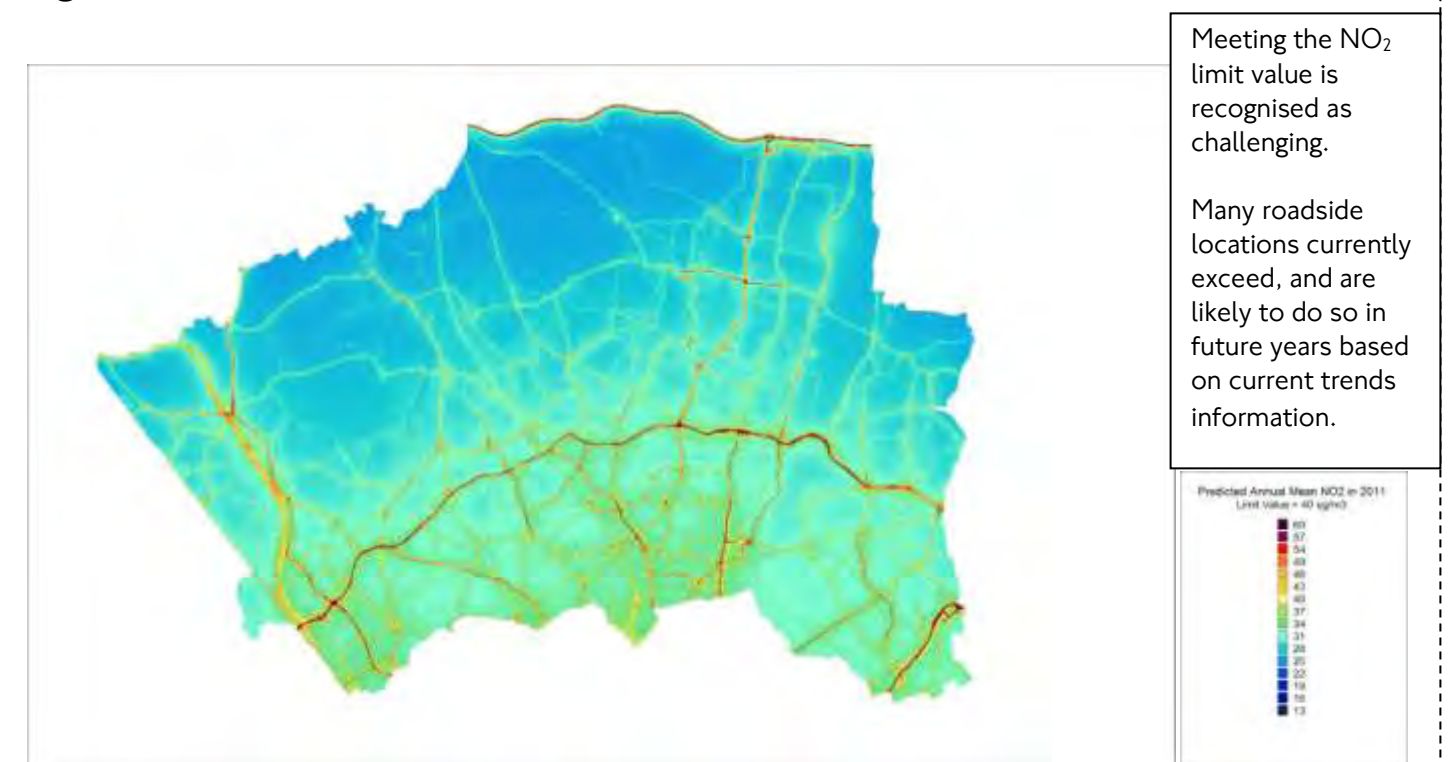
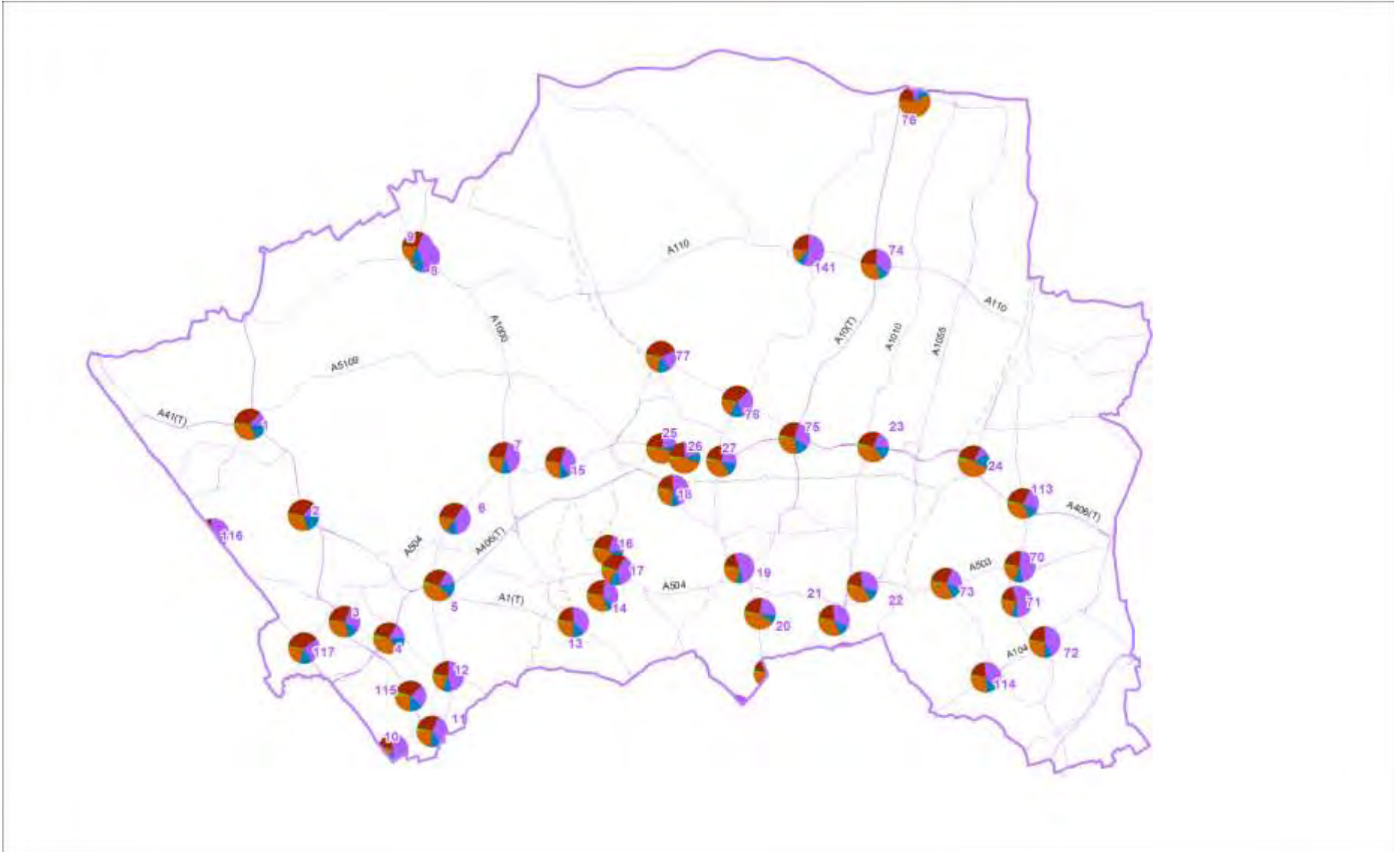


Figure 3.6: Relative contribution of road transport vehicle types to NO_x emissions in the north sub-region



TfL modelling indicates that the north sub-region will meet the EU targets for PM₁₀ in 2011. PM₁₀ emissions from buses in London have been reduced by over 90% in recent years. However, it is forecast that there will be a number of locations that may not meet the NO₂ targets in 2015, a problem shared with other cities in the UK.

The proportion of NO_x emissions from each vehicle type varies across the sub-region and reflects the traffic make-up. On a number of locations along the A406 and at the A10/ A1055 Bullsmoor Lane, freight vehicles, in particular HGVs, emit over half of road transport NO_x emissions. Comparatively, at Enfield Town, Walthamstow and Golders Green, buses emit over half of road transport NO_x emissions.

The nature of air quality focus areas are affected by the contribution of emissions from cars, taxis, buses, LGVs and HGVs, which are in turn influenced by factors that include:

- Whether it (or part) is on the TfL road network
- Whether it (or part) is on the London Freight Network
- Whether it (or part) is on a sub-regional corridor
- Local bus services and infrastructure
- Whether it is within (or partly within) a:
 - Town centre
 - District centre
 - Opportunity area
 - Area for intensification
 - Strategic industrial location
- Whether it is identified as a congestion hotspot
- Estimated contribution of emissions cars, taxis, buses, LGVs, and HGVs to NO₂ and PM₁₀ concentrations.

Potential solutions must be tailored according to the needs of the area.

3.3: Improving air quality

The Mayor's Air Quality Strategy

The draft Mayor's air quality strategy (MAQS) proposes a wide range of policies to reduce the emissions from various sectors, including road transport, in terms of both PM₁₀ and NO₂ in both 2011 and 2015. Examples of the larger policy initiatives include the introduction of LEZ phase 3 for LGV operators, and a taxi age policy is proposed in order to reduce emissions in future years from this source.

In addition, the strategy recognises that it is essential to capture the benefits of other long term proposals as outlined in the 20 year MTS. For example mode shift to 'active modes' will be encouraged through:

- Further promotion of work and school travel plans
- Better information for walking including event toolkits
- Improved and more inviting public spaces
- Cycle Superhighways
- Event days to encourage cycling

Other measures outlined within the strategy that have wider transport benefits include:

- Smoothing traffic through better traffic management and street works coordination through measures including the London Permit Scheme
- Focusing on incentivising the adoption of the cleanest vehicles and new technologies including electric and electric-hybrid cars
- Freight Delivery and Servicing Plans that are being promoted by TfL to reduce unnecessary freight mileage and increase freight efficiency
- Maintaining and increasing public transport mode share and reducing NO_x emissions from buses.

In addition to the overall strategy to improve air quality, additional measures may need to be considered to help reduce emissions locally and tackle poor air quality in focus areas. These may assist in reducing pollution levels further as they may reduce emissions, improve design and urban realm through planning, and help to reduce exposure to poor air quality. A toolkit has been developed to help identify these potential measures.

The toolkit provides a list of the potential options available to TfL and boroughs that may be suitable to help improve air quality at priority areas. The toolkit includes specific local measures and wider demand management solutions to reduce traffic flows, and smooth traffic and reduce congestion. However, the management of all different road transport modes in order to reduce contributions to emissions is important including increasing cycling and walking options, managing freight, and providing alternative forms of transport. The many options will vary within each site, depending on other local constraints, and may also be linked to planning and development related options, and potential options may not be suitable in all locations.

Toolkit

Local measures

- Adjustment or removal of traffic lights
- Shared spaces
- Access restrictions
- Effective policing of red routes
- Toll roads
- Restrictions on car parking
- Vegetation
- Access control/ clear zones
- Local LEZs
- Re-routing and road hierarchy
- Roadside emissions testing
- Urban Traffic Management and Control

Traffic related measures could include:

- Anti-idling while parked
- Awareness raising
- Cleaner fuelled vehicles
- Development of walking and cycling
- Fleet management and cleaner fuels
- Land use planning
- Parking management and charging

Modal measures

- Deployment of cleaner buses
- Adjustment or removal of traffic lights
- Effective policing of red routes
- Extension of the Freight Operator Recognition Scheme (FORS)
- Maintain and increase public transport mode share
- Reduce NO_x emissions from buses

Longer term options

- Modification of London-wide LEZ or local LEZs
- Road user charging

3.4: Improving noise impacts of transport

3.4: IMPROVING NOISE IMPACTS OF TRANSPORT

Noise impacts of transport

Noise is a quality of life issue because it can significantly affect health and wellbeing through annoyance, anxiety and sleep deprivation and associated cardiovascular disease.

Survey data shows that, as with the other sub-regions, the greatest cause of disturbance from transport related noise is traffic on the roads, followed by roadworks. These proportions are similar to the London average.

There is a higher than average proportion of noise disturbance from works on rail and tube, rail and tube services, and station announcements.

Disturbance from air transport is very low, and significantly lower than the other sub-regions. However, survey data shows north residents are least satisfied with transport noise.

Measures to address noise impacts of transport

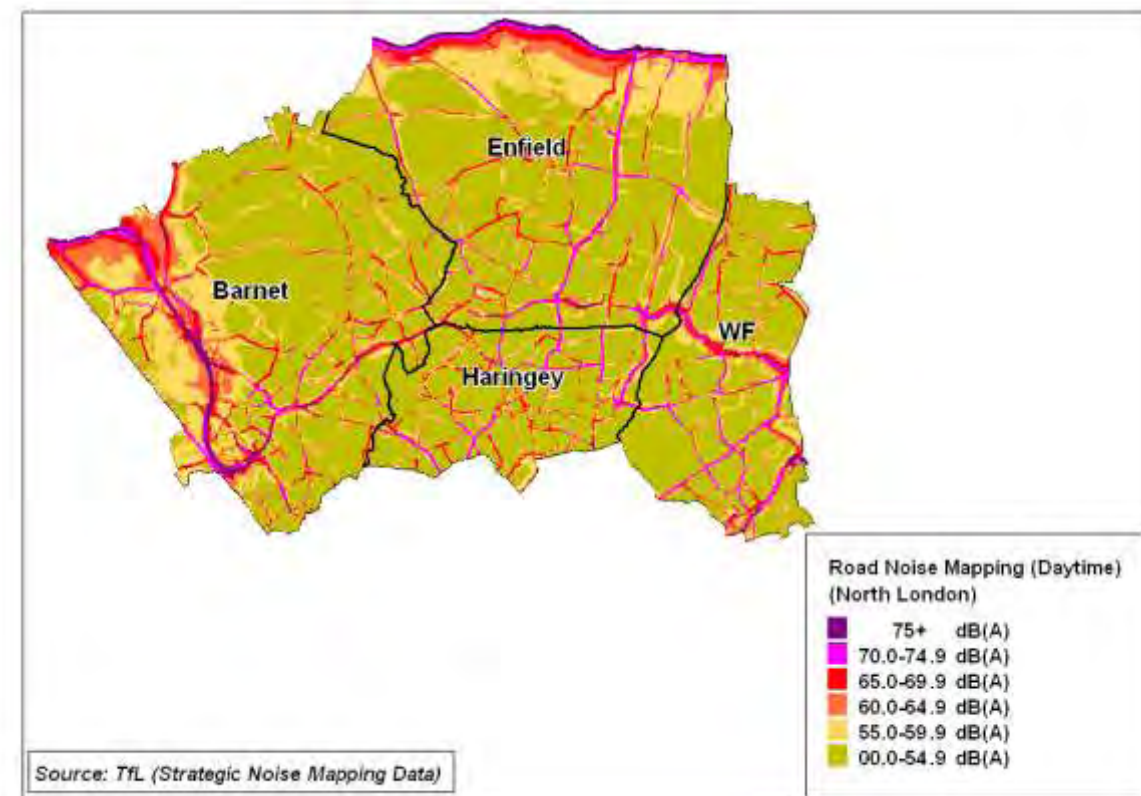
North London would benefit from measures targeted upon populations closest to exposure to road noise, in the vicinity of the M25 and M1.

In order to address noise disturbance from the rail network, further work should be undertaken to identify locations where noise from National Rail and Tube services and station announcements are most problematic.

Road traffic noise map

Road noise mapping shows noise levels are particularly high along the M1 and M25 corridors in Barnet and Enfield. High noise levels extend a significant distance from these roads. In addition, noise levels are also high along the A406 North Circular, particularly at Henly's Corner, and through Waltham Forest. Noise levels are also high along the A10 running north-south through Enfield.

Figure 3.7: Daytime road noise map



3.5: IMPROVING THE HEALTH IMPACTS OF TRANSPORT

Transport and health

Transport is a key determinant of health and wellbeing. It affects both physical and mental health in several ways with direct effects, for example through road traffic accidents, and indirectly through air pollution emissions which are harmful to health.

Conversely, transport also offers opportunities for physically active transport – walking and cycling – which provide clear health benefits by reducing the risk of developing heart disease and diabetes. Nearly one in 10 early deaths in the UK is due to excess weight and obese people die on average nine years earlier. Shifting journeys from car to walking and cycling would also bring about an improvement in air quality, with associated health benefits.

In north London generally, Barnet performs best on wide variety of health outcomes, with Enfield having the greatest number of indicators of poor health. Long term illnesses, health problems or disability rates, mortality rate, cancer incidence and life expectancy at 65 are worse in the east of the sub-region with mortality rates in Haringey and Waltham Forest between 5-15% higher than the national average.

Obesity

Transport can play a key role in combating obesity by encouraging active travel through walking and cycling and improving access to sports and leisure facilities.

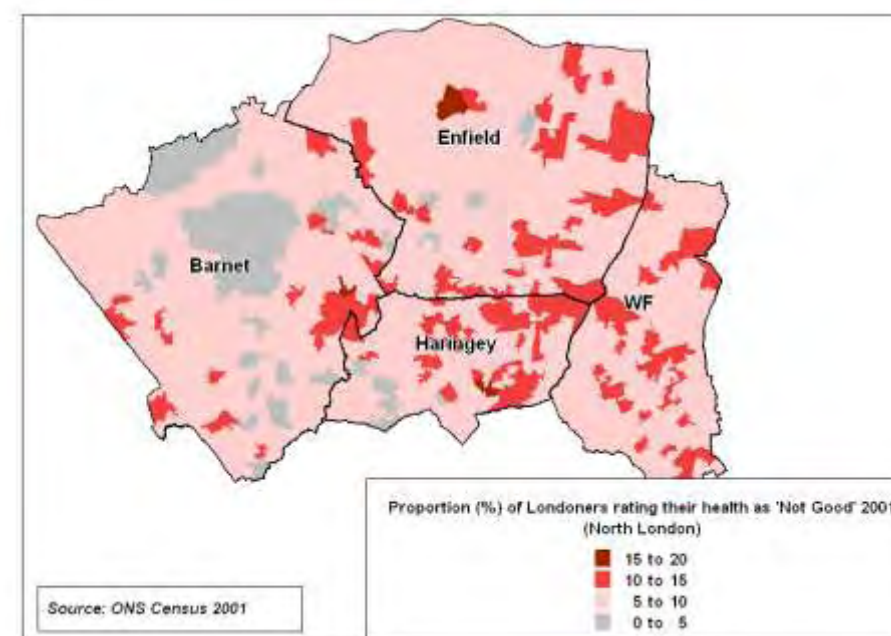
In 2007, around 22% of men and 27% of women in London were obese. The pattern of obesity in north London differs from that found elsewhere in London, where obesity is higher in inner boroughs. In north London, the highest proportions of obesity in children are found in Enfield (around 13% of 4-5 year old children and around 25% of 10-11 year olds), while Barnet has one of the lowest proportions of obese children amongst London boroughs.

Perceptions of health

Transport can affect a person's perception of their own health either positively by contributing to improved fitness through walking and cycling, or through access to health care, and negatively, for example where air pollution exacerbates existing health conditions.

In terms of perception of health, north London is equivalent to the London-wide average. However, there is significant variation within the sub-region in terms of the proportion rating their health as 'not good'. In general, locations where people rate their health as 'not good' tend to coincide with areas with the highest indices of health deprivation.

Figure 3.8: Proportion of Londoners rating their health as 'not good', 2001



Toolkit to improve health impacts of transport

- Address air pollution (see Section 3.3)
- Address road traffic noise (see Section 3.4)
- Improve access to health services, including working with the NHS to site health facilities in areas of good public transport access and where gaps in provision exist (see Chapter 5)
- Raise levels of active travel by encouraging walking and cycling (see Section 3.5)
- Reduce levels of illness and mortality through transport improvements to assist in regeneration of deprived areas and work with boroughs to address income and other inequalities (see Chapter 5)

3.5.1: FACILITATING AN INCREASE IN WALKING IN THE NORTH SUB-REGION

WALKING IN NORTH LONDON

Why focus on walking?

The MTS envisages a shift in mode share from to more sustainable modes, including walking. Shifting car and, to a lesser extent, bus trips to walking would have benefits on the transport network in terms of reducing congestion and crowding; improve air quality and reduce CO₂ emissions by reducing vehicle kilometres; and improve the health impacts from transport by encouraging more physically active transport. Walking is free, functional and reliable as a form of transport.

Context

Almost all residents of the north sub-region walk each day, even if the main form of transport is mechanised. Walking is also the most popular leisure activity in the UK, with significant opportunity for leisure walking in London provided by the strategic walking routes through the Upper Lee Valley.

On average, there were 810,000 walking trips per day in the north sub-region (30% of all modes) with an additional 326,000 mechanised trips of a distance and type that could be walked (12% of all trips in the sub-region).

