OLYMPIC LEGACY SUPPLEMENTARY PLANNING GUIDANCE

STRATEGIC TRANSPORT STUDY



Transport for London

Olympic Legacy Supplementary Planning Guidance Strategic Transport Study

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Executive Summary



This summary presents the main conclusions of the Olympic Legacy Supplementary Planning Guidance (OLSPG) Strategic Transport Study, undertaken by Policy Analysis, Transport for London (TfL) on behalf of the Greater London Authority (GLA). Steer Davies Gleave in consortium with Sinclair Knight Merz provided support on the strategic transport modelling described in this report. The London Thames Gateway Development Corporation also supported the connectivity aspects of the study. This is a strategic transport study to consider the transport challenges arising from the existing and proposed development within the OLSPG area and the transport interventions that are required to support the scale and geography of development the Guidance promotes. This work provides a framework for further detailed assessments which will be required as developments are taken forward to the detailed planning stage, to design and deliver the transport required.

The Transport Study provides an evidence base for the Connectivity and Transport section of the OLSPG and identifies a package of measures that need to be in place to support and mitigate any adverse impacts of the development, to provide a framework for negotiation at the planning application stage, to integrate the development into the local areas in a way which supports walking, cycling and public transport trips and identify measures that can be designed in by developers, including electric charging points, cycling and walking facilities.

Supplementary Planning Guidance Development Principles

The primary purpose of the Guidance is to supplement and apply London Plan policy for the OLSPG area by setting out the Mayor of London's strategic priorities and long term vision for the Queen Elizabeth Olympic Park and its surrounding areas in a single spatial planning document and sets out in maps and text how the Mayor wished to see this part of the Lower Lea Valley evolve and change over the next 20 years,

The draft Guidance sets six overarching development principles, each of which encapsulates a series of more detailed development principles, actions and interventions, which together are designed to deliver a shared vision for the OLSPG area. The vision has Convergence at its core, and aims to use the Legacy from the 2012 Games to make east London a place where people will choose to settle and stay, rather than move away from as their circumstances changes. The draft Guidance sets six overarching development principles are:

- Homes and Communities: To help meet London's urgent need for new homes by creating a network of well-connected Lifetime Neighbourhoods across the OLSPG area. These should be designed to meet the needs of existing and future communities, enable healthy and active lifestyles, maximise opportunities for family housing, promote community cohesion, and provide access to employment opportunities, local shops and community and social infrastructure.
- Business and employment: To promote Stratford as a new Metropolitan Centre, ensure land use change leads to a wide range of new business, training and

- employment opportunities across the OLSPG area, and to identify and protect sites needed for social infrastructure.
- Connectivity and transport: To ensure that existing and new communities across the OLSPG area are linked by a network of strategic and more fine-grained local connections, to use the area's public transport infrastructure to achieve a lasting shift to more sustainable forms of transport and movement such as walking and cycling, and to minimise adverse impacts on the capacity and operation of the area's public transport and highway networks.
- Urban Form: To use the area's unique open spaces, waterways, heritage buildings and contemporary city scale architecture and sporting facilities to create a network of new linked, inclusively designed and revitalised Lifetime Neighbourhoods.
- Sustainable development: To build on the sustainability platforms inherited from the 2012 Games, to promote and achieve exemplar standards of sustainable design and construction and environmental quality across the OLSPG area, and to create a part of London which us ready to response to the challenge of climate change.
- Convergence: Planning applications that propose more than 100 residential units or 1,000 square metres of new floorspace or uses should include a statement setting out how they will help achieve the Convergence outcomes.

Understanding the current and future situation

The current situation and completed strategic transport modelling (for both the highway and public transport networks) has been analysed in order to understand the current and future transport challenges in the OLSPG area and its surroundings. The modelling assisted in understanding any future challenges under different development assumptions. The modelling tests two main future year development scenarios; one (the Reference Case) based on the indicative employment capacity and minimum new homes described in annex 1 of the London Plan, using the broad land uses set out in the Mayor's 2007 Lower Lea Valley Opportunity Area Planning Framework, and a second scenario assuming further industrial land release and borough ambitions as expressed in their emerging local development plan documents. Assumed growth in the rest of London is based on the London Plan borough level forecasts.

There has been significant investment in public transport infrastructure over the last twenty years in this area to support regeneration and the Olympics. These include the Jubilee Line extension, Channel Tunnel Rail Link and improvements to London Overground, with the DLR Stratford International route and Crossrail due to open in the future. The opportunity to maximise the benefits from this investment must be taken for this area to meet the vision set out in the OLSPG document.

There are areas which suffer significant severance and there is differential accessibility across the area especially to the north of the park and around Hackney Wick caused by physical barriers, for example, major roads and natural barriers like the River Lea. The detailed planning of this area will need to consider this issue further. Connections to other areas should be strengthened to enhance walk, cycle and public transport links.

Rail crowding which currently occurs on routes into central London and from the west to Canary Wharf will increase in the future and there will be increased crowding at some key

stations and interchanges. There is also expected to be increased demand for buses in the future.

There is currently significant highway congestion on strategic routes (e.g. A12, A13 and A11) and key junctions (e.g. Bow Roundabout) which is more prevalent in the evening peak. This is also expected to increase in the future. Delay in vehicle hours are expected to increase by approximately 170% in the morning peak and 180% in the evening peak between now and 2031 under the Reference Case assumptions. The higher levels of congestion will have a negative impact on journey time reliability for all road users including buses and freight.

Key Conclusions

The existing road network is operating at capacity now and current funding limitations mean that public sector investment on large scale road schemes in the short to medium term is likely to be limited. The A11 and A12 have a key role to support the economic of the local area and the whole of London so local interventions are unlikely to have a significant impact.

Public transport appears to have capacity for the assumed end-state based on modelling results though it is unlikely to absorb future demand to the extent required for significant mode shift from car without significant intervention. The growth in public transport use appears to be in the counter-peak direction and therefore has little impact on the level of crowding of lines. Flows increase by 25 to 35% on the Central Line between Liverpool Street and Stratford in the morning peak compared to a 1 to 2 per cent increase in the other direction when comparing the Reference Case projections for this area and the OLSPG projections. However, there is increased crowding seen at key stations and interchanges, for example, flows at Bromley by Bow are expected to increase by 20 per cent between the Reference Case and OLSPG development assumptions.

The modelling considers only the end state, the interim situation will also need to be taken into account i.e. before people adjust the location of both their jobs and homes to the optimum solution as this could lead to different transport challenges.

Transport and land use interventions needed to support the development within the OLSPG area will include measures to:

- Maximise walking, cycling and public transport use Encourage behaviour change and ensure good local connectivity
- Rail Capacity and connectivity improvements
- Bus Ensuring sufficient infrastructure and capacity
- Highways Traffic management and encourage less car use
- Land Use Using policy to minimise car use

Options for Transport Solutions

Maximise walking, cycling and public transport use

Connectivity is a key issue for both transport and the liveability of the area. Improving the local connectivity of the area will support the integration of the new development into the surrounding area, reduce severance and maximise the access to opportunities, services, employment and key public transport nodes. Improving local connectivity will also support a mode shift from mechanised modes to walking and cycling.

Links were identified from previous studies and Masterplans for the area and were assessed in terms of meeting the objectives of both the OLSPG and the Mayor's Transport Strategy. The Transport Study identifies 23 key additional links to those already funded and committed in the area.

These are all included in the OLSPG Connectivity and Transport section and are split between the strategic and local connectivity principles.

Rail Interventions

There are a number of transport improvements which will begin operation in the short term as part of TfL's Business Plan, HLOS and in preparation for the Olympics. These include Crossrail, DLR Stratford International Route, London Underground upgrades and bus improvements. The benefits of these improvements need to be maximised by minimising any barriers to use, for example, ensuring that access to stations meets best practice guidelines.

Stratford International station also provides an opportunity to improve Stratford's connectivity to both national and international destinations as schemes are proposed this benefit should be considered.

Demand on the Stratford to Canary Wharf leg of the DLR is heavy in the morning peak and this line could not accommodate substantially more passengers with the current capacity. Beyond January 2012, there will be 10 trains per hour on this section as a mixture of 2 and 3 car services, one option to increase capacity could be to lengthen more services to 3 car. The estimated capital cost per vehicle is £2.5 million. Increasing the frequency of trains on this route would also increase capacity, however in order, to achieve increased train frequency the section between Bow Church and Stratford would need to be double-tracked, which would also lead to a reliability benefit. There would be synergies in delivering double tracking when Crossrail was on site. However, some potential issues around deliverability have been identified, and land would potentially need to be safeguarded. The cost of double-tracking would be an approximate £50 million (including land costs).

DLR modelling suggests that there will be crowding on the Stratford International to Canning Town route and that capacity enhancement (possibly through 3-car operation) may be needed from around 2015/16.

The Central line currently operates an morning peak frequency of 30 trains per hour westbound and 27 trains per hour eastbound for a short period of time. A power upgrade would allow 30 trains per hour to be operated in both directions for a sustained period of 2.5 hours during the morning peak.

A business case, conducted in 2007, found a good Business Case Ratio, for the power upgrade. This was based on a lower level of development than proposed in the OLSPG. The benefits are likely to be higher with the higher level of development proposed. The power upgrade could have the following benefits for the Olympics Legacy SPG:

- Increase the frequency of eastbound services and therefore reduce wait times for people taking eastbound morning peak journeys
- Improve the reliability of the Central line, having benefits for OLSPG residents and employees

- Encourage more people to use London Underground services as opposed to private cars and therefore help to reduce highway congestion.
- Help reduce crowding through central London, which may be made worse if OLSPG employees are travelling from destinations from the west.
- Help relieve Jubilee line eastbound crowding

The estimated cost is £50 to 60 million (derived in 2007).

This Study also considered the impact on stations and identified that there are current congestion problems at Leyton and Bromley-by-Bow stations that are expected to increase and that improvements will need to be made to these stations. The impact on other stations should be continuously monitored as plans develop for this area to ensure that congestion or poor quality of stations does not act as a deterrent to use or become a safety issue. Other stations that require improvements to interchange and access are Hackney Wick, Stratford International and Hackney Central/Hackney Downs.

Both the East London Sub-Regional Transport Plan and this study have identified that there is a gap in public transport links north from Stratford. This has also been highlighted by the public transport modelling for this study which predicts an increased demand for bus trips along this corridor in the future. A number of schemes have been considered for this route such as West Anglia main line upgrade and/or Hall Farm Curve to enable direct train services from Chingford and Walthamstow to Stratford and/or infrastructure improvements at Tottenham Hale. These are being examined in the High Level Output Specification (HLOS2) for the period 2014-2019. The layout of Stratford Regional station currently acts as a constraint to the number of additional trains that could be run without the need to reduce the frequency of other routes using the station. Additional infrastructure works at Stratford Regional station, for example, to deliver additional platforms would allow some Cambridge to Liverpool Street services to run via Stratford to provide improved links along the growth corridor to Cambridge and down to Canary Wharf are required. However, the infrastructure works at Stratford would be expensive.

The OLSPG area has a section of the safeguarded route of the Chelsea-Hackney Line (Crossrail2). The Mayor has been asked by Government to undertake a review of the route to ensure the scheme will provide the maximum benefit and value for money and a number of options are currently being developed and tested with key stakeholders.

Planning for High Speed 2 is now underway and if connected to High Speed 1 (possibly using the North London Line without negatively impacting current passenger or freight services) would allow direct connections between Stratford International, Birmingham, the north of England and mainland Europe.

Bus Interventions

Measures need to be taken to ensure that bus infrastructure is protected or provided to enable bus services to meet future demand and traffic conditions should not compromise the reliable operation of the bus network.

The two new bus stations being provided in Stratford City should be protected as should the existing Stratford bus station. TfL also needs to retain, and ideally improve, standing facilitates at Hackney Wick and the on-highway stand at Chapman Road.

The road layout needs to support direct routings; including bus only links / bridges:

- Sugar House Lane to the River Lea
- Bromley-by-Bow North to Three Mills Lane
- Devas Street to Bow Road via Devons Road and Stroudley Walk
- Two-way operation of Eastway for buses

There needs to be sufficient infrastructure including enough to cover future growth, including stations, stands, depots and substantial growth expected between Stratford and Walthamstow, Leyton, Mile End, Bow, Hackney, West Ham and along the Romford Road corridor.

Highway Interventions

Enhancements will be required on the highway network otherwise further traffic growth is expected to result in severe congestion to the detriment of all road users. Possible interventions could include improvements to junctions and road layout as well as, measures to minimise car use for example, promoting car clubs, car sharing and taxi facilities. Smoothing traffic flow is also a key objective for TfL and the Mayor, as stated in Proposal 30 of the Mayor's Transport Strategy, the Mayor, through TfL and working with the London Boroughs and other stakeholders will introduce measures to smooth traffic flow to manage congestion for all people and freight movements on the road network and maximise the efficiency of the network.

The River Crossings Package could also have a significant impact. A key issue for the area is the resilience of the highway network particularly to an incident in the Blackwall Tunnel which if it leads to a closure of the Tunnel leads to wide spread congestion across the area and significantly higher journey times and reduced journey time reliability. The proposed vehicle link at Silvertown would help to mitigate the impact of incidents at Blackwall Tunnel but would not reduce day to day congestion. The River Crossings Package also includes a cable car between North Greenwich and the Royal Docks as well as possible replacement of the Woolwich Ferry at Gallions Reach.

Land Use Interventions

Land Use policies should be used to minimise car use and encourage trips to be made using walking, cycling or public transport. Measures to minimise car use could include encouraging car clubs and car sharing as well as travel planning.

Parking standards should be considered which support the need to minimise vehicle use and should be used for all vehicles and purposes (residential, commercial and events) and consider not only new development but also existing uses. Car free or low car developments should be considered where appropriate and particularly in areas with high PTALs.

Measures should also be taken to ensure that demand for employment is from the residential areas that are local or to the east of the OLSPG area, for example, considering the phasing of development to ensure that when homes are built there are jobs available in

the local area and also ensuring that the skill requirements for the jobs in the area match the skills of the local residents.

The OLSPG predicts that there will be around 13,000 additional children in the OLSPG areas as part of the focus of family housing. Therefore, school travel planning is required to encourage low car mode share for these trips.

Further Studies and Analysis

This Transport Study has considered possible interventions to mitigate against the negative impacts of the development levels proposed in the OLSPG.

Further work is required as the redevelopment plans are developed in more detail, to enable more detailed understanding of the transport requirements in the OLSPG area. Figure 0.1 describes further studies that would be required

Figure 0.1 Further studies

Task/Mode	Future Study
Bus	Further assessment of the bus priority measures and infrastructure (such as bus stands) required to deliver the bus services to support the OLSPG development.
Underground	Further investigation of the benefits of the Central Line Power Upgrade. Further modelling of passenger flows and investigation of the requirements at Bromley-By-Bow and Leyton stations.
DLR	Further investigation of the impact of the preferred development scenario on operations of DLR stations
Freight	Further investigation of the impact of the preferred development scenario on changes in freight patterns.
Cumulative Impact	Understanding the cumulate effects of development in the
of Opportunity Area	Opportunity Areas in the East London sub-region on the transport
Development in	network
East London	
Package of	Further understanding of the transport package of measures with
measures	costs.

1. Introduction



This report documents the work of the Olympic Legacy Supplementary Planning Guidance (OLSPG) Strategic Transport Study, undertaken by Policy Analysis, Transport for London (TfL) on behalf of the Greater London Authority (GLA). Steer Davies Gleave in consortium with Sinclair Knight Merz provided support on the strategic transport modelling described in this report. The London Thames Gateway Development Corporation also supported the connectivity aspects of the study by collating the local connectivity schemes highlighted in the Masterplans and Studies for the surrounding area. The Transport Study is a strategic study to consider various options for improving public transport accessibility within the OLSPG area, and address the main transport issues (public transport and highway) arising from the development scenarios proposed in the planning framework. Further assessment is required when developments are taken forward to the detailed planning stage, to enable thorough understanding of the transport requirements in the study area.

1.1. Olympic Legacy Supplementary Planning Guidance Area

The OLSPG covers 2,000 hectares of east London and is at the fulcrum of two nationally important growth corridors, the London-Stansted-Cambridge-Peterborough corridor to the north and the Thames Gateway to the east. It also falls within four London boroughs, Hackney, Newham, Tower Hamlets and Waltham Forest.

The draft Guidance sets six overarching development principles, each of which encapsulates a series of more detailed development principles, actions and interventions, which together are designed to deliver a shared vision for the OLSPG area. The vision has Convergence at its core, and aims to use the Legacy from the 2012 Games to make all of east London a place where people will choose to settle and stay, rather than move away from as their circumstances changes. The draft Guidance sets six overarching development principles are:

- Homes and Communities: To help meet London's urgent need for new homes by creating a network of well-connected Lifetime Neighbourhoods across the OLSPG area. These should be designed to meet the needs of existing and future communities, enable healthy and active lifestyles, maximise opportunities for family housing, promote community cohesion, and provide access to employment opportunities, local shops and community and social infrastructure.
- Business and employment: To promote Stratford as a new Metropolitan Centre, ensure land use change leads to a wide range of new business, training and employment opportunities across the OLSPG area, and to identify and protect sites needed for social infrastructure.
- Connectivity and transport: To ensure that existing and new communities across the OLSPG area are linked by a network of strategic and more fine-grained local connections, to use the area's public transport infrastructure to achieve a lasting shift to more sustainable forms of transport and movement such as walking and cycling,

- and to minimise adverse impacts on the capacity and operation of the area's public transport and highway networks
- Urban Form: To use the area's unique open spaces, waterways, heritage buildings and contemporary city scale architecture and sporting facilities to create a network of new linked, inclusively designed and revitalised Lifetime Neighbourhoods.
- Sustainable development: To build on the sustainability platforms inherited from the 2012 Games, to promote and achieve exemplar standards of sustainable design and construction and environmental quality across the OLSPG area, and to create a part of London which us ready to response to the challenge of climate change.
- Convergence: Planning applications that propose more than 100 residential units or 1,000 square metres of new floorspace or uses should include a statement setting out how they will help achieve the Convergence outcomes.

The Supplementary Planning Guidance will capture the once in a lifetime opportunity to bring about fundamental and lasting change in east London, focussed on the Olympic Park and adjacent to the emerging Metropolitan town centre at Stratford. In the wider OLSPG area there is the potential to build more than 29,000 homes and 1.4 million m² of employment floor space in the next 20 years. This is based on a development capacity study completed by GLA which assessed capacity in line with the principles in the London Plan and borough planning documents.

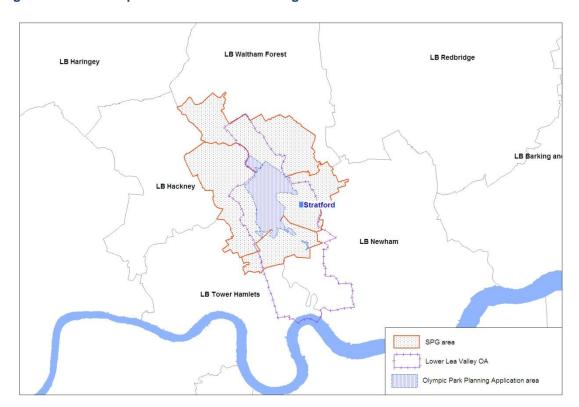


Figure 1.1 OLSPG Spatial Context and Coverage within Greater London

1.2. Background to the Strategic Transport Study

The Strategic Transport Study has been undertaken to provide the transport input to the OLSPG being led by the GLA. It is the evidence base for the Connectivity and Transport section of the OLSPG. It has been carried out in consultation with key stakeholders including the London Boroughs of Hackney, Waltham Forest, Newham and Tower Hamlets, GLA, LTGDC, and ODA as well as the TfL businesses.

1.3. Report Structure

The report is structured as follows:

- Chapter 2 describes the context for the Transport Study
- Chapter 3 summarises the current and future situations
- Chapter 4 outlines the strategic transport modelling for the OLSPG
- Chapter 5 considers the local connectivity in the area
- Chapter 6 presents options for transport solutions
- Chapter 7 gives the study conclusions

2. Context for the Transport Study



2.1. Objective

The objective of the OLSPG Transport Study is to provide the context for and inform the direction of the transport elements of the OLSPG. The Study has assessed a range of transport initiatives against the OLSPG's preferred development scenario to arrive at conclusions on the most appropriate transport solutions to enable growth and encourage long-term investment in the OLSPG area.

2.2. Study-specific Objectives

The objectives of the Transport Study are:

- To highlight issues and challenges associated with the development
- To identify a package of measures that mitigates adverse impacts caused by development traffic, especially increases in congestion
- To assist in enabling the new development to be integrated seamlessly into the rest of the city through ensuring local connectivity supports walking, cycling and public transport trips.

2.3. Study Approach

2.3.1. Overall Approach

The study estimates the impact of the preferred development scenario on the transport network compared to the London Plan minimum capacity estimates for the area, background growth and base year.

2.3.2. Stakeholder Consultations

The stakeholder consultations were completed through the OLSPG steering group which includes the London Boroughs of Waltham Forest, Hackney, Newham and Tower Hamlets, the 5 Host Boroughs Unit, Design for London (DfL), Housing and Communities Agency (HCA), London Thames Gateway Development Corporation (LTGDC), Olympic Delivery Authority Planning Decisions Team (ODA PDT) and London Development Agency (LDA).

2.3.3. Transport Modelling

Transport modelling has been undertaken using the London Transportation Studies (LTS), Land Use Trip End (LUTE), RAILPLAN and SATURN models for overall demand, public transport and highway assignment modelling respectively. These were considered the best available models when the modelling was undertaken in summer 2010. In outline:

- Overall travel demand by mode was forecast using the LTS model as a basis and LUTE for local demand changes
- Public transport flows were assessed using RAILPLAN-A12, a version of TfL's morning peak RAILPLAN model developed for the LTGDC A12 Transport Capacity Study and based on the TGX model with the detail from the OPAL model added.

- Traffic flows and congestion were assessed using TfL's ELHAM phase 1, a morning and evening peak SATURN model developed for the LTGDC A12 Transport Capacity Study, which is the TGX model with the detail from the OPAL model added and calibrated for the area
- Station patronage flows and congestion problems were assessed using observed data and the results of RAILPLAN A12

These models were tested for their fitness for purpose for this study before a decision was made to use them. Full details of the development of these models are provided in the relevant Model Validation reports.

2.4. Planning Policy Context

The OLSPG Integrated Impact Assessment Scoping Report (June 2010) provides a full review of the planning documents for reference, with key objectives, indicators and targets relevant to the OLSPG.

The London Plan (July 2011) sets out the overall strategic plan for London for the next 20-25 years. Policy 2.4 sets out the strategy to realise the benefits of the 2012 Games and their legacy.

The Mayor's Transport Strategy (May 2010) accompanies the London Plan and sets out the Mayor's transport vision. One of the six goals of the overarching vision is to "Support delivery of the London 2012 Olympic and Paralympic Games and its legacy" and this is developed further in Policy 26, to "maximise the benefits of [the 2012 Games] physical and behavioural legacy to support the principle of convergence".

Each of the four London Boroughs have either saved policies from Unitary Development Plans (UDPs), or are progressing with their Local Development Frameworks (LDFs) which contain relevant sections concerning transport, as well as developing Masterplans or Area Action Plans (AAPs) for particular locations. These have been considered in this Transport Study, including Hackney Wick Area Action Plan, Stratford and Lower Lea Valley Area Action Plan and the Northern Olympic Fringe Masterplan.

2.5. Transport Context

The Study is consistent with the Mayor's Transport Strategy, May 2010 and the funded and committed schemes are assumed to be completed in the time period of this study.

The East Sub-Regional Transport Plan sets out five transport challenges for the sub-region. These are:

- Improving connectivity to and within key locations to support existing communities, growth, aspirations for change and improve the quality of the environment
- Reducing the physical barrier to travel including the River Thames in East London, and improve the resilience of the transport network
- Supporting the efficient movement of goods and encouraging sustainable freight movement

- Ensuring the benefits of funded transport investment are maximised
- Managing highway congestion and public transport crowding and make efficient use of the transport network

Future versions of the East London Sub-Regional Transport Plan will consider the conclusions of this study.

3. Understanding the Current and Future Situations



3.1. Land Use

At present many parts of the OLSPG area – such as Fish Island and Hackney Wick, Pudding Mill Lane and Sugar House Lane, and Lea Bridge Road, Ruckholt Road and Orient Way remain in industrial use providing a wide range of jobs and activities that support London's wider economic role, with particular emphasis on engineering, chemicals, warehousing and distribution, power generation, transport and food processing. In parts of the OLSPG area, new clusters of economic activity have emerged such as creative and cultural industries (see figure 2.B.2 in the draft Guidance).

Westfield Stratford City, which will provide 160,000sq.m. of retail floorspace, is currently under construction and due to open in autumn 2011. Planning permission exists for nearly half a million square metres of new offices at Stratford, and after the Games, the permanent Olympic venues will be brought into public use with new development brought forward where the Game's temporary buildings and facilities are now being constructed. This includes the International Broadcast Centre / Main Press Centre (IBC / MPC) which will provide 80,000 square metres of business space, with the potential to enable thousands of new jobs.

The London Plan proposes that a new Metropolitan centre will be focused on Stratford town centre to be complimented by a rich mix of employment, housing and open spaces across the Lower Lea Valley Opportunity Area. LB Newham is currently developing a Masterplan for the transition of Stratford from a Major to a Metropolitan centre. Current land use key diagram for the OLSPG area can be seen in Figure 3.1.

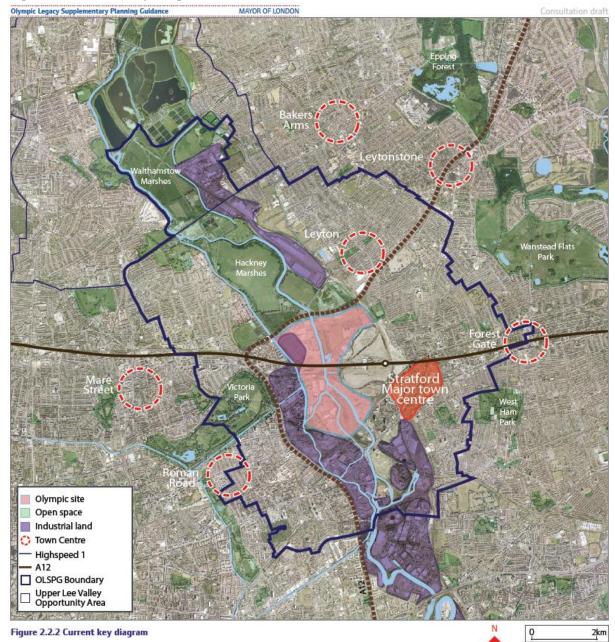
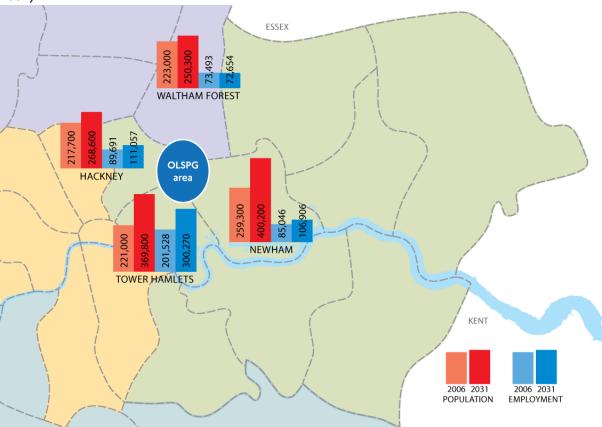


Figure 3.1 Current Key Diagram from draft Guidance

3.1.1. Population and Employment

Some of the largest growth in London is to be seen within the East London sub-region and the OLSPG area is no exception, as Figure 3.2 shows.

Figure 3.2 London Plan Population and Employment Change in OLSPG Boroughs (2006 and 2031)



Of the four Boroughs which cover the OLSPG area, Newham is projected to have the largest population in 2031 however the largest population change is set to be in Tower Hamlets. Waltham Forest is projected to have the smallest population increase.

The areas with the highest concentrations of deprivation are located to the south of Stratford and in the Bow & West Ham areas within the OLSPG area.

The East London sub-region has a relatively high proportion of younger people compared to the overall London average, as shown in Figure 3.3. The London Boroughs of Newham and Tower Hamlets have the largest proportions of 15-29 year olds. Newham also has the largest proportion of 0-14 year olds. Conversely Waltham Forest has the largest proportion of over 60 years olds compared to the other Boroughs and higher than the London average.