Around 60% of households in the north sub-region have access to one or more cars. Furthermore, around 89% of the trips that could be walked, on the basis of distance and type of journey, are currently done by car. This is the highest proportion of any sub-region. Around 40% of trips that could be walked are less than 1 km.

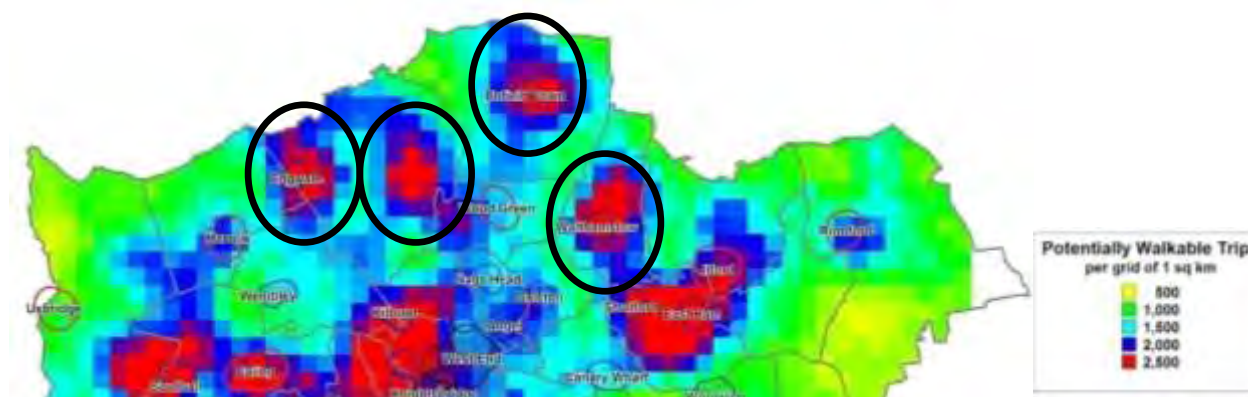
Potential barriers to walking

Survey results indicate that Londoners are discouraged from walking because of fumes, dirty streets, and feeling unsafe walking in their local area. More than half of Londoners indicated they would walk more if there were improved routes and they had more information about them. Other barriers include the relative ease of using mechanised modes and the overestimation of how long it takes to walk places.

Walking potential in north London

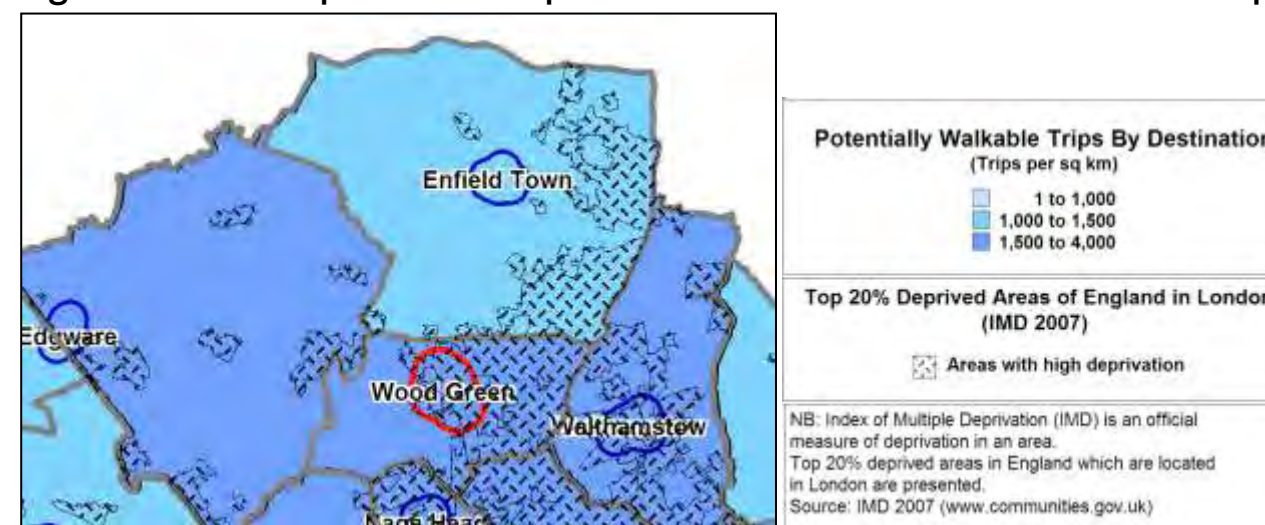
Current walk trips tend to be concentrated in the southern part of the sub-region with clusters in the outer boroughs around the town centres. Significant clusters of potentially walkable trips (those of a short distance and type suitable for walking) can be seen around town centres where there is already a relatively high level of walking (Walthamstow and Wood Green) and in places where there are currently no walking clusters (Enfield Town, Edgware and North Finchley).

Figure 3.9: Trips that could be walked by destination



Measures that could encourage walking, such as improving the urban realm and designing safer environments, could also have benefits in terms of regeneration and tackling deprivation. Figure 3.10 shows that both Haringey and Waltham Forest have a high index of deprivation but also a relatively large number of trips that could be walked. Measures to tackle deprivation are considered in Section 5.2.

Figure 3.10: Comparison of trips that could be walked with areas of deprivation



3.5.1: Facilitating an increase in walking in the north sub-region

PACKAGE OF MEASURES TO INCREASE WALKING POTENTIAL

Schemes underway in north London

There are a number of urban realm schemes underway that have potential to increase walking:

- Britannia Junction (Camden High Street)
- Tottenham Hale (by 2014, LB Haringey & LDA)
- Walthamstow Central to Queens Road Key Walking Route (by end 2012)

Other planned or aspirational schemes include

- Tottenham High Road Historic Corner (Great Spaces), (2012, LB Haringey)
- Golders Green (Great Spaces) (2020, LB Barnet)
- The High Street Life (Great Spaces) (2020, LB Waltham Forest)
- Dollis Valley Green Walk (2012, LB Barnet)
- Lordship Recreational Group (2012, LB Haringey)
- Harbet Road Towpath (2014, British Waterway & LB Enfield)
- Tottenham Hale Green Link (2018, LB Haringey & LDA)
- Ponders End (Open Spaces) (2020, LB Enfield)
- Walthamstow Reservoirs (2017, Thames Water, Lee Valley RPA)

Opportunities in north London

There are opportunities to maximise the effects of walking in north London when different characteristics are considered together.

- Brent Cross is forecast to have significant population and employment growth in a higher density environment – potential to embed walkability into environment
- As a borough Enfield has the highest levels of childhood obesity. There is significant walking potential in Enfield Town – links with school travel planning and walking buses
- There is significant potential to increase walking in Waltham Forest, particularly in town centres such as Walthamstow, and the Council is seeking to increase walking trips through promotion, public realm improvements and land use planning.
- There are also opportunities to optimise benefits in term of improved air quality and health and invigorate local town centres and local communities through support for leisure walking opportunities such as the Strategic Walk Network.

Preferred measures to improve walking in north London

- Key Walking Routes – this is the main approach advocated in terms of LIPs bids and work; bespoke to location and includes measures such as urban realm and public space improvements by removing street clutter, widening footpaths, improving natural surveillance, and bench installation to ensure resting places
- Roll out of Legible London way-finding scheme in outer London town centres and around transport hubs and key destinations
- Pedestrian safety and security measures, such as A406 Bounds Green improvements
- 20mph zones
- Changes to and greater provision of crossing facilities, such as Henlys Corner junction improvements
- Communication and promotion activities, such as the 2011 Year of Walking

Long term measures to increase walking

- Low-car and car free developments and areas
- Traffic management/ re-balancing areas (Sub-regional Panels)
- Partnership working



SPOTLIGHT: PILOTING LEGIBLE LONDON IN CAMDEN

The London Borough of Camden recognised that incomplete and uncoordinated pedestrian signage was a barrier to walking and exploring the borough on foot.

Camden realised the benefits that a comprehensive, London-wide system linked into the wider TfL modal family could offer, such as network congestion relief (highway and public transport), mode shift to walking and the provision of a co-ordinated information system to the public.

In partnership with Westminster, Camden requested to be and was successful in becoming one of the pilot areas for Legible London. Having completed the pilot implementation, Camden is now using council, LIP and business improvement district funds to expand Legible London coverage, ensuring pedestrians can access high quality wayfinding information in more locations across the borough.



3.5.2: Facilitating an increase in cycling in the north sub-region

3.5.2: FACILITATING AN INCREASE IN CYCLING IN THE NORTH SUB-REGION

Cycling is becoming increasingly popular in London, as a means of commuting, for more local journeys and for leisure. Furthermore, the Mayor is seeking to deliver a 400% increase in cycling trips and a 5% mode share across London by 2025. Cycling offers benefits in terms of more efficient use of road space, reduced emissions of CO₂ and air pollutants and lower costs associated with health. TfL survey work also suggests that cyclists and pedestrians spend more money in town centres than users of other modes (this information is available on the Boroughs Extranet). However, only around 1% of trips in the north sub-region are by bike, which is about half the London-wide average (1.7%). Furthermore, around 70% of people in the sub-region never cycle.

Cycling infrastructure in the sub-region

See figure 3.11.

- **Barclays Cycle Superhighways:** New cycle lanes running from outer London to central London. They aim to provide cyclists with safer, faster and more direct journeys to central London in order to encourage longer distance cycling trips, principally for work. Three of the 12 routes are planned for the sub-region, with two in Haringey and one in Barnet.
- **Biking Boroughs:** Biking Boroughs will be making a step change in their local transport delivery to improve their cycling environment and to raise the profile of cycling through local events and community initiatives. Biking Boroughs will be underpinned by strong local partnerships with the public sector and local community organisations. In the north, Haringey is a Biking Borough.

Figure 3.11: Map showing Biking Boroughs and Barclay Cycle Superhighways in the north sub-region



Cycling in the north sub-region

On average, around 27,000 trips are made each day by bike with an origin or destination in the north sub-region (0.9% of all trips) and 13,000 people cycle in the region every day. Of these, 41% are for work and 41% for shopping and leisure purposes. Only 4% of residents of the north sub-region are frequent cyclists (cycle three or more days a week), with another 4% cycling at least one to two days a week.

The mode share of cycle trips varies across the sub-region. Haringey has the highest cycle mode share at 2%, with Barnet and Waltham Forest having 1% and Enfield less than 1%. The neighbouring boroughs of Camden, Islington and Hackney have a higher cycling mode share of 3%.

The challenge for cycling in the sub-region will be to find ways of increasing the uptake in all boroughs, recognising and overcoming the barriers that currently lead to low adoption rates in some areas.

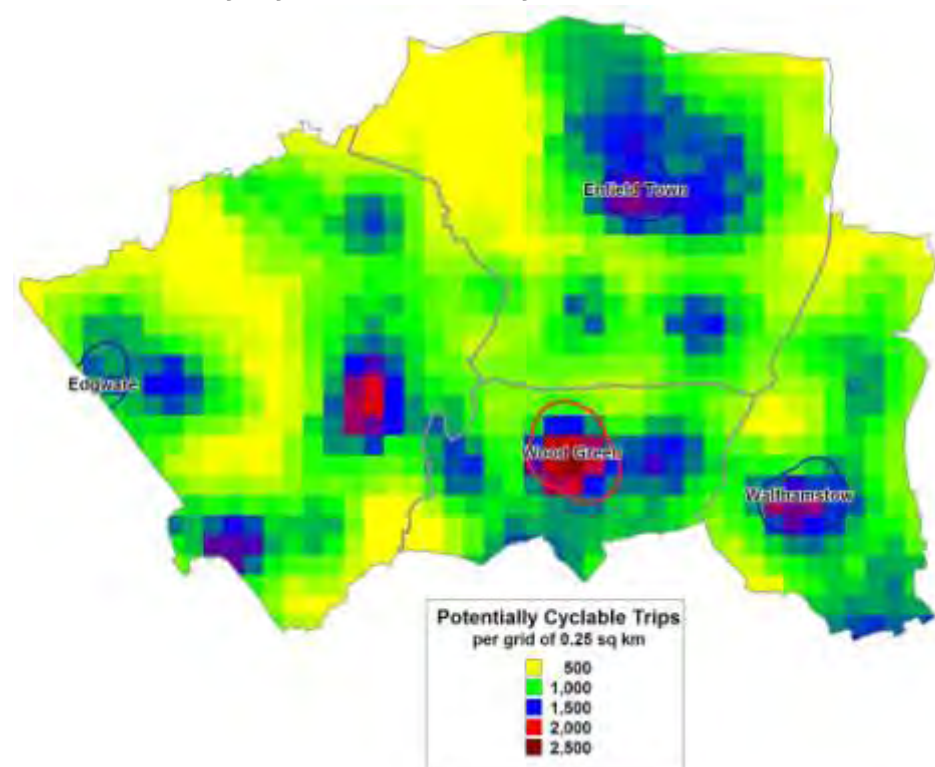
3.5.2: Facilitating an increase in cycling in the north sub-region

Potential to increase cycling in the north sub-region

There are 732,000 mechanised trips with an origin or destination within the north sub-region which are potentially cyclable*, representing 34% of all mechanised trips and 24% of all trips within the north sub-region. Figure 3.12 below shows the density of potentially cyclable trips in the north sub-region. There are significant clusters around Wood Green and the major centres.

Nearly two thirds of potentially cyclable trips are currently made by car, the majority of the remainder by bus. Of the trips that could be cycled, 21% are for work, 19% for education and 20% for other purposes.

Figure 3.12: Potentially cyclable trips by destination



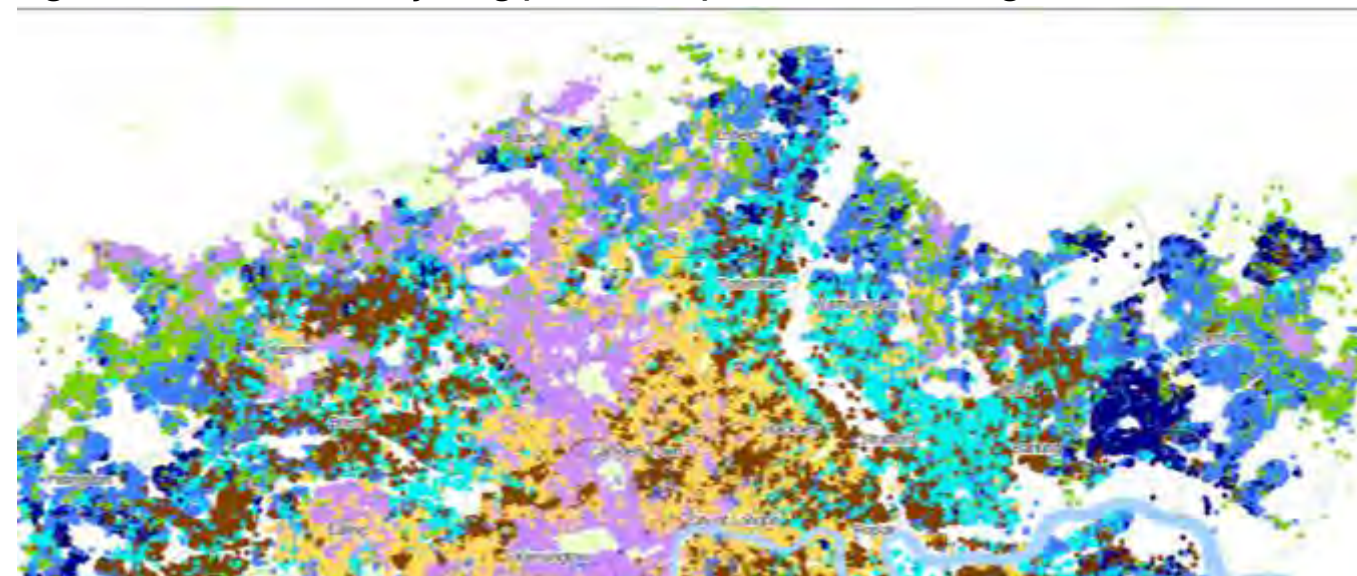
*Potentially cyclable trips are defined as trips currently made by other modes which could reasonably be cycled all the way (based on data from TfL's London Travel Demand Survey). All trips made by young children, elderly or disabled people, and all trips longer than 8km or which would take at least 20% more time were excluded, along with trips made at night or with heavy or bulky goods. The methodology and the results for each borough are available from the Boroughs Extranet.

Figure 3.13 presents a market segmentation analysis which can be used to identify likely target areas for cycling interventions. Each postcode has been colour coded to represent the marketing segment into which the majority of its residents fall. This allows a ready estimate of the propensity of its residents to cycle. The 'High Earning Professionals' and 'Urban Living' categories tend to have the highest propensity to start cycling.

It should be noted that the distribution and concentration of socio-demographic segments will constantly evolve due to the anticipated growth in the region.

Population and employment growth presents an ideal opportunity to overcome traditional barriers, since people moving into the area for work or housing will need to establish new travel patterns and behaviour.

Figure 3.13: MOSAIC cycling profile map of north sub-region



Combined potential cycle trips and market segmentation analysis

A map showing potentially cyclable trips made by people in the categories with the highest propensity to cycle, namely the 'Urban living', 'High earning professionals', 'Young families and couples', and 'Suburban lifestyle' segments by trip origin is also available.

For more information about promoting cycling and behavioural change please read TfL's 2009 Attitudes to cycling report and the 2008 Cycling in London report, to be published shortly. Please also see the [Cycle Safety Action Plan](#) for information on addressing this key barrier.

3.5.2: Facilitating an increase in cycling in the north sub-region

The new evidence (introduced on the following page) relating to cycling potential allows decision makers to target resources in the most cost effective way. It relies on getting the balance right between the following three categories of intervention:

Promote: These interventions are not focused on a particular area and are able to reach large numbers of people at relatively low cost. Examples might include awareness campaigns and training.

Focus: More intensive infrastructure based solutions focused on areas which have been identified as having the highest concentrations of potentially cyclable trips. Examples might include cycle lanes and cycle parking.

Intensify: Trial and introduce new and innovative measures, and monitor and share the results in order to promote best practice. Examples might include legislative change.

The appropriate approach will depend on local conditions, and getting the right mix is crucial:



TfL recommends that boroughs adopt the following approach to determine the correct interventions to use to increase cycling in a given area:

Step one: Review TfL's Cycling Potential analysis and market segmentation data for the area to identify target locations

Step two: Identify characteristics of market (e.g. density, size and existing trips) and select target group(s)

Step three: Review additional sources of evidence including customer research, behavioural research and local knowledge in order to identify barriers that might prevent the uptake of cycling, such as:

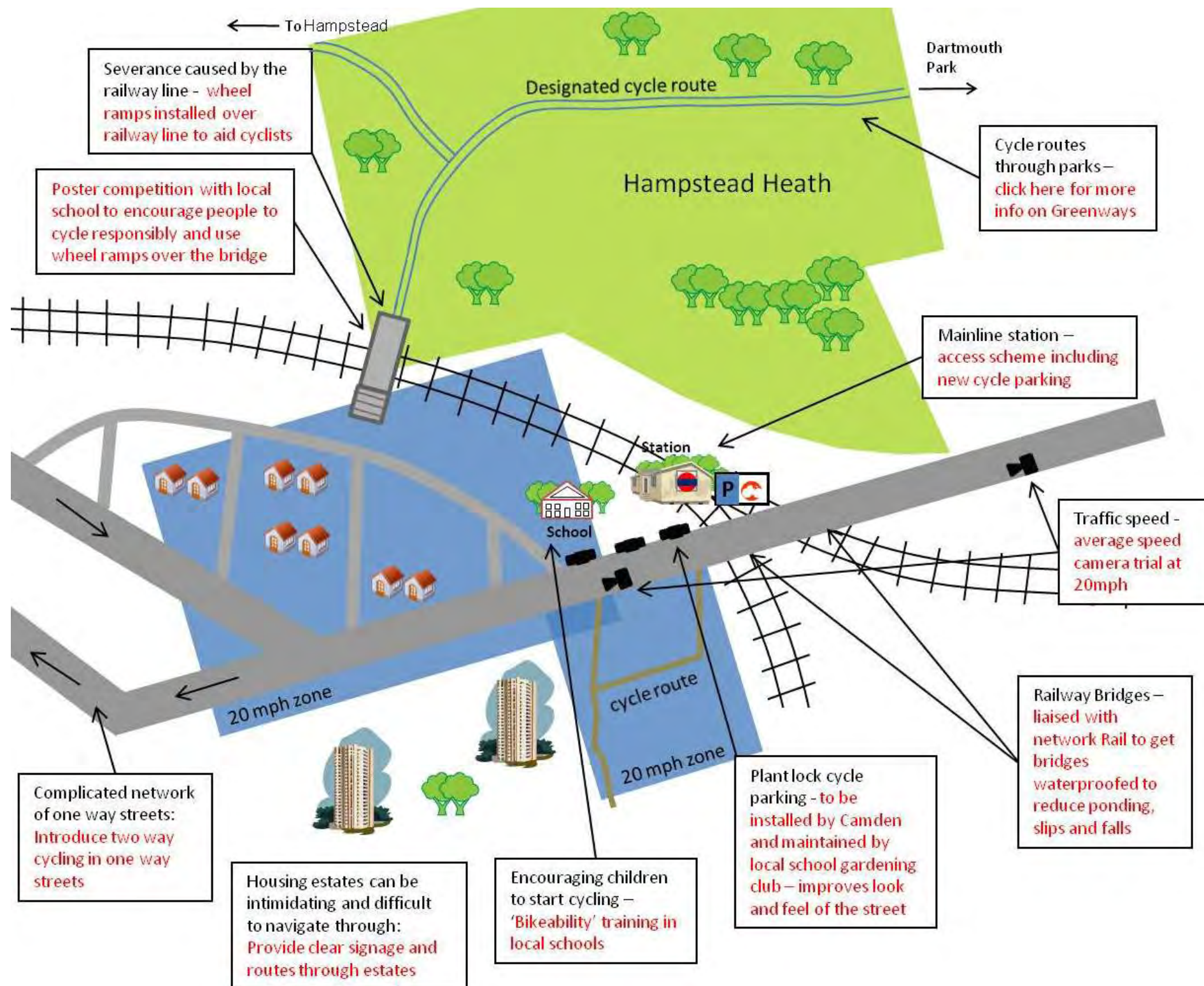
- Physical impediments
- Poor existing cycle facilities
- Perceived danger
- Adverse topography

Step four: Identify solutions, for example through workshops with TfL and local stakeholders (campaign groups, NHS trusts, charities etc) who understand the barriers which exist and ensure solutions are joined-up with neighbouring boroughs.