This raises the question of how travel patterns will change in the future as these people mature. Analysis of the London Travel Demand Survey shows that in general the highest car driver trip rate is for 45 to 59 year olds where as the highest for all trips is 25 to 44 year olds. Therefore as the relatively young population in these boroughs matures we would expect average trip rates to increase and therefore the number of trips to increase. This

presents an opportunity to shape travel behaviour, to encourage place making, to encourage use of more sustainable modes such as walking and cycling and to promote public transport wherever possible.

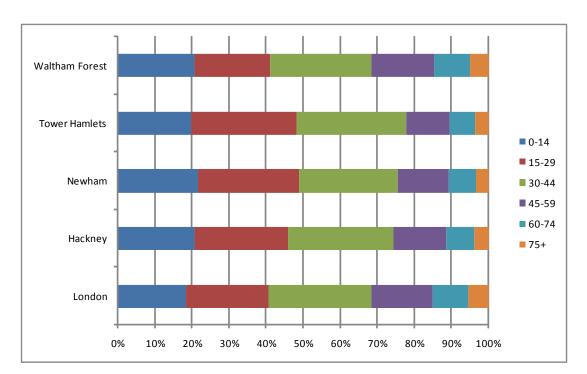


Figure 3.3 Comparisons of age groupings across each of the Olympic Legacy Boroughs together with the overall London average (2006)

As Figure 3.2 shows the largest employment increase will take place in Tower Hamlets, notably because of the location of Canary Wharf within its Borough boundaries. Canary Wharf is expected to increase significantly over the London Plan period. Continued connections between Stratford and Canary Wharf are vital for the OLSPG area.

3.1.2. Transport-related land uses

Figure 3.4 below shows the strategic transport sites in the area. These uses include large sites such as the Bow West and Bow East railhead sites currently being used for Olympic construction activity which after 2012 will be returned to a fit for purpose state.

There are safeguarding proposals for Crossrail and also for the Chelsea Hackney Line, for permanent and temporary uses (such as during construction phases). This includes the replacement Pudding Mill Lane DLR Station and associated viaducts. (This safeguarded alignment is shown in figure 2.C.2 in the draft Guidance.)

There are also River Wharves, as at Bow Free Wharf, designated as an Industrial Employment Area by LB Tower Hamlets. This is used by British Waterways for maintenance, and would need to retain access for HGVs to the water's edge.

The Legacy area includes several other strategic transport sites including

Bus stands and stations – Eastway Road Hackney Wick, Leyton High Road,
 Stratford bus station

- Bus garage Bow Bus garage, Fairfield Road (which is also Grade II listed)
- London Underground operational land and depots, including Stratford Market Depot

These will need to be retained and there may need to be additional infrastructure provision infrastructure provision across the OLSPG area to support the enhancement of the network.

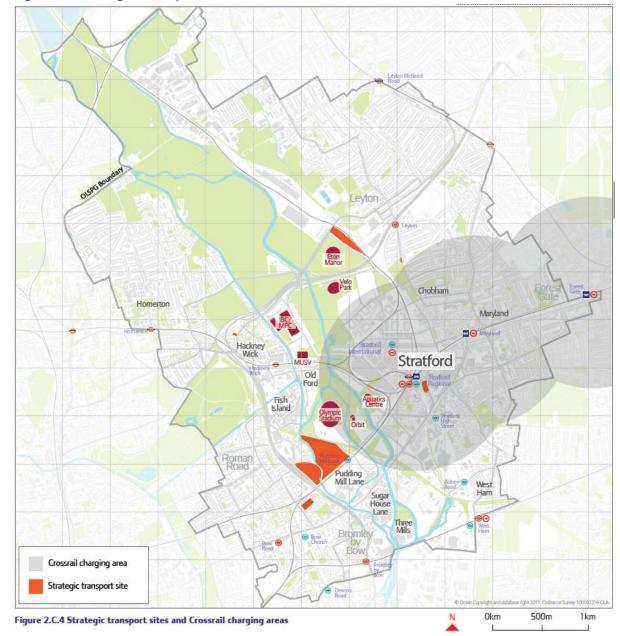


Figure 3.4 Strategic Transport sites from draft Guidance

3.2. Transport Facilities and Service Patterns

The area has a broad range of transport infrastructure ranging from the strategic Transport for London Road Network (TLRN) to local roads and accesses, high speed domestic and international rail services, National Rail services, Docklands Light Railway (DLR), London Overground (LO), London Underground (LU), numerous bus routes and walking and cycling routes. The current and planned network can be seen in Figure 3.5.

Stratford station is the main transport hub in the vicinity. Investments are taking place to upgrade the interchange for the Olympics & associated development such as Stratford City. Currently the Station is served by Central & Jubilee Line LU services providing access to Central London, the City and Canary Wharf, whilst National Rail Services connect into Essex and East Anglia. Two branches of the DLR provide further access to Canary Wharf, together with the Royal Docks (including London City Airport) and under the Thames to Woolwich Arsenal. London Overground orbital services terminate at the interchange. Stratford station is the ninth busiest station in London based on entry and exit points in the morning peak.

From 2018 Stratford and the surrounding area will also benefit from Crossrail Services to Central & West London.

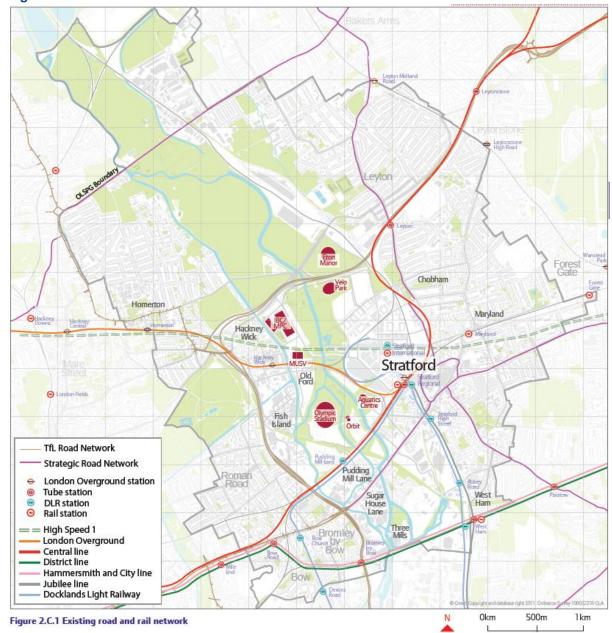


Figure 3.5 Current road and rail network the OLSPG Area

The Stratford International Station situated within the core of the Olympic Park and connected to Stratford station via the DLR and walk routes. Hackney Wick London Overground Station and Leyton and Bromley by Bow Central Line Stations are also in close proximity.

The OLSPG area is skimmed by the A12 on the western and northern edges of the Olympic Park. This road provides key routes south of the river via the Blackwall Tunnel and north connecting with the M11 and M25. These roads and rail lines cause severance and can act as a barrier to trips particularly to walking and cycling.

Passenger volumes are high on the National Rail and London Underground lines. Bus services carry much lower volumes on individual links but over a very extensive network. Service frequencies for public transport serving the area are summarised in Figure 3.6.

Figure 3.6 Service frequencies for public transport serving OLSPG study area, morning peak hour

Mode	Route	Services per hour in each direction		
Due	05			
Bus (Stratford Bus	25	10 / 10		
Station, hackney	26	7/7		
Wick Station,	30	7/7		
Leyton Station)	58	5/5		
	69	6/6		
	86	10 / 10		
	97	6/6		
	104	9/9		
	108	6 / 6		
	158	5/5		
	236	6/6		
	238	6/6		
	241	6/6		
	257	8/8		
	262	6/6		
	276	6/6		
	308	15 / 15		
	388	6 / 6		
	425	5/5		
	473	6/6		
	488	5/5		
	D8	5/5		
DLR	Stratford < > Lewisham	8.5		
Overground	Stratford < > Richmond / Clapham Junction	6 / 6		
Rail	Liverpool Street < > Out of London	20		
		(calling at Stratford)		
	St. Pancras < > Kent	~6 / 4		
Underground ¹	Central Line East < > West	27 / 30		
-	Jubilee Line Stratford > Stanmore	18 / 18		

-

 $^{^{1}}$ The figures quoted ate for the peak hour. The average frequencies over the peak period (0700-1000) are Central Line 25/27 and Jubilee Line 17.3/17.6.

3.2 Travel Demand

Travel Patterns

The data in this section is taken from the London Travel Demand Survey. Due to the sample size it has not been possible to complete the following analysis for the OLSPG area itself. Therefore, the analysis below considers the four boroughs which are partly covered by the OLSPG area.

Figure 3.7 Trips and travel distance, totals and per person per day, by residents of the region and Borough

Area	Population aged 5 and over (000s)	Trips per day (000s)	Total distance travelled per day (000km)	Trips per person per day	Travel distance travelled per person per day (km)
East	1,892	4,301	24,875	2.3	13.1
Hackney	198	422	2,227	2.1	11.3
Newham	232	542	2,546	2.3	11.0
Tower Hamlets	207	442	1,837	2.1	8.9
Waltham Forest	204	494	3,009	2.4	14.7
Greater London	6,972	17,881	104,137	2.6	14.9

Source: London Travel Demand Survey, 2006 to 2009

Figure 3.7 above shows that the residents of the four boroughs have lower trip rates per person per day that the London average, this is also true for the East region as a whole. The lower level of travel in the East London sub-region probably reflects a number of local factors including high levels of deprivation (those on a low income tend to make fewer trips and also are more likely to travel on foot or by bus), the severance effects of the river and other factors such as a more degraded public realm and to some extent isolation of certain communities as a result of barriers such as major highways, examples of this can be found around the A12 at Hackney Wick. Trip rates are particularly low in the boroughs of Hackney and Tower Hamlets.

The distance travelled per person per day shows that Waltham Forest has a distance travelled similar to the London average whereas the other boroughs have lower averages. This is likely to be impacted by the more suburban nature of Waltham Forest. Tower Hamlets has a particularly low distance travelled. The distance travelled statistic is likely to be influenced by a number of local factors including levels of deprivation, the density development in the borough, car ownership rates and distance travelled to work.

It would be expected that as regeneration and convergence with the rest of London takes place the trip rate per person and distance travelled would increase. This trend plus the increased number of people in the region would lead to significantly higher numbers of trips.

Mode Shares of Travel

Figure 3.8 shows that the mode share of trips made by residents of the different boroughs which form the OLSPG vary widely with Waltham Forest having similar mode shares to the

Greater London average. Hackney, however, has significantly higher bus, cycle and walk mode shares than Greater London, while Tower Hamlets and Newham have significantly higher walk mode shares.

The difference in mode share seen in these boroughs is likely to reflect a number of different factors including public transport accessibility, deprivation levels, proximity to central London and density differences between residents of inner and outer London. Higher density areas often have more mixed use areas combining housing, shops and other services. Both Tower Hamlets and Hackney have maintained traditional high streets and markets whereby local residents are able to access food markets and other retail. This is reflected in the car mode share in the inner boroughs of Tower Hamlets (20%), Hackney (21%) and Newham (31%) as being significantly lower than the sub-regional average, the public transport and walk mode shares are correspondingly higher for these boroughs. In particular, more than four in ten trips made in Tower Hamlets are walked; this can in part explain the low distances travelled per person per day in this borough. The bus mode share is high in Hackney, where three in ten trips are made by bus. Hackney also has a cycle mode share that is significantly above average, at 4%.

Mode share may change as regeneration and convergence take place, with greater numbers able to afford to own and operate a car. This could lead to actually and proportionally more car trips in the area.

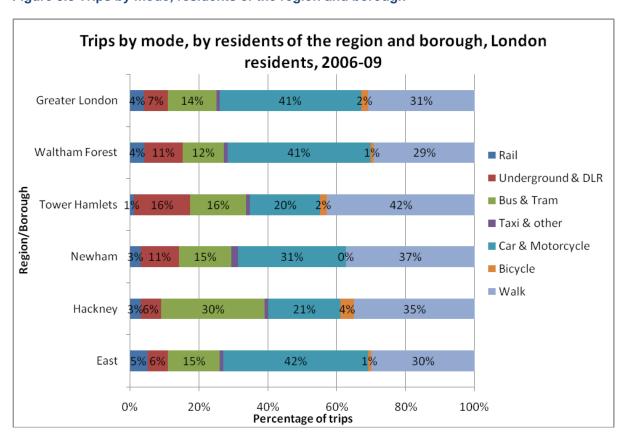


Figure 3.8 Trips by mode, residents of the region and borough

Source: London Travel Demand Survey, 2006/09. Note: Waltham Forest is not included in the East sub-region average

3.2.2 Public Transport

Public Transport Accessibility Levels (PTALs) give an indication of the relative density of the public transport network at a specific location. It effectively measures the combination of the distance to public transport services from a given point and the frequency of services. The results are expressed on a scale of 1 to 6 (including sub-divisions 1a, 1b, 6a and 6b) where 1a indicates extremely poor accessibility to the location by public transport and 6b indicates excellent access. Figure 3.9 to Figure 3.11 show the change in PTAL in 2007 to 2016 to 2026.

Figure 3.9 2007 PTALs in OLSPG area

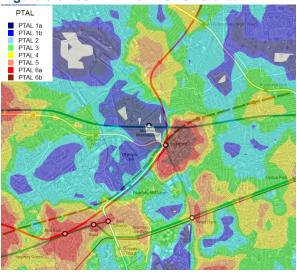


Figure 3.10 2016 PTALs in OLSPG area

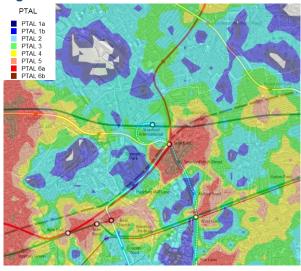
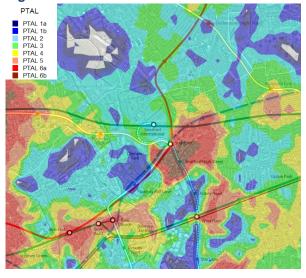


Figure 3.11 2026 PTALs in OLSPG area



PTAL scores for the Stratford area, due to the existing infrastructure, are considered to be very good, with a large proportion of the area surrounding Stratford Regional Station at levels 6a and 6b. With the introduction of the DLR Stratford International Extension (2010) and Crossrail (2018) the background PTAL levels increase across the OLSPG area but most noticeably with 6a/b coverage increases significantly into the Olympic Park. However, the PTAL scores across the area vary quite significantly with lower PTAL scores in the north east of the study area and west of Stratford. The area to the north is a lower density area through improvements in accessibility could be made especially to support the IBC/MPC. The area to the west of Stratford appears to be bounded by the Overground line and the Central and DLR lines. These lines could be part of the problem and options to decrease severance should be considered. It is also just as important to note that the lower PTAL scores present around the Olympic Park in 2008 increase from 1 to 2 & 3.

Bus

Stratford Regional is well served by buses. Currently 15 buses serve the station, with 5 of these services additionally being 24 hour or night bus services. National Express coaches also serve the station en-route to Stansted Airport and Cambridge. An additional 15 other bus routes serve Hackney Wick and Leyton Stations. An example of the bus routes that serve Stratford Regional Station can be seen in Figure 3.13. Buses will play a key role in providing local connectivity in Stratford, the OLSPG area and across East London.

The bus network will be continuously reviewed and changes made to meet current demand. Therefore, the study will not propose specific changes to routes but will highlight areas expected to see significant increases in demand and to identify where improvements in or additional infrastructure will help buses meet the increase level of demand in the future.

The bus routes in the area will change over the next few years with routes revised due to the opening of the Stratford City retail centre (September 2011), Eastway becoming two-way for bus operation and the changes required to routes due to the changing road network as part of Olympic construction.

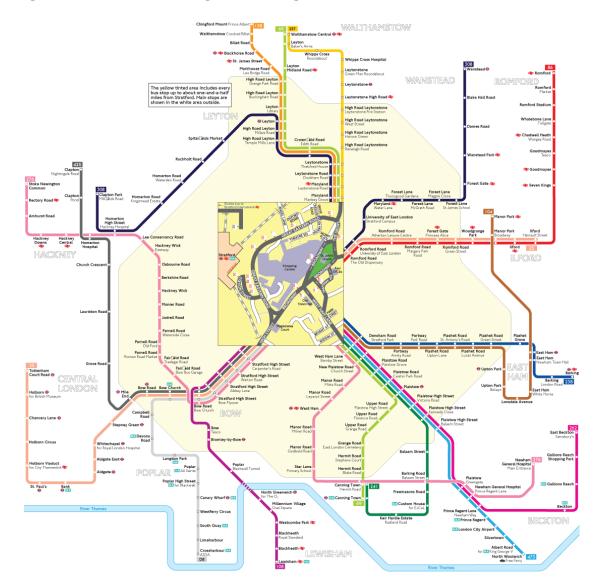


Figure 3.12 Bus routes serving Stratford Regional Station

Bus usage is high where there is interchange with rail services, reflecting its role as a feeder service to rail and a key driver of bus demand. This is certainly the case for Stratford and associated interchanges such as Hackney Wick and West Ham within the OLSPG boundary. Bus demand is also generally higher in residential areas compared to employment areas.

DLR

Significant investment has taken place on the DLR network over the past few years. The area surrounding Stratford is supported by a number of DLR stations including, Stratford Regional, Stratford International (2011), Stratford High Street (2011) and Pudding Mill Lane. In 2010 DLR 3-carriage operation commenced on the Bank to Lewisham branch. 3 car operation is also on the existing Stratford branch funded until 2016 only. The current & future DLR network can be seen in Figure 3.13.

Currently the DLR provides services to Canary Wharf and Lewisham from a high level platform within the central concourse of Stratford Regional providing step free access to other modes. From 2011, the DLR will also operate a further station within the Stratford Regional Interchange providing services to Stratford International and to the Royal Docks, London City Airport and Woolwich Arsenal. Recent DLR figures for Stratford Regional show approximately 4,000 boarding and 1,700 alighting (average weekday morning peak).

Figure 3.13: DLR Network 2010



The only remaining constraint on DLR capacity between Stratford and Canary Wharf are the sections of single track between Stratford and Bow Church Stations. Double tracking this section of track would deliver greater capacity on the line.

The Canary Wharf Travel Survey (2009) suggests that a large proportion of people from the North / North-East of London, and out of London from the North-East direction, arrive at Canary Wharf in the morning peak via Bus, DLR (17 per cent) and Jubilee Line (17 per cent), interchanging at Stratford Regional Station from national rail services. The number of

jobs at Canary Wharf is expected to increase over the period of the OLSPG therefore we would expect to also see increased numbers of interchanges at Stratford Regional Station.

London Underground

Stratford Regional serves as the Eastern terminating point of the Jubilee Line as well as accommodating Central Line services on the high level platforms.

The Jubilee Line upgrade programme is currently scheduled for completion in 2011 allowing more trains to be run to increase capacity by a third. For 2012 the Central Line Platforms will be realigned within Stratford Regional Station to allow for step free access to the rest of the station and to allow greater capacity at peak times. The Jubilee Line stations in the OLSPG area have step-free access. Bow Road and Bromley-by-Bow stations on the District and Hammersmith and City lines; and Leyton station on the Central line do not currently have step-free access.

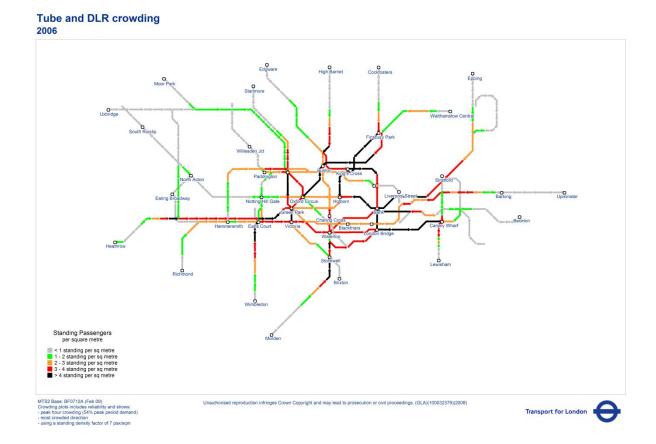
Recent RODS data can be seen in Figure 3.14. This shows that the different lines and directions have different peak periods. For the Central line the peak periods appear to be affected by commuting patterns with the eastbound direction towards central London having an morning peak and the westbound direction having a evening peak as commuters return home. However, the Jubilee Line also has a significant number boarding and alighting in the interpeak implying that the Jubilee Line to Stratford is also used for trips with purposes as well as commuting.

Figure 3.14 London Underground RODS Data, Boarders and Alighters 2008 (rounded to nearest 100)

Station	Line	Direction		- 7am	7am- 10am	10am- 4pm	4pm- 7pm	7pm- 10pm	10pm+	Total
Stratford	Central	Е	Boarders	400	2,800	4,200	7,100	2,600	1400	18,500
			Alighters	400	3,200	8,000	13,600	5,900	2,700	33,700
Stratford	Central	W	Boarders	1,900	10,500	6,600	5,000	2,000	390	26,200
			Alighters	2,000	9,200	4,200	2,200	1,400	300	19,400
Stratford	Jubilee	N	Boarders	2,300	9,800	10,000	6,700	2,200	690	31,800
		S	Alighters	500	4,800	7,400	9,300	3,900	2,600	28,500

In terms of crowding, as seen in Figure 3.15, within the Stratford area in 2006 crowding can be seen on the Central Line towards Central London at 3-4 people standing per square metre (pspsm). This increases from Leyton on approach to Stratford and continues to increase until it reaches Liverpool Street at over 4 pspsm. Minimal crowding exists on DLR and Jubilee Line towards Canary Wharf in the westbound direction. There is, however, crowding on the Jubilee Line in the eastbound direction from London Bridge to Canary Wharf, with greater than 4 pspsm. This is one of the crowding hotspots on the London Underground network, (as shown in Figure 3.15) leading to passenger discomfort, service delays and putting a constraint on growth in the corridor.

Figure 3.15 LU and DLR crowding in 2006 with MTS reference case



London Overground

London Overground orbital services operate from the northern end of Stratford Regional Station via a new set of platforms. Historically the North London Line section of London Overground, it has benefited from significant investment over the past few years including new trains, refurbished stations and further connections with the addition of the direct interchange with the East London Line at Highbury & Islington and Canonbury in 2011. At present, all London Overground stations have a step-free access in the OLSPG area except for Leyton High Road and Leyton Midland Stations. Recent operational figures suggest an average of 300 passengers board each of the services commencing from Stratford Regional Station towards Richmond and Willesden Junction (morning peak) and as would be expected further passengers join the train at Hackney Wick Station. An overview of the London Overground network can be seen in Figure 3.16.

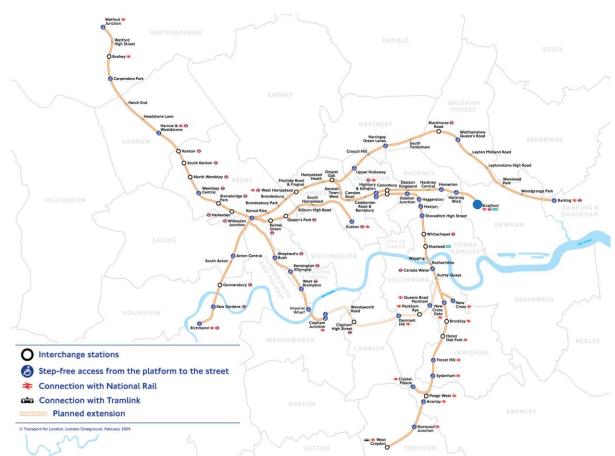


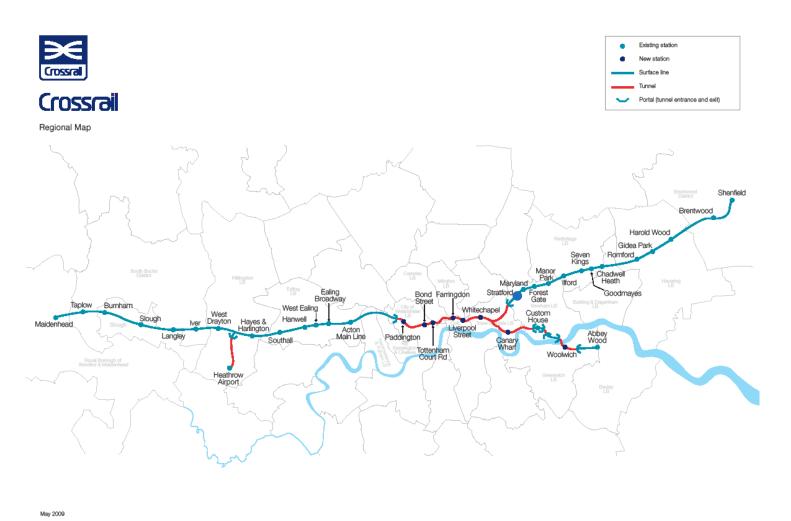
Figure 3.16 Overview of the London Overground Network, existing and planned extensions

Crossrail

From 2018 Crossrail will increase capacity and connectivity between East London, Central London and out towards the West, providing two branches of services towards the north-east via Stratford Regional Station and south-east towards Canary Wharf, the Royal Docks and Abbey Wood. It will open up access to the two Metropolitan Centres in East London (and two of the proposed new Metropolitan Centres) and five Opportunity Areas. A map of the route of Crossrail can be seen in Figure 3.17.

Current service assumptions show that at peak hour 24 trains an hour will operate within the central section of Crossrail dividing to provide 12 trains an hour each to both eastern branches. When emerging from the purpose built tunnel at Stratford it will replace 10 or 12 of the existing National Rail services stopping at Stratford Regional Station.

Figure 3.17 Route of Crossrail



National Rail

Stratford Regional station is served by numerous National Rail services. These are chiefly through the Great Eastern franchise towards East Anglia and Essex. From 2018 Crossrail operations will commence also utilising the National Rail lines at Stratford.

Presently in the high peak hour (8am to 9am) there are 14 trains per hour (tph) passing through Stratford on the Electric lines (used by slow services) – all of which call at Stratford – and 13tph passing through on the Main lines (used by fast services) – only 6 of which call at Stratford.

The bulk of current National Rail investment at Stratford is funded by the ODA. For the Great Eastern, this includes lengthening of platform 10A from 10-car to 12-car, which will allow all peak fast services to stop at Stratford. On the route as a whole, the plan is:

- Run additional peak fast services from Southend, Colchester & Chelmsford
- Lengthen nine fast services to 12-car
- Run two additional peak stopping services from Gidea Park

In the future Crossrail provides the main investment on the Great Eastern Line so no further investment is currently committed. Once Crossrail is implemented the service will include 12 tph of 10-car length through the Crossrail tunnel as well as an additional 6 trains per hour of 8-car length peak additional services into Liverpool Street "high level" terminus.

There is crowding on National Rail travelling westwards into Stratford at 3-4 passengers per square metre (pspsm) where it is then alleviated to 1-2 pspsm on approach to Liverpool Street as passengers interchange at Stratford for Canary Wharf. This can be seen in Figure 3.18. Although, the plot taken from analysis for the Mayor's Transport Strategy shows little crowding on the London Overground services from Stratford, more recent modelling shows that crowding into Stratford is a major problem.

The London and South East Route Utilisation Strategy consultation draft, December 2010 considers the gaps to 2031 that remain on the national rail network after the committed and recommended schemes have been delivered. It is important to note that the modelling described later in the document only models the committed schemes. TfL will be responding to this consultation. The key strategic issue for the OLSPG area and London more widely is that changes to the rail network should not jeopardise the delivery and operations of Crossrail as defined by Parliament and expected by stakeholders.

Rail crowding 2006

Standing Passengers per square mitte

1 Standing Passengers per square mitter

2 Standing Passengers per square mitter

2 Standing Passengers per square mitter

3 Standing Passengers per square mitter

3 Standing Passengers per square mitter

4

Figure 3.18 London Overground and National Rail crowding in 2006 with MTS reference case

High Speed Rail

High Speed commuter services commenced operation from the station in 2009 allowing passengers to travel from Ashford International in Kent to Central London in 37 minutes. Currently Eurostar International Services do not stop at the station. Connections will be enhanced when the DLR Stratford International Extension begins operation in 2011 and further when Westfield Stratford City opens in 2011, providing walking access between Stratford Regional and Stratford International.