3.5.2: Facilitating an increase in cycling in the north sub-region

Potential application of 'focus' type schemes: Gospel Oak, Camden



There is a wide range of more ambitious measures which could be classified as intensification measures. These would require financial commitment from the borough and political leadership. Impacts should be monitored and results shared (as success may prompt others to follow).

Examples of potential intensification measures

- Following 'Superhighway' principles to provide wide, continuous cycle lanes and rationalise parking and loading on key routes to reduce the need to merge in and out of traffic. Implementing cycle lane markings through junctions.
- Creating areas where space is shared between pedestrians and cyclists. [Click here to see the results of the trial of a shared space path for pedestrians and cyclists in Regents Park.](#)
- Developing [Greenways](#) in order to provide peaceful, non-threatening and attractive conditions to cycle in a largely traffic-free environment and helping to encourage non-cyclists to get on their bike.
- Changing the Highway Code and road traffic regulations (working with TfL and the Department for Transport to pilot legislative change).
- Using volunteer rangers to investigate maintenance issues.

TfL can provide strategic support for scoping of monitoring and should also act as a depository for information when published. This allows best practice to be freely shared between boroughs and others.

This process will be aided by reference to the [London Cycle Design Standards \(LCDS\)](#), the Cycle Parking Delivery Plan (being produced by TfL by the end of 2010) and the [Cycle Security Plan](#).

CHAPTER 4: IMPROVING THE SAFETY AND SECURITY OF ALL LONDONERS

Transport Strategy goal: Improving the safety and security of all Londoners

London is a very safe place in which to travel. Traffic collision rates have been falling over a number of years, and public transport services continue to demonstrate very high standards of safety. Likewise, those travelling in London can be confident that their security is being maintained by the police and other stakeholders. Nevertheless, TfL, the British Transport Police, the Metropolitan Police and others concerned will continue to work together to ensure that all opportunities are taken to improve safety and security through new technology or emerging best practice.

This goal is comprised of two challenges:

- 4.1 Reducing crime, fear of crime and anti-social behaviour
- 4.2 Improving road safety
- 4.3 Improving public transport safety



4.1: Reducing crime, fear of crime and antisocial behaviour

4.1: REDUCING CRIME, FEAR OF CRIME AND ANTISOCIAL BEHAVIOUR

Measures to reduce crime rates and improve the perceptions of personal safety and security will address the challenge of reducing crime, fear of crime and antisocial behaviour.

London's transport network is experiencing historically low levels of crime. All modes of transport in London have experienced reductions in crime including bus, Tube, Docklands Light Railway (DLR) and National Rail.

The low levels of crime on the transport system have been achieved through a combination of:

- Visible and accessible policing
- Targeted and intelligence led enforcement
- Staffing of stations
- Improvements in design (incorporating new evidence on crime prevention)
- Introducing new technologies (such as CCTV), environmental improvements and listening to, and informing, staff and the travelling public

Analysis of crime on public transport in the north sub-region is presented in the Challenges and Opportunities document.

“The Right Direction”

Later this year TfL and its policing partners will publish ‘*The Right Direction: The Mayor’s Strategy to improve transport safety and security in London 2010-2013*’ (draft available on tfl.gov.uk).

The focus of the strategy is for all transport modes - public transport, walk, cycle or motorised vehicle. These priorities are likely to be relevant on both a local and sub-regional level and therefore the strategy should be read in conjunction with this sub-regional plan.

The objectives of the document are to:

- Reduce crime and antisocial behaviour on the public transport network
- Increase confidence in the safety and security of travelling in London
- Reduce the volume of Londoners injured on London’s roads as a result of criminal or antisocial behaviour
- Improve cyclists’ safety and security by tackling crime and antisocial behaviour
- Contribute to the step change in the walking experience through removing crime and the fear of crime as barriers to walking

The Right Direction provides more detailed commentary and analysis against each of these areas and identifies a number of actions to deliver on the objectives and achieve the targets within the document.



4.2: Improving road safety

4.2: IMPROVING ROAD SAFETY

Measures to reduce the numbers of road casualties will address the challenge of improving road safety.

Significant improvements in road safety have been achieved in London over the last decade. Potential activities for achieving further reductions in the number of people killed or seriously injured, notably in the context of increasing levels of cycling, are outlined by the MTS. These include public engagement to improve road user behaviours, specific measures to improve cyclist/ HGV safety, work related safety initiatives, road safety engineering, and road safety enforcement. The MTS also describes the potential benefits of lower speed limits and better speed limit enforcement including through equipping vehicles with 'intelligent speed adaptation' technology.

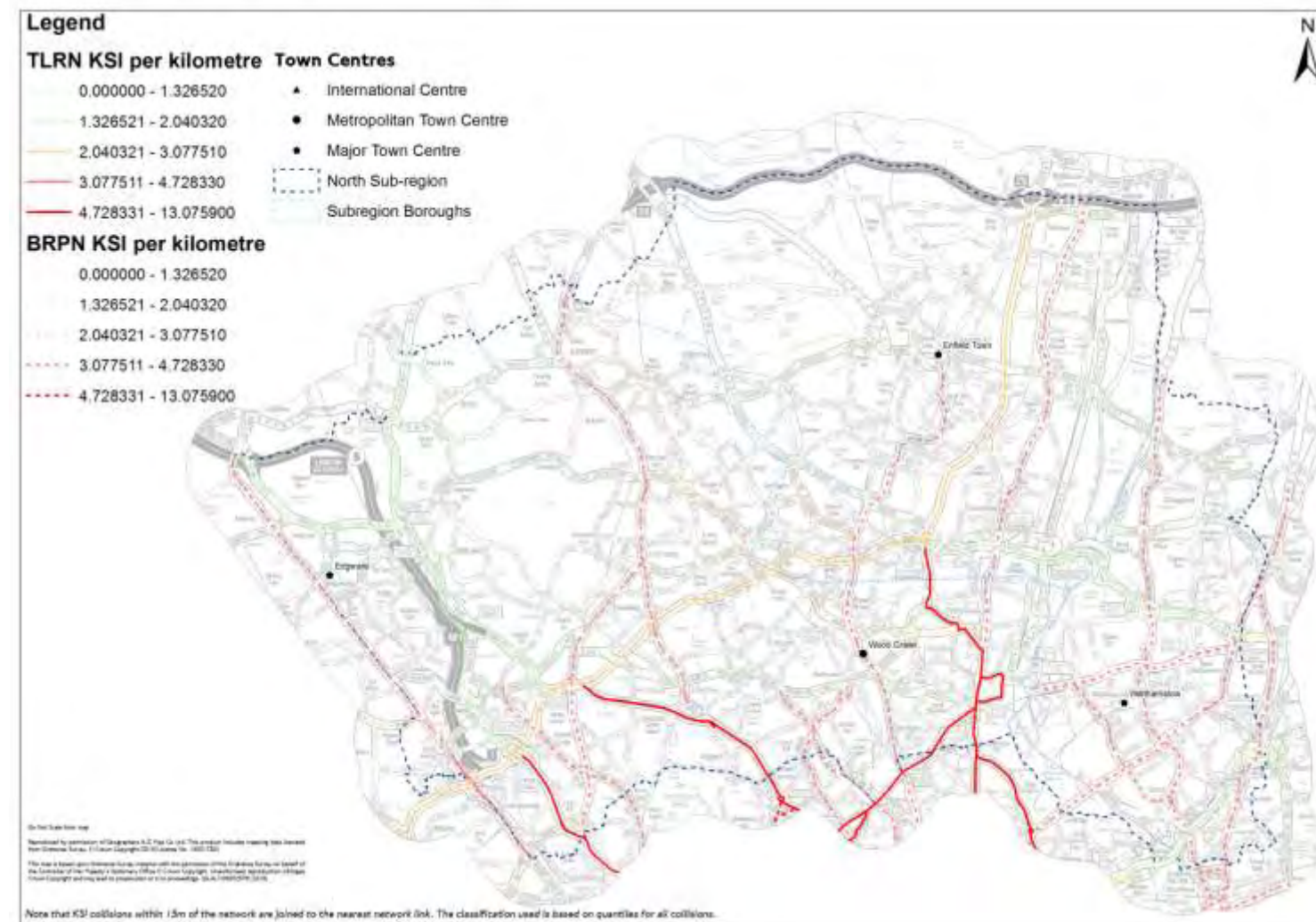
Motorcyclists account for over 20% of the number of road users killed each year, yet the number of journeys made by motorcyclists account for less than 1%. Motorcycling can therefore be considered the most dangerous mode of transport. Consideration should be given to motorcycle issues during the safety audit process of new schemes.



Safety improvements for A and B roads

Almost 40% of KSIs occur on 30 mph A roads in this sub-region. While reductions in speed limits are generally not appropriate for these roads, there is scope for targeted enforcement and public information campaigns to improve road user behaviour. The map below shows potential priority areas where these activities could be targeted.

Figure 4.1: Priority areas for improving road safety in the north sub-region



4.2: Improving road safety

The potential for 20mph zones on local roads to reduce the number of people killed or seriously injured (KSI) in road accidents

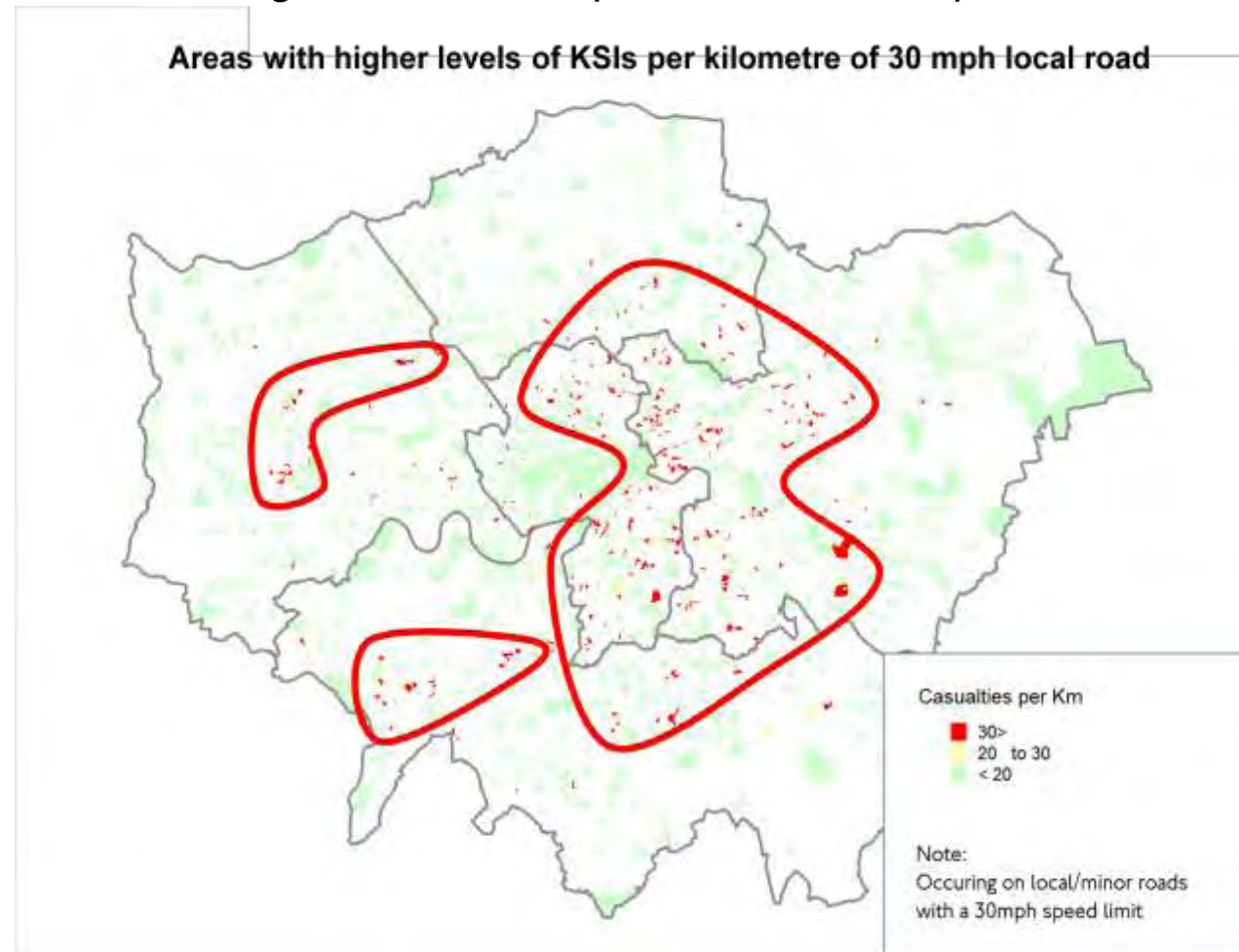
Research suggests that across London there are potential safety benefits from extending 20mph speed limits (with traffic calming features or enforcement) to residential roads. Analysis has shown that reductions in KSIs of about 28% can be expected.

The rate for KSIs on 20mph local roads is 0.05 per km. The equivalent rate for 30mph local roads is three times higher at 0.15 per km. These rates are lower than the London average for 20 and 30 mph local roads which are 0.07 and 0.20 KSI/km respectively.

If all local 30 mph roads were converted to 20mph with appropriate enforcement, and assuming a 28% reduction in speed on these roads were achieved, KSIs would reduce by 25 per annum, or 9% of the overall total for all roads in the sub-region.

The map below provides an indicative guide to broad areas of each of the sub-regions where further conversion of 30 to 20 mph roads might potentially be most effectively targeted.

Figure 4.2: Areas with higher levels of KSIs per kilometre of 30mph local roads, 2007-2009



Toolkit to improve road safety

- Road and junction improvements to improve safety for all road users, for example the A406 Bounds Green safety improvement scheme
- 20mph zones on residential roads
- Speed over distance cameras to enforce speed limits at locations with poor collision records
- Educate drivers and other road users, including children and other vulnerable groups on measures they can take to avoid injury on the road and be aware of other road users
- Improve driver training for lorry and other large vehicle drivers to ensure awareness of the dangers of these vehicles to cyclists
- Increase the number of lorries with sideguards or fitted with electronic warning devices that detect cyclists
- Advanced stop lines for cyclists to pull away within view of other motorists
- Enforcement of advance stop lines for use by cyclists



SPOTLIGHT ON A406 BOUNDS GREEN ROAD TO GREEN LANES SAFETY IMPROVEMENTS

The Bounds Green improvement scheme aims to improve the safety and security of all road users while maintaining existing traffic capacity. The scheme promotes the use of more sustainable transport modes, encourages traffic from residential roads back onto the main carriageway and protects and improves the local environment while enhancing community cohesion. The commencement of works also removes blight and uncertainty in the area, allowing properties alongside the road to return to long-term sustainable use.

The improvements will create a predominantly two lane dual carriageway with improved traffic flow at junctions, better pedestrian crossing facilities, new bus lanes, access improvements for people with visual and mobility impairments and new pedestrian and cyclist facilities.

This section of the A406 has a high incidence of accidents. In the three years to the end of December 2005, approximately 2.5 times as many accidents occurred on this length of A406 as would have been expected on routes with similar characteristics elsewhere in London. Some of the main causes of accidents include speeding traffic, conflicting traffic movements at junctions and vehicles turning into and out of side roads.

There are large numbers of pedestrians including shoppers, school children and bus passengers living in the area who need to cross the road and the scheme delivers this through signalised pedestrian and cyclist crossings at and between all the four major junctions. The design of the junctions and carriageways reduce congestion and improve journey time reliability for bus and other users of this major arterial road.

TfL's contractor commenced the main construction in May 2010 and completion is expected in spring 2012.

Figure 4.3: Map showing Bounds Green safety improvements



4.3: Improving public transport safety

4.3: IMPROVING PUBLIC TRANSPORT SAFETY

Measures to reduce the number of casualties on the public transport network will address the challenge of improving public transport safety.

The injury risk posed to passengers and staff on London's public transport network is already very low and there are no specific sub-regional issues. The 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 unpredicted events.

Targeted activity can include:

- Congestion and crowding management – such as station closures at busy times
- Measures to reduce passenger incidents caused by heat on the Tube, such as fainting
- Awareness campaigns, for example at Christmas regarding alcohol and public transport
- Management of special events, such as station closures to manage crowds or crowd control measures for football games. Making TfL aware of these events as soon as details are known is essential to ensuring the event is managed well from a transport perspective.



CHAPTER 5: IMPROVING TRANSPORT OPPORTUNITIES FOR ALL LONDONERS

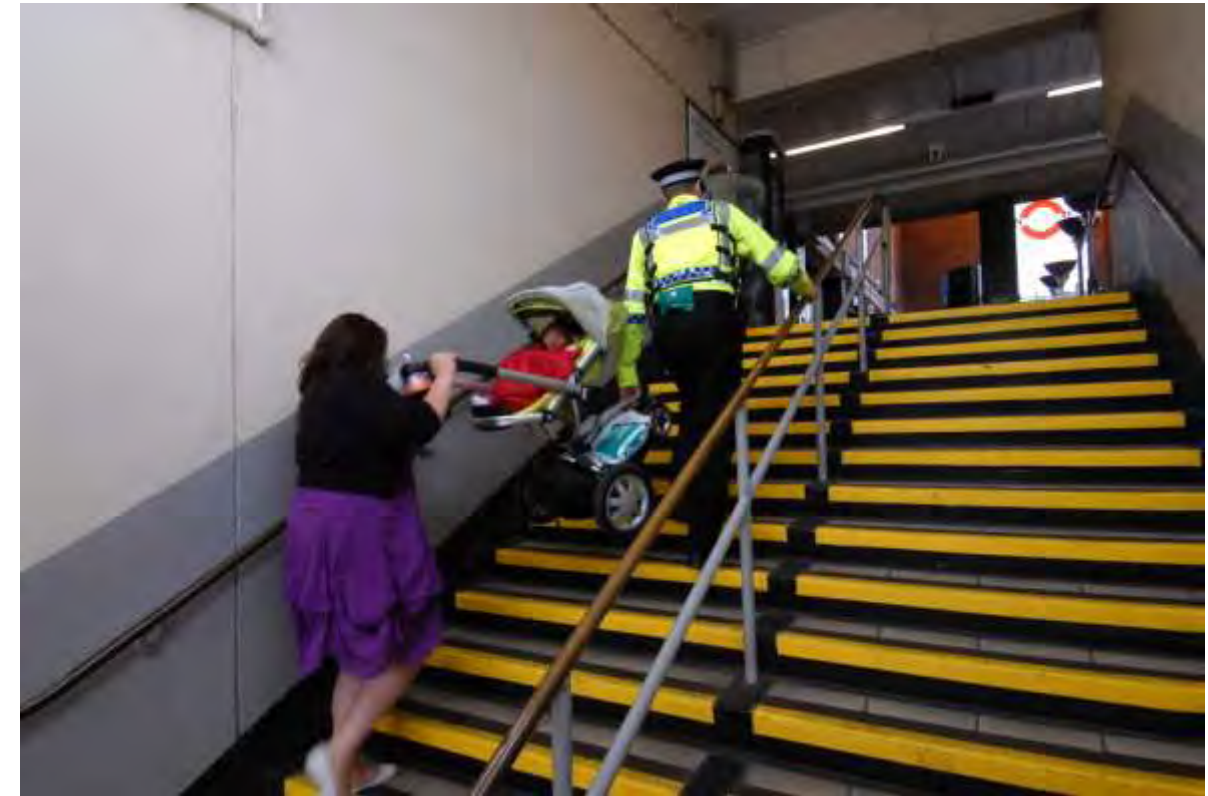
Transport Strategy goal: Improving transport opportunities for all Londoners

A key objective of the Mayor's Transport Strategy is to ensure that all Londoners have access to the wealth of opportunities the city offers, bringing benefits both to individuals and entire communities. To achieve this, TfL, along with boroughs and other stakeholders will need to consider the location and accessibility of services, jobs and amenities, identifying gaps and possible improvements. Places which are yet to be built present a particular opportunity for joined up planning. There will also be particular focus on the specific needs of those less able to access travel opportunities than others, and all stakeholders will need to work together to ensure that access to transport is not in itself a barrier to opportunities.