Proposals for a second high-speed line to link the centre of London with Birmingham, in the first instance, as part of a possible wider domestic high-speed rail network, are currently being considered by the Department for Transport. The opportunity to provide good linkage between High Speed 1 and 2 are being considered to enable the maximum benefit from the two lines to be realised. The London and South East Route Utilisation Strategy draft for consultation, December 2010, recommends that detailed consideration of the impacts of a link between High Speed 1 and 2 is required, given the significant interface with the North London line. A way forward is required which is consistent with the strategy for both local passengers services and longer distance freight services. TfL support this recommendation.

Stations and Interchange

As part of the ongoing development of Stratford, Stratford City and the Olympic Park, Stratford Regional Station is undergoing major improvements in order to accommodate forecast future demand. Recent improvements to the Station include:

- New high level DLR platforms connecting into the existing (southern) ticket hall;
- Relocation of North London Line (London Overground) services to new platforms;

- Incorporation of the DLR Extension to Stratford International which will open in 2011 (taking over the old North London Line platforms); and
- Improvements to National Rail high level platforms.

Further improvements are underway and include:

- New northern ticket hall in addition to the existing ticket hall;
- Connection of the northern ticket hall to the existing subway system for access to platforms and re-modelling of the existing subway layout;
- Decluttering of platforms and reconfiguration of equipment;
- Additional stairs from the western subway to different platforms and reconfigured existing stairs;
- Concourse enhancements to the existing ticket hall, including an additional staircase between the Jubilee Line concourse and mezzanine level;
- Connection of the town centre link to the existing mezzanine level via a new gateline;
- Incorporation of a new Central Line westbound platform; and
- Widening of island platforms 6/8 at the eastern end.

Stratford will also benefit from two new DLR Stations in Stratford from 2011. Firstly at Stratford International, linking in with High Speed 1, and secondly at Stratford High Street, which will open to the southern edge of Stratford.

Other stations within the OLSPG area are also benefitting from enhancements. West Ham Station is benefitting from enhancements as part of the ongoing London Underground upgrade works and in time for the Olympics and will also benefit from an additional mode via the addition of the DLR Stratford International Extension. An upgrade of Bromley-By-Bow is not included in London Underground's upgrade works, but funds are being sought from Section 106 contributions towards an upgrade in the longer term. An LTGDC project aims to improve Hackney Wick station including a new entrance closer to the Olympic Park.

Public Transport 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. Analysis from the development of the East London Challenges & Opportunities Report has shown the following.

The Train Operating Companies in the OLSPG area have above average reliability, with all three (National Express East Anglia, London Overground, and SouthEastern) running 90 percent or more of services within 5 minutes of scheduled time. London Underground 'excess wait time' reliability measure has been reducing year on year, to 6.4 minutes from a high in 2002/03 of 9.7 minutes (Table 4.6 Travel in London 3). However, the Hammersmith & City Line was one of the worst performing lines in terms of 'scheduled kms operated' in 2009/10. The DLR had over 94 percent of trains running on time in 2009/10.

Bus service reliability inevitably is affected by traffic congestion. This has been mitigated against in recent years by increasing service levels and bus priority and the introduction of Quality Incentive Contracts for bus operators. The Bus service reliability indicator of mean

excess waiting time by borough published in the Travel in London 3 Report Appendix B Table B.2 shows that all four boroughs that form part of the OLSPG study area have higher excess waiting times than the Greater London average. Congestion continues to be the main source of major reliability problems, with 80 percent of scheduled bus kms lost (e.g. turning back late running buses before reaching their destination) due to traffic conditions.

Freight

Freight and servicing are considered pan-London issues. Both the London Plan and the Mayor's Transport Strategy recognise the negative impact of existing and future highway congestion to, from and within London, on major freight routes especially the M25 and wider South East Region.

Road freight currently consists of 89 percent of London's freight by tonnage and the second largest mode on the roads. It is critical to support the growth in forecast population and employment, both for serving but equally within the construction of infrastructure. The A12 provides a core freight route North-South but currently experiences high levels of traffic congestion.

Rail freight has an important role to play within East London, in addition to increasing sustainable freight movement. The rail freight network can be seen in Figure 3.19. Firstly, in terms of construction, it should support London's growth and help in the delivery of key projects such as the 2012 Olympic and Paralympic Games. It will also play a major role in the expected growth of deep sea container traffic from East of London. The map below shows the major demand and capacity on rail freight in London from major ports, where a majority of this freight traffic currently travels through Stratford.

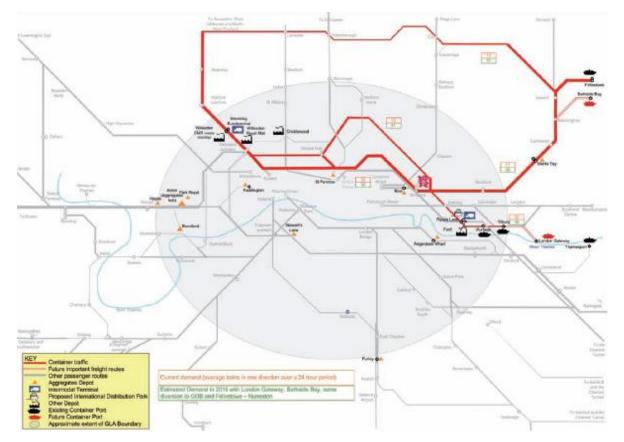


Figure 3.19 Rail freight routes to/from major ports in London

Over the past few years significant investment has taken place on the North London Line, particularly the section between Stratford and Camden Road (including Hackney Wick). The new infrastructure has been designed on the basis of providing capacity for four freight paths per hour. This includes:

- Four-tracking sections west of Dalston
- A Channelsea avoiding Line
- Extension of the Angel Lane Loop.

The development of Crossrail will also benefit freight growth. A number of projects, such as the gauge enhancement and capacity scheme for the Barking to Gospel Oak/Willesden and Felixstowe to Nuneaton routes will have benefits for freight movements providing relief to the capacity constrain on the Great Eastern Mainline and on the North London Line.

Water freight is also being used for the Olympic construction with the waterways improved to enable use of the river. The use of these waterways for freight post the Olympics should be promoted and where appropriate infrastructure provided for the Olympic construction should be maintained and kept in use.

3.2.1. Cycling, Walking & Urban Realm

Walking and Urban Realm

The area connects to a number of the strategic walking routes in London. These are namely the Lea Valley Walk and the Capital Ring, which includes the Jubilee Greenway. During the 2012 Olympics the park will provide a large amount of natural/open space to the public and it is important that this is maximised during Legacy and that links are continued with the adjacent Victoria Park and Hackney Marshes.

On average, around 1.33 million walk trips are made each day which either have an origin or destination in the East Sub-Region (27% of all trips in the region) and about 0.6 million people make at least one walk trip in the region every day. This walking mode share is lower than for London as a whole, where 31% of trips are made on foot.

Figure 3.20 shows the concentration of current walk trips by trip origin and by trip destination respectively in the East Sub-Region. The town centre boundaries are as defined by the GLA in the London Plan. Within East London, clusters of origins and destinations of current walk trips can be seen around Stratford, East Ham, Ilford and Barking town centres and in the Canary Wharf area, otherwise current walk trips are quite dispersed across the sub-region.

The TfL East sub-region Challenges & Opportunities Report (February 2009) identifies Stratford and the surrounding area to have significant walking potential by origin and destination. This analysis considers the potential for walking and cycling trips by London residents. 'Potentially walkable / cyclable trips' are defined as trips currently made by other (mechanised) modes which could reasonably be walked / cycled all the way. This analysis is based upon trips made by London residents, from the London Travel Demand Survey 2005-8 dataset. Trips that were already walked or cycled and trips that could not reasonably be walked or cycled, based upon characteristics of the trip and traveller, were excluded from the analysis. This includes trips made by young children, elderly and disabled people, trips which involved carrying luggage, travelling at night, or were over long distances and would be significantly slower. Note: this analysis does not identify any potential for additional cycle or walk trips that could be made by non-residents or the potential for parts of trips to be walked or cycled. This is not a demand analysis and no conclusions are drawn as to whether the potentially cyclable / walkable trips could or would ever be walked or cycled, but reflects the opportunity available.

There are a number of barriers to walking which may prevent these potential trips being walked these include poor walk environment, severance and safety and security. There is an opportunity as the area develops to ensure that the design of the areas considers these issues and minimises them.

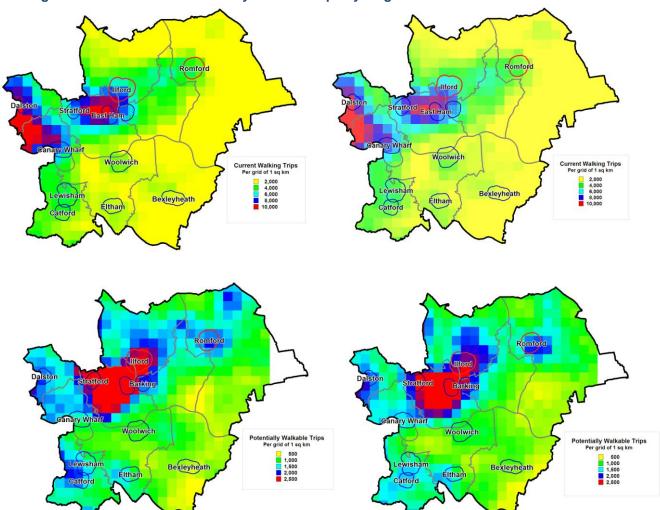


Figure 3.20 Current and Potentially walkable trips by Origin and Destination

Ongoing projects exist which will help motivate this potential. These include:

Extension to the Lea Valley Walk (LTGDC)

• will form the southern-most part of the Lee Valley Park. It will provide linear parkland along the River Lea with a north south route from the Olympics site at Stratford to the Thames. It will connect the different Lea Valley Park projects with the communities.

Olympic Cycle and Walk Routes Enhancement Programme (OCWRE)

- Comprising of 150 schemes delivered by various local authorities and stakeholders
- ODA funding upgrades that include specific, priority locations where barriers currently exist to walking
- In addition to walking enhancements in the vicinity of the venues and the Elevated Greenway enhancement project
- Figure 3.21 below shows the Olympic cycle and walking routes being developed.

Redbridge

Redbridge

Weitham Forest

Olympic Cycle and Walking Routes

Map Issued to Delivery Authority

Route

Generally Allerdam

Generally Allerdam

Tower Hamlets

Nowham

Tower Hamlets

Route

Generally Allerdam

Tower Hamlets

Tower Les Wiley

Lower Las W

Figure 3.21 Olympic cycle and walk routes in development

In addition to walking, improving the urban realm is a recognised key local priority for the East London sub-region and indeed is echoed in the OLSPG priorities. The Olympic Park design and construction takes this into account, providing over 200 hectares of new sustainable and inclusive park space. Similarly important areas surrounding the Olympic Park will need to use guidance such as the 'Better Streets' document, which sets out a range of approaches to achieving a better balance between the needs of all street users. An example where this has already been a success can be seen at Meridian Square in Stratford.

The OLSPG should take advantage of the existing links with the All London Green Grid, to help enhance the network of inter-linked, multi-functional and high quality open spaces which connect with town centres, public transport nodes, countryside in the urban fringe, the Thames, major employment and residential areas. The OLSPG should also take advantage of the role of waterways in providing walking routes through the area. The OLSPG should also take advantage of the role of waterways in providing walking routes through the area.

Cycling

The park connects into the London Cycle Network+ routes to the north, south and west. With the proposed increase in cycling it is important to maximise on its use not only in connecting up the Olympic Park to other parts of London but within the Park itself.

Hackney is one of the most popular origins and destinations for cycling trips in East London, shown in

Figure 3.22. This fits closely with analysis showing that boroughs with high levels of cycling tend to be those which have populations with a high propensity to cycle (who are younger and in steady employment for example), have good access to parks and open spaces, and in areas which have invested more heavily in cycling over the last eight years. Meanwhile

Newham is one of the boroughs which offer most potential as both an origin and destination (at around 10-15% for both origin and destination both currently and potentially). It is also possible that the level of cycling in these town centres is underreported because of the greater prevalence in outer London town centres of people from outside London, who are not captured in the analysis.

Residents of Hackney currently make 40% of East London's cycle trips – but account for only 9% of potential trips – reflecting that cycling has been more successfully integrated into the life and culture of the borough and reflecting the lower provision of rail-based public transport in the borough. Hackney Council in collaboration with the London Cycling Campaign have initiated a number of changes to the available cycle network in order to make cycling and walking the natural choice. 'The Permeability Project' aimed to achieve a street network with minimum diversion for cycle journeys, allowing direct and uncomplicated travel. Examples of the interventions include:

- Restoring streets to two way operation for all traffic
- Building cycle 'slips' allowing cycle access (where it was previously no entry to all traffic)
- Contra-flow cycle lanes
- Opening up road closures to cycle traffic
- Making exceptions for cycle traffic in traffic management orders e.g. 'no right turn except cycles'

The TfL East sub-region Challenges & Opportunities Report identifies Stratford and the surrounding area as having significant cycling potential. Similar analysis to that carried out for walking has been carried out for cycling potential as shown below. Clusters of potentially cyclable trips can be seen particularly around Stratford and East Ham.

The prospect of significant population growth in the East London sub-region presents a huge opportunity to increase the rate of cycling by capturing new potential cyclists. Investment in the Olympic and Paralympic games (and for instance in further development of Greenways) should assist in making the role of cycling in East London more prominent.

The OLSPG area is close to the existing Cycle Superhighway (CS) CS3 which opened in the summer 2010 and which runs from Barking to Tower Gateway via the A13. The CS2 Bow - Aldgate route which opened in summer 2011 runs very close to the OLSPG area. The Cycle Superhighway provides a safe, fast and direct, continuous and comfortable way of getting from outer London by bike along recognised commuter routes and will provide key access to the OLSPG area. It will link in with the existing London Cycle Network and London Cycle Network+ which run parallel to the Olympic Park.

As part of the 2012 Olympic and Paralympic Games large areas of cycle parking will be supplied within the park area. The permanent venues being built by the ODA for, during and after the Games will have sufficient numbers of permanent secure cycle parking facilities, with the aim for them to be available for use within legacy.

Given the opportunities for walking and cycling and the size, characteristics and level of investment in the area, this provides one of the biggest opportunities to promote sustainable

modes. In this respect, the inclusion of cycling and walking as a key part of the development of the whole area (cascaded down to master plan, development and detailed construction level) could transform the area into an example of promoting cycling and walking through development and regeneration.

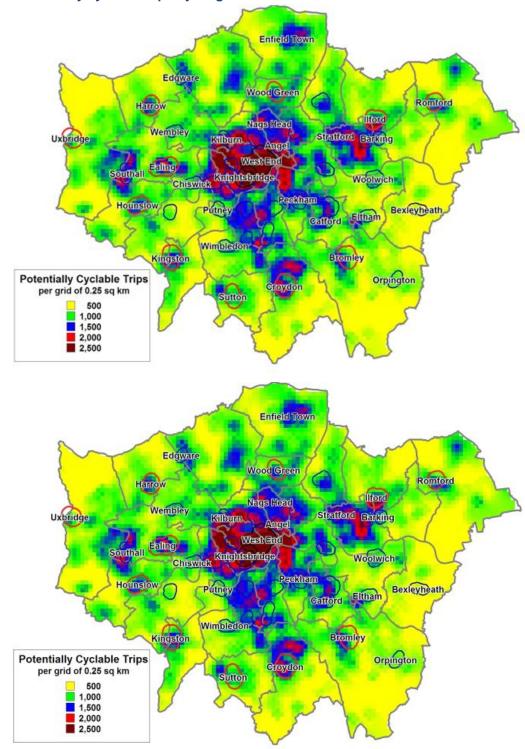


Figure 3.22 Potentially cyclable trips by Origin and Destination

3.2.3 Highway

As previously mentioned Stratford and the OLSPG area is well connected to the Strategic Road network. The A11, A12 and A13 form part of the Transport for London Road Network (TLRN) which are the busiest and most economically important radial and orbital arterial routes crossing the Capital. The TLRN accounts for around five per cent of total road length in London, but carries more than 30 per cent of London's traffic. The strategic road network is a key resource for the local economy and the whole of London and its operation and efficiency will need to be maintained to support London's economic development. TfL's current policy is to ensure that the capacity of the road network is not reduced. These roads will continue to maintain a key strategic role in the future and therefore it is important that their operation and efficiency is maintained.

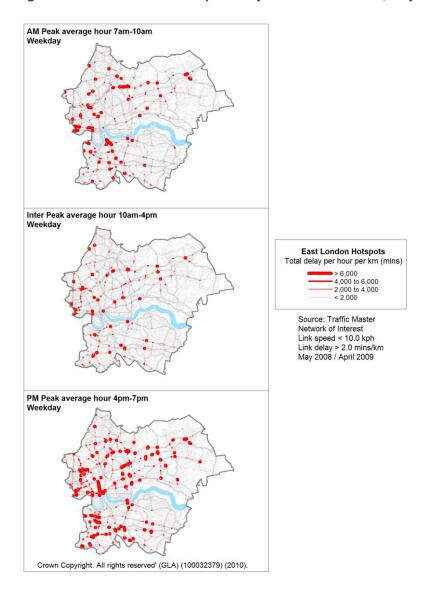
The A12 is key as a link to the Blackwall Tunnel, the OLSPG area and access to south of the River. The importance of river crossings in this area is discussed in section 3.4. It is key that the strategic nature of the A12 is maintained to enable travel to the south of the river and support the economic growth both within the OLSPG area and the wider East London Sub-Region.

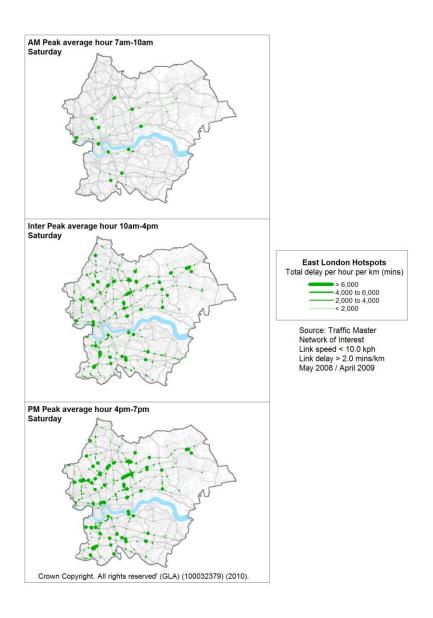
Recent analysis using Trafficmaster data has shown that there are a significant number of traffic congestion hotspots in and around the OLSPG area, particularly around the A12 at the Olympic Park.

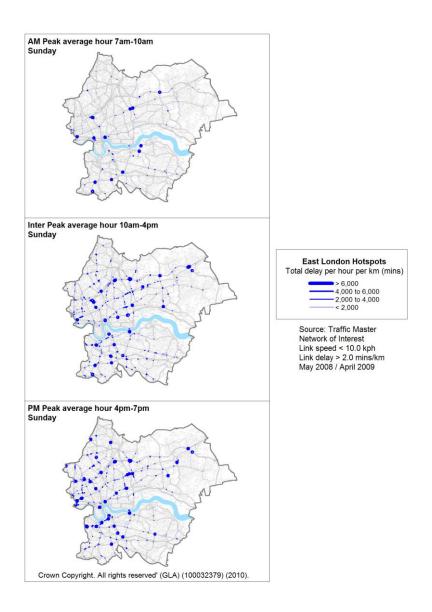
The hotspots in Figure 3.24 below for all time periods by week day. The figures show quite clearly that the level of congestion in the evening peak is worse than the morning peak. The impact of queuing to cross the Blackwall Tunnel from the north in the evening peak is clear to see. The plots show that there is also significant congestion at the weekend (both Saturday and Sunday) again with the evening peak being worse than the morning peak. It should be noted that these plots show an average period and therefore an incident which closes or significantly reduces the capacity of the Blackwall Tunnel would lead to higher levels of congestion throughout the whole region. The East London River Crossings Review undertaken by TfL considered the need for river crossings in east London based on a clear understanding of what the current and future challenges and opportunities are expected to be. The outcome of the review was a River Crossings Package which is being taken forward; the development of this package will need to be considered in future development work in this area.

Significant congestion on the road network especially the strategic road network reduces the efficiency and journey time reliability for all road users, including buses and freight. A key Mayor's Transport Strategy objective is managing the road network and ensuring that it operates effectively. Therefore, the impact of this congestion is a key concern for TfL.

Figure 3.23 Trafficmaster hotspot analysis in East London, May 2008 to April 2009







The strategic roads with high traffic flow also cause significant severance, particularly the impact of the A12 on regeneration of the surrounding area. The A12 Transport Capacity and Access Study, March 2010 carried out by LTGDC and TfL in partnership considered measures to decrease severance caused by the A12. It has been shown that there is a pressing need to review the usage and improve the poor quality of the existing crossings along the A12 together with improving the overall quality of the pedestrian environment along the corridor. A large number of options were considered including more radical and expensive options, however the constraints of cost and maintaining strategic access to the south of the river meant that the prioritised option was a series of 10 recommendations improving links across the A12 and bus routing around the area. The outputs of the A12 Study have been incorporated into this Transport Study including all the schemes which were considered positive but were not included in the top 10 recommended list. The full A12 study and modelling report is available. LTGDC are continuing to take forward the recommended schemes with stakeholders.

Figure 3.24 below compares the car ownership by household for the four boroughs within the OLSPG area based on data from the London Travel Demand Survey 2006 to 2009. This

shows that all four boroughs which form part of the OLSPG area have a higher percentage of households with no cars compared to the London average. Waltham Forest is closer to the London average than the other four boroughs. This is likely to be impacted by the more suburban nature of the borough.

Figure 3.24 Car ownership in the East London Sub-Region

Boroughs	Ownership by Household (Percentage)						
	No car	One car	Two or more cars				
Hackney	62	34	4				
Newham	57	37	6				
Tower Hamlets	63	33	4				
Waltham Forest	45	43	12				
All London	42	42	16				

Source: London Travel Demand Survey, 2006 to 2009

Without any change in the car ownership rates in the area it would be expected that the population growth would lead to higher numbers of car trips and further congestion. However, without policy intervention it is also expected that as the area regenerates and the residents begin to have higher incomes that car ownership will increase to levels similar to the London average leading to further increases in car trips and add increased pressure to the road network and result in a further spread of congestion. This is particularly the case in Boroughs such as Newham which has been shown to have a larger proportion of young people than the London average which could result in a larger proportion of adult car trips in the future. This is particularly a concern given the high level of congestion currently seen in this area.

The trip purpose for highway trips surveyed within the Stratford area is shown in Figure 3.25. The surveys were conducted on highway trips which left an enclosure around Stratford and were conducted in Autumn 2009 as part of CRISP (Continuous Road Side Interview Project). This shows that in the morning peak highway trips are dominated by work related trips whereas in the other time periods they are dominated by "other" purposes.

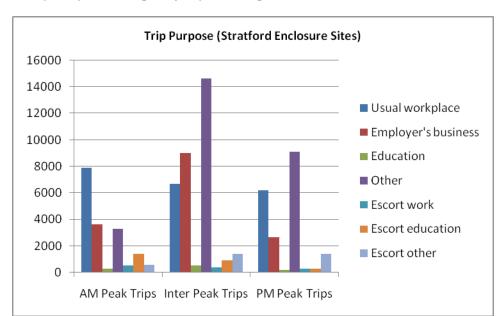


Figure 3.25 Trip Purpose of highway trips leaving the Stratford Enclosure

As would be expected car dominates the vehicle types that leave the town centre as seen in Figure 3.26 below. The pattern of car trips shows a peak around 8am with then a steady increase throughout the day to around 5pm, this links with the work trip purpose pattern seen in

Figure 3.25. It also shows that there is little variation in the level of LGVs (large good vehicles) and HGVs (heavy good vehicles) throughout the day.

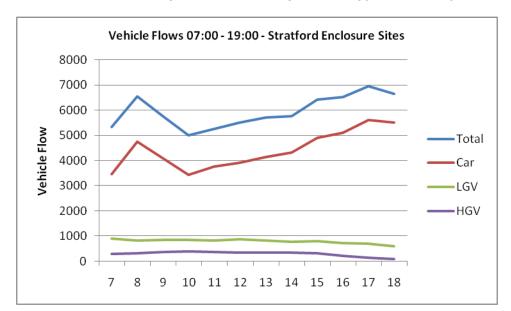


Figure 3.26 CRISP roadside surveys Vehicle Flows by Vehicle Type – 7am to 7pm

Figure 3.28 shows the trip length distribution of trips originating in the Stratford enclosure by time period. For each time period the highest proportion of trips are between 2 and 8 km. These are relatively short trips and some could possibly be cycled. Encouraging more of these shorter trips to be walked or cycled could help reduce pressure on the road network and decrease congestion. Generally, the average length of trips increases throughout the day.

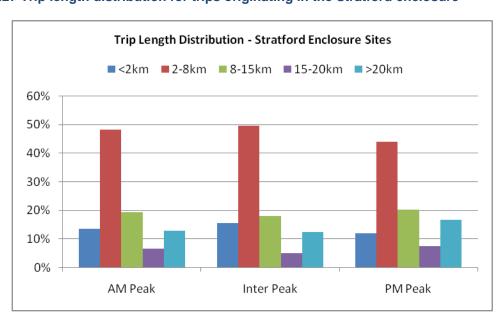


Figure 3.27 Trip length distribution for trips originating in the Stratford enclosure

3.3 Road Collisions

Between 2007 and 2009, there were 208 collisions resulting in a serious or fatal injury in the OLSPG area (5 per cent of which were fatal). Over half of the injuries are to car users. While pedestrians make up almost 40 per cent of serious or fatal casualties and pedal cyclists make up around 10 per cent.

Figure 3.28 Road Traffic Casualties in the OLSPG area

	Fatal	Serious	Slight	All severities
Pedestrian	6	74	202	282
Pedal Cycle	0	20	157	177
Powered 2 Wheeler	2	29	148	179
Car	2	65	849	916
Taxi	0	1	11	12
Bus Or Coach	0	3	94	97
Goods Vehicle	0	3	20	23
Other Vehicle	0	3	11	14
Total	10	198	1,492	1,700

Spatially, the casualties are focused around the major roads. For pedestrians and pedal cyclists, collisions causing casualties appear to mainly occur on the A11, Stratford High Street and Gyratory, Homerton High Street and Leyton High Road.

3.4 River Crossings

There are fewer river crossings in East compared to West London, partly due to the greater width of the river; and because of the historic navigational requirements associated with the former docklands (any new crossing will also need to take account of current navigational requirements and the existence of London City Airport). Therefore the barrier of the Thames acts as the major constraint on the sub-region's development and economic potential, not just in geographical terms but also in terms of congestion due to lack of capacity at the three existing road vehicle river crossings (Rotherhithe Tunnel, Blackwall Tunnel and Woolwich Ferry). A significant challenge is therefore to both increase and improve existing river crossings in East London in order to mitigate the severance effects of the river both on communities (including those within the OLSPG area) and on the region's economy. This will also have positive benefits for the resilience of the road network and easing congestion will improve air quality locally and reduce the sub region's carbon dioxide emissions. Another key issues is that there are a number of public transport crossings but very few crossings specifically for walking and cycling.

The impact of an incident which closes the Blackwall Tunnel is felt across a wide area of east London and leads to significant increase in journey times as trips divert to other river crossings. The East London River Crossings Review undertaken by TfL considered the need for river crossings in east London based on a clear understanding of what the current and future challenges and opportunities are expected to be. The outcome of the review was a River Crossings Package which is being taken forward; the development of this package will need to be considered in future development work in this area.

This package includes an additional vehicle crossing at Silvertown and replacement of the Woolwich Vehicle Ferry with a ferry at Gallions Reach. A cable car across the river between North Greenwich and Royal Docks is currently being constructed and will provide an additional crossing for pedestrians and cyclists.

3.5 Air Quality

Air quality in the general area is expected to meet the objectives for Nitrogen dioxide (NO₂) and particulate matter (PM₁₀, PM_{2.5}) set out in the National Air Quality Strategy by 2015, but many roadside locations are predicted to be above or close to these levels, particularly for NO₂. General sources such as industry, energy uses (such as domestic heating), construction, and pollution from outside the area all contribute to air quality, however, the main source of air pollution locally tends to be from road traffic emissions. Concentrations of NO₂ are likely to remain elevated close to major roads and junctions including the A12 (Hackney Wick and Bow Interchange), A11 (Leytonstone Road), A104 (Lea Bridge Road), A12 (Eastern Avenue), and A118 (Romford Road) and the impacts of developments affecting these locations and centres nearby (such as Hackney Wick, Stratford, Leyton, Upton Park, Canning Town, and Ilford) will need to consider the air quality impacts on existing exposure such as residential locations and shopping high streets, and within proposed development locations. Air quality impacts assessments should consider, where necessary, the potential long term operational impacts (including traffic and industrial/commercial/residential sources of emissions), along with those temporary impacts associated with construction activities on and off-site, including road traffic impacts.