This goal consists of two challenges:

5.1: Improving transport accessibility

5.2: Supporting regeneration and tackling deprivation



5.1: Improving physical accessibility

5.1: IMPROVING ACCESSIBILITY

Improving accessibility has two key aspects, improving the physical accessibility of the transport system and improving access to services. This section addresses physical accessibility while access to services is considered in section 5.2 in the context of regeneration.

5.1.1: IMPROVING PHYSICAL ACCESSIBILITY

Current accessibility of rail and Underground network

The diagrams below shows current physical accessibility levels in London compared with public journey time difference to Bank between physically accessible and fastest route. These diagrams show that physical accessibility on the public transport network is poorest in inner north London. The differential between step-free provision in inner and outer London is mainly due to the physical nature of the rail network. Stations in inner London are more likely to be underground, making the cost and feasibility of installing step-free access particularly challenging. While accessibility is better in outer London, there are considerable pockets in Enfield and Barnet where the total journey time differential between accessible and the fastest forms of transport is greatest.

North London corridors:

- Corridor J – St Albans to St Pancras
- Corridor K – Potters Bar to Kings Cross and Moorgate
- Corridor L – Cheshunt and Enfield Town to Liverpool Street

Figure 5.1: Proportion of stations in London corridors with step-free access in 2010

• Proportion of stations with step free access in 2010

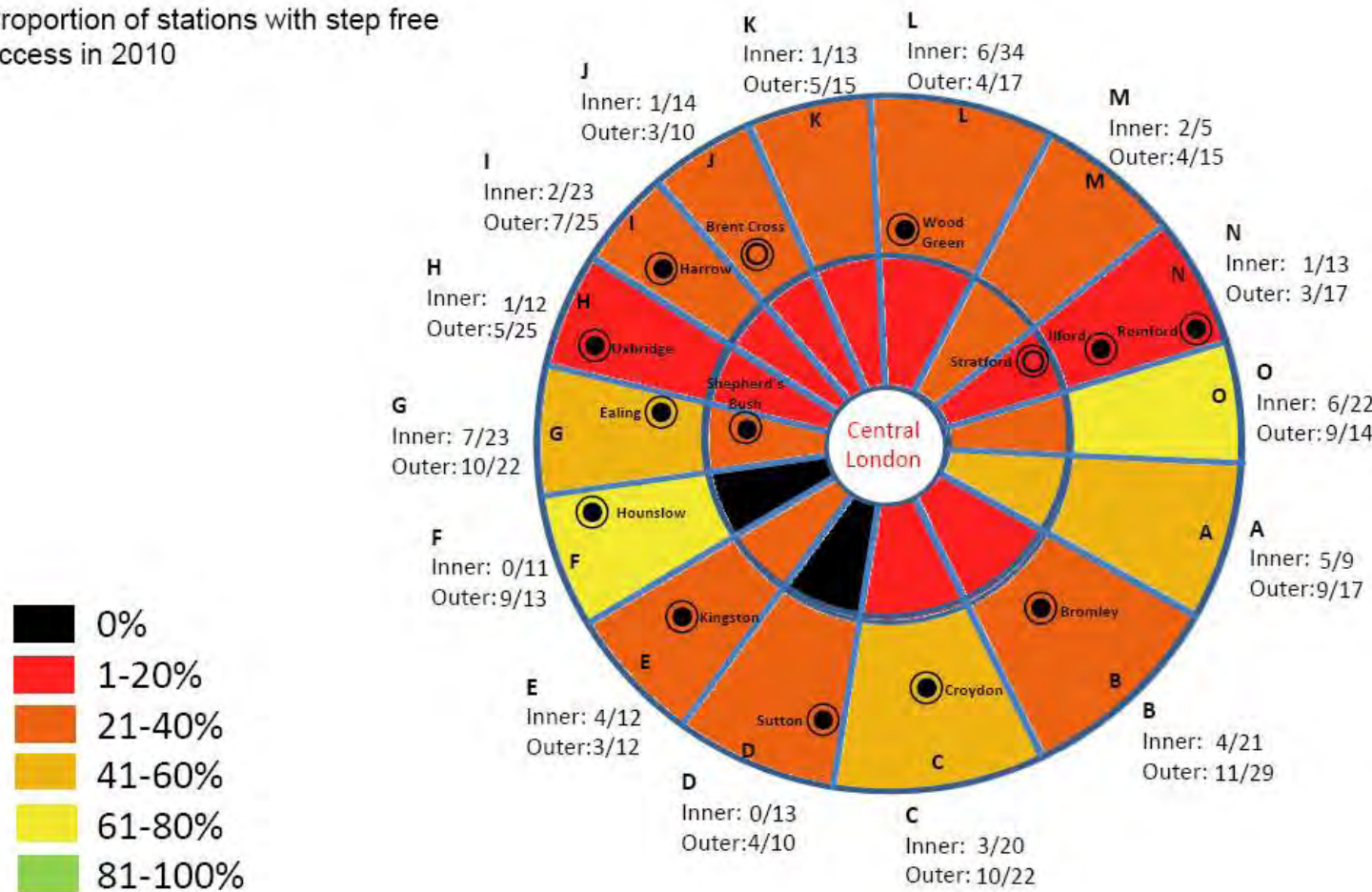
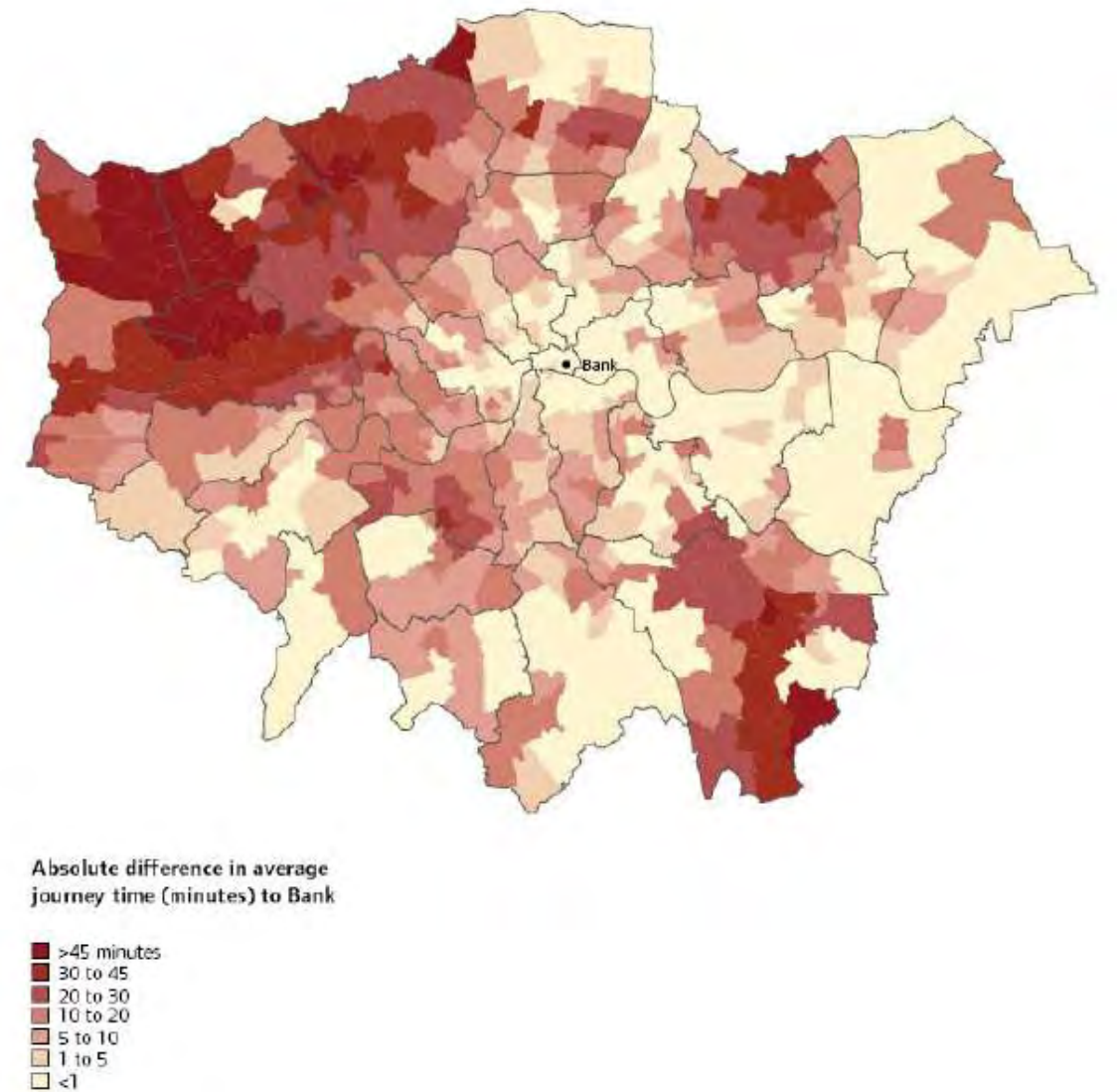


Figure 5.2: Absolute different in average journey time (minutes) to Bank using step-free access



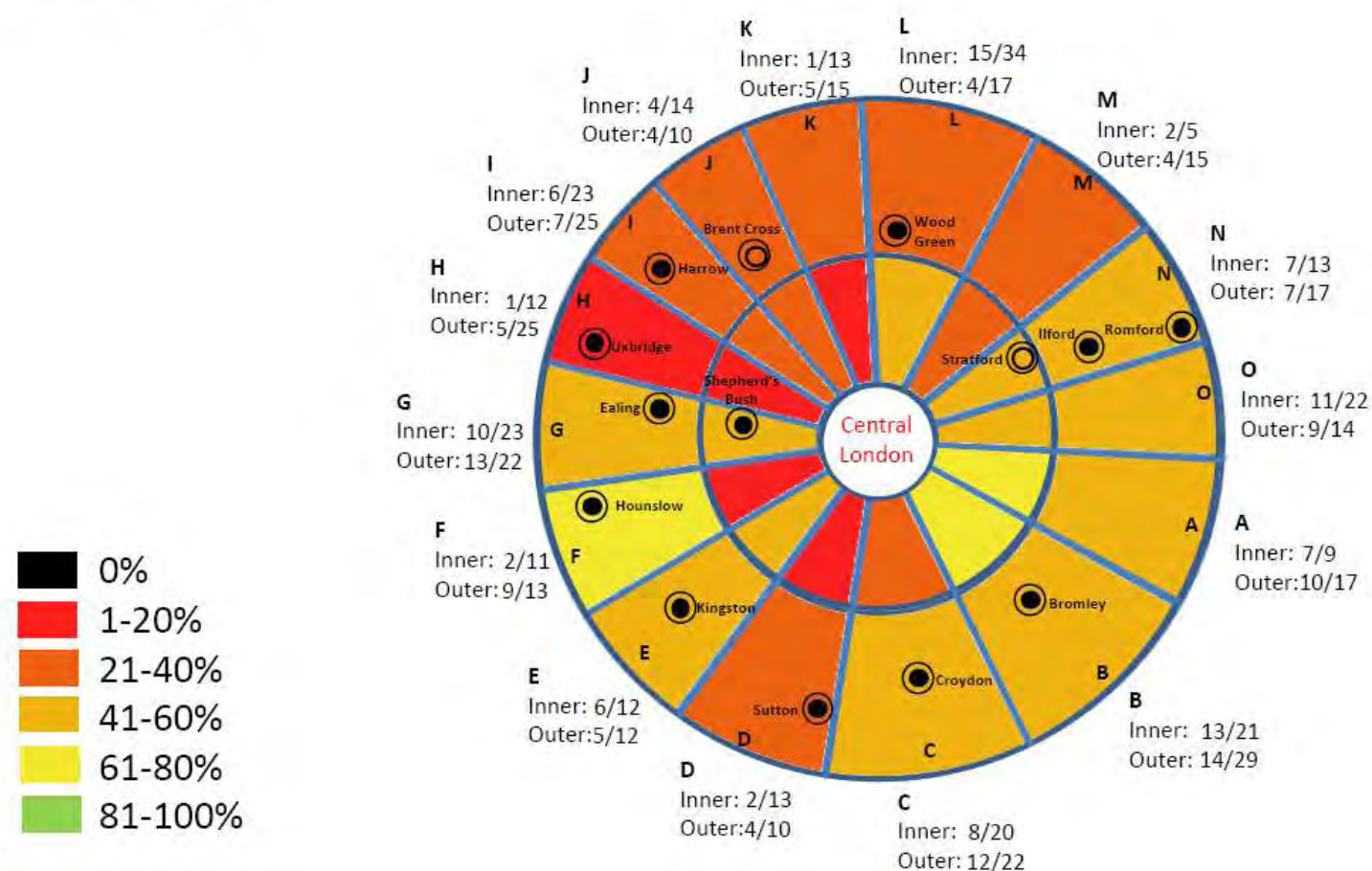
Future step-free access to stations

The committed investment in the Underground and National Rail will lead to marginal improvements in accessibility in north London to 2018. However, it could also be assumed that potential congestion relief schemes and work on strategic interchanges would increase the number of step-free stations. Examples of strategic interchanges in north London include Finsbury Park, Highbury and Islington, Hackney Downs/ Central, West Hampstead and Seven Sisters stations. Potential congestion relief schemes affecting London Underground stations in north London include Finsbury Park, Highbury and Islington and Camden Town stations.

The National Rail stations in the north sub-region that TfL is recommending are taken forward by the Department for Transport’s Access for All programme in order to increase the number of step-free stations in London are West Hampstead, Brondesbury, Hampstead Heath, Seven Sisters, Edmonton and Palmers Green. Potential improvements could include installation of lifts to platforms.

Figure 5.3: Proportion of stations in London corridors with step-free access in 2031 following planned funded and unfunded improvements

Reference case, strategic interchanges and congestion relief schemes



5.1.1: Improving physical accessibility

Physical accessibility involves the design and layout of all the main components of the transport network – stations, streets and vehicles

Measures to improve station access

- Including plans for physical accessibility in plans for station developments/ refurbishment and urban realm improvements
- Integrating step-free plans with car parking facilities – targeting improvements at outer London stations with significant parking facilities or introducing more parking at step-free stations
- TfL Interchange is working with National Rail to standardise information and wayfinding at major interchanges (for example, using Legible London format).



Measures to improve streets

Priorities for improving the physical accessibility of the local environment in north London are the streets around existing step-free stations with poor levels of accessible urban realm as well as around planned step-free stations.

Other priorities areas include places where trip levels are high.

Measures to improve streets access:

- Decluttering – removing unnecessary street furniture and guard railing
- Enforcing regulations regarding A-boards and commercial operations that extend out onto the public footpath
- Widening and smoothing footpaths
- Reducing speed limits
- Ensuring pedestrian desire lines are properly catered for
- Removing/relocating onstreet parking
- Improving the integration of footpath and road



Measures to improve vehicles

In the north sub-region there are occasions when people with mobility impairments or those with young children in pushchairs cannot board the busiest services. In some cases vehicle design options may assist.

Measures to improve vehicle access:

- Use franchise renewals to improve the suitability of vehicle design for passengers with mobility impairments
- Improvements to bus stops that do not meet accessibility guidance to maximise access to the bus network
- Awareness campaigns to improve passenger behaviour towards people with mobility impairments



Other measures to improve physical accessibility in north London:

- Information and marketing of upgrades and improvements – especially to groups with physical impairments
- Dial-a-Ride improvements

DOOR-TO-DOOR TRANSPORT SERVICES TO IMPROVE ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Door-to-door transport services are a crucial element in providing accessibility to opportunities and services for all by providing transport for people who find it difficult or impossible to use mainstream public transport. Door-to-door services are provided by Transport for London as well as a number of public and private service providers. Taxicard and Capital Call provided subsidised taxi and minicab travel in London for people with mobility impairments who have trouble using public transport. In addition, TfL services include Dial-a-Ride service.

Dial-a-Ride

TfL's Dial-a-Ride provides a vital transport service for people with permanent or long-term mobility impairments that make mainstream public transport services impossible or extremely difficult to use. It is therefore a crucial element in providing accessibility to opportunities and services for all people. Dial-a-Ride offers customers transportation to any destination within their local area and 2 years ago the service was centralised, allowing journeys to be made across administrative boundaries. Dial-a-Ride also offers a travel mentoring service whereby trained staff accompany customers on mainstream services in order to build up confidence for independent travel.

To improve the accessibility of this service, Dial-a-Ride have already embarked on vehicle replacement programme with 80 of the 358 strong fleet having been replaced to the new low floor, Euro 5 compliant type. A further 20 new vehicles are due to be introduced by the end of 2010. Further funding is required to upgrade the remainder of the fleet.

Other key accessibility improvements centre around communication technology, information provision and marketing. These include the following short, medium and long term measures:

Short Term

- Roadshow bus
- DVDs explaining Dial-a-Ride and the travel mentoring service – made available online and at events
- More liaison with boroughs regarding Dial-a-Ride services and borough-run travel mentoring services
- Publicising that passengers can now make cross boundary journeys

Medium Term

- Mobile data terminals (PDAs) for drivers instead of schedule sheets
- Service updates to customers by SMS
- Automated telephone booking

Long Term

- Internet booking system
- Real time information and two-way communication – passengers able to receive information about their dial-a-ride service before they arrive at a station/bus stop etc, and passengers able to let Dial-a-Ride know that they are running late.



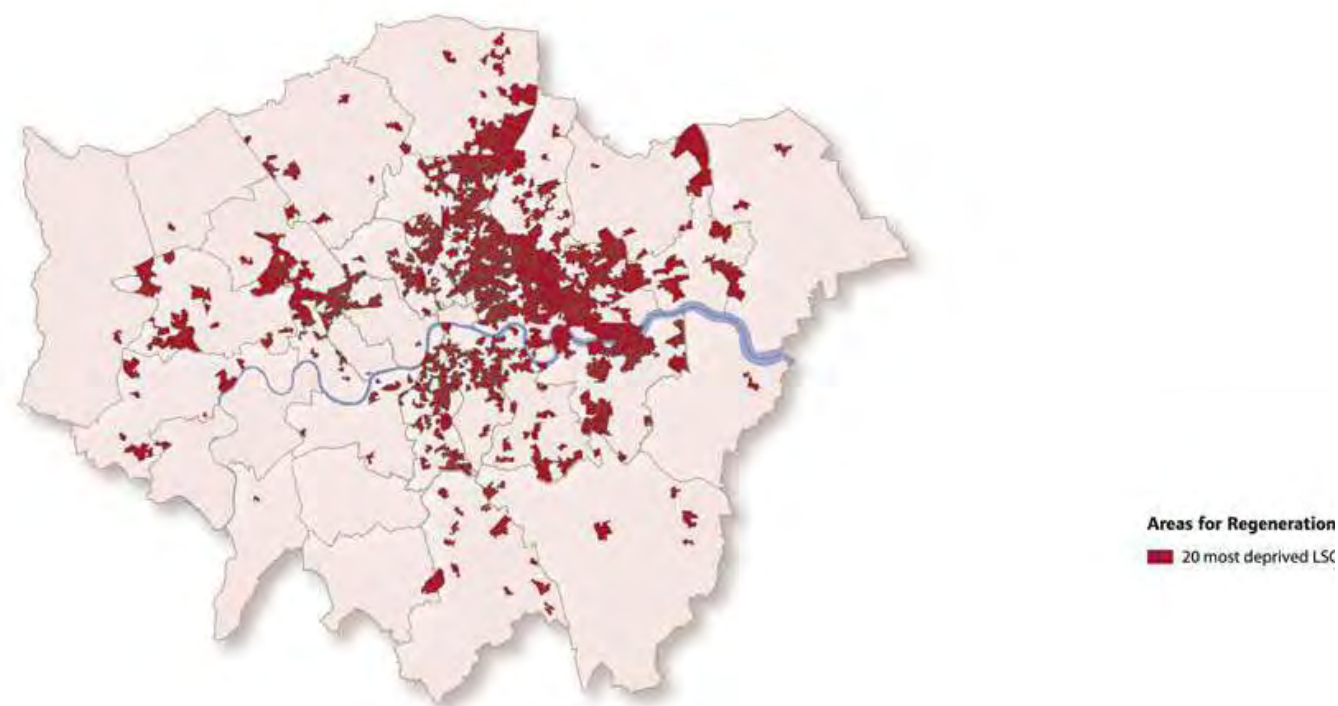
5.2: SUPPORTING REGENERATION AND TACKLING DEPRIVATION

Supporting regeneration

The London Plan identifies key areas of change. Opportunity areas reflect the capital's major reservoir of brownfield land with significant capacity to accommodate new housing, commercial and other development linked to existing or potential improvements to public transport, walking and cycling. Areas for intensification are typically built-up areas with good existing or potential public transport, which can support redevelopment at higher densities, but generally lower densities than the opportunity areas. As set out earlier, north London has three opportunity areas and three areas for intensification, which represent a significant share of the forecast population and employment growth for the sub-region.