TfL look to reduce human exposure to harmful pollutants but that we acknowledge that there are impacts from poor air pollution on habitats. This is not to say that the Olympic Legacy would benefit or worsen the situation for habitats as no detailed modelling or analysis has been undertaken to understand the impact of changes in land use and traffic flows.

4. Strategic Transport Modelling

4.1. Introduction

The OLSPG Transport Study is intended to assess the impacts of varied levels of development on the highway and public transport network in the OLSPG area. The forecast year for modelling purposes is 2031. The OLSPG model tested the morning and evening peak periods for highway modelling; public transport modelling was only carried out for the morning peak.

4.2. Model Validation and Calibration

The study employed TfL's local planning tools available when the study commenced; the East London Highway Assignment Model (ELHAM phase 1); a Railplan based public transport assignment model and the Land Use Trip End (LUTE) Model. These models were developed for the A12 Transport Capacity and Access Study. Both models were developed from the Thames Gateway Bridge (TGX) and Olympic Park (OPAL) Model to assess the network impacts of the regeneration initiatives in the Lower Lea Valley, along the A12. They contain significant zonal disaggregation to represent the different development sites in the corridor and added network detail. These models have been re-validated to the extent that ELHAM phase 1 surpasses the performance of both the TGX and OPAL models and will provide a good platform for continued highway modelling.

Railplan (A12) was used for this study and was developed in a similar way to ELHAM phase 1, in terms of the network and zoning detail it provides benefits that outweigh the use of the other public transport models available for this area.

For each tested scenario, the LUTE Model was used to translate forecasts of housing and employment levels provided by the GLA in the study area. These trips were converted into car and public transport trip totals and then distributed into the highway and public transport model zones which best represented the development sites.

The London-wide demand was taken from TfL's London Transportation Studies model (LTS).

The OLSPG highway network was further validated against highway conditions in the TrafficMaster database for peak periods during the week and weekend model for the base network. Figure 4.1 shows morning peak delays in the base year using TrafficMaster data.

Model reports are available for the models used in this study.

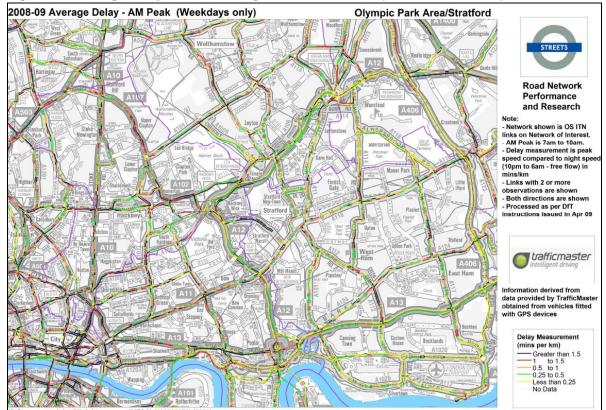


Figure 4.1 Average delay in the Morning Peak in 2008/2009 (TrafficMaster data)

4.3. Modelling Scenarios

Modelling was undertaken for various scenarios once the suitability of the ELHAM phase 1 and Railplan (A12) had been assessed. The following scenarios were tested for both the morning and evening peak in the highway model; and in the morning peak only for the public transport assignment model.

- Scenario 1: London Plan minimum capacity estimates based on the GLA's 2009 SHLAA (Strategic Housing Land Availability Assessment) and Development Activity Database (DAD) for the area, using the broad land uses set out in the Mayor's 2007 Lower Lea Valley Opportunity Area Planning Framework and the Mayor's Transport Strategy (MTS) Reference case (funded and committed schemes)
- **Scenario 2**: No development in the study area beyond the Olympic Games development and the MTS Reference case network
- Scenario 3: OLSPG preferred development scenario in the study area, which assumes further industrial land release and borough ambitions as expressed in their emerging local development plan documents and MTS Reference case. This scenario allows total development to exceed London Plan minimum capacity estimates and borough level forecasts. This scenario was tested using the highway network used in Scenario 1. This scenario was superseded by scenario 4 so no further results from scenario 3 are reported.
- Scenario 4: OLSPG preferred development scenario in the study area and MTS Reference case. This scenario allows total development to exceed London Plan minimum capacity estimates and borough level forecasts. The highway network in this scenario has been revised with the Olympic Park Road Network consistent with the Transformation Planning Application

- Scenario 5: This sensitivity test scenario is similar to Scenario 4, but assumes an 80:20 public transport and highway modal split rather than the 70:30 modelled in the other scenarios.
- Scenario 6: This scenario is based on Scenario 4 but includes a mode share shift to
 walking and cycling. This scenario assumes that 40 per cent of non business car trips
 with trip lengths less than 8km will switch to walking and cycling.
- Scenario 7: This scenario is also based on Scenario 4 with additional OLSPG road network schemes.

Scenarios 1 through 4 were core scenarios, tested with the defined assumptions on housing and employment. Scenarios 5 through 7 were tested as possible interventions, based on the performance of particularly the highway network, upon the core scenarios.

4.4. Modelling Assumptions

The assumptions made for population, employment and trips for the scenarios described above varied. Figure 4.2 below summarises the different levels of additional population and employment assumed in each tested scenario.

The base year estimate for homes and jobs is derived from the zones covering the OLSPG area in LTS v5.4 model. The population and employment figures in this model are consistent with DMAG, GLA statistics. Scenario 1 – London Plan minimum capacity estimates are consistent with the LTS figures though have been taken from the ELHAM phase 1 model. The GLA provided TfL with estimates of additional homes and jobs above the Scenario 1 level in May 2010. Since this time there have been changes made to these estimates which have not been taken into account in the modelling completed for this Study. The additional employment floorspace has been revised from 1.3 million m² to 1.4 million m² of employment and the additional homes have been revised from 35,000 to 29,000 homes.

There has been a decrease in housing growth estimates in all sub-areas except the Southern Olympic Fringe. The largest decreases in the estimates are in the Stratford area and in terms of housing typology the majority of the reduction is from one bed units.

For the purpose of our modelling, all additional employment development was assumed to be an "office" land use equating to approximately 18 m² per job. This is different to the assumptions in the OLSPG document which has a land use of approximately 25m² per job, as it is assumed a wider range of jobs will be created. One and two bedroom housing units were assumed to be flats; with units with three or more bedrooms being houses. Parking assumptions are based on London Plan standards.

Due to the changes in growth forecasts since the modelling was completed, the modelling is likely to have overestimated the impact of growth in the area. However, the highway network in the area is currently operating at capacity and any increases in road traffic growth will have a negative impact on the efficiency of the network in the area.

The highway statistics are reported for the OLSPG area while the public transport statistics consider the additional trips compared to the base and report the crowding hours for the whole London area as the crowding impact from the additional growth is likely to be outside the OLSPG area.

Figure 4.2 Modelling Assumptions and key statistics

Scenario Homes Jobs			Highway - Statistics for OL SPG area				Public Transport - Statistics for whole of London							
တိ			Мо	Morning Peak Evening Peak				Morning Peak						
			Distance (pcu-km)	Speed (kph)	Average Speed (kph) telay in Vehicle Hours (pcu-hrs)	Distance (pcu-km) e Speed (kph)	elay in Vehicle Hours (pcu-hrs)	al Trips tse	Mode Share of additional trips (%)			Hours		
			Travel Distance (pcu-km)	Average	Delay in Vehicle Hours (pcu-hrs)	Travel Distance (pcu-km)	Average	Delay in Vehicle Hours (pcu-hrs)	Additional Trips to Base	Bus	Rail	LU	DLR	Crowding
Base	50,000	50,000	85,000	29	1,000	80,000	28	1,000						226,000
1 – Reference Case	100,000	110,000	110,000	20	2,800	110,000	20	2,700	266,000	64%	24%	11%	2%	301,000
2 – London– wide background growth only	70,000	100,000	105,000	22	2,400	105,000	21	2,500	260,000	64%	24%	10%	1%	299,000
4 – OLSPG Preferred	130,000	180,000	120,000	17	4,300	115,000	16	4,200	279,000	63%	24%	11%	2%	307,000

Note: Crowding Hours is a measure which shows the Perceived additional travel time due to crowding times number of people who experience it.

The OLSPG Preferred Development scenario was derived by the development capacity modelling completed by the GLA and agreed with key stakeholders. The plot below (Figure 4.3) gives an indication of the spatial change in land use proposed.

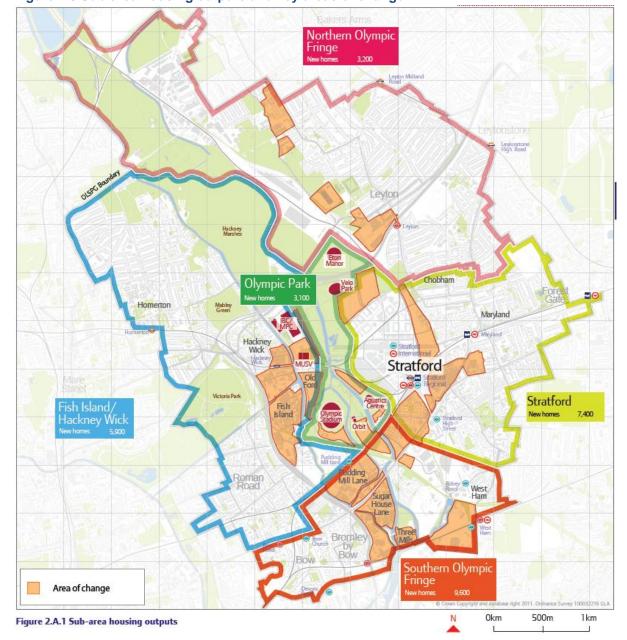


Figure 4.3 Sub-area housing outputs and key areas of change

4.5. Network Assumptions

The 2008 base network represents the current local road layout which includes road closures associated with the Olympic Park work sites. Scenarios 1, 2 and 3 investigate the impact of different levels of transport demand without testing any network interventions. These Do Minimum networks include reinstated roads previously closed under the Olympic Park network, new road layouts for the Olympic Park and all additional committed road schemes.

The Do Minimum committed schemes introduced in the highway network are described in

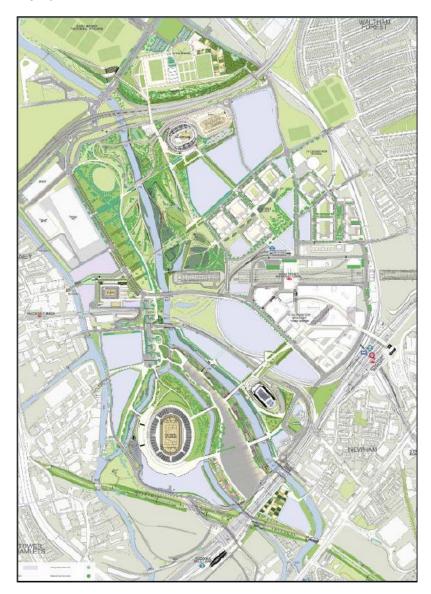
Figure **4.4** below.

Figure 4.4 Do Minimum 2031 – Committed Road Schemes

Scheme Name	Description
Canning Town removal of slip roads	The existing roundabout is replaced by a signalised junction. Existing A13 East Bound on-slip and West Bound off slip will be removed to free up space and reduce severance. Also, associated works to the whole area to facilitate movement of diverted traffic following closure of A13 on-slip and off-slip
Lochnagar Street pedestrian crossing	The existing left in/left out priority junction is replaced by a new signal controlled crossing, including pedestrian phases, on the A12 at the junction with Lochnagar Street and Zetland Street
Bow Roundabout pedestrian crossings	New controlled pedestrian crossing together at Bow Roundabout.
A118 (A11) / Warton Road Signals	Redesign of the existing signalised junction, with road widening to provide additional capacity and pedestrian facilities

Scenario 4 was tested with the updated Olympic Park Road Network (OPRN) received from Arup. Scenarios 5 through 7 were also modelled based on this network. A layout of the OPRN network is shown below in Figure 4.5.

Figure 4.5 2031 Olympic Park Road Network



For the Public Transport model, the Railplan future year model was used for all tests with the assumed public transport network in 2031 based on the MTS funded and committed schemes.

The Do Minimum committed schemes for the public transport network are shown in the table below.

Figure 4.6 Key Infrastructure assumptions for future year strategic transport modelling

Public Transport

Enhanced domestic services on High Speed 1

Crossrail

London Overground – programme of expansion and enhancement of services

West Anglia – 12-car capability to Stansted and Cambridge. Additional capacity also on inner services

Thameside south Essex – 12-car capability on all routes

Great Eastern – capacity increases

Jubilee Line upgrade providing additional capacity and improve journey times

Sub-Surface Railway – Circle, District, Hammersmith & City and Metropolitan lines upgrade to provide additional capacity and improve journey times

DLR Extension Stratford International to Canning Town

East London Transit phase 1b

Bus network development

Bus Priority

4.6. Matrix Development

The modelling was based on the London Transportation Studies (LTS) model. LTS is a strategic London wide four-stage model. Highway and public transport matrices for the base and forecast years in the LTS model were translated to ELHAM phase 1 for highway modelling and to Railplan (A12) for public transport modelling.

The LTS future year matrix includes the planning assumptions consistent with the London Plan minimum capacity estimates (based on 2009 Strategic Housing Local Accessibility Assessment (SHLAA) and Development Activity Database (DAD)) and the MTS. Matrices extracted from the 2031 LTS model for modelling already include trips generated by the new developments in the study area. This input data is only accurate at borough level, so the trip distribution from the LTS model was adjusted using the trip ends from LUTE model, which is based on local land-use information.

The trip ends derived from the LUTE model is based on London Docklands trip rates which have a higher proportion of public transport mode share, compared to the OLSPG area (85:15 and 80:20 for Public transport/Car for morning and evening Peak respectively). The morning Peak modal split derived from LTS for the four boroughs in the immediate study area is 70:30 for public transport: Car. Manual adjustments were made outside LUTE to reflect the representative modal split of 70:30. The 70: 30 public transport/car mode split was adopted for this study for all new developments, although this was varied for the sensitivity test in Scenario 5.

The mode split taken from LTS implies an increase in public transport mode share between now and 2031. (Figure 3.8 shows an estimate of the current mode share for the four boroughs taken from the London Travel Demand Survey.)

The process used to develop the future year (2031) matrices for ELHAM phase 1 model is shown in Figure 4.7.

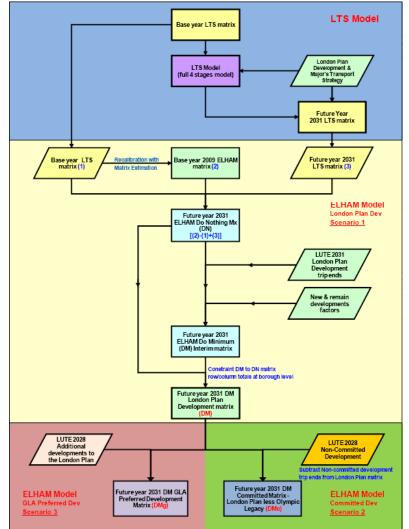


Figure 4.7 2031 Future Year Matrix Development Process

4.7. Current Situation

The highway network in the study area in the base year shows high flows along the A12, A13 and A406 during the morning peak. The northbound approach to the Blackwall Tunnel also has high flows. Figure 4.8 shows the morning peak trends in areas where actual flows exceed 3,000 PCUs/Hr (passenger car unit per hour). Figure 4.9 shows that currently, the highway network is congested along approaches to the OLSPG study area and at key locations within the region e.g. Hackney Wick. This matches with the results seen in the observed TrafficMaster data in Figure 4.1.



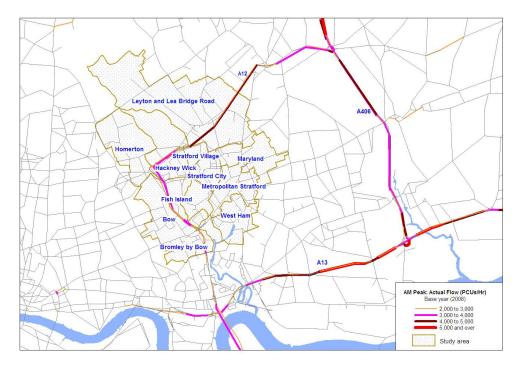
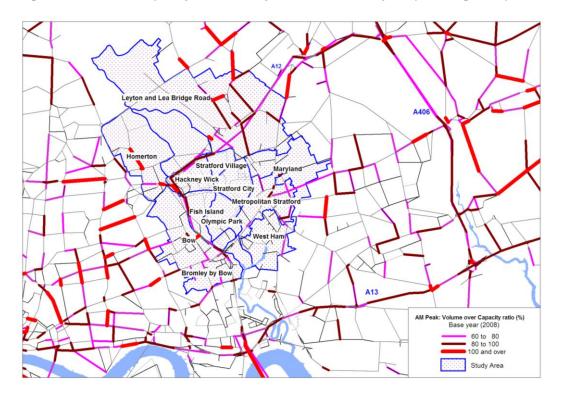


Figure 4.9 Volume/Capacity in the Study area in the Base year (Morning Peak)



As shown earlier in paragraph 3.2.1, the highway is also congested in the evening peak the plots below show the modelled situation in the base year. Compared to the morning peak they show more congestion on the southbound approach to the Blackwall Tunnel.

Figure 4.10 Actual Flows in the Study area in the Base year (Evening Peak)

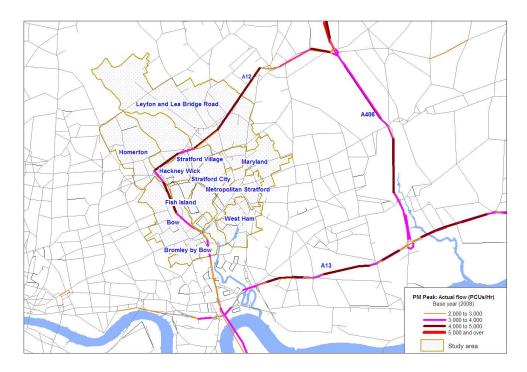
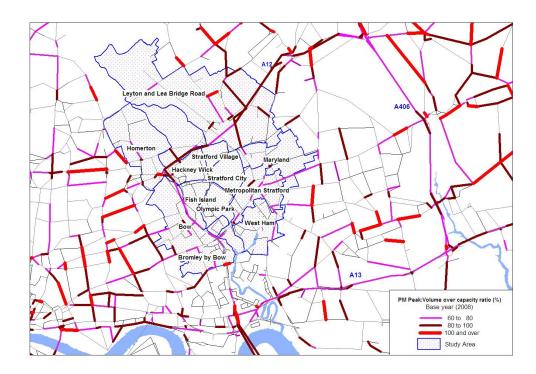


Figure 4.11 Volume/Capacity in the Study area in the Base year (Evening Peak)



The public transport network has high levels of crowding towards Central London in the morning peak. During the evening peak, passenger flows are high towards the study area.

No evening peak public transport model was available to show a comparison with the morning peak. The study area, in the counter-peak direction, remains relatively less crowded during the peak periods in the base year.

Figure 4.12 Public Transport link flows, Morning Peak, 2006 Base Year

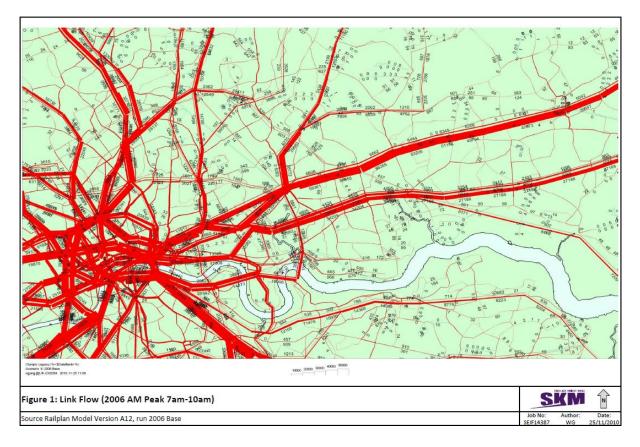


Figure 4.13 LUL/DLR Crowding Plot 2006 Base Morning Peak Busiest Hour



Figure 4.14 National Rail Crowding Plot 2006 Base Morning Peak Busiest Hour



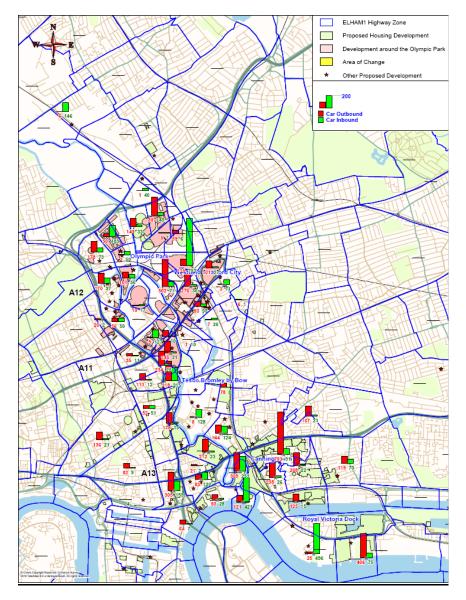
4.8. Future Year Scenarios

4.8.1. Scenario 1 - London Plan Reference Case

The reference case scenario is consistent with the London Plan minimum capacity estimate assumptions of London-wide growth and the Mayor's Transport Strategy funded and committed schemes. A comprehensive dataset of land use data from the London Thames Gateway Corporation (LTGDC), consistent with the London Plan indicative development thresholds, was available for each development site. The dataset was available for employment and housing.

Figure 4.15 below shows the car trips originating and terminating within the OLSPG and A12 corridor during the morning peak period in the reference case. It shows significant outbound trips with few zones with higher numbers of inbound trips corresponding to significant trip attractors, for example, Stratford City.

Figure 4.15 Car Trips for London Plan Reference Case Development (Scenario 1) during the morning peak



On the highway network, heavy delays occur at the junctions of A11/A12, A12/Devas Street and Wick Road, Victoria Park Road, Kenworthy Road and Cassland Road. These roads are at, or very close to capacity.

The northbound Blackwall Tunnel is operating over capacity in the morning peak. In North Greenwich, where three lanes merge into two, a bottleneck is created on the road network, resulting in large delays of up of 17 minutes. The northern exit of the Blackwall tunnel shows lower levels of congestion, compared with the northern approach. This is because the queues to enter the tunnel are formed south of the Blackwall Tunnel, continuing to the Woolwich Flyover and beyond and do not affect traffic flow north of the tunnel.



Figure 4.16 Reference Case (Scenario 1) highway congestion in the morning peak

During the evening peak, the southbound direction of the Blackwall Tunnel is operating at capacity and there are large delays of up to 10 minutes for traffic approaching the tunnel. On the A12 and A13 junction, traffic moving southbound faces heavy congestion with long tailbacks on the A12 in both directions. East India Dock Road Tunnel (A1261) also experiences long queues in the eastbound direction at the junction with East India Dock Road (A13).

The average vehicle speeds in the evening peak are much lower than observed in the morning peak with approximately 30kph and 15kph for northbound and southbound directions of the A12 respectively. The slowest section occurs at Devas Street and the Tunnel entrance in the southbound direction, where the average speed drop to 14kph reflecting the large delay occurring at the congested A12/A13 interchange

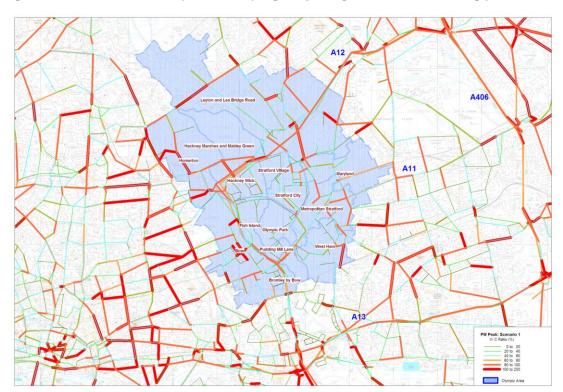


Figure 4.17 Reference Case (Scenario 1) highway congestion in the evening peak

In comparison with traffic conditions in the base year, there is an observed overall increase in congestion levels. Congestion on many links in the study area has increased by at least 30 percent. Areas around Hackney Wick have higher observed levels of congestion (Figure 4.18). These plots suggest that the highway network would not continue to operate efficiently with this level of growth and that improvements to the highway network would be required to enable the level of development assumed in the SHLAA 2009 to proceed.

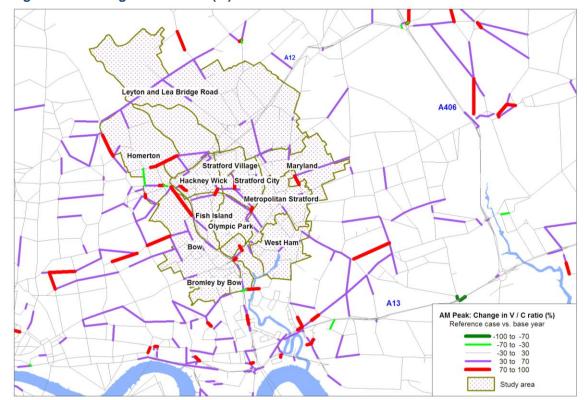
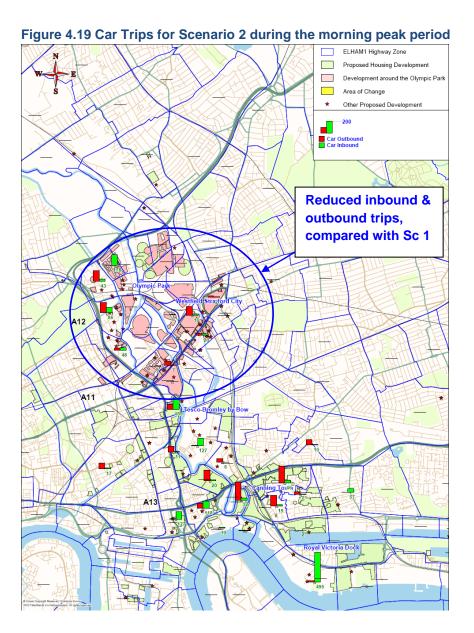


Figure 4.18 Change in V/C ratio (%) between Reference case & Base

4.8.2. Scenario 2 – London Plan Reference Case minus Olympic Legacy Minimum Capacity Estimate Assumptions

The London Plan Reference Case scenario already assumes some growth related to the Olympic Legacy therefore to understand the full impact of the OLSPG growth this needs to be removed from our modelling. In this scenario London Plan growth forecasts at borough level are assumed across the whole of London, while in the study area only the background growth is included. The transport network is assumed to be the Mayor's Transport Strategy funded and committed schemes.

The LUTE model was used to estimate trip ends to and from the development zones based on the Reference Case development assumptions for the area. These were then deducted from the matrices to effectively remove any demand growth associated with the Legacy development.



Scenario 2 (Figure 4.20 and Figure 4.21) shows congestion levels similar to those observed in scenario 1. The reduction in development in scenario 2 compared with the Reference Case is minimal, which could explain the minimal changes observed. Figure 4.22 shows how congestion in Scenario 2 compares with the base year scenario.



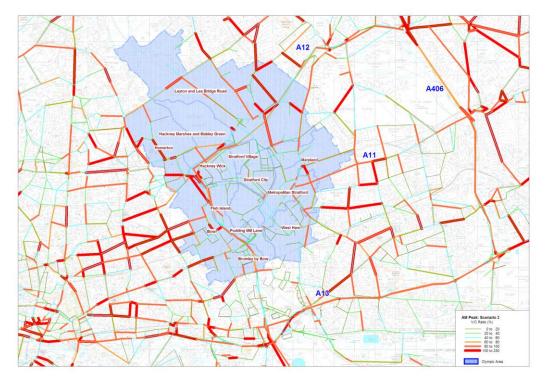


Figure 4.21 Highway congestion during the evening peak period



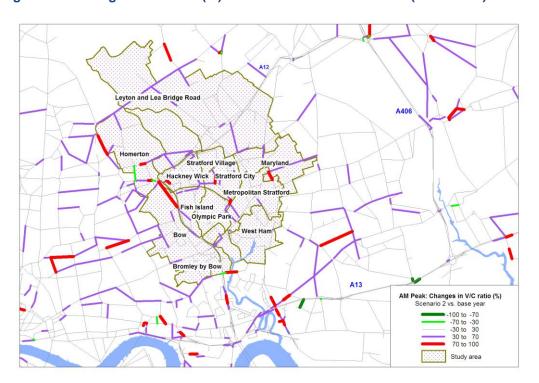


Figure 4.22 Change in V/C ratio (%) between London Plan minus (Scenario 2) & Base

This model scenario shows that highway congestion will increase in the area due to background growth. These plots suggest that the highway network would not continue to operate efficiently with the level of background growth expected and that improvements to the highway network would be required to enable any further development to proceed.

4.8.3. Scenario 4 – OLSPG Preferred Development (OPRN network)

This scenario tests the OLSPG preferred development scenario as at May 2010 in the OLSPG area and growth assumptions consistent with the London Plan borough forecasts across the rest of London. New sites for development were identified with provision for an additional approximately 30,000 households and 70,000 jobs by the GLA development capacity study (rounded to the nearest 10,000). These are the numbers that have been modelled though work continued on the preferred development scenario and the OLSPG promotes slightly lower numbers. The highway network within the Olympic Park is the Olympic Park Road Network. This road layout was used as it has planning permission and the new developments are likely to be built around this design.

The LUTE model was used to estimate the new trip ends to and from the Legacy sites based on the additional developments. These new trips were then added into the highway and public transport matrices.

Figure 4.23 below shows car trips for this development scenario in the morning peak.

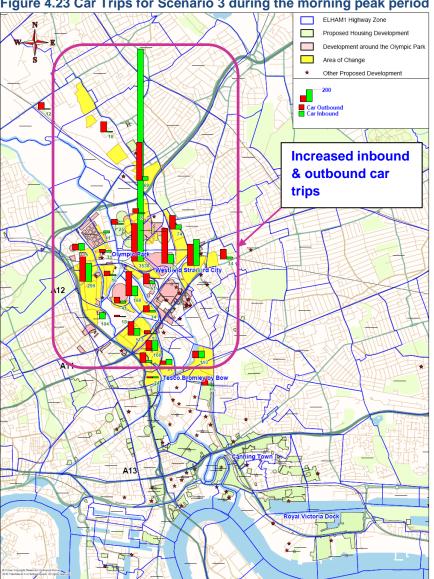


Figure 4.23 Car Trips for Scenario 3 during the morning peak period

Figure 4.24 shows traffic congestion under SPG's preferred scenario. Sections of the A13 are more heavily congested. The Legacy region also has more queues and delays compared with Scenario 1 and 2.

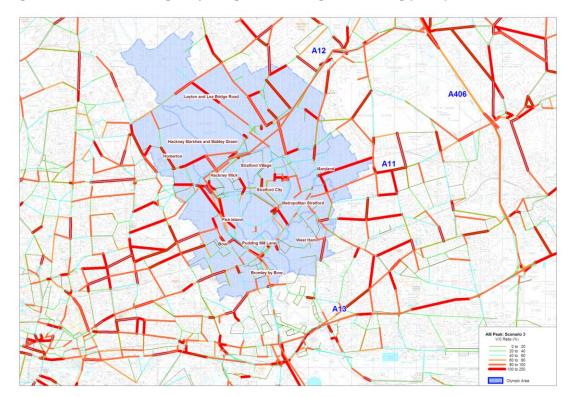


Figure 4.24 Scenario 3 highway congestion during the morning peak period

In the morning peak, the average speed for northbound traffic along the A12 between Blackwall Tunnel exit and the A12 Temple Mills Lane is about 45 kph. The speed for the southbound traffic for the same section is approximately 41kph. The average speed in the evening peak is approximately 27 kph and 14 kph for northbound and southbound directions respectively.

In the OLSPG Preferred scenario, there are more congested links around Stratford and Hackney due to the additional demand above that assumed in scenario 1. Actual flows increase along the A11 and A12 corridors. Roads within the Olympic Park and Stratford city show very large increases. These observed increases in flow are consistent with the increase in the demand.

The modelling of the highway network shows that there will be significant increases in highway trips and congestion between now and 2031 based on assumed growth assumptions in scenario 1. The additional development proposed in the OLSPG will lead to further highway trips and congestion which would mean that the highway network would not work efficiently unless improvements were made to the network.

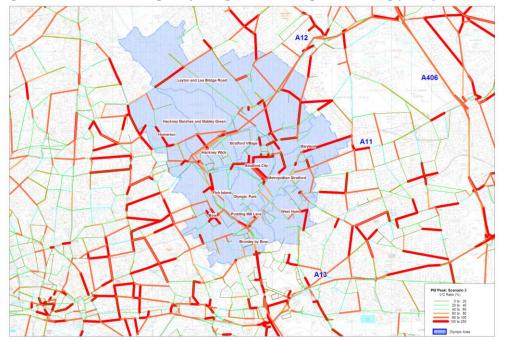


Figure 4.25 Scenario 3 highway congestion during the evening peak period

4.8.4. Public Transport

The Public Transport modelling was undertaken for the morning peak for scenarios 1, 2 and 3.

Scenario 1 Reference Case shows an increase in trips for all modes compared to the base year. The crowding seen is consistent with the London-wide modelling completed for the Mayor's Transport Strategy, though there are minor differences due to the different models used.

Passenger demand flows on the public transport network are high in the study area, flowing through Stratford and West Ham. The Central and District Lines on the Underground and the National Rail line through Stratford have particularly high flows, especially for Scenario 3 (OLSPG Preferred scenario), relative to the Reference case as shown in Figure 4.28 and Figure 4.29 4.29 respectively.

Figure 4.26 Change in boardings by mode between 2031 and the Base

	Reference Case compared to the Base (1 compared to Base)		London-wide background growth only compared to the Base (2 compared to Base)		OLSPG preferred development compared to the Base (3 compared to Base)	
	Actual	Proportion	Actual	Proportion	Actual	Proportion
	change in	of change	change in	of change	change in	of change
	boardings	by mode	boardings	by mode	boardings	by mode
Bus	974,500	64%	966,000	64%	992,000	63%
LU	161,000	11%	155,000	10%	175,500	11%
DLR	23,500	2%	20,000	1%	25,000	2%
National Rail	364,000	24%	361,000	24%	371,500	24%
Total	1,521,000	100%	1,500,000	100%	1,562,500	100%

Note: Rounded to nearest 500

Figure 4.27 Change in boardings by mode under different development assumptions, 2031

. igaio nei chango in boaranigo by modo andor amoroni dovoropinoni						
	OLSPG pre	eferred	OLSPG preferred			
	developme	ent	development			
	compared	to	compared to London- wide background growth only (3			
	Reference	e Case (3				
	compared	to 1)				
			compared to 2)			
	Actual	Proportion	Actual	Proportion		
	change in	change in of change		of change		
	boardings	by mode	boardings	by mode		
Bus	17,500	42%	26,000	42%		
LU	14,500	35%	20,500	33%		
DLR	1,500	4%	5,000	8%		
National Rail	8,000	19%	10,500	17%		
Total	42,000	100%	62,500	100%		

Note: Rounded to nearest 500

The table above shows that the majority of the additional trips in the preferred development scenario would be expected to be accommodated on the bus and London Underground networks.

Figure 4.28 Difference in trips on London Underground in 3 Hour Morning Peak (OLSPG Preferred vs. London Plan)

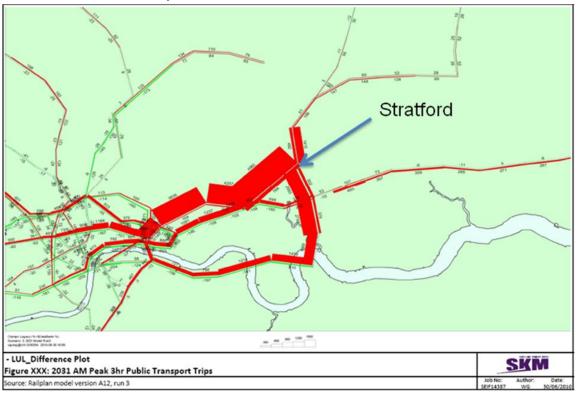
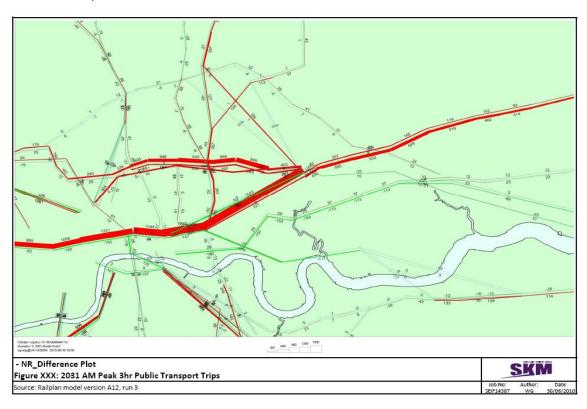


Figure 4.29 Difference in trips on National Rail in 3 Hour Morning Peak (OLSPG Preferred vs. London Plan)



In the study area, there are considerable capacity issues forecast, with crowded links on the Central, Jubilee and District lines under the Reference Case. This can be seen in the plots below (Figure 4.30 and Figure 4.31).

Figure 4.30 Tube & DLR crowding during the morning peak (Reference Case)

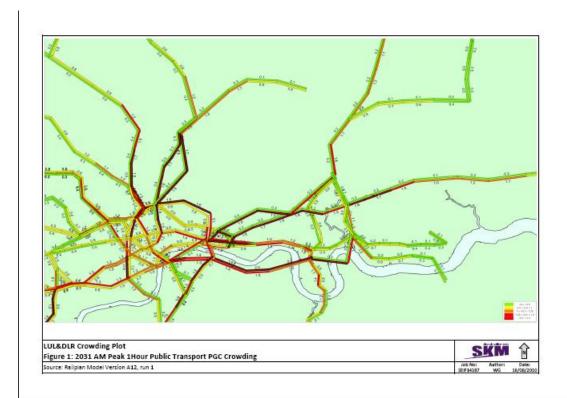
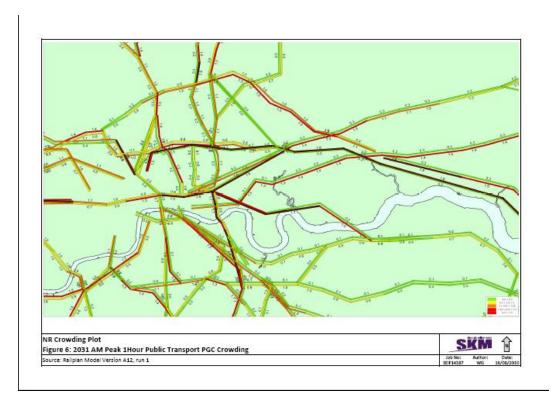


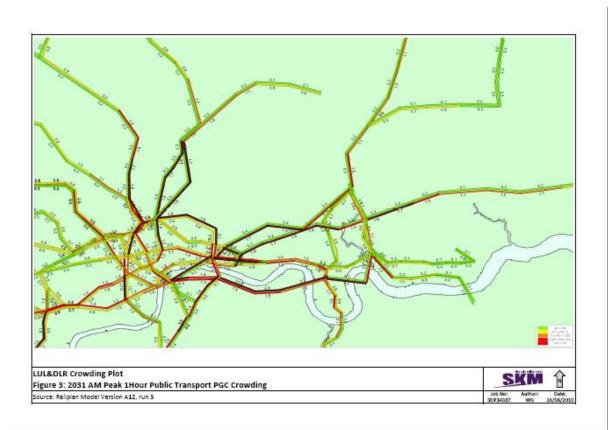
Figure 4.31 National Rail crowding during the morning peak (Reference Case)



The modelling for the preferred development scenario (Scenario 3) shows that the majority of the additional trips from the OLSPG development in this scenario would be in the counterpeak direction (east-bound) in the morning peak and not worsen the near—capacity levels of service in the westbound direction. This is because the number of jobs in the area is expected to increase which leads to significant in-commuting. There is also expected to be some increase in flows from the east though not to a level which impacts on crowding levels. This can be seen in the plots below (Figure 4.32 and Figure 4.33); small increases are seen in crowding on some of the links but not significant increases which lead to changes in the classification of the level of crowding on the link. One location where the OLSPG development will exacerbate an already crowded section is on the Jubilee line, where the peak direction flows in the eastbound direction between London Bridge and Canary Wharf. This is one of the most constrained parts of the London Underground network.

It should be noted that the modelling considers the end state when residents are assumed to have moved jobs and houses to the optimum solution. However, the interim changes may lead to different travel patterns and therefore different crowding patterns.

Figure 4.32 Tube & DLR crowding during the morning peak (OLSPG Preferred Development Scenario)



NR Crowding Plot
Figure 4: 2031 AM Peak 1Hour Public Transport PGC Crowding
Source: Religion Model Version ALZ, run 3

RELIGIONAL CONTRACTOR SOURCE SERVING SOURCE SERVING

Figure 4.33 National Rail crowding during the morning Peak (OLSPG Preferred Development Scenario)

4.8.5. Congestion Impacts on Bus Service Reliability

Congestion has a negative impact on bus journey times and service reliability.

The effect of the proposed changes on bus journey times was investigated to assess any impacts on bus services levels. The highway model was used to estimate the impact of congestion on bus reliability. Route 108 was selected for analysis because of its route through the Blackwall Tunnel. Average speeds on bus route 108 (Lewisham to Stratford) from Stratford to the Blackwall Tunnel Entrance were analysed. Generally, the speeds do not vary by direction for each scenario in the morning peak. This could be explained by the section of the bus route being investigated. Most of the morning peak congestion would be at the northbound approach to the tunnel which is not captured by this section of the bus route.

There is a drop in average speed on this route by an average of 8 percent between the base year and the 2031 Reference Case in the morning peak. Bus journeys would be slowest under Scenario 3 (OLSPG Preferred) due to the increased congestion on the highway network, shown in Figure 4.25.

In the evening peak, average bus speeds between the north and southbound direction vary by an average of 12kph. In all scenarios, the southbound journey is slower than the northbound as the roads are already congested around the northern approach to the Blackwall Tunnel. Generally, bus journeys are longer in the evening, compared with the morning peak (Figure 4.34).

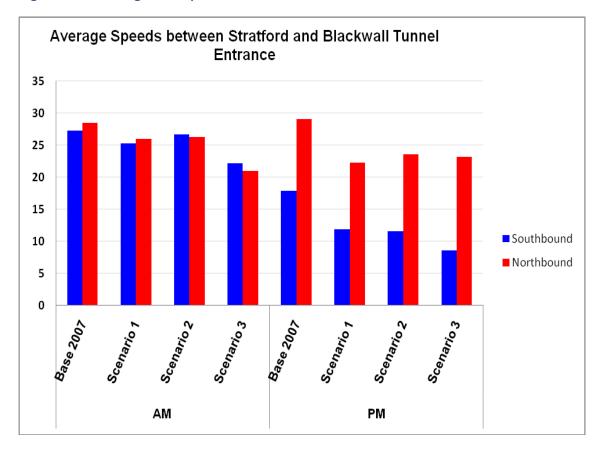


Figure 4.34: Average Bus Speeds between Stratford and Blackwall Tunnel

4.8.6. Impact of road congestion on freight

The impact on freight operations will be at both a local level and also a wider regional level and both need to be considered in any future development. Congestion will increasing cost and time to transport goods and lead to decreased air quality in the immediate surroundings.

At a regional and national level, there are a number of key strategic freight routes running through and close to the study area these are the A11, A12 and A13 which link the national road corridors of the M25, M11 to Harlow and A1 to Stevenage/Peterborough and routes from Dover and Felixstowe via river crossings.

Freight trip patterns will change within the study area due to land use changes, both decreasing as industrial uses decline and increasing to support the new development. Overall, the preferred development scenario proposed by the SPG will decrease the amount of Strategic Industrial Locations and increase the number of homes in the area. For example, the Old Ford area near Hackney Wick is currently an industrial area which is rapidly changing to a residential area and is highlighted in the Olympic Legacy SPG document as an area particularly suitable for family housing. The change in the type of

^{*}Please note that the journey times in the models are generally quicker than the observed times so the actual speeds would be lower than those extracted from the model.

housing and socio-economic group of the residents of this area will also have an impact on freight trip patterns for services that support them.

At this stage of the planning process it is too early to understand in detail how the local freight trip patterns will change but further work will need to be done to understand the issues and to design in solutions which not only reduce the impact of congestion on freight but also the negative impact of freight on the local area. These solutions will need to reduce freight mileage and/or trips, for example, drop-off points with sustainable modes for local deliveries from them and collection points near stations.

4.8.7. Station Crowding Impacts

Station interchange flows in the morning peak hour were analysed to assess the impacts on the potential population and employment growth on station patronage. It was also important to assess any possible implications on crowding of services. Figure 4.35 below shows the morning peak station interchange flows at selected stations in the study area.

The public transport model used was the best available at the time of starting this study, however, it is not very well validated for some DLR stations. Therefore, as future development plans for this area develop in more detail the impact on station operations should be investigated further using Regional Railplan which is now available. Further modelling is also required to understand the impact of forecast evening peak demand stations, and to dynamically model flows.

Figure 4.35 Morning Peak Hour Station Total Flows

	Base Year	Scenario 1	Scenario 2	Scenario 3	% Difference		e:e
					1 - Base	4 - 1	4 - 2
Bow Church	400	600	600	700	40%	15%	19%
Bow Road	1500	1,700	1,700	1,800	19%	5%	5%
Bromley-by- Bow	1,400	2,700	2,100	3,400	89%	26%	62%
Forest Gate	1,100	2,400	2,400	2,300	112%	-3%	-3%
Hackney Wick	200	800	700	1,700	354%	117%	154%
Leyton	6,800	7,300	6,300	8,900	7%	23%	42%
Maryland	300	1,300	1,300	1,300	317%	-1%	0%
Plaistow	3,400	3,500	3,400	3,700	1%	8%	10%
Stratford	18,400	35,300	33,200	44,400	92%	26%	34%
West Ham	3,200	5,600	5,500	6,400	77%	13%	16%

^{*}Please note that the station flows in the models may vary from observed flows. Relative flow comparisons give a more accurate indication of likely trends.

The ability of Bromley-by-Bow and Leyton to cope with the anticipated increase in demand has been examined. Demand flows at these stations were compared to 2009 RODS (LU's Rolling Origin Destination Survey) station flow data for each of the scenarios. The method of factoring Railplan results into RODS data was taken from LU's Station Demand Modelling Guidance note.

The method for determining the level of crowding was taken from LU's Station Planning Standards and Guidelines. The width of the corridors, staircases and entrances was measured. The number of people using a corridor, staircase or entrance per minute were calculated per metre of width. This allowed a Fruin's level of service to be applied to the link, where level of service "A" represents free circulation, and "F" represents a complete breakdown in traffic flow. For two-way links it is recommended that LU links operate at level of service C or below. The level of service quoted below represents the busiest peak flow forecast.

The number of people using the ticket gates was analysed to determine how many gates would be necessary to clear the platform before the next train arrives. If the platform is not cleared congestion will quickly build up.

The space available on the platforms was not assessed as part of this analysis.

Leyton Station Demand Flows Modelling

The staircases to/from the eastbound and westbound platforms were at level of service C for the peak hour in 2009 (acceptable). The level of service is forecast to deteriorate by 2031 with all scenarios. The OLSPG Preferred development makes the station congestion worse leading to a complete breakdown in traffic flow (

Figure 4.36) to/from the westbound platform in the morning peak hour (F).

Figure 4.36 Fruin's Level of Service at Leyton Station

Leyton Station	RODS 2009	Scenario 1	Scenario 2	Scenario 3
Staircase to/from Westbound platform	С	Е	Е	F
Staircase to/from Eeastbound platform	С	E	D	F
Number of ticket gates required	5	8	7	8

There are currently 5 ticket gates at Leyton station, which is enough to satisfy the current demand (RODS 2009). The number of ticket gates required will increase to 8 with the OLSPG Preferred development scenario. In these scenarios the ticket gates will become the second pinch point in the station (following the staircases discussed above). Without more gates, crowding will mean that the platform cannot be cleared before the next train arrives.

Leyton station will be heavily congested in 2031 due to development growth assumed in the Reference Case. The extra demand from the OLSPG Preferred development scenario, which is in addition to the growth envisaged in the Reference Case, will make the level of congestion even worse with the current infrastructure.

There are various options for increasing the capacity of Leyton station which have been suggested by London Underground, the London Thames Gateway Development Corporation and London Borough of Waltham Forest. Further work is necessary to determine which is the preferred solution. Tackling this congestion would mean improving the capacity of the staircases, corridors and ticket gates. The depth of the ticket hall would also have to be increased to prevent run-offs on to the street. The works would require track possessions, likely during operational hours, such as at weekends or longer. Addressing only one of these pinch points in the station would merely push the problem around the station

There is currently no funding for LU to make these improvements. In the absence of improvements, should congestion levels in the station increase due to the growth planned in the OLSPG area, LU will manage the congestion safely through a range of station control measures, including temporarily closing the whole station for busy periods, as a worse case. The Olympic Legacy development, occurring on top of the Reference Case growth, would likely mean that these mitigation measures could need to be taken more often. They would

also mean that the station improvement plans would need to be designed to a higher specification, to accommodate more demand. This is likely to require developer contributions to fully fund the scheme to ensure that the station can serve the OLSPG area without regular station closures.

Bromley-by-Bow Station Demand Flows Modelling

The corridors and staircases in Bromley-by-Bow station are wider than those at Leyton, and the demand lower. This means that the level of service on these links does not increase above A for any scenario.

The only capacity constraint at Bromley-by-Bow is the number of available ticket gates, which is constrained by the size of the ticket hall. There are currently 3 gates, which is all that is required for present day demand. By 2031, the number required will rise to 4 (Figure 4.37). Without any improvements this could mean that the station would have to operate as exit only in busy periods to prevent congestion building up in the station due to queuing back around the gateline. The results suggest that the number of ticket gates would have to be increased with the growth assumed in the Reference Case and that the need will increase further with the OLSPG Preferred development scenario.

Figure 4.37 Estimated number of ticket gates at Bromley by Bow

Bromley by Bow Station	Current	RODS 2009	Scenario 1	Scenario 2	Scenario 4
Number of ticket gates required	3	3	4	4	4

At Bromley-by-Bow a further issue is the access to the station. The entrance is located on the A12, with pedestrian access further constrained by the railway line, meaning that most passengers have to cross over or under the busy road to access the station. The current low level of demand at Bromley-by-Bow station may be related to the highly constrained access point. This may mean that the full potential of the station to serve the local area is not realised and it may push more people onto the (congested) roads instead.

A Capita Symonds Report "Bromley-By-Bow Station Improvement and Integration Study", March 2010 found that the capacity issues at the station would arise by 2026, given the amount of development planned for the area. The growth in population, retail and office space, couple with the increase in pedestrian accessibility built in to the new development, will mean that the relative population served by the station could increase by 300%.

The LTGDC has proposed solutions to the capacity and access problems as part of its plans for development in the local area. These options all have a high estimated cost. This is because they involve completely reconfiguring the platforms and station entrances. Work is underway to understand more fully how many trips will be generated by the London Thames Gateway development and to clarify the timescales for when the station will be impacted by this increased demand. A further study will investigate better value options to increase the

capacity of the station, introduce step free access lifts and increase the prominence of the station.

4.9. Weekend Model

4.9.1. Introduction

The study area includes Stratford City and Olympic Park which are expected to induce trips to the area for shopping, leisure and sporting activities over the weekend. It was necessary to develop a weekend model to represent these busy times – the highway model previously developed and described above represents morning and evening peak weekday peak hours. A public transport weekend model was not thought necessary and has not been developed.

ELHAM phase 1 on which the highway assignment model is based only covers the morning and evening peak periods. The London Thames Gateway Crossing (TGX) model, on which ELHAM 1 is based, has an inter-peak model. The interpeak network was developed using the same process as the Morning and Evening peak models so that all ELHAM phase 1 time periods include the network improvements and finer zone representations in the main study area (Olympic Park and A12 corridor). It contains the same level of detail as the OPAL2 and TGX models beyond the immediate study area. The weekend (Saturday Evening) model was assumed to have the same network as the weekday interpeak as a starting point. Signal settings were then adjusted based on the weekend traffic demand patterns at junctions which were under stress, so that the network operates satisfactorily in the 2009 base year.

The weekend model report is available.

4.9.2. Model Assumptions

For the development of a validated weekend model from a weekday off peak model, the following assumptions were made:

- Trip patterns and signal settings for the weekend were the same as the trip patterns and signal settings for weekday off peak
- The weekend model would be based on the busiest weekend peak hour Saturday afternoon peak hour (17:00-18:00) when there are high levels of shopping trips and trips from major planned sporting events in the Olympic Park.

The model was calibrated with Automatic Traffic Count data collected in November 2009 for the ELHAM model. Over 450 counts covering the entire study area were used and yielded very good calibration results.

Traffic flow profiles for Blackwall Tunnel northern approach (Figure 4.38) for Saturday and Sunday were assessed to identify the busiest peak hour. The profiles indicated a peak hour to be between 17:00 and 18:00 as shown below. This period also coincides with the normal football fixture finishing time for Saturday afternoon matches.

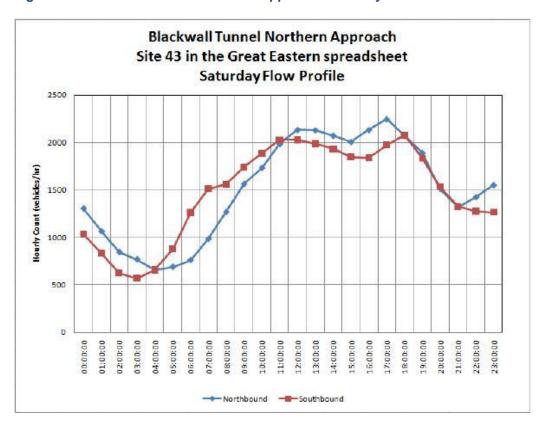


Figure 4.38 Blackwall Tunnel Northern Approach Saturday Flow Profile

In the estimation of the demand of car use for travel to events at the stadium (therefore assuming the highest demand scenario), the following assumptions were made:

- The stadium would be used as a football ground with a 60,000 seat capacity
- The trip rates are the same as those observed for the Arsenal Emirates Stadium, which has the following characteristics
 - 11.5 percent car usage with vehicle occupancy rate of 2.6;
 - 74 percent of spectators depart from the stadium in the first post match hour, 21
 percent leave in the second hour and 5 percent leave 15 minutes before the final
 whistle;
 - Average walking time is 18 minutes, approximately 1 mile walk
 - Surveys of walk times suggest that just under half of the people who drive to the stadium park within the CPZ, with the remainder parking just outside
- The trip distribution for the event trips was assumed to be the same as already assumed for those zones.
- Residents Access Permits and Event Day Road Closures will be in operation
- Local roads immediately surrounding the stadium are closed when a match is played to ensure pedestrian safety and to allow emergency access
- Stadium car park would be limited to staff and Blue Badge holders only; 100 spaces would be made available for blue badge holders. There would be 800 parking spaces within a 2km radius and up to 1000 spaces between a 2 3 km radius. The catchment of spectator car parking is shown below.

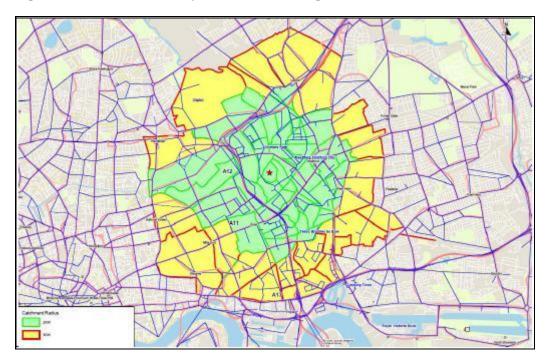


Figure 4.39: Catchment of Spectator Car Parking

The table below (Figure 4.40) summarises the matrix totals for the weekend evening peak in the base and future year.

Figure 4.40 Base year & Future year matrix totals for Saturday evening peak model.

ELHAM 1 Saturday Evening	Matrix Total (PCUs/Hr)						
Peak	Total	Car	LGV	HGV			
2009	764,500	630,000	78,000	56,500			
2031	842,000	690,500	87,000	64,500			
2031 with Event on	844,000	692,500	87,000	64,500			
2031 - base	10%	10%	11%	15%			
2031 (with -without event)	0.2%	0.3%	0%	0%			

4.9.3. Model Calibration

Assigned flows were compared with observed counts across screenlines based on the criteria outlined in DMRB Volume 12 Section 2 Part 1.