Areas of regeneration reflect the 20% most deprived areas. These are areas where the Mayor will work with strategic and local partners to coordinate their sustained renewal by prioritising them for neighbourhood based action.

Figure 5.4: Map showing areas of regeneration in London



Source: Department for Communities and Local Government
ONS Super Output Area Boundaries.
© Crown copyright. All rights reserved.
Greater London Authority 100032379 (2009)

The London Plan Review Draft Consultation Plan (2009)

Tackling deprivation

The causes of deprivation in north London are multi-faceted and tackling deprivation therefore requires action in transport and in a number of policy areas by a number of different agencies. There is no clear correlation between deprivation and public transport accessibility. However, investment in enhanced transport can make a positive contribution to regeneration. Improving the quality of public transport services and providing better quality walking and cycling routes and facilities in deprived areas and addressing the reasons why people do not walk and cycle are among the essential steps in giving people the opportunity to access jobs and services.

Access to opportunities and services in north London

The overall level of access to opportunities and services across London is high, particularly when compared to other parts of the UK. This is in part due to the extensive public transport system in London, but also due to the high density of people and the services they need. However, when looking at a sub-regional level there are some areas with relatively poorer access as well as more general disparities between sub-regions.

In the north sub-region for example, access to schools and GP surgeries is generally very good in comparison with other sub-regions. However, access to open space is poorer with just under 80% of the population being within 15 minutes travel, which is poorer than all other sub-regions except south London. Around 90% in the north sub-region have access to 10,000 white collar jobs within 30 minutes while the proportion for blue collar jobs is much lower at around 60%. Figures 5.5 and 5.6 on the next page show employment access for the sub-region now and in the future.

IMPROVING ACCESS TO OPPORTUNITIES AND SERVICES IN AREAS OF SIGNIFICANT DEPRIVATION

Improving access to opportunities and services

Improving accessibility to public transport is principally the responsibility of TfL. However improving the access to opportunities and services requires the involvement of other stakeholders including service providers, developers and boroughs.

As with all regions, with the possible exception of central London, the level of access to public transport in the north sub-region is predominantly influenced by the “hub and spoke” nature of the town centre network. The areas of high public transport accessibility are associated with National Rail and Tube stations. However, there are also relatively high levels of car ownership and car mode share indicating the importance of cars to north London residents.

In some instances the level of access to public transport and services may be high but people do not use the public transport system or access local services. It is under these circumstances that other barriers to access, such as lack of knowledge, fear of crime or affordability, are likely to be more significant.

Figure 5.5 and 5.6 compare employment access for the sub-region between the current situation (in 2006) and that forecast for 2031. This shows that the more densely populated areas of the sub-region have greatest access to jobs and that the situation will improve, particularly around Wood Green and Brent Cross/ Cricklewood.

Figure 5.5: Employment access for north London (2006)

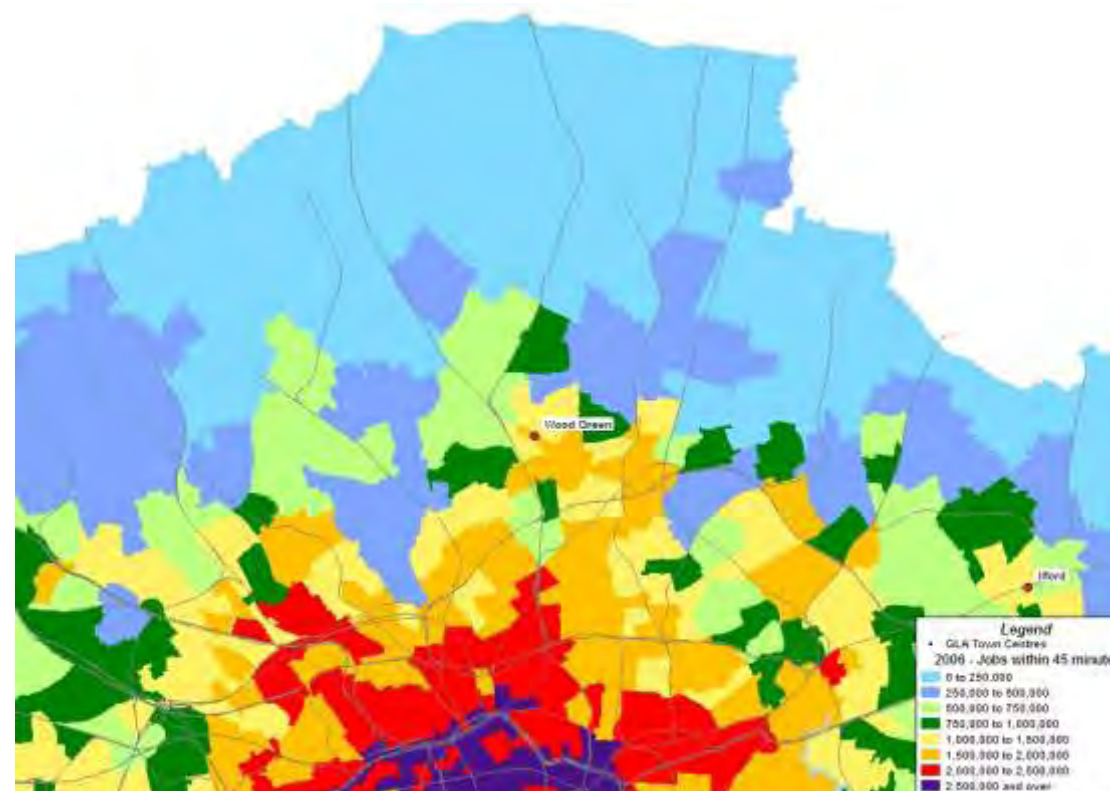
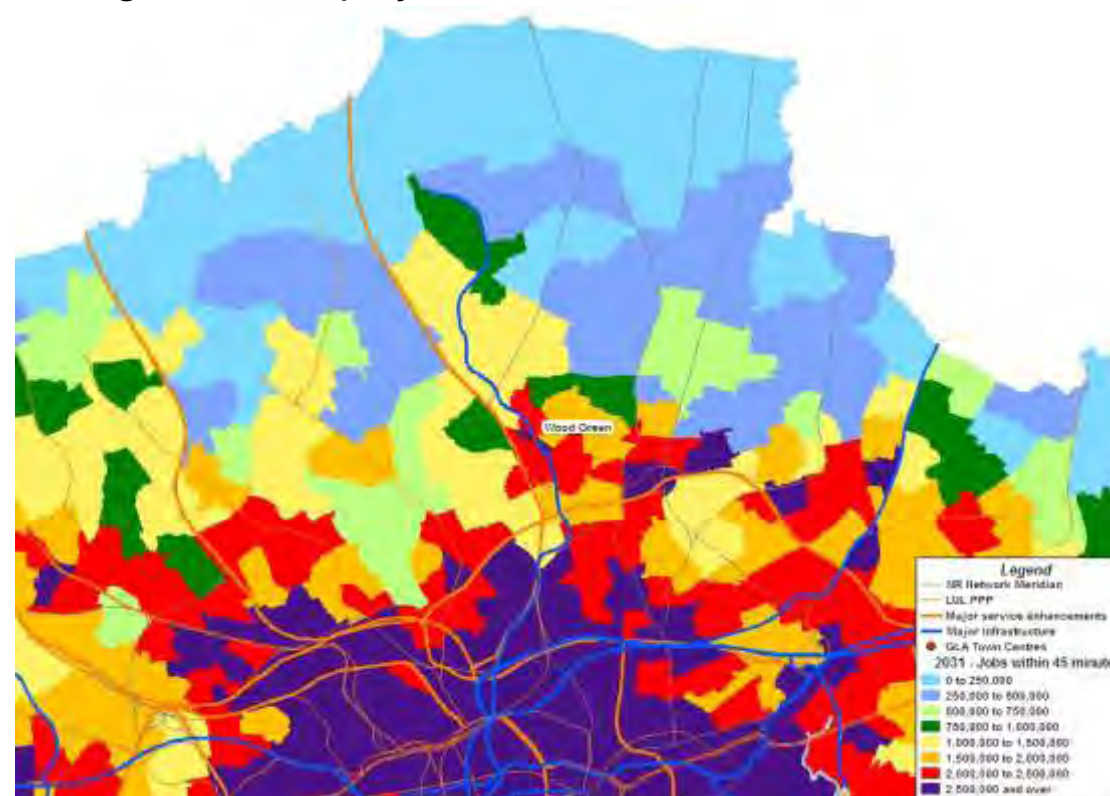
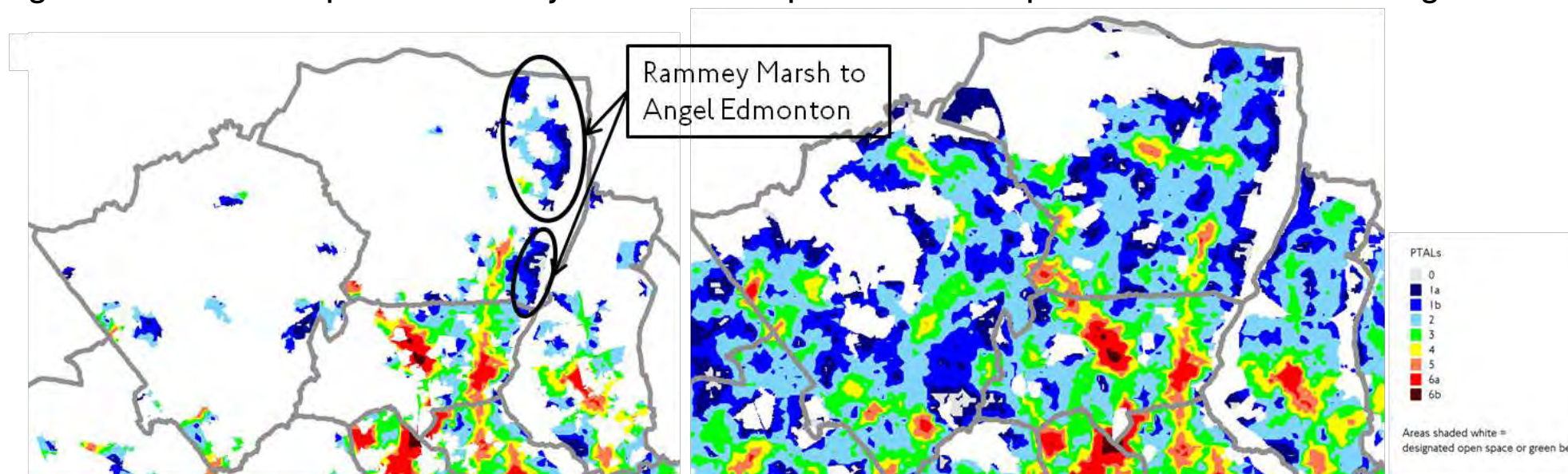


Figure 5.6: Employment access for north London (2031)



SPOTLIGHT: IMPROVING ACCESS TO OPPORTUNITIES AND SERVICES IN THE UPPER LEE VALLEY

Figure 5.7: Public transport accessibility level (PTAL) map and areas of deprivation in the north sub-region



The map above on the left shows public transport accessibility for the areas in the north sub-region in the top 20% most deprived in England, while the map on the right shows public transport accessibility levels in the sub-region. Deprived areas are likely to have lower car ownership therefore access to public transport is relatively more important than for other, less deprived areas.

The biggest areas of deprivation with the lowest levels of public transport accessibility are circled on the map above. In these areas, the main solution will be improvements to the bus network when they are due for review, and ensuring there is sufficient links with the National Rail and London Underground Lines.

Case study: Rammey Marsh to Angel Edmonton corridor

The part of Enfield Borough between the West Anglia Main Line and the River Lea, from Rammey Marsh in the north to Angel Road in the south, has lower levels of access to public transport and a significant level of deprivation. There are stations at Angel Road, Brimsdown and Enfield Lock. A north to south bus service runs through the heart of the area giving links to Waltham Cross, Ponders End and Edmonton Green. There is also an east to west bus service at Enfield Lock. There is potential to enhance the capacity of the rail line, and thereby provide an enhanced train service frequency. To maximise the benefits of any increased train service, walking routes to stations could be reviewed to reduce severance due to highway design.



Tackling potential barriers to using the public transport system

- Information – highlighting opportunities and travel horizons in north London and making the most of the new investment
- Design – impact on walking/ cycling potential as well as safety and security
- Fares – information on lowest cost options, including walking and cycling
- Identifying local barriers to walking and cycling, including attitudes and safety and security concerns

CHAPTER 6: REDUCING TRANSPORT'S CONTRIBUTION TO CLIMATE CHANGE AND IMPROVING ITS RESILIENCE

Transport Strategy goal: Reducing transport's contribution to climate change and improving its resilience

In response to the issue of climate change, the Mayor has set an ambitious target of a 60% reduction in London's CO₂ emissions.

Because of its high population density and other characteristics of its transport geography, London is well-placed to take on this challenge – but facing it will require concerted action across the coming years and decades to improve conditions and change travel in the capital.

London will need to find ways to reduce its contribution to climate change even further, whilst leading the world in the face of a potentially fast-changing climate. Dealing with these challenges should generate wider economic and social benefits, while avoiding the potentially serious consequences of inaction.

This goal consists of two challenges:

6.1 Reducing CO₂ emissions

6.2 Adapting to climate change



6.1: REDUCING CO₂ EMISSIONS

Tackling climate change by reducing greenhouse gas emissions, including CO₂ is a global priority. There is now a strong scientific consensus that such emissions as a result of human action are causing the climate to change at an unprecedented scale and speed.

The key transport-related tools which can be used to reduce emissions are: land use policies; infrastructure designed to increase the use of sustainable modes; new approaches to influencing travel demand; and measures to improve the energy efficiency of individual modes. Together these tools should be used to reduce the need for and length of journeys while making those journeys which do need to take place more energy efficient. They should be deployed in a flexible manner to achieve the greatest overall effect.

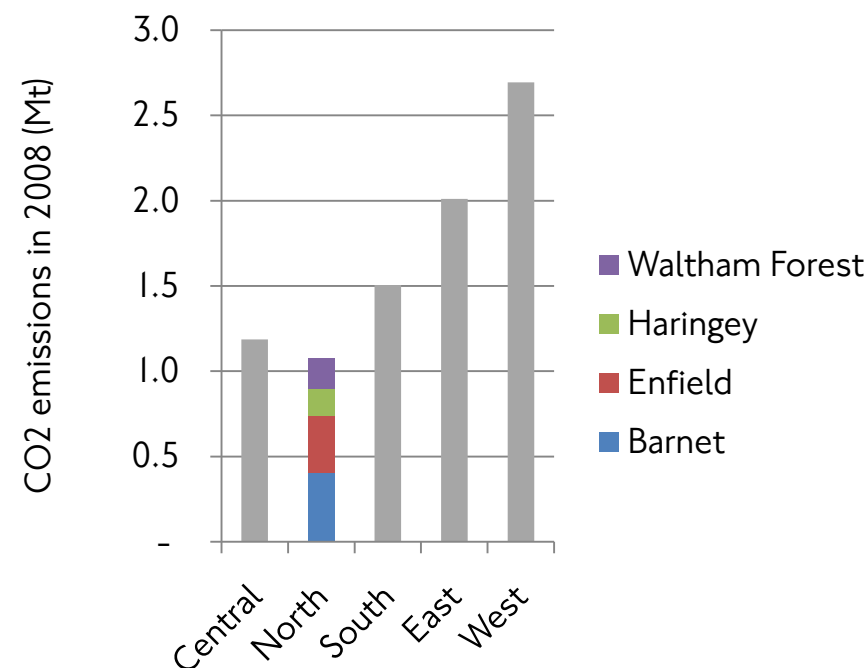
While targets will be a useful means of achieving results through apportioning responsibility for emissions reductions, they must be set in the context of local conditions or they risk focusing attention on specific locations at the expense of the bigger picture, or simply shifting a problem elsewhere. Therefore each borough will need to consider both local conditions and circumstances and also how these fit into the overall context when setting specific targets for the reduction of CO₂ from transport. TfL will monitor progress against these targets when it reviews the borough LIPs.

TfL will help boroughs reduce carbon emissions across the range of their activities, for instance by assisting in identifying suitable locations for electric vehicle charging points, and implementing policies to reduce mileage from delivery and servicing vehicles.

CO₂ emissions in the north sub-region

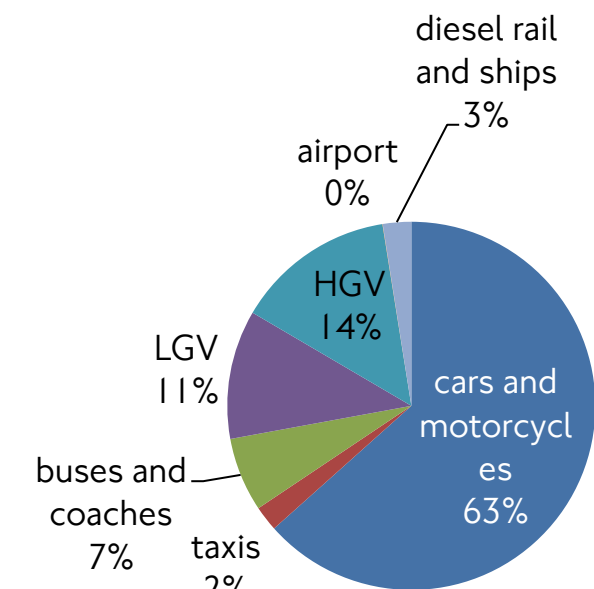
As can be seen in figure 6.1, the north sub-region has the lowest CO₂ emissions from ground based transport, resulting from its relatively smaller population size. In 2008, ground based transport emissions of CO₂ (excluding electricity generation) were estimated for the north sub-region at 1.08 million tonnes.

Figure 6.1: Ground-based transport CO₂ emissions, 2008



The mode split of emissions is equivalent to the London-wide level, with the largest proportion from cars and motorcycles (63%).

Figure 6.2: North sub-region CO₂ emissions from ground-based transport, 2008



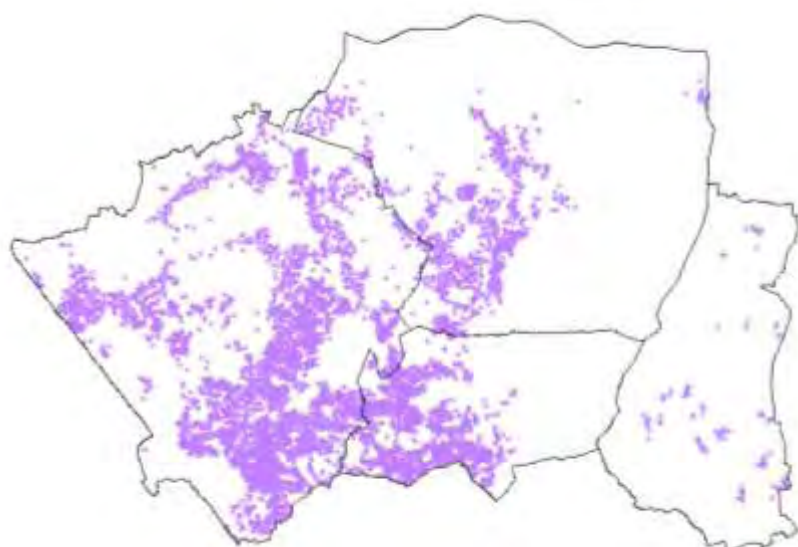
Given the high mode share for cars and motorcycles in the north sub-region, and the relatively high car ownership in the sub-region, it will be important to ensure that the forecast growth in trips includes a shift from cars to more sustainable modes and lower emission vehicles to prevent increasing CO₂ emissions.

MEASURES TO REDUCE EMISSIONS

Electric vehicles

The Mayor's draft Climate Change Mitigation and Energy Strategy sets out that the Mayor, working with partners, aims to deliver 25,000 charging points by 2015. Figure 6.3 below highlights the areas in the north sub-region where electric vehicle uptake is considered most likely in the short to medium term. This distribution is based on analysis using MOSAIC Public Sector, a tool which draws on 400 data variables to characterise every UK postcode as one of 61 socio demographic types. The map shows the locations of the five socio demographic types considered most promising for electric vehicle uptake.

Figure 6.3: Potential electric vehicle uptake in the north sub-region in the short to medium term



The areas of the sub-region with higher levels of deprivation, in particular the Upper Lee Valley, show very low potential uptake in the short to medium term but could still be considered as suitable locations for electric vehicles in the longer term as costs and battery range move more in line with conventional vehicles.

Beyond these areas of potential early uptake, new residential and commercial developments should provide facilities for electric vehicle charging even if not highlighted on the map to take into consideration the changes in the regional make up over time.

Alongside provision for electric vehicles, boroughs in the north sub-region should also consider the promotion of alternative fuels and other emerging technologies. This could be through trialling new technology for borough fleet vehicles and introducing technology-neutral incentives for the uptake of more carbon-efficient vehicles, such as graduated parking charges.



Freight

In north London, one quarter of CO₂ emissions from ground-based transport in 2008 were from freight vehicles.

Measures to reduce freight's contribution to CO₂ emissions are closely aligned with those for personal transport. For example, land-use policy can ensure that freight-generating activities are located in places which reduce journey lengths and in locations with access to sustainable modes such as rail and waterways to reduce the environmental impact of journeys. Meanwhile, consolidation centres can reduce the number of journeys required to move freight around, and measures to improve the energy efficiency of freight vehicles reduces the impact of those journeys that cannot be shifted onto more sustainable modes or reduced in length.



Car Clubs

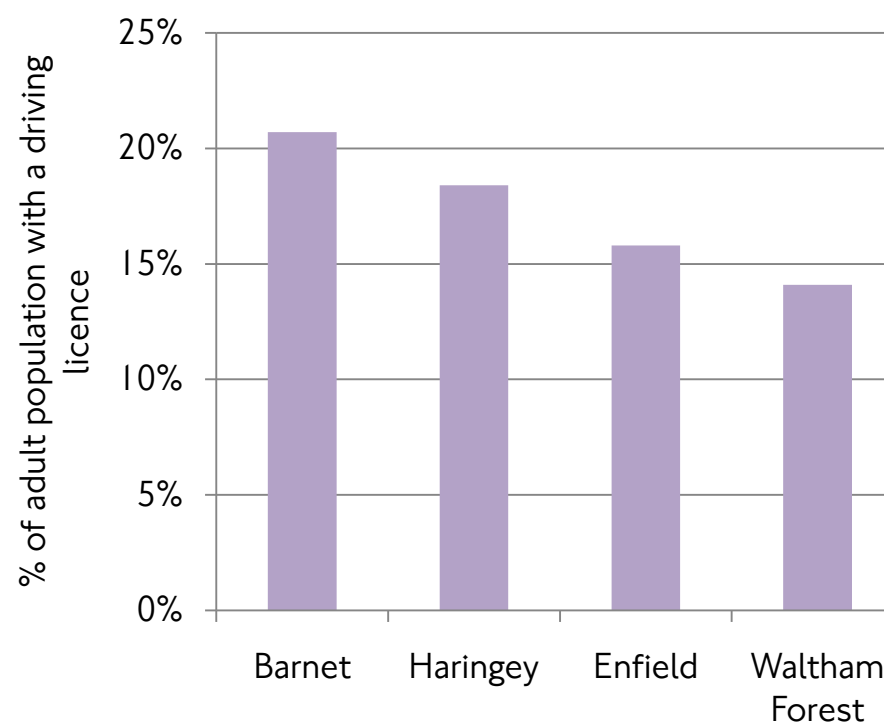
Car Clubs enable people who require occasional access to a car to have this on a pay-as-you-go basis without the need to own a vehicle. Car Club members also have an incentive to avoid non-essential car journeys. Since May 2008, the Mayor and TfL have invested more than £1m in the development and expansion of Car Clubs in London. London has 127,000 Car Club members, accounting for 87% of the UK's Car Clubs.

The continued expansion of Car Clubs in north London will make an important contribution to the reduction of CO₂ emissions as users reduce their mileage and use vehicles that are more efficient than the average private vehicle in London. On average the Car Club fleet is 10-33% more efficient than the average UK fleet and each Car Club car is estimated to result in an average of 11 private vehicles being sold and a further nine not being purchased.

According to the Carplus annual survey of Car Clubs for 2009.10, on average Car Club members report making four to five car driver trips of less than 25 miles per month, compared to 33 for the average London driving license holder.

In the north sub-region, based on the socio-demographic make-up of the area, TfL analysis indicates that Barnet has the greatest potential for the uptake of Car Club membership with Waltham Forest having the lowest. As with electric vehicle uptake, new residential and commercial developments will create greater potential for membership and so provision of Car Club bays in these areas should be encouraged. In existing high density residential areas, on-street Car Club bays can help to alleviate parking pressures and expand the number of members.

Figure 6.4: Percentage of adult population (with a driving licence) that could potentially be a member of a Car Club



Other sections of this Plan directly relevant to the goal of reducing CO₂ emissions

Opportunity Areas: much of the growth in north London is concentrated in the three opportunity areas. This provides a chance to achieve more sustainable densities of population and employment than a more dispersed growth pattern would allow by encouraging and facilitating more sustainable travel habits. See opportunity areas section in Chapter 1 for more information.

The implementation of sustainable transport schemes: measures to encourage the use of public transport through infrastructure and service improvements, reduce congestion and journey lengths, and urban realm improvements will increase the availability, usefulness or attractiveness of sustainable travel.

Rethinking travel: measures which encourage people to adopt more sustainable travel habits will by definition reduce emissions. These include smarter travel programmes, better information provision, pricing initiatives and low-car or car-free developments.

6.2: Adapting to climate change

6.2: ADAPTING TO CLIMATE CHANGE

The Mayor's draft Climate Change Adaptation Strategy recognises that climate change is now inevitable and there is evidence that it is already happening. It looks at how vulnerable London is to weather related risks and sets out a number of actions that can be taken to deal with flooding, drought and overheating. The MTS also includes policies and proposals that help adapt to climate change that will have an impact across London by ensuring that the transport network is more resilient to the risk of flooding and other adverse weather conditions.



CHAPTER 7: SUPPORTING THE DELIVERY OF LONDON 2012 OLYMPIC AND PARALYMPIC GAMES AND ITS LEGACY

Transport Strategy goal: Supporting the delivery of London 2012 Olympic and Paralympic Games and its legacy

The 2012 Games will place new pressures on London's transport system. Much has been and continues to be done to upgrade and enhance the network to respond to these pressures, including new infrastructure and careful planning. During the Games themselves, TfL, boroughs and other stakeholders are committed to keeping London moving.

The Games also present an opportunity for London to capture lasting legacy and regeneration benefits and embed sustainable travel habits in its growing population. This section considers the legacy further.

This goal consists of two challenges:

- **Supporting the delivery of the London 2012 Olympic and Paralympic games**
- **Supporting the legacy of the games**

The north sub-region borders the Olympic Park and Waltham Forest and Hackney are two of the five host boroughs for the Olympics. In November 2009, the Strategic Regeneration Framework for the Olympic host boroughs was published in which the five boroughs outlined their vision for the Olympic legacy. The Olympic area has one of the largest clusters of deprivation in England and Wales with a significant gap in relation to a number of indicators with the rest of London. The Strategic Regeneration Framework sets out an ambitious legacy vision with the aim that within 20 years the communities in the host boroughs will have the same economic and social chances as the rest of London.

What does Olympic legacy mean?

The MTS states that a good legacy is lasting behavioural change, physical transport improvement and convergence of the social and economic outcomes of the five host Olympic Boroughs. The Olympic legacy is only relevant for interventions intended for the Olympics (for example, infrastructure), having an effect from the Olympics (for example, increase in walking and cycling) or having an effect on convergence within the five host Olympic Boroughs (for example, improvements to health, access to employment, health, education or sporting facilities).

The Strategic Regeneration Framework sets out a number of critical actions up to 2015, the majority of which support regeneration and convergence in terms of social and economic indicators. While the north sub-region will benefit less than the east sub-region in terms of transport infrastructure resulting from the Olympics, there are transport measures that will support the critical actions. Measures include those set out in Chapter 5 to improve access to services and opportunities and to support regeneration.



CHAPTER 8: KEY PLACES IN NORTH SUB-REGION

Overview

Key places for each sub-region were identified in the Challenges and Opportunities documents published in February 2010. These were based on London Plan designations, local policy documents (SPD, LDFs, etc) and engagement with the sub-regional boroughs. Examples of the key places are included in this chapter.

The north London Challenges and Opportunities document identified some 20 key places in the sub-region including the two opportunity areas, three areas for intensification, the metropolitan centre and a number of major and district centres. Other key places included Brimsdown, a strategic industrial location.

Initial analysis and assessment of these areas has been carried out, in line with the process shown below. The challenges and opportunities set out in the preceding sections of this plan must be integrated to ensure good access to, from and within town centres and other key places. The quality of the urban realm is also vital to ensure their attractiveness as places to live, work, shop and visit.

In some areas, more specific additional analysis has been undertaken including surveys of town centres and case studies of potential urban realm improvements, such as that at Wood Green, as set out in Chapter 3.

In the context of constrained funding, ensuring complementary investment and focusing resources where there are other opportunities will be particularly important. TfL and the boroughs will need to work closely with organisations including Network Rail and developers to maximise the value of investment.



Key considerations

Good access to/ from key places is vital. In some cases, enhanced capacity will be needed to support growth and reduce crowding while in some areas, new links may be needed to improve connectivity. Bus services play a key role in supporting access to town centres and provision will need to be reviewed on an ongoing basis. Interchanges are important, not just in terms of their capacity, quality and accessibility but also their integration to the surrounding area.

There is significant congestion in many of the town centres in north London and parking is an issue for many. However, these areas also have potential to increase walking and cycling and to encourage mode shift, with appropriate support measures, such as cycle parking and wayfinding information. Freight access to key places and provision for deliveries and servicing is integral for their commercial vitality – finding better ways to manage this and reduce the traffic and environmental impacts will be increasingly important.

Access and the quality of movement within these locations must also be prioritised, including encouraging walking and improvements to the urban realm. The value for money of measures is likely to be increased where combined with other initiatives and investment being made, such as in interchanges.

In some cases, tension between access to and within places may be an increasing issue with the impacts of traffic, including buses, needed to be considered and priorities assessed.

Next steps

As highlighted, some more detailed work has already been undertaken in a few locations to enhance TfL's understanding of current and potential future travel patterns and some of the opportunities for change. Further more detailed work to try and establish the key transport and urban realm issues in each place will be discussed with the Sub-regional Panels to agree the priorities and approach. In addition, specific studies may be undertaken with particular schemes or growth areas, such as Opportunity Area Planning Frameworks, which will consider potential transport requirements in more detail.

UPPER LEE VALLEY OPPORTUNITY AREA (LB ENFIELD)



The Upper Lee Valley is identified by the London Plan as an opportunity area, and is the largest opportunity area in London at 3,884ha. The area stretches for six miles from south to north and is bounded by Lea Bridge Road to the south and the M25 at the north. The North Circular (A406) crosses the area at Central Leaside. Other key roads include the A1055 and A1010 running north to south and the A110 and A503 running east to west. It is served by the Victoria Line at Seven Sisters, Tottenham Hale and Blackhorse Road and by National Rail services to/ from Stratford and Liverpool Street. There are also rail stations on the West Anglia Main Line at Tottenham Hale, Northumberland Park, Angel Road, Ponders End, Brimsdown and Enfield Lock. It is well served by services. The area is characterised by waterways and reservoirs.

Given the large size of the opportunity area, rather than being spread evenly across the area, housing and/ or employment growth is forecast to be concentrated in a number of areas including Tottenham Hale, Central Leaside, Blackhorse lane, Brimsdown/ Freezywater, Ponders End and the A1010 Tottenham High Road.

Constraints

Congestion on the North Circular Road, capacity on the West Anglia Main Line, the waterways and the extensive reservoirs serve to restrict movement within the area. Where crossings do exist they can be subject to considerable delay: the level crossings of the Lee Valley line for example, can be closed to road traffic for more time than they are open, creating congestion and hampering the reliable operation of bus services.

In addition, the rail lines (both Lea Valley line into Tottenham Hale and the Southbury loop feeding Seven Sisters) experience peak time crowding within the area, whilst the Victoria Line is not crowded within the area, but experiences severe crowding further south, from Finsbury Park.

Amongst other places, highway congestion within the area occurs at peak times along the A1010, on the A1055 and at the Tottenham Hale Gyratory. The most serious congestion is on radial routes into town centres and Lee Bridge Road.

The area has the best access levels to public transport in the built-up residential areas, at town centres and at stations, where there are significant bus interchanges. However, some stations have a relatively poor level of stopping services. This is largely a result of constrained line capacity and priority being given to longer distance services. In addition, access to Stratford, its expanding economy and Olympic legacy, is seen as weak.

Opportunities

Beyond 2020, four-tracking of the West Anglia Main Line would reduce crowding and allow for more local stopping services, as well as permitting more regular services to access opportunities in Stratford.

Development in the opportunity area should make best use of existing infrastructure and service opportunities, without overloading these, and where significant development might be proposed (Central Leaside for example), new proposals for complementary transport interventions are likely to be required.

There are opportunities to improve east to west and north to south links for walkers and commuter cyclists and to make the area attractive and safe after dark.

BRENT CROSS/ CRICKLEWOOD OPPORTUNITY AREA (LB BARNET)

Map showing Brent Cross/ Cricklewood opportunity area

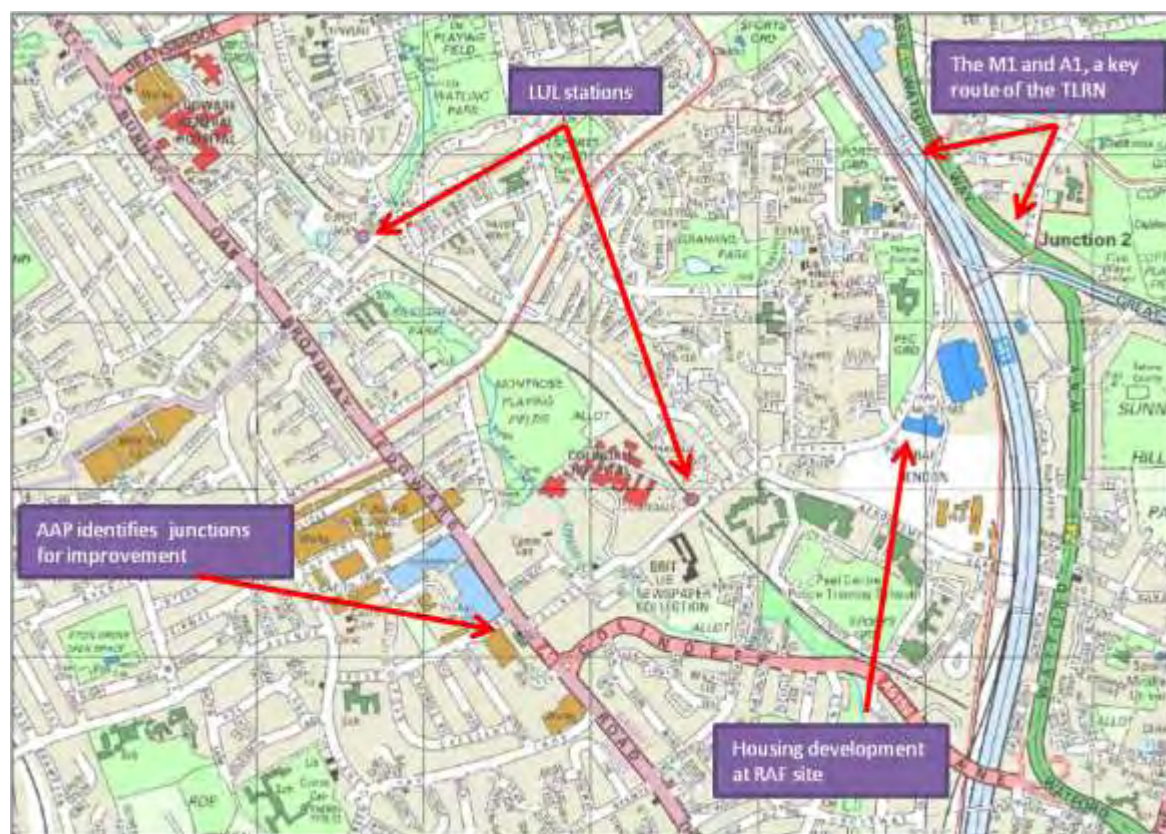


Cricklewood/Brent Cross is the subject of a large planning application and transport assessment. There are several funded investments for transport related to the development led package, although precise yearly funding and implementation are still to be confirmed. The first phase will include the expansion of Brent Cross shopping centre and associated bus priority, segregated cycle lanes and pedestrian enhancement measures. Later in the phasing of the development a new train station will be built, as well as a rail freight facility and bigger bus station. Major improvements to the strategic road network are planned with resulting improvements to bus priority and the pedestrian and cycling environments. The local boroughs and TfL are also working with the developers to take the opportunity to introduce a varied and comprehensive package of green travel planning initiatives. The need for additional bus routes and capacity is being reviewed in relation to development phasing and other changes in the area.

The challenge will be to ensure that necessary transport interventions keep ahead of the development of demand. It may not be until post-2017/18 that parts of the development, and hence some of the transport interventions outlined above (including the new railway station), come on-stream. These are planned to be in place by the development “end state” (assumed to be 2026 in the transport assessment), by which stage the developer is committed to bringing about a substantial reduction in mode share for cars (down to 34% of development-related trips).

COLINDALE/ BURNT OAK OPPORTUNITY AREA (LB BARNET)

Map showing Colindale/ Burnt Oak opportunity area



Colindale/ Burnt Oak benefits from access to two London Underground stations, Colindale and Burnt Oak, on the Edgware branch of the Northern line. Five bus routes go through the area, serving Kilburn, Brent Cross, Harrow and Wembley. There are also two National Rail stations serving Kings Cross, the City and Luton nearby, although they are slightly outside the boundaries of the opportunity area. The area is well connected to TfL road network, lying adjacent to the A1 and A41, as well as the M1 motorway. Although not part of the TfL road network, the A5 is the most important traffic artery going through the opportunity area.

Some parts of the area not adjacent to stations suffer from low public transport accessibility levels, although this is generally deemed appropriate for a suburban area. However there is a lack of sufficient pedestrian and cycling routes, compounded by the barriers created by railway lines and the many main roads in the area. The Northern line currently suffers from crowding during peak times. Although crowding is not an issue in the Colindale area, users from the opportunity area are likely to continue their journeys into central London and thus contribute to crowding on the Northern line.

Presently there are few funded transport investments. The Northern line upgrade will improve frequencies and journey time. Barnet Council have produced an Area Action Plan for Colindale, published in 2009, which identifies sites in the area where development should be intensified. The AAP sets out Colindale's improvements in three packages covering different phases of development; these improvements largely include junction and road upgrades. Further investment in the transport network to support growth will have to be funded in conjunction with developer contributions and s106 monies stemming from the new residential development planned for the area.

MILL HILL EAST AREA FOR INTENSIFICATION (LB BARNET)

Mill Hill East is identified in the London Plan as an area for intensification with an indicative capacity of 1,800 new jobs and 2,100 new homes over the next 20 years. Redevelopment opportunities exist around the Underground station, especially at the council depot, Ministry of Defence Inglis Barracks and the gas works.

It is served by a branch off the High Barnet branch of the Northern line and a number of bus services provide links to the nearby town centres of Edgware, Finchley and Golders Green. The area is somewhat removed from the strategic road network, lying between the A1 and A598.

The Northern line upgrade is currently being implemented, when completed this will provide additional capacity and reduced journey times. The upgrade is important to support growth in Mill Hill East as the Northern line suffers from crowding in peak times south of Archway and passengers from Mill Hill East are likely to make journeys which extend into the crowded parts of the line. There are no other funded investments planned for the area up to 2017/18, although there could be further improvements to the Northern line service if the planned partial line separation is implemented.

Large scale housing development under the Area for Intensification designation may create pressure for bus service enhancements and Underground station access improvement. It could also provide the opportunity to make urban realm improvements which could benefit walking and cycling infrastructure in the area.

WEST HAMPSTEAD AREA FOR INTENSIFICATION (LB CAMDEN)

West Hampstead is both a strategic interchange and sub-regionally important interchange. Three separate stations (all called West Hampstead) are located within 200 metres of each other along the B510 (West End Lane). A London Underground station serves the Jubilee line; a London Overground station serves the North London Line; and a National Rail station serves Thameslink services. Despite their close proximity, interchange between the three stations is poor. Chiltern Railway, East Midlands Trains and Metropolitan line services all pass through the area without stopping. In addition to rail, three bus routes, (139, 328 and C11) pass along West End Lane. This road is not on the TLRN, however key routes, the A5 Kilburn High Road and A41 Finchley Road, are located on either side of the area.