The highway network in the base year was also compared with traffic conditions in the TrafficMaster database (2008/2009) for Saturday evening peak. Figure 4.41 below shows the average delay around the study area during the weekend evening peak period.

2008-09 Average Delay - PM Peak (Saturdays only)

Olympic Park Area/Stratford

Road Network
Performance
and Research
Note:

Note:

Network shown is OS ITN
links on Network of Interest.

- PM Peak Span Span

Road Network
Performance
and Research
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Figure 4.41 Average delay for Saturday evening peak (2008/2009)

4.9.4. Highway Network Performance

right. All rights reserved' (GLA) (100032379) (2009)

In the base year weekend evening peak, the highway network has some congestion. The volume over capacity ratio on the A12 and A13 is on average about 60% (Figure 4.42). However, queues form on the approach to the Blackwall Tunnel. Some minor roads in and around the study area show high levels of congestion, although these tend to be isolated.

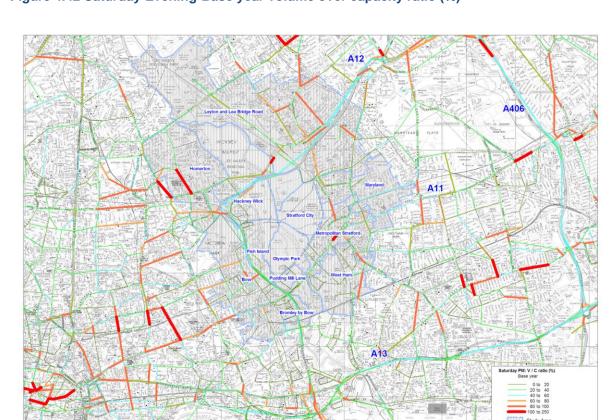
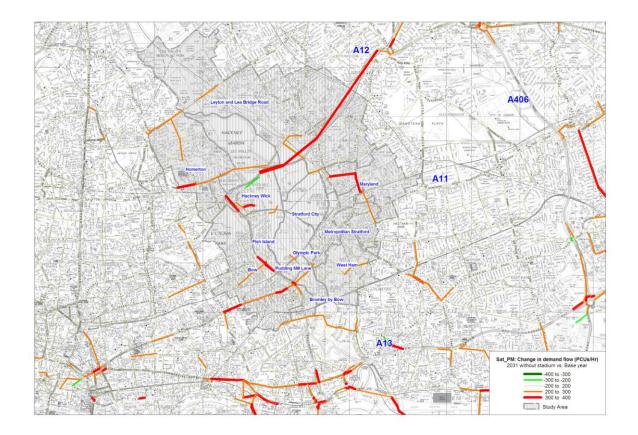


Figure 4.42 Saturday Evening-Base year volume over capacity ratio (%)

The growth in traffic flow in the base year was compared with the future year weekend growth without the additional flow associated with the stadium. Sections of the A12 and A13 have an increase in demand in 2031. The impact of increased demand on congestion is minimal. This is because the weekend evening peak highway network in the base year is not congested on key links. Though, there is an observed increase in congestion along particular sections of the A12 (Figure 4.43 and Figure 4.44).

Figure 4.43 Changes in Demand flow (PCUs/Hr) for Saturday evening peak (2031 vs. Base year)



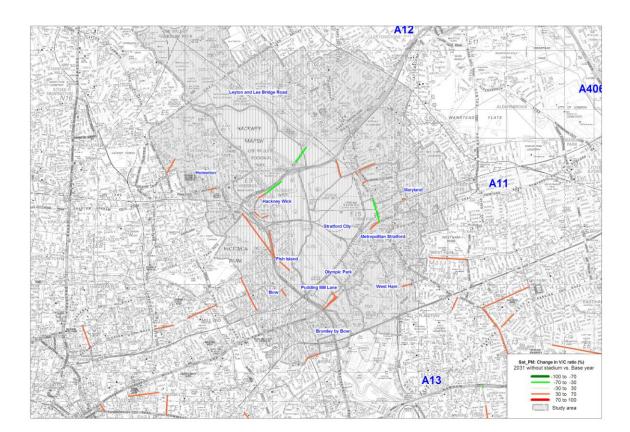


Figure 4.44 Changes in V/C ratio (%) for Saturday evening peak (2031 vs. Base year)

4.9.5. Impact of Stadium Trips

The stadium is expected to generate extra trips in the study area in the future year. The weekend model has investigated the impacts of the extra trips on the highway network. The weekend model evening period was set to coincide with the normal time of the final whistle at football matches.

The introduction of the stadium appears to have a minimal effect on the highway network. The most obvious increase in demand is on the A12 approaching the A406, which could represent trips leaving the stadium after the game has finished (Figure 4.45). The impact of the additional demand has not been considered on the public transport network.

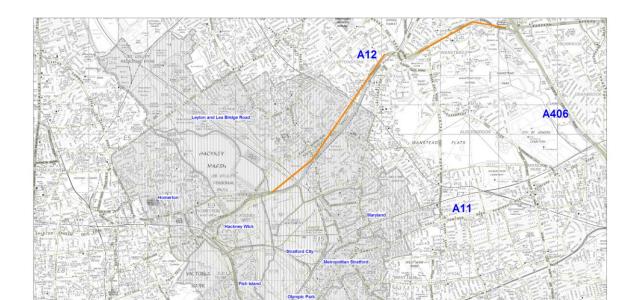


Figure 4.45 Impacts of stadium trips on demand flow (with stadium vs. without stadium)

The proposed stadium does not appear to significantly introduce congestion on the network, based on the modelling assumptions previously defined. Figure 4.46 shows a negligible change in congestion levels. However, this assumes that significant travel management interventions are put in place to decrease the number of people that travel by car to events at the stadium.

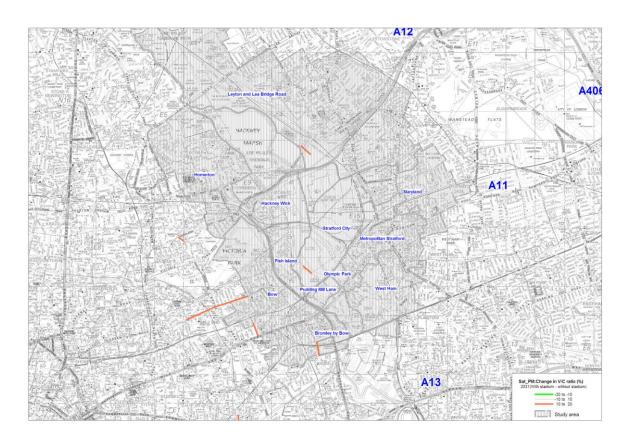


Figure 4.46 Impacts of stadium trips on congestion (with stadium vs. without stadium)

In general, the highway network still operates satisfactorily with the stadium fully functional. However, there is a slight increase in congestion.

5. Improving Local Connectivity



5.1. Introduction

The Olympic Legacy SPG area is well connected strategically however, one of the most prevalent features of the existing Legacy area is that much of it has poor local level connections to surrounding neighbourhoods and communities, with numerous physical barriers such as railway lines, roads, and limited crossings over waterways in the area surrounding the Olympic Park which effectively prevent the creation of coherent well-connected new neighbourhoods. In addition cul-de-sacs and roads with little or no footpaths or associated public realm tend to reduce the desire of pedestrians and or cyclists to move through the area.

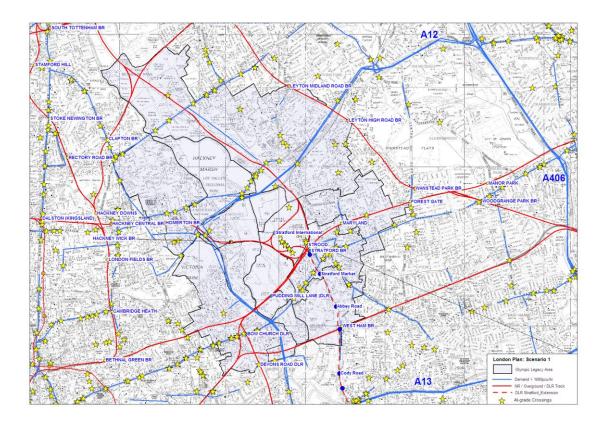
In order for this new development to become part of the surrounding city rather than a separate and distinct area there needs to be a clear network of local links to support permeability between the area and the local environs.

Improving local connectivity will also support the use of more sustainable modes of travel and enable a higher proportion of local short trips to be made by walking and cycling rather than car or public transport. This in turn would help to manage the demands on both the road and public transport networks. The aim of this section is to identify key connections which should be retained, safeguarded or developed to enable this.

5.2. Current connectivity

This area suffers from significant severance caused by the railway lines, roads and waterways. The plot below (Figure 5.1) aims to show these issues geographically. The red lines show the rail routes through the study area including DLR, Central Line, Jubilee Line, London Overground and National Rail lines. The blue lines show the roads with high flow.





This plot should also be considered alongside with the PTAL plots shown in the context section of this study. PTAL scores for the Stratford area, due to the existing infrastructure, are considered to be very good, with a large proportion of the area surrounding Stratford Station to be levels 6a and 6b. With the introduction of the DLR Stratford International Extension (2011) and Crossrail (2018) the background PTAL levels increase across the OLSPG area but most noticeably with 6a/b coverage increasing significantly into the Olympic Park. It is also just as important to note the lower PTAL scores present around the Olympic Park in 2008 increase from 1 to 2 & 3. However, some areas of Hackney and Waltham Forest remain with low PTAL levels in 2031.

Figure 5.1 and Figure 3.9 to Figure 3.11 show that the levels of connectivity across the OLSPG area vary significantly. In order, to maximise the benefit of the future growth in this area and for this growth to be sustainable the levels of connectivity need to be improved. The appropriate level of connectivity will vary depending on the land use and density aspirations for each area.

5.3. Connectivity in 2014

The OLSPG area will undergo significant development and implementation of a number of connectivity schemes in the short term. A baseline case which shows the expected situation in 2014 after the Olympic Park Transformation has been completed.

This baseline was established by reviewing Masterplans, OPTEMS and other local studies and identifying the schemes with committed funding that would be operational by 2014. See Annex A for a detailed list of the schemes assumed in the baseline. The map below uses the committed schemes to identify the existing and missing key local connections.

Chobham Stratford 2014 Legacy Position Cycle/Pedestrian Existing key local connection Missing key local connection Cycle/Pedestrian riverside Existing key local connection Missing key local connection Cycle/Pedestrian/Vehicle Existing key local connection --- Missing key local connection Mode to be determined --- Missing key local connection Connectivity project references are found on the page opposite 0km 500m 1km Figure 2.C.3 Key local connections

Figure 5.2: Key existing and missing local connections in the OLSPG area

The map shows that there will be some local connectivity gaps between key places in the area in 2014. Following the completion of the Olympic Transformation, the A12 will continue to cause severance as will the River Lea.

Due to the new development in the area there will also be increased need to link specific key places, for example, Hackney Wick and Stratford City as well as improving access to and from key places, for example, Sugar House Lane and Three Mills.

In order to support the promotion of sustainable modes to manage road congestion and support climate change mitigation there is also a need to enable improved access to all public transport stations in the area and specifically, Hackney Wick and Bromley-by-Bow.

There also appears to be gaps in the north of the study area, the area which is also shown to have poor PTAL scores both now and in the future. However, with the exception of the MPC/IBC, the land use of this area is mainly open space and will remain so in the future therefore it would be inappropriate for this area to have the same PTAL score and local connectivity across it as a densely populated area. However, it is important that local residents and businesses are able to access this area.

5.4. Required connectivity schemes

This work aimed to identify key gaps in the local connectivity network in the OLSPG and surrounding areas and identify potential options for interventions which could be implemented to overcome the connectivity gaps.

These options will naturally be defined over time as the shape of the development becomes clearer. At this stage, the OLSPG is highlighting the key links that would need to be taken forward in the future for this area to meet the aspirations described in the OLSPG document. All these schemes will be subject to further development, assessment and analysis as they seek the necessary approvals and funding to proceed.

Following the identification of the committed connectivity schemes to 2014, a workshop was held with representatives of TfL, GLA, LDA and LTGDC. This was followed with engagement with the Boroughs. Through the workshop the key gaps in the local connectivity network were agreed and potential options to solve these gaps were established based on a review of the interventions proposed in masterplans, OPTEMS and other local studies. It should be clearly stated that the list of potential options is not exhaustive and it is expected that further work is required to establish the optimum solution for each identified gap.

Annex B lists the identified locations were there will be gaps in local connectivity in 2014 and are mapped in Figure 5.2. The key gaps are:

- Improving links from Roman Road, Fish Island to the Queen Elizabeth Olympic Park and Stratford, in particular over the A12
- Improving connections in the West Ham area, in particular to the station from the west
- Improve links over the River Lea south of Bromley by Bow
- Improving the highway network in Stratford Town Centre to improve its environment making it attractive for all users and to reduce congestion, including new or improved

pedestrian and cycle routes linking Carpenters Estate, Greenway and Pudding Mill Lane

- Improved links between Ruckholt Road and Leyton
- Creating new and improved pedestrian and cycle links between Leyton and the Queen Elizabeth Olympic Park and Eton Manor
- Improving pedestrian and cycle links across the A12 especially from Bow Roundabout southwards, and improved pedestrian and cycle environment along the A12
- Further improvements at Bow Roundabout
- Improved links north of Hertford Union Canal between Hackney Wick across the Lee Navigation
- Improved links south of Hertford Union Canal between Hackney Wick across the Lee Navigation
- Improving north-south pedestrian and cycle connections on both sides of the River Lea to better link the Queen Elizabeth Olympic Park north to Hackney Marshes and south to Three Mills, with particular focus where the river goes under the North London Line and the A12
- New bus infrastructure around the A12 to enable improved bus services
- Improved links to the western entrance of Stratford Station

The list of interventions also includes overarching area wide interventions to improve connections to all public transport stations in the Legacy area and walking and cycling routes.

These potential schemes have been assessed against the Mayor's Transport Strategy objectives by using TfL's qualitative Strategic Assessment Framework which aims to assess all schemes on a consistent basis. The scores of each of the potential schemes are included in Annex C. There is not a significant range in the scores seen for the schemes tested, all the schemes tested receive a reasonable positive score. This is likely to be due to the fact that the schemes were identified through Masterplans and other studies which would have rejected the schemes which had a negative or negligible impact on connectivity. The Strategic Assessment Framework scores the schemes which improve access and capacity of rail stations highest, this is because these schemes will improve not only walking and cycling links through improved public realm but also improves access to key employment centres outside of the OLSPG areas.

Highway impact of these schemes

A number of the potential schemes could have an impact on the flow of traffic on the road network. As the modelling analysis earlier showed this is an area with significant road congestion and any intervention which has a negative impact on the operation of the highway network could have a significant impact in terms of increased congestion and delays. It is important to understand and consider the trade off between increased local connectivity and the operation of the highway network.

A model scenario was run including the potential schemes which would have an impact on the highway network to estimate the cumulative impact of these schemes. It should be noted that many of these schemes were still at the concept stage at the time of modelling and therefore detailed drawings were not available. Also, this modelling has been completed at a strategic level so it is not possible to examine in detail the impact of individual changes to the network. Further more detailed analysis, assessment and design of each intervention would need to be undertaken with advice from TfL and the appropriate authorities before implementation. The list of potential schemes included in this model run are listed in Annex D.

The following analysis compares the revised Preferred Development Scenario with the Olympic Park Transformation Network in 2031 with and without these schemes. The modelling was completed for the morning and evening peak. The number of trips is unchanged between the Preferred Development Scenario and this Scenario.

Morning Peak

The plots show that the demand flow has decreased around the Stratford Gyratory and along the A11 and the A12. This appears to be largely due to three of the schemes tested; Stratford Town Centre highway improvements, Sugar House Lane improvement schemes and the Bromley-by-Bow improvements which impact both the morning and evening peak periods.

As part of the Stratford Town Centre highway improvements, the gyratory system was tested as having two-way operations and providing shared space between bus, cyclists and pedestrians. The strategic modelling suggested that this would lead to large changes in flows, as eastbound traffic rerouted from the Great Eastern Road to the High Street. The flows along the A11 between Sugar House Lane and Bromley-by-Bow roundabout appear to reduce since eastbound traffic exiting Sugar House Lane no longer needs to first go to the Bromley-by-Bow roundabout then loop back to go east. The junction layout tested in this modelling also enables direct access to Sugar House Lane from the A12 eastbound removing the need to go to the Stratford gyratory and loop back.

The all movements junction at Bromley-by-Bow would mean that northbound traffic from the superstore will no longer need to first go south to Twelvetrees Crescent then loop round to Devas Street to join the A12 northbound. Similarly, traffic approaching from the south no longer need to go north then exit the A12 at Bow Roundabout and loop back along the A12 southbound.

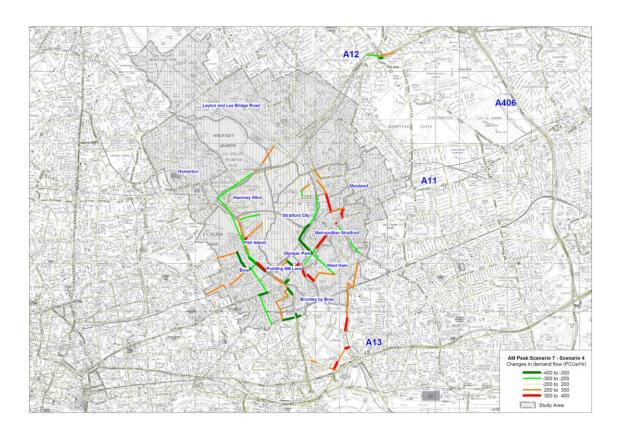


Figure 5.3 Change in Morning Peak Demand flow (Scenario 7 vs. OLSPG Preferred)

The improvements to the Sugar House Lane Junction lead to significant reductions in delay at this junction. Decreases are also seen along the A12 though there are some increases on the A12 near Leytonstone.

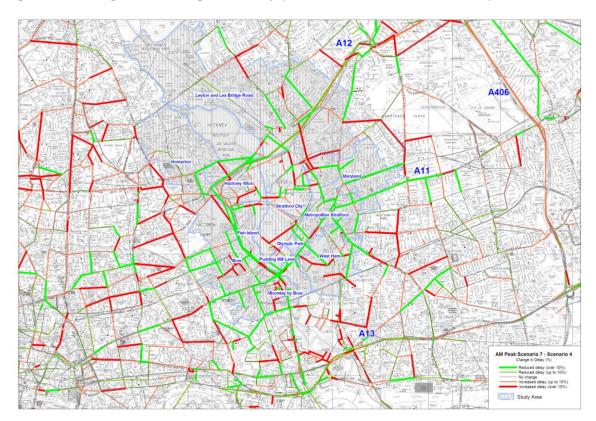


Figure 5.4: Changes in Morning Peak delay (Scenario 7 vs. OLSPG Preferred)

In line with the reduction in traffic along the A11 and A12, the plot above shows a reduction in delays along these routes. However, there are increases in delays on the highway network especially on local links. There appears to be increased delay around Chobham, this could be due to knock on impacts from changing the Stratford Gyratory to two way and therefore reducing capacity.

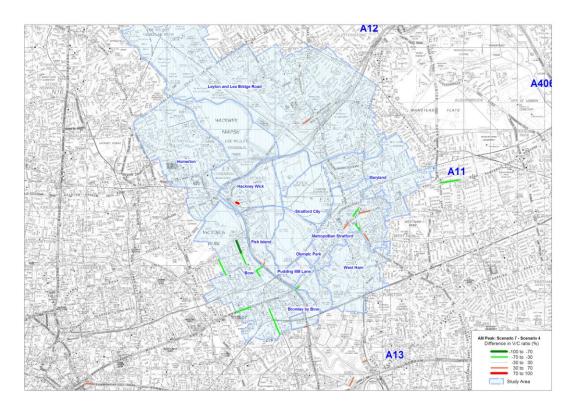


Figure 5.5: Changes in Morning Peak V/C ratio (%) (Scenario 7 vs. OLSPG Preferred)

The speed of the strategic roads (A12 and A11) increase slightly (3-4 kph) though the A12 northbound between Bow Roundabout and Hackney Wick increase significantly by about (13-14kph).

Evening Peak

Compared to the evening peak preferred development scenario, the most significant changes in actual flow are along the A11 and around the Stratford Gyratory. Generally, there are decreases in actual flow in this area likely to be caused by the reduced need for vehicles to double back due to the all movements junction at Sugar House Lane. There are significant increases in flow on the A11 eastbound towards Stratford Gyratory likely to be caused by the increased capacity released by the all movements junction.

Compared to the morning peak for this scenario, smaller increases in flow are seen along the A11 and smaller decreases in flow along the A12. There are also significant increases in flow on the A11 eastbound towards the Stratford Gyratory.

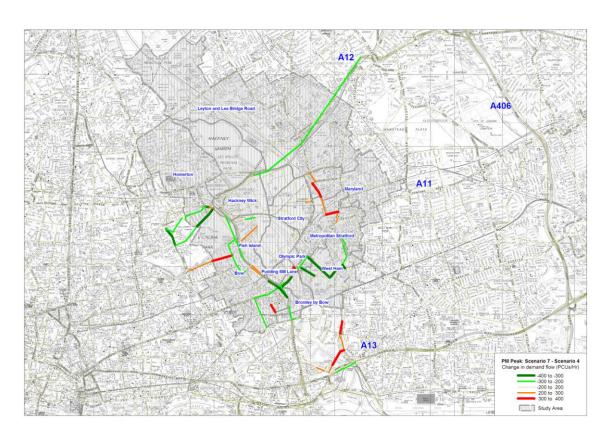


Figure 5.6: Change in Evening Peak demand flow (Scenario 7 vs. Scenario 4)

Compared to the evening peak preferred development scenario, the most significant changes in average delay are to the east of the Olympic Park around Stratford Gyratory with delays along Leyton Road.

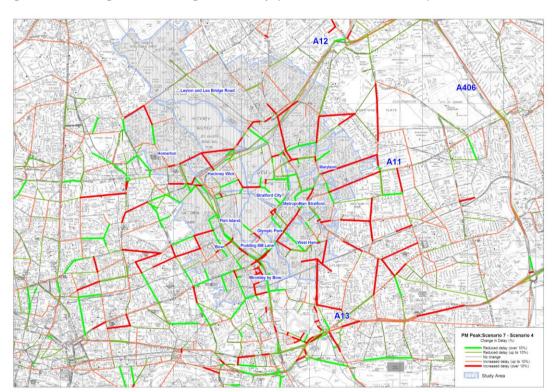


Figure 5.7: Changes in Evening Peak delay (Scenario 7 - Scenario 4)

Generally, decreases are seen in the level that links are over capacity especially on the A12 north of the Bow Roundabout and on the roads on to the A11 between Bow Roundabout and Stratford Gyratory. There is some increase on the A11 between Bow Roundabout and Stratford Gyratory and Leyton Road.

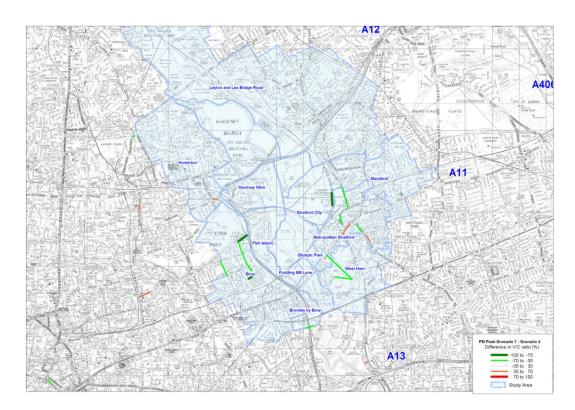


Figure 5.8: Change in Evening Peak V/C ratio (%) (Scenario 7 vs. OLSPG Preferred Development)

The pattern of changes in speed is not very clear though generally increases are seen apart from Sugar House Lane, Pudding Mill Lane and A11.

In general, the changes to the highway network tested here which increase the level of local connectivity do not appear to have a significant impact on the efficiency of the highway network. However, there still remains significant congestion as discussed above under the reference case and preferred development scenario. This is consistent to the conclusions when a similar test was run as part of LTGDC's A12 Transport Capacity and Access Study. However, before any of these schemes are implemented further detailed simulation modelling will need to be completed in line with TfL's guidelines to ensure that the junctions do not have a negative impact on the efficiency of the highway network. Equally, schemes should also be assessed against TfL's qualitative assessment; PERS audits should be included to assess pedestrian environments, which will determine improvements to increase the potential for walkable trips.

5.5. Conclusion

This section has identified the baseline situation for local connectivity in 2014 and derived proposed links which should be provided as development progresses.

The delivery of local connections is key to the success of the OLSPG area, not only to ensure that the area links in well with the surrounding area and enables the regeneration potential to be fully realised but also to assist in managing congestion and increasing the use of sustainable modes in the area. Good local connections will enable residents and

employees to travel around the area by foot or cycle easily reducing the need to travel by car. Equally, improving access to local transport stations (bus and rail) will support the increased use of the public transport network. These local connections are a key tool to supporting the low car use and high public transport and walking and cycling needed for this area to be sustainable and reduce the impacts of highway congestion on the area.

6. Options for Transport Solutions



The strategic modelling in chapter four showed that there is now and will be in the future significant highway congestion issues within the study area and its immediate environs. This section considers possible mitigation measures to decrease the highway congestion caused by the additional development proposed in the OLSPG.

There are a number of possible solutions that could assist in reducing congestion on the highway network, for example, increasing the capacity of the road network or decreasing demand by encouraging mode shift away from car use. No measures that significantly increase road capacity have been identified so this section focuses on understanding the impact of mode shift and considering possible measures to achieve this.

6.1. Testing mitigation for the future situation

Further strategic transport modelling was completed to test scenarios aimed at investigating the possibility of reducing the impacts of the OLSPG development on, in particular, the highway network by changing mode share. Figure 6.1 below shows the modelling assumptions for each of the tested scenarios and modelling outcomes.

Figure 6.1 Development Assumptions & Matrix Totals for further testing

Scenario	Homes	Jobs	Н	lighway	/ - Statist	ics for OL	SPG area		Public T	ransp	ort - St Lon		s for wh	nole of
Sc	_		Morr	ning Pe	ak	Ev	ening Pea	k		N	/lornin	g Peal	k	
			Travel Distance (pcu- km)	Average Speed (kph)	Delay in Vehicle Hours (pcu-hrs)	Travel Distance (pcu- km)	Average Speed (kph)	Delay in Vehicle Hours (pcu-hrs)	Additional ips to Base		Mode : dition			Crowding Hours
			Travel Distan km)	Ave Spe	Dela Veh (pcu	Travel Distan km)	Ave Spe	Dela Veh (pcu	Add	Bus	Rail	LU	DLR	Ö
4 - OLSPG Preferred	130,000	180,000	120,000	16	4,500	115,000	14	5,500	517,000	63	24	11	2	307,000
5 - 80:20 mode share	130,000	180,000	115,000	18	3,500	115,000	17	3,900	521,000	63	24	11	2	308,000
6 - Mode shift to walking & cycling	130,000	180,000	115,000	19	3,300	110,000	17	3,700	N/A	N/A	N/A	N/A	N/A	N/A
5 v 4			-2%	14%	-21%	-4%	21%	-29%						
6 v 4			-3%	18%	-26%	-6%	23%	-32%						

The OLSPG preferred development scenario adds approximately 5,000 additional highway trips compared to the Reference Case scenario and an additional 10,000 to the scenario with background growth and no Olympic Legacy related development. The two scenarios tested here reduce the number of highway trips but not quite to the level of the Reference Case or the London-wide background growth only scenario. Scenario 5 reduces the number of trips by approximately 2,000 while scenario 6 reduces the number of highway trips by almost 5,000. This implies that even more significant changes than those tested in these two scenarios would need to be achieved to reduce the number of highway trips to the level seen under the Reference Case assumptions.

6.1.1. OLSPG Preferred 80:20 (Scenario 5)

The car to public transport mode share used for testing the three scenarios described previously was 30:70. This test adjusted the mode share for additional trips associated with the new development to 20:80 for car and public transport trips respectively. This scenario is to test the extent of reduced congestion on the highway network as a result of the adjusted modal shift and also to understand if there is a negative impact on the public transport network from this increased demand. There is a package of measures which can be used to minimise car use, for example, car parking restraints or measures which encourage public transport use e.g. travel plans.

The modal shift reduces actual flows on the highway network around the Olympic Park, Stratford City and sections of the A12, compared with the OLSPG preferred scenario (Figure 6.2). The decrease in demand also leads to increases in average speeds across the corridor. Similar changes are seen in the evening peak.