There are a number of funded investments to 2017/18 which will benefit the area. By May 2011, Overground services through West Hampstead will see increased capacity with new, longer and more trains, increased frequency of trains to every ten minutes and a refurbished station with better CCTV, lighting and security and new customer information. The service will be further improved in 2012 when the last link of the orbital network (Surrey Quays to Clapham Junction) is completed. Station improvements and capacity enhancements as part of the Thameslink Programme are scheduled to be completed by 2015.

Interchange between the three stations is poor due to inadequate quality in the urban realm and design of the area, with pavement width being a particular problem. There are aspirations to improve the West Hampstead Interchange by making it into a single station interchange zone, or proximity interchange, however this is currently unfunded. If this were to be completed it could form an important Strategic Interchange on the network. Chiltern Railways also have an aspiration to develop new platforms adjacent to an upgraded London Underground station, however there is no timescale for this to progress. The Jubilee line through West Hampstead will also be upgraded, leading to a 33% increase in peak capacity.

WOOD GREEN METROPOLITAN CENTRE AND HARINGEY HEARTLANDS AREA FOR INTENSIFICATION (LB HARINGEY)

Wood Green is identified in the London Plan as a metropolitan centre. With Haringey Heartlands, it is also an area for intensification with an indicative capacity of 2,000 jobs and 1,000 new homes over the next 20 years. It is a major centre of employment in north London with a strong retail function.

It is well connected into the public transport network with Wood Green and Turnpike Lane stations on the Piccadilly Line and a National Rail station at Alexandra Palace. It has a sub-regionally important bus interchange with 14 bus routes and two night buses passing through it and is well linked to the strategic road network (the A10 and North Circular).

The area for intensification benefits from a planning framework designed to coordinate the range of development opportunities on the railway and industrial lands to the south-west of Wood Green town centre. These sites include the Clarendon Road gas works, adjacent Coburg Road industrial area and Hornsey waterworks. There is significant scope for enhancement of these areas, building on the area's industrial heritage. Site assembly and provision of better links with the town centre will be key to a comprehensive development. The provision of sustainable high-density mixed-use development for housing, leisure, retail, employment and open space should be included in any redevelopment plans. Opportunities should be taken to redevelop parts of Wood Green town centre for high-density, mixed-use schemes.

Key potential and issues

- The Piccadilly and Victoria line upgrades will increase capacity and improve journey times (reflecting interchange between the lines at Finsbury Park station)
- The area experiences highway congestion at the north and south ends of the High Road
- An urban realm study for the High Road is underway, but there is no identified funding for any recommendations that might arise from these
- Exploration of traffic management measures are also underway
- A Planning Framework exists to coordinate development around the old industrial and railway lands
- Some of the Haringey Heartlands area has poor pedestrian links into the rest of Wood Green and opportunities it offers



WALTHAMSTOW (LB WALTHAM FOREST)

Walthamstow is identified in the London Plan as a major centre and its regeneration is a key borough priority. Waltham Forest Council produced a masterplan for the town centre, which was adopted by its Cabinet in May 2008, and is currently producing an overarching area action plan. It plans for 2,438 new homes in the town, nearly 50% of the London Plan's housing target for the whole borough. The town borders the Upper Lea Valley opportunity area, and the significant forecast growth there could increase pressure on Walthamstow's infrastructure.



Walthamstow Central station is the terminus of the Victoria line and is served by National Express East Anglia services from Liverpool Street to Chingford. It is also served by the London Overground Richmond/Clapham Junction to Stratford line at Walthamstow Queens Road. As the two stations are within 300 metres there is scope to create a proximity interchange between the two. Walthamstow bus station is the third busiest in London and is served by 17 bus routes and three night buses. The main thoroughfare in the borough, the A112, is subject to major congestion and there are a number of road casualty hotspots around the town centre.

The Olympic Park in Stratford is nearby, which brings with it challenges and opportunities. There is potential to maximise the benefits and legacy of the 2012 Games and provide improved access to new opportunities in Stratford. New links could include reinstatement of the Chingford to Stratford rail route (Hall Farm Curve), which will also serve Walthamstow, bus priority on existing routes, which would be achieved by reducing the congestion on the A112 and other approaches to the town.

Walthamstow has high cycling potential. However current cycling mode share in the borough (1% of residents' trips) is around half the London-wide average. The town centre could be a location for a Better Streets initiative and could benefit from significant urban realm improvements associated with proximity and Strategic Interchange. These measures would enhance the walking and cycling environments and encourage a shift to these modes.

ENFIELD TOWN (LB ENFIELD)

Enfield Town is identified in the London Plan as a major centre. The LB Enfield has an area action plan for the centre.

Enfield Town is well connected with the east-west A110 running through it and proximity to the A10. It is served by 13 bus routes and one night bus. Enfield Town station is a terminus on the National Express East Anglia service from Liverpool Street, and Enfield is also served by Enfield Chase station on the First Capital Connect service from Moorgate to Stevenage.

The area action plan identifies issues with traffic management and the pedestrian environment. The town centre could therefore benefit from Better Streets initiatives and urban realm improvements. It is classified as a type C1 place, with similar issues and outcomes to the study areas of Romford and Kingston, as set out in Chapter 3. The town centre also has high cycling potential.

EDGWARE (LB BARNET)

Edgware is identified in the London Plan as a major centre. The LB Barnet is producing a planning strategy for the town centre.

Edgware is a terminus station on the Edgware branch of the Northern Line. The adjacent bus station is served by 18 routes and two night buses. The main thoroughfare is the A5, which experiences congestion. The town centre is also adjacent to the Colindale/ Burnt Oak opportunity area and could experience additional pressures from growth and development in this area. There is more information about the transport issues and opportunities in Colindale/ Burnt Oak opportunity area in Chapter 2.

The town centre could benefit from Better Streets initiatives and urban realm improvements. It is classified as a type A2 place, with similar issues and outcomes to the study area in Wood Green, as set out in Chapter 3. As a centre, it also has high cycling potential.

DALSTON (LB HACKNEY)

Dalston is identified in the London Plan as both a major centre and an area for intensification with an indicative employment capacity of 1,000 and 1,700 new homes.

Dalston is served by Dalston Junction on the East London line, Dalston Kingsland station on the Richmond/ Clapham Junction to Stratford line and London Fields station on the National Express East Anglia service from Liverpool Street to Enfield Town and Cheshunt.

Dalston has experienced improved transport connectivity with the opening of the East London line to West Croydon and will experience greater connectivity when the Overground network is extended to Highbury and Islington. The improved connectivity provides a key opportunity to regenerate the area and tackle local deprivation.

NAG'S HEAD (LB ISLINGTON)

Nag's head is identified in the London Plan as a major centre. The Nag's Head Supplementary Planning Document was adopted in 2007 and identifies opportunities to tackle the key issues for the town centre through physical change, improved management and specific projects. Nag's Head was the borough's main shopping centre until about 20 years ago, and has been perceived as being in decline since this time.

Nag's Head is divided east to west by the A1 Holloway Road which experience considerable congestion. The volume of traffic causes problems for pedestrian movement in the area.

It is not directly served by rail or Underground, although Holloway Road station on the Piccadilly line and Upper Holloway station on the London Overground are relatively close by. It is served by 12 bus routes and 7 night buses.

FINSBURY PARK (LB HACKNEY, HARINGEY AND ISLINGTON)

Finsbury Park is identified in the London Plan as a district centre and is on the boundary of London boroughs of Hackney, Haringey and Islington. Finsbury Park was identified by Islington Council as a priority area for an area action plan. The area action plan, published in 2006, provide a clear planning framework for the regeneration of the area, which experiences significant deprivation and is under development pressure.

Finsbury Park station is a strategic interchange and a sub-regionally important interchange and is the busiest interchange outside zone 1. The rail and Underground lines serving Finsbury Park both experience significant crowding and the station itself experiences congestion. The station provides interchange between the Victoria and Piccadilly lines on the Underground and First Capital Connect services from Kings Cross and Moorgate to Cambridge and Stevenage. The station also provides access to the Emirates stadium. The bus station is serviced by 12 bus routes and 5 night buses. More detail on the station is provided in Chapter 2.

The area action plan seeks to improve public transport provision and accessibility through a consideration of the street layout, the station, wayfinding signage and the surrounding area. It also focuses on the urban realm to provide better connections to transport, open space and event spaces and the surrounding residential areas.

CHAPTER 9: DELIVERY OF THE PLAN AND SUSTAINABILITY ASSESSMENT

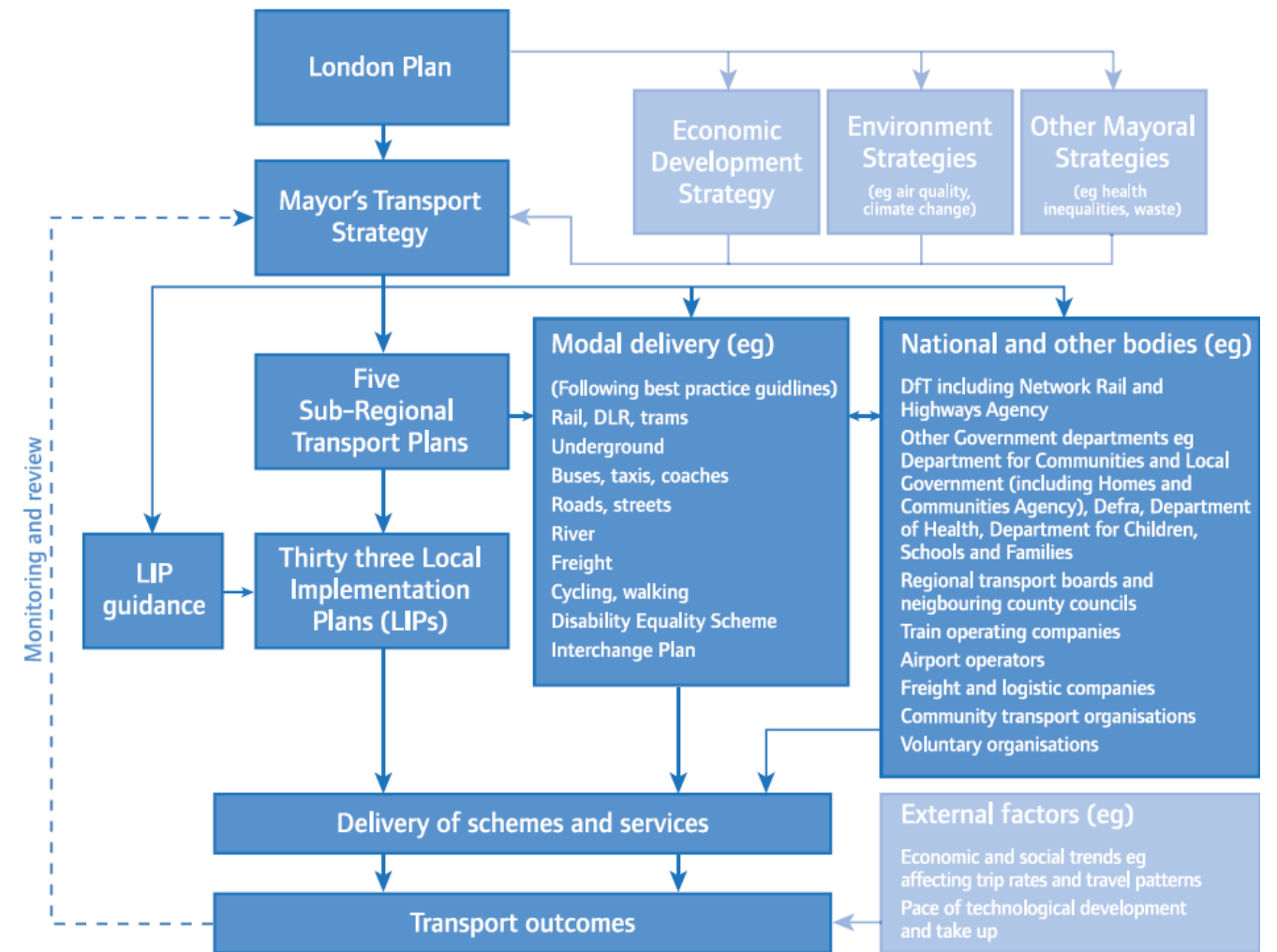
The sub-regional challenges set out in Chapter 1 of this plan were agreed by TfL and the north sub-region boroughs and partners as the major transport issues for the sub-region over the next 20 years. The plan has set out various schemes, measures and initiatives that contribute to meeting the sub-regional challenges, and these are also summarised below.

This sub-regional plan will be delivered over twenty years and that details of this, including phasing and funding are shown in the Implementation Plan at Appendix I.

The delivery process is set out in the MTS and in the LIP guidance. These set out the organisations involved and shows how the SRTP (in full) relates to London boroughs' LIPs. Figure 9.1 summarises the process.

An overview of how the sub-regional challenges will be met by the implementation plan is set out in Section 9.1. Section 9.2 provides information about the Assessment of Sustainability carried out on the plan.

Figure 9.1: Delivery process



9.1: SUMMARY OF MEASURES TO MEET THE MTS CHALLENGES



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

The additional Underground and rail capacity and connectivity described in the plan will support economic growth and productivity improvements ('agglomeration benefits') in the future.

The plan sets out the necessary transport improvements required to support the development envisaged by the London plan for all the opportunity areas and areas for intensification in the sub-region. However, not all of these are currently funded and some, notably the mainline station at Brent Cross, are dependent on private funding.



Challenge 2: Relieving crowding on the public transport network

Crowding will be reduced and reliability improved through:

- Underground upgrades and asset renewal, which will increase capacity and provide a more reliable service with automatic train operation and fewer asset failures
- National rail upgrades and the Thameslink programme, which will provide more capacity.
- Unfunded schemes, including Chelsea Hackney Line and four-tracking of the West Anglia Main Line, will add capacity and reduce crowding further
- Station capacity schemes will reduce crowding at stations such as Finsbury Park and thus improve door-to-door journey time reliability
- Ongoing management of bus service reliability
- Smarter travel initiatives and investment in cycling, for example cycle superhighways



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

Across the sub-region congestion will be managed through better traffic control systems, better management of planned events and better management of unplanned incidents. Potential interventions include:

- A406 Henlys Corner junction improvements works
- Tottenham Hale gyratory works
- A406 Bounds Green scheme
- Making the most of rail upgrades as an opportunity for mode shift, for example Thameslink programme and West Anglia Main Line upgrade
- Opportunities for mode shift and road improvements from Brent Cross development
- Promoting existing orbital bus and rail services and strategic interchange



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

Measures to improve connectivity in north sub-region could include:

- Encouraging mode shift from car to walking and cycling for short journeys
- Road management of A406, A12, A10, A104, A503
- Improvements to strategic and sub-regionally important interchanges, including Finsbury Park, Tottenham Hale and Hackney Downs/ Central
- Potential reinstatement of Hall Farm Curve
- West Anglia Main Line four-tracking
- New platforms at Stratford station



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

The measures to enhance connectivity would also improve access to key locations. Other measures include:

- Measures to improve physical accessibility of transport network
- Improving accessibility to public transport, particularly in areas of higher deprivation
- Providing information, including highlighting opportunities and travel horizons and making most of new investment
- Urban realm and designing in safety
- Fares and providing information on lowest cost options, including walking and cycling

9.2: ASSESSING THE SUB-REGIONAL TRANSPORT PLANS

The sub-regional transport plans are not legally subject to a formal Strategic Environmental Assessment (SEA). Nonetheless, in keeping with best practice, TfL has chosen to undertake an Assessment of Sustainability for each plan, which incorporates a non-statutory SEA.

Carrying out the Assessment of Sustainability is intended to maximise the contribution that the plan can make to progressing sustainability across London in line with the vision set out in the Mayor's Transport Strategy.

The Assessment of Sustainability incorporates informal consultation with those organisations who would otherwise have represented the 'statutory consultees' for an SEA, namely: The Environment Agency, Natural England and English Heritage. Comments from these consultees have been considered and used to inform the development of the plans.

The Scoping Report and the subsequent Assessment of Sustainability for the north sub-region will be made available as separate documents in due course.



CHAPTER 10: NEXT STEPS

10.1: ONGOING WORK

Using the sub-regional panels

The north sub-regional transport plan has now been produced, but this does not mean that the work is finished. The sub-regional transport plan process has led to an improved analytical capability as well as more collaboration between TfL, boroughs and other stakeholders. It has built upon the broad policies and proposals set out in the MTS and provided more detail about the challenges, opportunities and priorities for the north sub-region.

The Plan is a 'live' document which means that, although London and the UK are facing a period of financial uncertainty, the importance of planning beyond the short term is even greater. The sub-regional transport plans will continue to make the case for more investment in London, helping to prioritise the limited resources available and improving the evidence base upon which decisions are made. Whilst no additional funding has been identified to deliver the specific elements of the plan, the scene has been set for what will be required to meet the needs of all those who live, work and visit London.

The next phase of the work will use the sub-regional panels to help steer sub-regional engagement, articulate the agreed priorities and scope further work to be taken forward within the sub-region. The programme of work will include additional analysis, assessment of options and, where appropriate, the sub-regional models may be used to test future scenarios.

Future work areas

This Plan makes reference to some areas and issues where further study is required to develop the Plan further. These need to be agreed via the sub-regional panels but could include:

- Managing the road network, initially with agreement on which sub-regional corridors to focus on next
- Walking and cycling priorities in north London
- Air quality focus areas and measures to reduce air pollution from transport

In addition, further understanding of the implications of the Government's spending review, especially in relation to National Rail's HLOS I and the opportunity area planning frameworks will influence the development of the Plan.

Further Development and Assessment of Options

Initial investigation has been undertaken into the range of schemes and proposals developed and supported in this Plan. This has involved an assessment of options against the goals and objectives outlined in the MTS. Both qualitative and quantitative data (where available) has been used in this assessment, including use of TfL's Strategic Assessment Framework.

In some cases, to determine demand and secondary impacts, individual mode and route options have been modelled using TfL's Railplan model. At this stage no traffic modelling has been undertaken to determine the highway impacts. In some cases high level engineering feasibility has been undertaken but if priorities identified by the sub-regional panel are to be progressed, further analysis is needed.

10.2: MONITORING

Monitoring MTS outcomes

The top-level monitoring of the outcomes in the MTS will be via TfL's annual Travel in London report. The MTS identifies 24 indicators to monitor the strategy's outcomes, the key Strategic Outcome Indicators (SOIs). In addition, the Travel in London report contains data, analysis and interpretation relating to other Transport Strategy policies that are not directly covered by the 24 SOIs.

The majority of MTS SOIs can be disaggregated to the more local level, be it network, sub-region or borough without additional work. However, for several, it is not readily possible to obtain robust statistics that directly reflect sub-regional geography (for example, some of the survey/perception-based indicators).

In other cases, such as operating costs, a sub-regional disaggregation is not appropriate (for example, they relate to transport network geography). Some indicators are more appropriately monitored on a case-by-case basis (for example, supporting regeneration, Olympics and Paralympic Legacy), and these will be covered by appropriate, specific content (for example, Case Studies) in future Travel in London reports.

The Travel in London reports are available from [TfL's website](#).

Link with LIPs

Local Implementation Plan Guidance mandates five LIPs performance indicators. These cover:

- Transport mode share
- Bus service reliability
- Road traffic casualties
- CO₂ emissions from ground-based transport, and
- Highway asset Condition.

These are in alignment with the 24 MTS SOIs, and can be readily aggregated to the sub-regional level.

TfL's Travel in London report will continue to include data, at a borough level, on each of these LIPs performance indicators.

Potential development of particular sub-regional monitoring

The principal area where additional work may be required is to monitor, perhaps on an 'exemplar' or 'case study' basis, the contribution to local and strategic transport goals of specific transport infrastructure development or policies. The Olympics and Paralympics, opportunity areas and major projects such as Crossrail are examples where this additional work may be required.

APPENDIX I: IMPLEMENTATION PLAN

The table below sets out the schemes planned for implementation in the north sub-region, their phasing and whether funding has already been or is yet to be secured. Funded schemes are shown in yellow, unfunded in red. Some schemes are labelled as unfunded as they require further funding to be made available before they could be taken forward, or because they fall outside the timeframe of TfL's current Business Plan.

The schemes identified in this plan are shown in three time periods for delivery:

- Short term: The period up to and including 2012
- Medium term: From 2013 up to and including 2020
- Long term: From 2021 up to and including 2031

The implementation plan reflects the current delivery priorities. The plan will be regularly reviewed through the TfL Business Plan, the GLA Corporate Plan and the DfT's Network Rail and Highways Agency investment programmes to ensure ongoing alignment with priorities. Longer-term unfunded schemes are at varying stages of development. Scheme development will be regularly reviewed to ensure alignment with policy priorities, value for money, deliverability and to take account of opportunities for funding that may become available.

This implementation plan is consistent with the MTS and London Plan implementation plans published earlier in the year, while providing more detail, where appropriate, of schemes particularly relevant to each of the sub-regions¹.