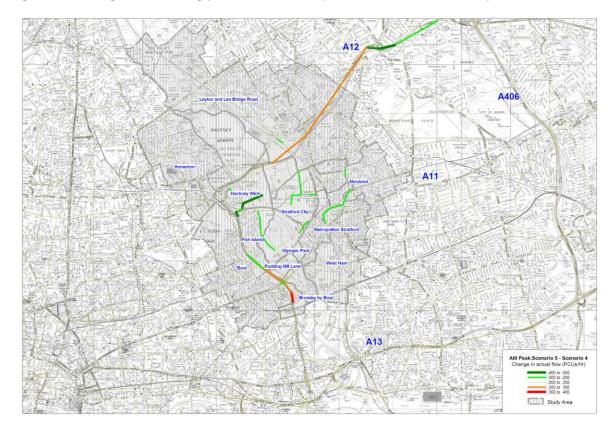


Figure 6.2 Changes in Morning peak actual flows (Scenario 5 vs. Scenario 4)

On the public transport network, there is an increase in demand for public transport to / from Stratford. This is a reflection of the increase in inbound trips around the Stratford area. The majority of these additional trips are on the London Underground (50 per cent of the additional boardings) and National Rail network (25 per cent) with smaller increases seen on the buses (18 per cent) and DLR (6 per cent).

Crowding levels in the 80:20 PT/Car mode share scenario show little difference from the levels observed under the OLSPG Preferred scenario. The westbound Jubilee line has increased crowding between Stratford and West Ham where the Planning Guideline Capacity (PGC) increases from 1.1 to 1.3, although the increase still falls within acceptable limits.

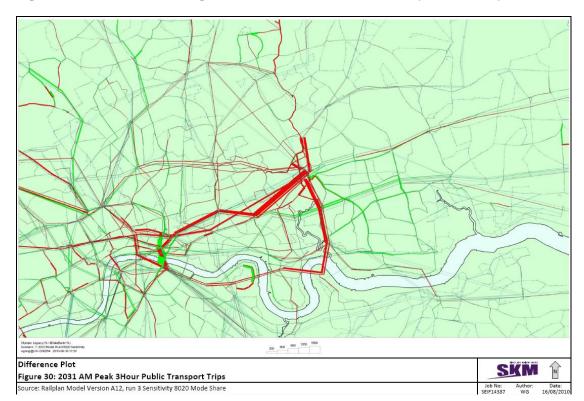


Figure 6.3 Scenario 5 Morning Peak - Difference in PT volumes (Sc 5 vs. Sc4)

6.1.2. OLSPG Preferred scenario with additional Walk/Cycle trips (Scenario 6)

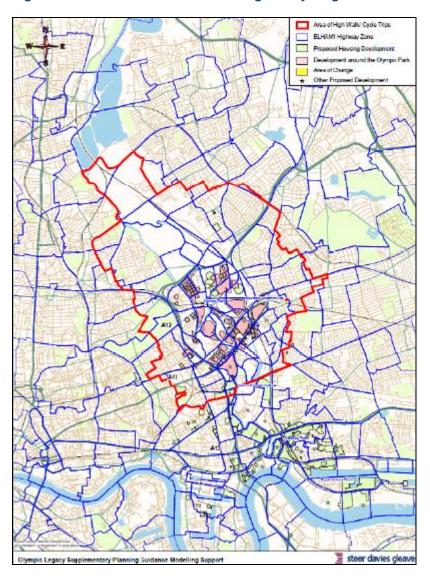
This scenario was completed to test the impact of shifting a proportion of short trips currently made by car to walking and cycling. It is understood that trips which shift to walking and cycling are normally from public transport rather than car but it was felt that this test was important to show the possible impact of achieving a shift from car direct to walking and cycling.

Journeys with trip lengths of up to 2km are considered to be of a length that could potentially shift to walking. Trips with lengths of less than 8km could potentially shift to cycling. The LTS model has previously assigned approximately 30 percent of short car trips in London to walking and cycling. Current trip patterns in the East London sub-region imply that approximately 13 percent of trips made by mechanised modes between 2005 and 2008 could have been walked; comparatively 32 percent of trips made by mechanised modes in the sub-region could have been cycled. This is estimated using analysis of the London Travel Demand Survey and assessing short trips. Trips are considered to not be potentially walked or cycled if they are made by someone with a mobility impairment, elderly, accompanying a young child or encumbered by heavy bags. About 60 percent of car trips in the OLSPG model had trip lengths less than 8km, as shown in Figure 6.4 below.

Figure 6.4 OLSPG area trip length distribution

Distance	Morning Peak	Evening Peak
Trips within modelled zones	1%	2%
Between 0 and 2km	11%	11%
Between 2 and 8km	47%	50%
Total less than 8km	59%	63%
Greater than 8km	41%	37%
Total	100%	100%

Figure 6.5 Area where a shift to walking and cycling was considered



For the purpose of this test, 40 percent of non-business car trips (both existing and new) with either an origin or a destination within the study area (outlined in red in the figure below (Figure 6.5) and with a length of less than 8km were re-assigned to walking and cycling. This was based on previous analysis undertaken by TfL in the East London Sub-Region. This is a best case scenario, there is currently no evidence to show the proportion of these trips which

could realistically be shifted from car to walking and cycling. The mode share allocation for car and public transport for this test scenario was 30:70 respectively.

The matrix totals for this scenario results in approximately 5,000 and 5,300 fewer car trips in the morning and evening peak respectively, reflecting a reduced demand (Figure 6.6). Demand reduces in the Olympic Park, Stratford City, and along sections the A11 when compared with the OLSPG Preferred scenario. This results in a reduction in average delay, particularly in Stratford City.

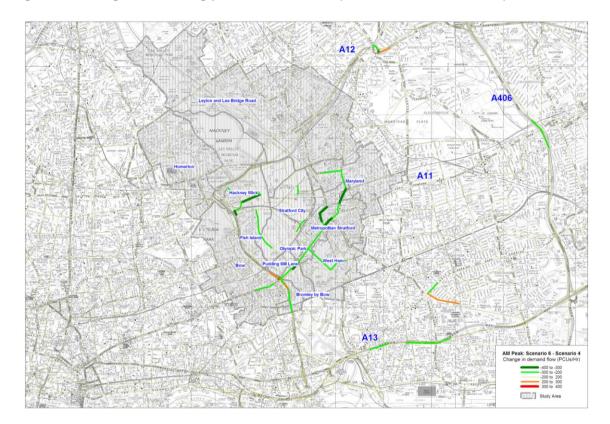


Figure 6.6 Changes in morning peak demand flows (Scenario 6 vs. Scenario 4)

Although, both the scenarios tested considered the impact of mode shift from car to other modes, the impact of possible mode shift from public transport to walking and cycling should also be considered.

6.2. Implications of the strategic modelling

The modelling and analysis above and in the previous chapters indicate that the Reference Case growth will have a significant impact on the transport network including increasing crowding to central London on the public transport links and increasing congestion along the key strategic routes in the area i.e. A11, A12 and A13. Modelling of the additional development put forward in the OLSPG suggests that highway congestion would increase further though the public transport modelling showed limited increase in crowding on the rail lines because most of the additional journeys are forecast to be made in the counter peak direction. Increased numbers of bus journeys are seen in the area which would be negatively impacted by highway congestion. The main focus of future interventions will be to reduce the

impact of highway congestion, by encouraging mode shift away from cars while still supporting regeneration through enhancing connectivity into the surrounding areas, with a particular emphasis on walking and cycling connectivity or public transport only links, improving the attractiveness of public transport trips and using a package of measures to minimise car trips. Though, physical infrastructure improvements to the highway network will also be required. The modelling has also identified possible impacts at rail, DLR and Underground stations with Bromley-by-Bow and Leyton identified as key issues.

As housing and employment increases the number of car trips will increase. However, as regeneration and convergence takes place in the OLSPG area we would expect to see an increase in trip rates and car ownership leading to further increases in car trips. Analysis of the London Travel Demand Survey shows that there is a clear correlation between income and car driver trip rates as income rises the car driver trip rate also increases. The aim of future development should be to support this regeneration and enable residents aspirations and needs in respect of travel are met but without significant increases in car use or car mode share.

It is also likely that as the average level of income increases this will have an impact on trip patterns. This is likely to increase trip rates per person and distance travelled.

The interventions described in this section mainly impact on the new development in the area and does not consider measures to change the trip patterns or mode share of current residents. Though, this may also need to be considered to meet the objectives of the OLSPG.

The rest of this section groups possible interventions into three different types:

- Improving the attractiveness of public transport trips
- Improving the attractiveness of walking and cycling trips
- Minimising vehicular use

6.2.1. Improving the attractiveness of public transport trips

There are a number of aspects to improving the attractiveness of public transport: it includes reducing barriers to use (both perceived and actual), improving information about services and also increasing public transport capacity.

Travel planning will be needed for both residents and visitors to the area to increase the awareness of public transport modes as a viable alternative to car travel. This could also lead to increased walking and cycling.

The walking routes to public transport nodes often act as a barrier to travel as they are perceived to be unsafe or the route to the entrance may be convoluted and not follow desire lines. It is important that the walking routes to all public transport nodes (both bus stops and rail stations) meet best practice design standards and provide safe and convenient routes to stations and stops. PERS audits of the stations will also improve connectivity by addressing issues to increase usage. Considering crowd density and ensuring ease of travel for all (including people with disabilities) should ensure a greater likelihood of a mode shift to

walking. There is an overlap here with some of the schemes included in the local connectivity section.

The attractiveness of bus journeys should be considered to encourage use of buses for short trips which can not be made through walking and cycling. Ensuring that bus journey times are reasonable and reliable will be a key part of increasing the attractiveness of these trips and encouraging travel by bus rather than car. Bus priority measures will need to be used to reduce the impact of highway congestion on bus journey times and improve reliability. Sufficient bus stands and facilities will need to be provided to meet both the additional demand from the increased population and employment levels and to support the increased mode share of buses required in this area. The road layout will need to support direct routings, including bus only links/bridges, for example, Sugar House Lane to the River Lea, Bromley-by-Bow North to Three Mills Lane, Devas Street to Bow Road via Devons Road and Stroudley Walk as well as two-way operation of Eastway for buses. Sufficient infrastructure will need to be provided including enough to cover future growth, including stations, stands and depots. There is substantial growth expected between Stratford and Walthamstow, Leyton, Mile End, Bow, Hackney, West Ham and along the Romford Road corridor. The exact locations of the infrastructure would be dependent on the frequency increases and route alignments introduced, and so would need to be agreed when detailed service planning has taken place. Also, existing infrastructure will need to be safeguarded. It is also important the traffic conditions do not compromise the reliable operation of the bus network.

Increasing public transport capacity to key destinations for local residents and employees of the area could also increase the attractiveness of public transport trips by increasing the number of destinations that can be conveniently reached by public transport and by controlling crowding. The schemes included in the Mayor's Transport Strategy full strategy may assist in this. New developments will be expected to contribute to this.

A specific scheme which could benefit this area would be increasing train frequency on the Central Line. The Central line currently operates a morning peak frequency of 30 trains per hour westbound and 27 trains per hour eastbound for a short period of time. A power upgrade would allow 30 trains per hour to be operated in both directions for a sustained period of 2.5 hours during the morning peak.

A business case of the power upgrade, conducted in 2007, found a good benefit cost ratio. The case for the power upgrade would increase if the benefits calculation included the OLSPG induced demand. The power upgrade could have the following benefits for the OLSPG:

- Increase the frequency of eastbound services and therefore reduce journey times for people taking eastbound morning peak journeys (a substantial number of people were modelled to make this journey to the OLSPG for employment).
- Improve the reliability of the Central line, having benefits for OLSPG residents and employees. The operation of the current timetable with the power supply available means that the risk of power-related performance issues is increased.
- Encourage more people to use London Underground services as opposed to private cars and therefore help to reduce highway congestion.

- Help reduce crowding through central London, which may be made worse if people working in the OLSPG area are travelling from destinations from the west.
- Help relieve Jubilee line eastbound crowding, which is set to worsen with the developments in the OLSPG area.
- The requirement for the power upgrade may become more pressing if the
 employment in the OLSPG is of the type to attract demand from further afield (higher
 end employment, similar to that found on the Isle of Dogs). This type of employment
 could lead to an increase in west-east morning peak flows and add to crowding on
 the Central line.

The estimated cost of £50 to 60 million (derived in 2007) and includes 60% contingency. Further work would be required on this to fully understand the possible benefits of the scheme as a whole and specifically to the Olympic Legacy area.

Demand on the Stratford to Canary Wharf leg of the DLR is heavy in the morning peak and this line could not accommodate substantially more passengers with the current capacity. Beyond January 2012, there will be 10 trains per hour on this section as a misture of 2 and 3 car services, one option to increase capacity could be to lengthen more services to 3 car. The estimated capital cost per vehicle is £2.5 million. Alongside or instead of 3-car operation, increasing the frequency of trains on this route would also increase capacity. However in order, to achieve increased train frequency the section between Bow Church and Stratford would need to be double-tracked. This would also lead to a reliability benefit. There would be synergies in delivering double tracking when Crossrail was on site. However, some potential issues around deliverability have been identified, and land would potentially need to be safeguarded. The cost of double-tracking would be an approximate £50 million (Note: This includes the cost of all land). Further work would be required on this to understand the possible benefits of these schemes as a whole and specifically to the Olympic Legacy area.

DLR modelling suggests that there will be crowding on the Stratford International to Canning Town route and that frequency enhancement (possibly through 3-car operation) may be needed from around 2015/16.

Both the East London Sub-Regional Transport Plan and this study have identified that there is a gap in public transport links between Stratford and areas to the north e.g. Walthamstow and Tottenham Hale. This has also been highlighted by the public transport modelling for this study which has shown that there is an increased demand for bus trips along this corridor in the future. A number of schemes have been considered for this route including increasing the frequency of services from Tottenham Hale to Stratford and constructing the Hall Farm Curve to enable direct train services from Chingford and Walthamstow to Stratford. These are being examined in the High Level Output Specification (HLOS2) for the period 2014-2019. The layout of Stratford Regional station currently acts as a constraint to the number of additional trains that could be run along this route without having to reduce the frequency of other routes running through the station. Additional infrastructure works at Stratford Regional station, for example, to deliver additional platforms would allow some Cambridge to Liverpool Street services to run via Stratford to provide improved links along

the growth corridor to Cambridge and down to Canary Wharf are required. However, the infrastructure works at Stratford would be expensive.

Lea Bridge station was sited on the line between Tottenham Hale and Stratford close to where the A104 Lea Bridge Road crosses the line. Analysis has been carried out by TfL in the past into re-opening the station alongside re-opening the Hall Farm Curve. This showed that there was insufficient demand to justify reopening the station. The catchment area of the station composed mostly of industrial estate and open space. The development capacity study carried out by the GLA does not change the land use of the catchment area of the station or propose significant intensification of the current land use; therefore the demand for a station here will remain low. A report by MVA and First Class Partnerships in January 2010 found that the business case ratio for the Hall Farm Curve is slightly higher without the Lea Bridge station included. Therefore, Transport Study does not recommend a station at Lea Bridge as a necessary requirement to support the development of the area as proposed in the Olympic Legacy SPG.

DLR Extensions from Stratford International to Walthamstow and Tottenham Hale have also been considered as part of the East London Sub-Regional Transport Plan analysis. Neither of these two DLR schemes was considered to be very strong due to issues over cost of delivering the schemes and potential demand. Further work would be required on this strategic link to understand the possible benefits and costs of the schemes to decide what the best way to go forward is.

In 2009, the Department for Transport asked the Mayor of London to review the Chelsea Hackney Line (Crossrail 2) scheme. This review has commenced. The key objectives of the Chelsea-Hackney Line route are:

- Alleviate crowding
- Improve termini dispersal
- Improve connectivity
- Support growth and regeneration
- Ensure value for money
- Improve transport quality
- Reduce CO₂ emissions

The emerging strategy for the Chelsea-Hackney line is a new rail route across London delivered in a number of phases based on the safeguarded corridor potentially connecting Chelsea to Hackney via Victoria, Euston and King Cross. The current assumed timescale is for the central London phase 1 to be delivered before 2031 with further phases post 2031. The Chelsea-Hackney review will consider the impact of the growth in the OLSPG area. Further engagement will be conducted as the review and preferred route is developed. It is expected that the review will report to the Mayor in summer 2011 describing three or four priority options. The current safeguarded route will remain until the final option has been agreed. The phase 1 route may provide additional routes to central London and south-west London via bus feeder services from the OLSPG area.

Proposals for a second high-speed line to link the centre of London with Birmingham, in the first instance, as part of a possible wider domestic high-speed rail network, are currently being considered by the Department for Transport. The opportunity to provide good linkage

between High Speed 1 and 2 is being considered to enable the maximum benefit from the two lines to be realised. A good linkage between High Speed 1 and 2 would enable Stratford to be linked directly with major UK cities including Manchester and Birmingham. It could also provide a faster service to Heathrow than the Crossrail line will provide. The London and South East Route Utilisation Strategy draft for consultation, December 2010, recommends that detailed consideration of the impacts of a link between High Speed 1 and 2 is required, given the significant interface with the North London line. A way forward is required which is consistent with the strategy for both local passenger services and longer distance freight services. TfL support this recommendation and will support the development of a national high-speed rail network in line with proposal 4 of the Mayor's Transport Strategy.

Stratford International station also provides an opportunity to improve Stratford's connectivity to both national and international destinations as schemes are proposed this benefit should be considered in line with Proposal 1 of the Mayor's Transport Strategy.

This Study also considered the impact on stations and identified that there are congestion problems at Leyton and Bromley-by-Bow stations currently and these are expected to increase. Improvements will need to be made to these stations and suggestions have been made earlier in this study. The impact on other stations will need to continue to be considered as plans develop in more detail for this area to ensure that congestion or poor quality of stations does not act as a deterrent to use or become a safety issue.

6.2.2. Improving the attractiveness of walking and cycling trips

The modelling and analysis above shows that there would be an improvement in highway congestion if more local short trips were made by walking and cycling though there would still be some congestion issues remaining. In order to support this level of increase, infrastructure measures need to be planned from the OLSPG stage and carried through to implementation.

There are a number of ways to improve the attractiveness of walking and cycling trips including improving local connectivity, improving wayfinding and legibility and ensuring good design which improved both the perception of safety and actual safety.

The local connectivity interventions developed in the earlier chapter will ensure that the Olympic Legacy SPG area is well connected and severance is reduced so that it is possible and desirable to make short local trips by either walking or cycling. These connections should be implemented and current connections maintained to ensure that this new piece of city is successfully integrated into the surrounding city. These schemes should also follow current best practice guidance.

The local connectivity interventions also include the need to ensure wayfinding and legibility while walking and cycling around the area are good. The wayfinding schemes should follow current best practice guidance and design. It is important to ensure good permeable routes are provided through new developments and that sites are linked with the local area, supported by a consistent wayfinding system.

It is also important that future studies of this area consider the possible impact of the increased levels of walking and cycling on the highway network. This study has not been able to consider this impact.

Future highway schemes will need to have the highest possible provisions for walking and cycling, and the design of every facility needs to consider the needs of pedestrians and cyclists. Encouraging walking and cycling through improved information and travel planning will also be required to ensure that both residents and visitors have the information to enable them to walk or cycle to their destination.

The future Masterplans and developments will need to support reducing the need to travel and ensuring that good access to opportunities and services is designed in at the planning stage. It will also be important to encourage people to work and live in the area.

Specific measures to encourage cycling would be providing easy access to secure cycle parking for residents, with corresponding limits on car parking. As well as ensuring adequate consideration of cyclists in the design of new roads with cycle lanes and clear paths indicated through all junctions, taking some elements from Barclays Cycle Superhighways and using the design principles set out in the London Cycling Design Standards. Cycle Hubs, areas with significant cycle parking and other key bike infrastructure for example cycle maintenance shops, should also be considered.

The urban form of new developments is critical to encouraging cycling, in particular:

- An emphasis on mixed development, to ensure convenient and quick access by bike from home to services
- Providing easy access to secure cycle parking for residents, with corresponding limits on car parking
- Ensuring good permeable routes are provided through new developments and that sites are linked with the local area, supported by a consistent wayfinding system
- Ensuring adequate consideration of cyclists in the design of new roads with cycle lanes and clear paths indicated through all junctions, taking some elements from Barclays Cycle Superhighways

The Cycle Hire scheme is being extended east into Tower Hamlets by 2012. There may be further opportunity to extend the Cycle Hire scheme to the OLSPG area, though that will depend significantly on demand. Cycle Hire schemes work best is very dense areas with high levels of travel demand as stands need to be close together in order to be attractive to users. They would not be used if the stands are not close to the origin and destination of the local trips they are being used for. Also, the scheme needs to be self supporting with only a small number of bikes being redistributed to high demand stands, otherwise the cost of ensuring the bikes are in the correct place becomes prohibitive.

6.2.3. Minimise vehicular use

As well as the measures described above, it will also be necessary to put in measures which minimise vehicular use both private cars and commercial vehicles. It is important to consider the impact of these measures in terms of the aspiration for regeneration and convergence. Generally, as income increases, trip rates, car trip rates and car ownership also increase. It is important that the need to manage the growth sustainably in terms of transport doesn't negatively impact regeneration and convergence. As this is an area with significant development there is an opportunity to fully design in measures which support low car use.

Minimising the use of private cars needs to consider both residents' car use and trips into the area by either employees or visitors. Discouraging residents' car use could be done in a number of ways, for example, reducing the number of parking spaces to below London Plan standards, encourage shared car use through car clubs and considering the location of resident parking so that it is not directly outside the front door. Car free or public transport led developments could also be considered in areas with high PTALs and good access to opportunities and services. The number of parking spaces for employment land uses should also be below London Plan standards. Future trip attractors, for example, the sports venues, should also consider tougher parking standards.

The ability of coach and taxi services to support reduced car use around, into and away from the area should also be considered. Further coach provision will need to be reviewed as post games venues and wider development plans / land uses evolve. The impact of providing coach parking for hotels, leisure, stadia and major exhibition venue to support demand in appropriate locations will need to be considered. This will aid reducing congestion on the road network and visitor safety.

Freight movements should also be considered and reduced where possible. Freight is not only negatively impacted by congestion but also a significant contributor. Therefore, measures to support the use of more sustainable modes for freight movement will need to be considered, this would include the use of the river and rail as appropriate.

The potential changes of use of existing freight and servicing activity and other new land uses will give rise to differing patterns of freight and servicing movement in the area. Therefore, the following actions should be pursued:

- Reducing the volume of delivery and servicing trips
- Changing the pattern of delivery and servicing trips and specifically reducing the number of trips during the peak travel periods
- Shifting mode share from road to other more sustainable modes such as water and rail, and the provision of more cycling and walking local freight solutions. To support freight movement by the water bridges over canals should allow for navigable movement.
- Seeking opportunities to provide freight and servicing consolidation centres
- Seek to provide the right facilities to promote night time distribution and servicing
- Preparation of Construction and Logistics Plans and Deliveries and Servicing Plans

As the plans develop freight usage across the area and its surroundings should be considered to ensure that adequate facilities are provided for local residents. The impact of the displaced industrial/commercial land uses should also be considered and consideration given to supporting their return if this would lead to reduced total mileage, pollution and congestion.

The impact of other interventions on freight movement should be considered and trade-offs made where necessary. For example, publicly accessible wharfs which are not currently safeguarded could be made redundant by walking and cycling routes along the river.

The areas identified for major change in the OLSPG are mainly existing industrial and logistics areas. These areas employ a range of staff and provide a range of services and goods for the local area and the wider London and South East England regions. Any change to these areas needs to recognise that any regeneration activity will displace existing activity, generating different patterns and levels of freight (and other transport) activity, possibly leading to longer trips on main transport corridors as businesses are located further from the centres of their core activity.

The measures described above will support reducing car use and increasing trips made through walking, cycling and public transport. However, the modelling and analysis in this Study showed that there is still likely to be congestion on the road network in the area particularly on the A12 and A11. A number of junctions have also been identified through the strategic modelling as not working efficiently under these development assumptions. Future developments and Masterplans should complete further modelling to understand the impact of the issues at these junctions in more detail and propose measures to improve the situation.

6.2.4. Highway Improvements

Enhancements will be required on the highway network in order to maintain an acceptable performance including for buses and freight. Possible interventions could include improvements to junctions and road layout. As well as, measures to reduce car use for example, promoting car clubs, car sharing and taxi facilities.

The River Crossings Package could also have a significant impact. A key issue for the area is the resilience of the highway network particularly to an incident in the Blackwall Tunnel which if it leads to a closure of the Tunnel leads to wide spread congestion across the area and significantly higher journey times and reduced journey time reliability. The proposed vehicle link at Silvertown would help to mitigate the impact of incidents at Blackwall Tunnel but would not reduce day to day congestion. The Mayor's Transport Strategy and Sub-Regional Transport Plans identify and aim to respond to the issue of congestion across the whole of London, Proposal 30 in the Mayor's Transport Strategy states that measures will be introduced to smooth traffic flow to manage congestion for all people and freight movements on the road network and maximise the efficiency of the network. The Mayor's Transport Strategy proposed that the road network would be managed through the development of a corridor approach. The A12 and A13 are strategic London-wide corridors and part of the TLRN. Their performance is monitored and the impact of interventions tested as part of the Network Operating Strategy. Development proposals will need to consider their impact on

the highway network and provide interventions to maintain an acceptable performance of the highway.

6.2.5. Progression towards 2031

This modelling and Strategic Transport Study considers only the end state, however, the progression towards this end state needs to be considered as it will lead to its own transport issues.

Due to the size of the area it will not be built out in one phase and so some parcels of land will be subject to interim uses which will generate trips. The impact of these trips needs to be considered by developers.

The modelling assumes that people will work and live in the area. However, this is unlikely to happen immediately and may take some time to come to fruition. The order of build out and phasing will need to be considered to enable people to work and live in the area from the beginning. Also, the skills of the residents and the jobs available in the local area will need to be matched by increasing the skills of the residents or by encouraging jobs of the appropriate level to the area.

Although, the modelling assumes a high percentage of people travelling from the East to work in the area, in fact, we may see people initially travelling from other areas. The origin of trips to the OLSPG development area will vary depending on the type of employment offered there. If employees travel from further afield to work in the area, or if the new population does not have employment opportunities in the local area, this would lead to different impacts on the public transport network than seen in this study. For example, it is likely that this would lead to increases in crowding on the London Underground routes as the travel would not be in the counter-peak direction. Therefore, it is key that the land use policies for this area do enable high levels of living and working in close proximity.

7. Conclusions



The Reference Case growth based on the London Plan minimum capacity estimates will have a significant impact on the transport network including increasing crowding to central London on the public transport links and increasing congestion along the key strategic routes in the area i.e. A12, A13. Modelling of the development promoted by the SPG suggests that highway congestion would increase further though the public transport modelling showed limited increase in crowding on the rail lines due to most of the growth in journeys being made in the counter peak direction. Increased numbers of bus journeys are seen in the area.

The main focus of future interventions will be encouraging mode shift away from cars while still supporting regeneration through enhancing connectivity into the surrounding areas, with a particular emphasis on walking and cycling connectivity or public transport only links, improving the attractiveness of public transport trips and using a package of measures to minimise car trips. The modelling has identified the possible impacts at rail, DLR and Underground stations, especially at Bromley-by-Bow and Leyton stations.

As plans for this area become more developed through masterplaning and planning applications the impacts of this development identified here will need to be analysed in more detail.

The study has identified connectivity interventions which must be delivered to support the integration of the development into the surrounding areas. This study has not undertaken feasibility or detailed modelling of the possible impacts of these connections, this will need to be completed in line with TfL's Network Assurance Guidance.

7.1. Deliverability and Implementation

The GLA will prepare and publish a Delivery Study for the OLSPG that will:

- Assess, identify and quantify the social, community and transport infrastructure requirements of the development the OLSPG envisages.
- Assess the delivery and investment plans of key land owners, agencies and infrastructure providers.
- Further test the assumptions underpinning the OLSPG's land use, housing and employment floorspace.
- Provide an infrastructure requirements evidence base and outline key delivery actions.
- Provide a high level viability assessment for the potential development of S106 and/or Community Infrastructure Levy/ies (CIL) to support the delivery of strategic infrastructure.
- Prepare a high level viability assessment to determine how development proposals can help support and deliver the required strategic infrastructure.

This material and analysis will form part of a shared evidence base that could be used by boroughs, the ODA, LTGDC, and, once established, the MDC, to develop S106, tariff and CIL approaches. This study will be published during consultation on the OLSPG and inform the final Guidance.