The reference numbers used in this table are common to all five sub-regional plans – this is to aid cross referencing between plans, hence the numbering is not sequential as some measures are not relevant for this sub-region.

¹ This implementation plan table does not list improvements to national and international services that will predominantly benefit all of London, such as improvements to national rail long distance services, or international rail services. (Where relevant to London, these are included in the MTS and London Plan implementation plans).

Key to Implementation Plan	
	Funded schemes
	Unfunded schemes
*	2012 for TfL schemes and 2014 for Network Rail schemes (as per HLOS CP4)
†	2013 for TfL schemes and 2015 for Network Rail schemes (post HLOS CP4)

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
Rail (DfT/Network Rail/TOC led schemes)					
3	High Speed 2 - new line from London northwards	London to the West Midlands and beyond with Strategic interchange at Old Oak Common and terminus at Euston. Opportunities to link into West London line, North London line, Crossrail and Heathrow Express as well as High Speed 1			
4	Thameslink phase 1	Phase 1: 12-car capability on most of mainline and 16 trains per hour through core			
5	Thameslink phase 2	Phase 2: 24 trains per hour through core, expanded network			
6	Thameslink - potential further enhancements	Lengthening more shoulder peak services to 12 cars			
7	West Anglia enhancements	More trains lengthened to eight cars on inner services and Twelve-car capability			

Appendix I: Implementation Plan

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
		(outers) to Stansted and Cambridge			
8	West Anglia enhancements	Lea Valley four-tracking - potential for enhanced frequency (4tph to local stations) and journey time improvements for longer distance services.			
9	West Anglia enhancements	Potential scheme to provide rail access from Chingford to Stratford via Hall Farm Curve, requiring increased platform capacity at Stratford			
10	West Anglia enhancements	Provision of Seven Sisters to Enfield/Cheshunt shuttle service			
27	Great Northern enhancements	Platform and train lengthening to 12 cars on outers			
28	Great Northern enhancements	Additional inner suburban services (delivered by timetable re-structure and limited infrastructure works)			
29	Great Northern enhancements	Further capacity increases (including potential transferring some Great Northern inner services onto Thameslink, instead of only outer services, as part of Thameslink programme)			
34	Rail service standards	Improved first and last train time consistency, and off-peak service frequencies to be at least four trains per hour including weekends			
35	Improved rail freight terminals to serve London	New and/or expanded rail freight terminals to serve			

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
		London			
36	Improved rail freight routes	Conceptual freight link from Barking to Gospel Oak line to West Coast Main Line			
Rail (TfL led schemes)					
40	London Overground enhancements	Completion of extension to Clapham Junction. 4tph to run Dalston Junction - Clapham Junction			
41	London Overground enhancements	Lengthen East London Line services and platforms to 5 cars			
42	London Overground enhancements	Further train lengthening			
44	London Overground enhancements	Barking to Gospel Oak line – electrification and train lengthening			
45	London Overground enhancements	Extension to Highbury and Islington. 8 trains per hour will run beyond Dalston Junction			
46	Chelsea Hackney line	Enhanced southwest – northeast London capacity and connectivity. All new infrastructure will be fully accessible.			
Stations and interchanges					
48	Further Tube station congestion relief schemes	Targeted station capacity expansion programme. For example, Finsbury Park, Highbury and Islington, Camden Town, Northern Line Bank branch (Old Street and Moorgate)			

Appendix I: Implementation Plan

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
49	Tube station refurbishment/modernisation programme	Continuing programme of refurbishment/modernisation of stations			
51	Develop strategic interchanges	Programme of schemes under development including increasing frequency on orbital London Overground routes, stopping more trains at strategic interchanges, and improving pedestrian routes. Examples of strategic interchanges include Finsbury Park, Highbury and Islington, Hackney Downs/ Central, Walthamstow Central/ Queen’s Road, Seven Sisters/ Tottenham Hale and West Hampstead.			
52	Rail station refurbishment/modernisation programme	Delivery of National Station Improvement Programme (NSIP) in London, and other service standards as agreed in rail franchises (Station facilities, notably availability and quality of CCTV, help points, shelter, lighting, passenger information, cleanliness, cycling facilities such as parking, and availability and quality of ticket retailing). Stations include Bush Hill Park, Finsbury Park, Harringay, Hatfield, Kentish Town, Mill Hill Broadway, Potters Bar, Seven Sisters, Waltham Cross,			

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
		West Hampstead, Welwyn Garden City, and Wood Street			
59	Improved surface-rail interchange	Improvements including enhanced bus services, interchange and urban realm at selected Crossrail and/or Thameslink stations			
60	Brent Cross/Cricklewood Opportunity Area interchange improvements	Subject to timing of development and release of S106 funds – deliver transport improvements to accommodate planned growth			
62	New Station at Brent Cross	Developer funded station on Thameslink Midlands Main Line to support Brent Cross development as part of planning consent			
	Tube				
63	Jubilee line upgrade	Jubilee line - upgrade involves installation of new signalling to provide faster more frequent services and provide 33% more peak capacity and 22% reduction in journey time			
64	Northern line upgrade phase 1	Phase 1: Northern line upgrade to provide additional capacity and improve journey times			
65	Northern line upgrade phase 2	Phase 2: Northern line Upgrade 2 to deliver a further 33 per cent increase in peak capacity through the simplification and recasting of service patterns			

Appendix I: Implementation Plan

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
67	Victoria line upgrade	Victoria line upgrade including new rolling stock and signalling to provide additional capacity and improve journey times			
68	Piccadilly line upgrade	Piccadilly line upgrade to provide additional capacity and improve journey times			
71	Bakerloo line upgrade	Bakerloo line upgrade: Including new energy efficient and high capacity rolling stock and signalling			
73	Cooling the Tube programme	Enabling operation of services post line upgrades and improved passenger comfort			
74	Tube network core asset renewal	Programme of core asset renewal to lock-in benefits from the upgrades and maintain assets in a state of good repair			
75	Energy-saving initiatives	Initially, a programme of trials to include low energy lighting, smart electricity metering at stations and low loss conductor rails			
76	Regenerative braking and automatic train control	To be implemented as an integral part of the Tube upgrade programme			
Bus					
90	Bus network development	Regular review of bus network, including reviews of the strategic priorities underlying the process approximately every five			

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
		years, to cater for population and employment growth, maintain ease of use, attractive frequencies and adequate capacity, reliable services, good coverage and good interchange with other modes			
91	Bus network development	Re-patterning of bus services to take in to account new infrastructure and the related changes in demand			
92	Development of a New Bus for London	Pilot to create new iconic bus for London (which will include enhanced accessibility design features)			
93	Phasing out of 'bendy' buses	Anticipated by the end of 2011			
94	Low emission buses	Intention that all new buses entering London's fleet post 2012 be low emission (initially diesel hybrid)			
95	Enhanced real time service information	Delivery of Countdown 2; enhanced real time information at stops, on internet and mobiles			
96	Bus priority	On a case by case basis, implement bus priority measures to maintain service reliability			
97	Provision of suitable bus infrastructure to support Opportunity Areas/new developments	Review individual developments on a case by case basis and provide as necessary bus priority measures, accessible bus stops, additional bus stands,			

Appendix I: Implementation Plan

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
		upgraded or new bus stations. To be delivered in phases to support development in area			
98	Provision of suitable bus infrastructure to respond to new rail infrastructure such as Crossrail, Tube Upgrades, HLOS upgrades	Review individual sites on a case by case basis and provide as necessary bus priority measures, accessible bus stops, additional bus stands, upgraded or new bus stations. To be delivered in phases to support development in area.			
99	Additional bus stands and upgraded or new bus stations	On a case by case basis, provide additional bus stands and/or upgraded or new bus stations to support demand in specific locations in order to increase capacity and improve service reliability			
Cycling					
101	Barclays Cycle Hire scheme enhancement	Possible expansion of area covered and/or additional bikes in Barclays Cycle Hire scheme where demand justifies			
102	Additional cycle parking	Around 66,000 additional cycle parking spaces in London			
103	Barclays Cycle Super Highways	Two initial trial radial routes to central London, followed by further routes, including three in north sub-region: CS1 Tottenham to City (A10), CS11 West Hendon to Marble Arch (A5), and CS12 Hornsey to City (A1)			

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
104	Borough cycling initiatives - infrastructure based	Infrastructure based solutions such as cycle parking, cycle routes and improved signage, on areas with highest potential including Biking Borough initiatives			
105	Borough cycling initiatives - non-infrastructure based	Non-infrastructure solutions to help promote cycling across London including identifying the markets and planning interventions based on evidence and other Biking Borough initiatives			
Walking and the urban realm					
106	London-wide 'better streets' initiatives to improve pedestrian connectivity and urban realm	Improvements to urban realm and pedestrian environment			
107	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, prioritising activity based on current demand and future growth			
109	Walking information and campaign	Walking campaigns, including the '2011 year of walking', that will focus on walking routes, wayfinding, events and activities			
110	Improved wayfinding	Targeted introduction of on-street wayfinding specifically designed for pedestrians, for example, using 'Legible			

Appendix I: Implementation Plan

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
		London' principles			
111	Urban realm improvements as part of the Mayor's Great Spaces initiative	Urban realm improvements to revitalise some of London's recognised and lesser known streets, squares, parks and riverside walks			
112	Urban realm improvements in town centres	Urban realm improvements			
113	Improving urban realm and walking conditions on key routes which have high demand, for example between stations and town centres	Urban realm improvements			
118	Increased tree and vegetation coverage	Additional 10,000 street trees by 2012 (funded), with a target of an additional two million trees in London's parks, gardens and green spaces by 2025			
Roads					
119	Improved traffic control on London-wide and sub-regional corridors	Improved traffic control systems, for example further roll out of SCOOT			
120	Improved management of planned interventions on London-wide and sub-regional corridors	Minimising the impact of planned interventions on the road network with the potential to disruption traffic flows through the use of the permit scheme for road works for example			

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
121	Improved management unplanned events on London-wide and sub-regional corridors	Minimising disruption from unplanned events (accidents, emergencies etc) in 'real time' as they occur and returning the network quickly and efficiently to its planned steady state operation as soon as possible			
122	Review of loading and waiting restrictions in central London and elsewhere	Review and report on potential improvements - using a targeted demand led approach			
123	A406 Bounds Green safety and environment improvements	Safety and environmental improvements: creates a two lane dual carriageway, improves facilities for pedestrians and cyclists			
124	A406 Henlys Corner junction improvement works	Smooths traffic flow and provides signal controlled pedestrian and cyclist crossings on all arms of the junction. Consents yet to be obtained			
126	Removal of Tottenham Hale gyratory	Existing one-way system to be converted to two-way, new bus station and public square created at Tottenham Hale, improved environment and urban design, underpins local housing growth and regeneration			
127	Potential gyratory and one-way system improvements, eg at Highbury Corner and Stoke Newington	Improvements to make greater contribution to urban realm, environmental, safety and quality of life goals, for example, as well as enabling			

Appendix I: Implementation Plan

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
		appropriate vehicular movement and smooth traffic flow			
136	Further highway enhancements and/ or changes to the local road network	Consideration of further highway enhancements that will smooth traffic flow and/ or changes to the local road network related to major developments in response to increased local demand, such as at Brent Cross/ Cricklewood			
137	Achievement of state of good repair of road infrastructure	Ongoing programme of maintenance			
138	Continue trials of intelligent speed adaptation technologies	Continue trials and technology development			
139	Encourage further implementation of average speed camera technology	Continue trials and technology development			
140	Investigation of merits of 20 mph zone or zones	Assess contribution of 20 mph zone or zones in central London or elsewhere to MTS goals including safety, air quality, CO2 and congestion benefits			
141	Car club support	Support expansion of car clubs			
142	Low Emission Zone enhancements	Further LEZ enhancements and vehicle coverage			

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
143	Provision of infrastructure to support low emission road vehicles	Introduction of electric vehicle recharging points by 2015 - and support distribution networks for other alternative fuels such as hydrogen and biofuels (unfunded)			
144	Continue to work with DfT on road pricing feasibility programme	Review the option of road user charging and/ or regulatory demand management measures to influence a shift to more CO2-efficient road vehicles and lower carbon travel options, such as walking, cycling and public transport			
145	Promote emission-based parking charges	Boroughs and car park operators to be encouraged to expand coverage of parking charges to vary by duration of stay and vehicle emissions			
Other measures					
155	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			
156	Enhanced travel planning tools	Ongoing programme of enhancements to information availability, including TfL Journey Planner			
158	Targeted smarter travel initiatives	Smarter travel initiatives to reduce the environmental impact of travel, make more			

Appendix I: Implementation Plan

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
		efficient use of limited transport capacity and/or encourage active travel such as walking and cycling			
159	Increased use of travel plans	Increased use and power of travel plans for workplaces, schools and individuals			
160	Continued development and roll-out of freight initiatives	Town centre and area-based DSPs, CLPs and promotion of collaborative approaches such as consolidation centres and/or break-bulk			
161	Promotion of freight best practice	Development and incentivisation of membership of the FORS and develop functionality of the freight information portal			
162	Integrated transport policing	Establish joint transport policing intelligence unit and reporting systems to enable integrated working between the agencies policing London's transport system			
163	Tackling antisocial behaviour	Programme of initiatives to tackle antisocial behaviour, including preventative and enforcement measures			
164	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			

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
165	Transport system climate change adaptation	Develop a strategy to improve transport system resilience and safety to the impacts of climate change			
166	Olympic & Paralympic Transport Legacy Action Plan	A range of interventions to secure the maximum benefit of the physical infrastructure provided for 2012; staging of the event and longer term opportunities this presents; behavioural change as a result of the event; and supporting convergence.			
Accessibility					
169	Chelsea Hackney line	All new infrastructure will be fully accessible			
170	New accessible tube and rail rolling stock	New rolling stock will be Rail Vehicle Accessibility Requirements compliant			
171	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. Recommended stations include West Hampstead, Brondesbury, Hampstead Heath, Seven Sisters, Edmonton and Palmers Green.			
172	Continuing roll out of step-free access schemes on the Underground	Continuing programme of station step-free access schemes			

Appendix I: Implementation Plan

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
173	Tube platform to train level-access	Platform humps rolled out across the Tube system as new rolling stock is introduced to provide level access from platform to train			
174	Tube station upgrade programme	<p>To include some of the following features at upgraded stations:</p> <ul style="list-style-type: none"> • Audible and visual information at all platforms and ticket hall- Improved handrail colour contrast and design • Improved visual contrast at leading edge of each riser and tread on steps • Removing, modifying or highlighting obstructions • Induction loops at Help and Information points- Listening points at some stations • Improved lighting and public address systems • Improved signs and wayfinding • Tactile walking surfaces on every platform and staircase • Increased amounts of seating • Accessible unisex toilets at all step-free stations where toilets already exist 			

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
175	Tube wide-aisle ticket gates	Explore opportunities for further implementation of wide-aisle ticket gates			
176	Tube travel information	Accessible Tube map showing step-free and mostly step-free routes			
177	Bus network development	Regular review of bus network, including reviews of the strategic priorities underlying the process approximately every five years, to cater for population and employment growth, maintain ease of use, attractive frequencies and adequate capacity, reliable services, good coverage and good interchange with other modes			
178	Bus stop accessibility	Improved accessibility of bus stops, for example, through removal of street clutter			
179	Development of a New Bus for London	New bus will include enhanced accessibility design features			
180	Accessible crossings programme and urban realm improvements	Improve the physical accessibility of the streetscape, particularly in town centres and on routes to stations and bus stops, taking accounts of the whole journey approach			

Appendix I: Implementation Plan

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
181	Travel information	Improve the availability, quality, quantity and timeliness of accessibility-related travel information			
182	Staff availability	To ensure staff are available to provide assistance, information and reassurance throughout services hours			
183	Staff training	To ensure the needs of the disabled passengers are understood by all frontline staff			
184	Initiatives to improve attitudes of staff and travellers	Stakeholder, staff and public initiatives to improve staff and public attitudes and raise awareness of people's accessibility needs			
185	Enhanced Dial-a-Ride service	New Dial-a-Ride fleet and review of operations			
186	Further Extensions to the public transport system	All extensions to the public transport system will meet the requirements of the Disability Discrimination Act			
187	Blue Badge discounts	Discounts on Congestion Charging schemes			

Reference Number	Scheme	Description	Completion 2010–2012*	Completion 2013–2020†	Completion Post 2020
188	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			
International and national rail links (DfT/Network Rail/TOC led schemes)					
189	High Speed 1 international service enhancements	Direct services to a wider range of European destinations (making use of new European infrastructure)			
190	Potential link between High Speed 1 and High Speed 2	Potential link between HS1 and HS2 allowing through services between HS2 and Europe, including calls at Stratford.			
191	West Coast Main line enhancements	Train lengthening and frequency improvements to London Midland services			
192	West Coast Main line further enhancements	Longer and more frequent trains			

APPENDIX 2: LIST OF FIGURES

Chapter 1: Introduction

- Figure 1.1: Diagram showing relationship between London-wide, sub-regional and borough level documents
- Figure 1.2: The ‘fuzzy boundaries’ of the five sub-regions
- Figure 1.3: Enhancements to London’s transport infrastructure
- Figure 1.4: Places of sub-regional importance in north London
- Figure 1.5: Map showing opportunity areas and areas for intensification in north London, including indicative capacities for housing and employment
- Figure 1.6: North London transport geography
- Figure 1.7: Comparison of mode share between sub-regions
- Figure 1.8: Comparison of total trips and indicative mode-share change from 2006 to 2031
- Figure 1.9: Map showing challenges and opportunities in the north sub-region

Chapter 2: Supporting economic development and population growth

- Figure 2.1: Northern line morning peak hour frequencies (trains per hour per direction)
- Figure 2.2: London Overground route map (2012)
- Figure 2.3: Further National Rail upgrades to support growth
- Figure 2.4: Possible phased approach to delivery of Chelsea Hackney Line
- Figure 2.5: Current bus routes and population growth to 2031
- Figure 2.6: Growth pressures for buses in the north sub-region
- Figure 2.7: Map showing corridors within the north sub-region with connectivity challenges
- Figure 2.8: Chingford to Stratford corridor
- Figure 2.9: HS2 Old Oak Common station potential links
- Figure 2.10: Sub-regionally important interchanges in the north sub-region
- Figure 2.11: Strategic interchange concept
- Figure 2.12: Map showing London-wide and sub-regional corridors in north London
- Figure 2.13: Map showing congestion on the road network in the north sub-region
- Figure 2.14: Potential interventions targeted at congested points on the highway
- Figure 2.15: Map showing Henlys Corner junction improvement scheme

Chapter 3: Enhancing the quality of life for all Londoners

- Figure 3.1: Types of places
- Figure 3.2: Distribution of typologies of places in north London
- Figure 3.3: Maps showing current and proposed lay out for Tottenham Hale gyratory
- Figure 3.4: Predicted annual mean PM₁₀ concentrations in north London in 2011
- Figure 3.5: Predicted annual mean NO₂ concentrations in 2011
- Figure 3.6: Relative contribution of road transport vehicles types to NO_x emissions in the north sub-region
- Figure 3.7: Daytime road noise map
- Figure 3.8: Proportion of Londoners rating their health as ‘not good’, 2001
- Figure 3.9: Trips that could be walked by destination
- Figure 3.10: Comparison of trips that could be walked with areas of deprivation
- Figure 3.11: Map showing Biking Boroughs and Barclay Cycle Superhighways in the north sub-region
- Figure 3.12: Potentially cyclable trips by destination
- Figure 3.13: MOSAIC cycling profile map of north sub-region

Chapter 4: Improving the safety and security of all Londoners

- Figure 4.1: Priority areas for improving road safety in the north sub-region
- Figure 4.2: Areas with higher levels of KSIs per kilometre of 30mph local roads, 2007-2009
- Figure 4.3: Map showing Bounds Green safety improvements

Chapter 5: Improving transport opportunities for all

- Figure 5.1: Proportion of stations in London corridors with step-free access in 2010
- Figure 5.2: Absolute difference in average journey time (minutes) to Bank using step-free access
- Figure 5.3: Proportion of stations in London corridors with step-free access in 2031 following planned funded and unfunded improvements
- Figure 5.4: Map showing areas of regeneration in London
- Figure 5.5: Employment access for north London, 2006
- Figure 5.6: Employment access for north London, 2031
- Figure 5.7: PTAL map and areas of deprivation in the north sub-region

Chapter 6: Reducing transport's contribution to climate change and improving its resilience

- Figure 6.1: Ground-based transport CO₂ emissions, 2008
- Figure 6.2: North sub-region CO₂ emissions from ground-based transport, 2008
- Figure 6.3: Potential electric vehicle uptake in the north sub-region in the short to medium term
- Figure 6.4: Percentage of adult population (with a driving license) that could potentially be a member of a Car Club

Chapter 9: Deliver of the Plan and sustainability assessment

- Figure 9.1: Delivery process