7.2. Next Steps and Future Studies

This Strategic Transport Study has considered possible interventions to mitigate against the negative impacts of the development promoted in the SPG.

Further work is required as the redevelopment plans are developed in more detail, to enable more detailed understanding of the transport requirements in the OLSPG area. Figure 7.1 describes further studies that would be required

Figure 7.1 Further studies

Task/Mode	Future Study
Bus	Further assessment of the bus priority measures and infrastructure
	(such as bus stands) required to deliver the bus services to support
	the OLSPG development.
Underground	Further investigation of the benefits of the Central Line Power
	Upgrade
	Further modelling of passenger flows and investigation of the
	requirements at Bromley-By-Bow and Leyton stations.
DLR	Further investigation of the impact of the preferred development
	scenario on operations of DLR stations
Freight	Further investigation of the impact of the preferred development
	scenario on changes in freight patterns.
Cumulative Impact	Understanding the cumulate effects of development in the
of Opportunity Area	Opportunity Areas in the East London sub-region on the transport
Development in	network
East London	
Package of	Further understanding of the transport package of measures with
measures	costs.

Annex A: List of connectivity schemes assumed to have been implemented in the OLSPG area by 2014

No:	Name	Description	Source of Funding	Borough	Status
1	A13 / Nutmeg Lane, Pedestrian Crossing	Staggered, at-grade crossing to provide improved access between Aberfeldy and East India Dock, together with enhancements to the existing uncontrolled crossing at Nutmeg Lane. The new crossing would enhance access to bus stops on East India Dock Road, and links in with the wider strategic pedestrian and cycle networks. It provides a crossing where there is no existing facility. Regeneration of Aberfeldy estate and River Lea sites.	Already being implemented - Assumption for 2014	LTGDC & developer	Tower Hamlets
2	A12 – Lochnagar signal controlled junction	New signalled, pedestrian crossing across A12 at junction with Lochnagar Street and Zetland Street. Also provides traffic calming measure, and a potential access point for buses to/from A12.	Already being implemented - Assumption for early 2011	LTGDC	Tower Hamlets
3	Limehouse Cut towpath connection	Provide new connection to footways on east side of A12.	Already being implemented - Assumption for 2014		Tower Hamlets
4	A12 – A11 Bow Roundabout new – ped crossings	Provision of controlled pedestrian / cycle crossing facilities, together with introduction of landscaping on roundabout. JMP commissioned by TfL to design scheme. Funding via OPTEMS (Olympic Park S106 money)	Already being implemented - Assumption for 2014	OPTEMS	Tower Hamlets
5	Pontoon link under A11 for ped/cycle access	Pontoon link under A11 to provide missing link on towpath. Crosses River Lea at Bow. Leaside Regeneration are currently developing the structural design and preparation of works package. Leaside Regen are liaising with TfL regarding placing of structures on TfL land, fixing to TfL structures and TfL PD rights.	Already being implemented - Assumption for 2014		Tower Hamlets
6	A12 – Tredegar Road junction	Increase capacity at junction and upgrade existing pedestrian/cycle facilities at existing junction. Key local highway link across A12 plus provides access for buses onto and off A12.	Already being implemented - Assumption for 2014		Tower Hamlets

7	Greenway – Wick Lane underpass improvement	Upgrade this key pedestrian/cycle link from Greenway to Victoria Park by improving the current underpass which is one of the only vehicular dominated sections of the Greenway link to Victoria Park. ODA have appointed SDG to undertake options analysis and feasibility for chosen scheme. Final option has high element of urban realm improvement.	Already being implemented - Assumption for 2014	ODA, OPTEMS and LTGDC	Tower Hamlets
8	Eastway Bus Link Two Way	Existing one way vehicular link into Hackney Wick to be upgraded to allow two-way flow for buses. This allows buses to serve the media centre and LMF site. Will provide improved bus access between Hackney Wick and LMF site. Funding identified from OPTEMS (S106).	Already being implemented - Assumption for 2014	OPTEMS (part- funded)	Hackney
9	Wick Road Underpass improvements	Physical enhancements to the eastern footway linking Victoria Park and Hackney including footway widening, improved surfacing and landscaping. Part of the strategic cycle network.	Already being implemented - Assumption for 2014		Hackney
10	Victoria Footbridge Enhancements	Will improve links between Victoria Park and Hackney Wick via existing footbridge. Involves installation of steps associated with the existing zigzag ramp on the Hackney Wick side. The proposals include the creation of an arrival point either side of the bridge to guide people to the station/ HUB area upon redevelopment of Hackney Wick (East) and Victoria Park (West).	Already being implemented - Assumption for 2014	LTGDC	Hackney
11	Wick Road / Northbound Offslip/Onslip improvements	Public realm improvements along Wick Road between junction of Cassland Road and Eastway	Already being implemented - Assumption for 2014		Hackney
12	Hackney Wick Parking Controls - Implementation	To address the potential overspill of construction workers parking within the local area.	Completed	OPTEMS	LB Hackney
13	Greenwich - Deptford Stations - Branded Cycling Route	To introduce a branded walking and cycling route linking the Greenwich and Deptford National Rail stations. The route will utilise a combination of existing infrastructure, notably the Hatch lifting bridge which carries the Norman Road to Creekside leg of the route over Deptford Creek. The expansion of the route will provide better walking and cycling access between	Already being implemented - Assumption for 2014	OPTEMS	LB Greenwich

		Deptford and Greenwich generally.			
14	Wick Road Junctions	Improved traffic flow in the Brookfield Road area by further linking of signals (Convert UTC to SCOOT) (nodes 13, 14, 15, 16 & 17). Junctions include • Wick Rd / Cassland Rd / Kenworthy Rd / Brookfield Rd; • Wick Rd / Victoria Park Rd / Cadogan Terrace; • Wick Rd / Off slip; • Wick Rd / On slip; and • Chapman Rd / Wick Rd / Eastway. The Wick Road junctions form part of the Olympic Road Network (ORN). The Olympic Road Network (ORN) Team have indicated that as of June 2009 eighty percent of the junctions on the ORN have been fitted with SCOOT (Signal Cycle Optimisation Offset Technique). The ORN are set to undertake a review of the existing operation of the outlined junctions and convert the current UTC (Urban Traffic Control) system to SCOOT five junctions form part of the TLRN and are therefore controlled by Transport for London (TfL). The scheme will be led by TfL.	Already being implemented - Assumption for 2014	OPTEMS	LB Hackney
15	Cadogan Terrace Traffic Calming	Traffic calming scheme along Cadogan Terrace in conjunction with LBTH to reduce rat running along residential road near to Junction 14. A raised entry treatment will be provided at Wick Road / Cadogan Terrace and a raised junction treatment will be installed at Cadogan Terrace / Cadogan Close. If deemed necessary improved traffic calming measures are to be provided at appropriate spacings to encourage local vehicle use only. Moreover, the improved treatment at the Cadogan Terrace / Cadogan Close junction will be designed to provide a safer and more convenient route for pedestrians and cyclists travelling between Victoria Park and the Hackney Wick Area via the Wallis Road Bridge (OPTEMS Bid). The scheme will be complemented by a similar treatment by LBTH at the south end of Cadogan Terrace, building on the ODA Greenway – Victoria Park	Already being implemented - Assumption for 2014	OPTEMS	LB Hackney

		improvement scheme. This will also be the subject of			
		an OPTEMS bid from LBTH.			
16	Hackney Wick Walking and Cycling Scheme	A scheme to improve the walking and cycling conditions within the Hackney Wick Area. Scheme involves: • Improving walking in the area through providing wayfinding signage; • Resurfacing works/ urban realm improvements; and • Determine the feasibility of providing additional pedestrian and cycle links were feasible through the area and in particular through the Trowbridge Estate.	Already being implemented - Assumption for 2014	OPTEMS	LB Hackney
17	Balls Pond Road/ Southgate Road	Scheme to improve conditions for cyclists at node 162. Scheme involves providing advanced signal linemarking (ASL) on each of the junction's four legs.	Already being implemented - Assumption for 2014	OPTEMS	LB Hackney
18	Kingsland High Street (A10)/ Crossway/ Shacklewell Lane	Scheme to improve conditions for cyclists within the vicinity of the junction (node 110). The scheme involves providing a drop kerb at the junction of Kingsland High Street and John Campbell Road.	Already being implemented - Assumption for 2014	OPTEMS	LB Hackney
19	Mare Street/ Well Street	Scheme to reconfigure/ improve the existing junction node 108 to better cater for the east-west movement of cyclists. The crossing location provides a key crossing point for east-west bicycle trips particularly those travelling to and from Victoria Park and the Olympic Park. A feasibility study is currently being undertaken by the LBH and the outcomes of this study will determine the extent of works possible.	Already being implemented - Assumption for 2014	OPTEMS	LB Hackney
20	Lower Clapton Road (A102)/ Urswick Road	Scheme to undertake minor works (including realignment of a kerb) at the junction of Lower Clapton Road (A102)/ Urswick Road and convert the existing pedestrian zebra crossing at the junction of Lower Clapton Road and Powerscroft Road to a shared use crossing for pedestrians and cyclists. The scheme in general aims to improve conditions for cyclists in the area. Scheme involves providing advanced signal linemarking (ASL) at the main junction and providing pedestrian and cyclist crossing point at Powerscroft Road at node 103. Improve pedestrian and cycle	Already being implemented - Assumption for 2014	OPTEMS	LB Hackney

		facilities at the node and in the surrounding area to reduce the reliance on private vehicle travel in the area.			
21	Homerton High Street/ Kenworthy Road/ Marsh Hill	Scheme involves the installation of priority T-junction at the intersection of node 104.	Already being implemented - Assumption for 2014	OPTEMS	LB Hackney
22	Walking Improvements to and from Public Transport Stations - Pre Games	Package of measures aimed at improving walking connectivity to and from key public transport interchanges in the Borough in order to ensure a high level of sustainable travel to the Olympic Park both pre Games and in Legacy. • Phase 1 (pre-games): The following stations have been selected for walking route improvements to/from the Olympic Park and venues, and to/from the surrounding residential catchment areas to the station: Maryland, Forest Gate, Wanstead Park, West Ham, Plaistow;	Already being implemented - Assumption for 2014	OPTEMS	LB Newham
23	Improvement and Provision of Crossing Facilities for People with Disabilities	Package of improvements intended to upgrade existing crossing facilities for disabled people at Perimeter and Off Site Junctions, and provide new controlled crossing facilities, on key walking routes to the Olympic Park and venues.	Already being implemented - Assumption for 2014	OPTEMS	LB Newham
24	Cycle Route Improvements - Pre Games	Package of measures aimed at improving the safety, comfort, accessibility and connectivity of the strategic cycling network to and from the Olympic Park and related venues, to ensure a high level of sustainable travel to the Olympic Park both pre Games and in Legacy. Phase 1 – Pre Games: Royal Docks to Stratford Cycle Route (via Prince Regent Lane, Plaistow and West Ham Lane); East Ham (via Upton Park) to Stratford Town Centre and Olympic Park; Connection to the Elevated Greenway.	Already being implemented - Assumption for 2014	OPTEMS	LB Newham

25	Cadogan Terrace & 'Missing Link' Enhancements	Environmental enhancements to the Greenway – Missing Link between the entrance to the Greenway and St.Mark's Gate entrance to Victoria Park together with traffic calming and environmental improvements to Cadogan Terrace including: • Feature gateway entrance to Victoria Park at the junction with Cadogan Terrace • Raised table and carriageway narrowing between Jodrell Road and the bridge over the Hertford Union canal • Raised carriageway incorporating inset parking bays on Cadogan Terrace between St. Marks Gate and Cadogan Close [the boundary with LB Hackney]. The scheme will be complemented by a similar treatment by LB Hackney for the northern of Cadogan Terrace which is also the subject of an OPTEMS bid from LBH and links to another LBH OPTEMS bid H09 Wallis Road Bridge Upgrade. The proposals for the treatment of Cadogan Terrace in its entirety, in turn, complements the masterplan for the refurbishment of Victoria Park which has identified the need to improve key access routes into the park.	Already being implemented - Assumption for 2014	OPTEMS	LB Hackney and LB Tower Hamlets
26	Ruckholt Road Area	Ruckholt Road E10 (High Rd to Temple Mills Lane and including Ruckholt Road Bridge). Improved traffic flow and safety along the route and at Nodes 25, 26, 27, 28, 30. Options considered for the submission: Option A – making improvements to Ruckholt Road (between High Road Leyton and Olliver Road) including the junctions of Marshall Road and Ruckholt Close. Option B – Making improvements to Ruckholt Road (between High Road Leyton and Temple Mills Lane) and all signalized nodes only. [refer to detailed proforma]	Already being implemented - Assumption for 2014	OPTEMS	LB Waltham Forest
27	Marsh Lane Footbridge	Provision of Marsh Lane footbridge ramps to enable cyclists and wheelchair users to travel b/n Leyton, Walthamstow, Redbridge and the Olympic Park.	Already being implemented - Assumption for 2014	OPTEMS	LB Waltham Forest

28	Signage and Way-finding for the Fatwalk Cycling and Pedestrian Parkland to Olympic Park	Contribution from OPTEMS towards signage and wayfinding elements of the Fatwalk scheme - a continuous walk/cycle path being implemented along the river Lea from the Olympic Park to the Thames. LTGDC is funding the majority of the scheme.	Already being implemented - Assumption for 2014	OPTEMS
29	Carpenters Estate - diagonal link to DLR station	Improvements to Hutchins Close / Wilmer Lea Close Diagonal from Stratford High St DLR to Olympics	Already being implemented - Assumption for 2014	LBN
30	Wise/Kerrison Roads	Implementation of a Home Zone type treatment in Wise Road; Enhance estate pedestrian movement through the estate; New communal parking areas, street furniture and provision for cycle parking as necessary; Relocation and upgrade of the existing play area; High amenity paths and enhanced lighting; Remove visual barriers and street clutter; Upgrade to carriageway & footway surfaces. The scheme will improve the traffic flows and reduce congestion within the estate and ensure that residential amenity is maintained. The scheme will improve permeability and maximise the potential for sustainable trips to the Olympic Park and ensure their integration with the newly developed area. It will also address the cliffedge effect of the Olympic Park and proposed improvements to the Stratford High Street 'streetscene'	Already being implemented - Assumption for 2014	LBN
31	Stratford High St 2012	(a) repaving the road, reducing street clutter, new street lighting new planting, (b) laying out of two pocket parks, (c) Landscaping and public realm improvements to Cam Rd and the entrance to the Channelsea Path	Already being implemented - Assumption for 2014	LBN
32	Stratford High St Carpenters Road	Phase 2 of LBN Stratford High St project - Carpenters Road upgrade	Already being implemented - Assumption for 2014	LBN
33	Roman Road Town Centre	Re-scoped at CLG request to focus on priorities of town centre improvement - heritage façade; streetscene improvements and reallocation of roadspace; wayfinding; public realm improvement to overcome barriers to movement; improved public space and street market infrastructure.	Already being implemented - Assumption for 2014	LBTH

As proposed by the Boroughs (a) Improvements to St Mark's Gate, Victoina Park's (b) Mitford Canal Bridge; (c) A12 bridge; (d) Wick Lane from Jodral Road to Crown Close; (e) Greenway surfacing in Character areas along Wick Lane between Victoria Park and Crown Close; (f) Footway surfacing in Character areas along Wick Lane between Victoria Park and Crown Close; (f) Footway improvements from Greenway, along Wick Lane, across Crown Bridge to Pamell Road glunction with Roman Road. 35 Abbot Rd/ A13 junction 36 Bridge Suitable for pedestrians and cycles as well as vehicles) over Jubilee Line at the DLR at Star Lane with connection to Manor Road and Star Lane DLR Station 37 Stephenson Street Bridge 38 Bridge Road Bus Link 39 Bridge Road Bus Link 39 Bridge Road/A11 junction 40 Manor Road Footbridge Manor Road Footbridge Manor Road Footbridge 41 West Ham Olympic Ramp Different options for the ramp –see ODA proposals; The ODA is still to confirm the preferred option. Peasibility studies are ongoing. 41 West Ham Olympic Ramp Fire 2014 Rick Roberts Way Already being incheracte in Activation Crown Conserved Proposals; The ODA is still to confirm the preferred option. Pre 2014 Pre 2014 42 Long Wall Pedestrian Link Pedestrian and cycle bridge ramp Pre 2014 Already being improve the activation of Davises and Crown Discover Street Bridge implemented - Assumption for 2014 Already being improve the Assumption of 2014 Already being improved to Cantacter Crown Bridge to Pare 2014 Pre 2014 Three Mill Lane Bridge Pre 2014 Pre 2014 Pre 2014 Pre 2014					
Abbot Rd/ A13 junction Allow all turning movements at the junction for buses only Bridge (suitable for pedestrians and cycles as well as vehicles) over Jubilee Line at the DLR at Star Lane with connection to Manor Road and Star Lane DLR Station 37 Stephenson Street Bridge Bridge Road Bus Link Bridge Road Bus Link Bridge Road Bus Link Bridge Road With Abbey Road for buses and cycles only Pre 2014 Bridge Road/A11 junction Bridge Road/A11 junction Bridge Road/A11 junction Bridge Road/A11 junction of Bridge Road with Abbey Road for buses and cycles only Junction/signals to allow turning movements for buses at junction of Bridge Road link and A11 Pedestrian and cycle bridge on Manor Road and the Jubilee Line at Milner Road or Gainsborough Road. No decision has yat been made by others on a pubilic access crossing at West Ham station nor new western access ticket hall and entrance. Different options for the ramp—see ODA proposals; The ODA is still to confirm the preferred option. Peasibility studies are ongoing. Pre 2014 West Ham Olympic Ramp West Ham Olympic Ramp Pre 2014 Long Wall Pedestrian Link Pedestrian and cycle ramp Pre 2014 Signaled junction on the A12 at Devas Street with pedestrian consigns and cycle facilities, Note: at this stage a feasible scheme has to be determined – see Appendix A discussion on A12. Three Mill lang Bridge Albota Ridge (suitables Pre 2014	34	The Greenway Links	Mark's Gate, Victoria Park; (b) Mitford Canal Bridge; (c) A12 bridge; (d) Wick Lane from Jodrell Road to Crown Close; (e) Greenway surfacing in character areas along Wick Lane between Victoria Park and Crown Close; (f) Footway improvements from Greenway, along Wick Lane, across Crown Bridge to	implemented -	LBTH
Star Lane Bridge vehicles) over Jubilee Line at the DLR at Star Lane with connection to Manor Road and Star Lane DLR Station 37 Stephenson Street Bridge Upgrade and improve the existing vehicular bridge. Including pedestrian and cycle facilities. Bridge Road Bus Link Road to connect Bridge Road with Abbey Road for buses and cycles only Junction/signals to allow turning movements for buses and cycles only Junction/signals to allow turning movements for buses at junction of Bridge Road link and A11 Pre 2014 Manor Road Footbridge Road Milh Add A11 Predestrian and cycle bridge on Manor Road and the Jubilee Line at Milner Road or Gainsborough Road. No decision has yat been made by others on a public access crossing at West Ham station nor new western access ticket hall and entrance. Different options for the ramp —see ODA proposals; The ODA is still to confirm the preferred option. Feasibility studies are ongoing. Pre 2014 Long Wall Pedestrian Link Pedestrian and cycle ramp Pre 2014 Rick Roberts Way Up-grade footpath for pedestrian and add cycle facilities; selective road widening and upgrading Signaled junction on the A12 at Devas St/A12 junction Stage a feasible scheme has to be determined — see Appendix A discussion on A12. Upgrade Three Mills Lane Bridge (for vehicle and Pre 2014)	35	Abbot Rd/ A13 junction	Allow all turning movements at the junction for buses	Pre 2014	
Stephenson Street Bridge	36	Star Lane Bridge	vehicles) over Jubilee Line at the DLR at Star Lane with connection to Manor Road and Star Lane DLR	Pre 2014	
Bridge Road Bus Link buses and cycles only Junction/signals to allow turning movements for buses at junction of Bridge Road link and A11 40 Manor Road Footbridge No decision has yat been made by others on a public access crossing at West Ham station nor new western access ticket hall and entrance. Different options for the ramp –see ODA proposals; The ODA is still to confirm the preferred option. Feasibility studies are ongoing. Pre 2014 Long Wall Pedestrian Link Pedestrian and cycle ramp Pre 2014 Devas St/A12 junction Signaled junction on the A12 at Devas Street with pedestrian crossings and cycle facilities. Note: at this stage a feasible scheme has to be determined – see Appendix A discussion on A12. Three Mill lane Bridge Upgrade Three Mills Lane Bridge (for vehicle and Pre 2014	37	Stephenson Street Bridge		Pre 2014	
at junction of Bridge Road link and A11 Pedestrian and cycle bridge on Manor Road and the Jubilee Line at Milner Road or Gainsborough Road. No decision has yat been made by others on a public access crossing at West Ham station nor new western access ticket hall and entrance. Different options for the ramp –see ODA proposals; The ODA is still to confirm the preferred option. Feasibility studies are ongoing. Pre 2014 Long Wall Pedestrian Link Pedestrian and cycle ramp Pre 2014 Rick Roberts Way Up-grade footpath for pedestrian and add cycle facilities; selective road widening and upgrading Vip-grade footpath for pedestrian and add cycle facilities; selective road widening and upgrading Signaled junction on the A12 at Devas Street with pedestrian crossings and cycle facilities. Note: at this stage a feasible scheme has to be determined – see Appendix A discussion on A12. Upgrade Three Mill Lane Bridge Vip-grade Three Mills Lane Bridge (for vehicle and Pre 2014)	38	Bridge Road Bus Link		Pre 2014	
Jubilee Line at Milner Road or Gainsborough Road. No decision has yat been made by others on a public access crossing at West Ham station nor new western access ticket hall and entrance. 41 Different options for the ramp – see ODA proposals; The ODA is still to confirm the preferred option. Feasibility studies are ongoing. 42 Long Wall Pedestrian Link Pedestrian and cycle ramp Pre 2014 43 Rick Roberts Way Up-grade footpath for pedestrian and add cycle facilities; selective road widening and upgrading 44 Signaled junction on the A12 at Devas Street with pedestrian crossings and cycle facilities. Note: at this stage a feasible scheme has to be determined – see Appendix A discussion on A12. 45 Three Mill lane Bridge Upgrade Three Mills Lane Bridge (for vehicle and Pre 2014	39	Bridge Road/A11 junction		Pre 2014	
West Ham Olympic Ramp The ODA is still to confirm the preferred option. Feasibility studies are ongoing. Pre 2014 Long Wall Pedestrian Link Pedestrian and cycle ramp Pre 2014 Rick Roberts Way Up-grade footpath for pedestrian and add cycle facilities; selective road widening and upgrading Signaled junction on the A12 at Devas Street with pedestrian crossings and cycle facilities. Note: at this stage a feasible scheme has to be determined – see Appendix A discussion on A12. Three Mill lane Bridge Upgrade Three Mills Lane Bridge (for vehicle and Pre 2014)	40	Manor Road Footbridge	Jubilee Line at Milner Road or Gainsborough Road. No decision has yat been made by others on a public access crossing at West Ham station nor new western	Pre 2014	
43 Rick Roberts Way Up-grade footpath for pedestrian and add cycle facilities; selective road widening and upgrading 44 Signaled junction on the A12 at Devas Street with pedestrian crossings and cycle facilities. Note: at this stage a feasible scheme has to be determined – see Appendix A discussion on A12. 45 Three Mill Jane Bridge Upgrade Three Mills Lane Bridge (for vehicle and Upgrading) Pre 2014 Pre 2014 Pre 2014	41	West Ham Olympic Ramp	The ODA is still to confirm the preferred option.	Pre 2014	
Rick Roberts Way facilities; selective road widening and upgrading Signaled junction on the A12 at Devas Street with pedestrian crossings and cycle facilities. Note: at this stage a feasible scheme has to be determined – see Appendix A discussion on A12. Three Mill Jane Bridge Pre 2014 Pre 2014 Pre 2014 Pre 2014	42	Long Wall Pedestrian Link	Pedestrian and cycle ramp	Pre 2014	
Devas St/A12 junction pedestrian crossings and cycle facilities. Note: at this stage a feasible scheme has to be determined – see Appendix A discussion on A12. 45 Three Mill Jane Bridge Upgrade Three Mills Lane Bridge (for vehicle and Pre 2014)	43	Rick Roberts Way		Pre 2014	
	44	Devas St/A12 junction	pedestrian crossings and cycle facilities. Note: at this stage a feasible scheme has to be determined – see	Pre 2014	
	45	Three Mill lane Bridge		Pre 2014	

46	Three Mill lane Road	Upgrade Three Mills Lane Road for access to Three Mills Development	Pre 2014	
47	Crows Rd Manor Rd Link	Upgrade the existing Crows Road bridge over the Jubilee Line and Bridge over Manor Road to link to Manor Road	Pre 2014	
48	Crows Rd	Upgrade Crows Road and allow access to the Islamic site	Pre 2014	
49	Crows Rd underpass	Upgrade the existing tunnel under the District Line to link Sarsen Road to Crows Road	Pre 2014	
50	Sarsen Close	Upgrade Sarsen Road to link Cody Road to Crows Road	Pre 2014	
51	Improve pedestrian and cycle route under the A12 from Eastway to Mabley Green	Public realm improvements to enhance pedestrian and cycling connectivity.	Pre 2014	Hackney
52	Wayfinding, visual clutter, street furniture and street lighting enhancement	New wayfinding interventions in line with the TfL Legible London scheme, to provide a coordinated approach to pedestrian signage. To include removal of existing pedestrain signage and review of other street furniture including benches, pedestrian lighting, CCTV cameras, public information points, public art and memorials, highways signage - and options for improvement e.g. removal, rationalisation, replacement, relocation, provision of new	Pre 2014	Newham
53	Hackney Wick tow path upgrade	Improve condition and amenity value of tow paths. Identified as a 'quick win' project by LBH - also LBTH sections??	Pre 2014	Hackney
54	A12/Hertford Union Canal underpass	Improvements to pedestrian and cycle connection under A12 along Hertford Union Canal	Pre 2014	Tower Hamlets
55	Homerton Station public realm	Improve the public realm and linkage around Homerton Station. LBH bid for funding for preparatory works to move Homerton Station but funders proposal is to focus funding on improving public realm	Pre 2014	Hackney

56	Hackney Wick wayfinding scheme	Implement a Wayfinding Scheme for Hackney Wick in accordance with TfL's Legible London scheme. The Borough in partnership with TfL is proposing to implement a Wayfinding scheme for the whole of East Hackney however the Hackney Wick area is not yet funded. Despite Hackney being located within close proximity to Central London and the Olympic Park, residents often consider distances to be longer than they really are. This is reinforced by the fact that Hackney has no town centre mapping and very few existing pedestrian signs. This scheme will provide important support for the influx of visitors expected to attend the 2012 Olympic Games. Improve pedestrian experience for visitors walking to and from and in the vicinity of the Olympic Park	Pre 2014	Hackney
57	upgrade of Greenway from West Ham to Beckton	Improvements to the greenway including the provision of a new foot and cycle path to extend enhancements of Olympic section - strategic route into Olympic area	Pre 2014	Newham
58	Great Eastern Crossing	Reconfigured to a one stage pedestrian crossing with increased capacity including changes to service road (redirection to meet Great Eastern Road before pedestrian crossing and/or raised table)	Pre 2014	Newham
59	Broadway super crossing	Revised pedestrian crossing sequence to provide an easier pedestrian crossing point that links the two sides of The Broadway, including assessment of extending public realm around Gurney Memorial, and outside 31 The Broadway	Pre 2014	Newham
60	Grove super crossing	New increased capacity pedestrian crossing	Pre 2014	Newham
61	Stratford High Street DLR entrance and public realm	Reconfiguration of old station building and provision of additional/reclocated pedestrian crossings to improve access to new DLR station for Stratford High Stret area	Pre 2014	Newham

62	Roman Road upgrade and linkages	Severe lack of connectivity between Roman Road area and the future Legacy development, and into Fish Island/Hackney Wick. Upgrade of environment of existing bridge linking Crown Close to Old Ford Rd, and improve pedestrian and cycle routes to/from Roman Road, Greenway and Hackney Wick and Legacy developments. LBTH bid for funding to improve street scene of Roman Road - proposal from funders is that this should be redirected to address linkage issues.	Pre 2014	Tower Hamlets
63	Temple Mill Lane bridge widening	Widening of Temple Mill Lane bridge to improve pedestrian and and cycle facilities. Lend Lease have prepared proposals and got planning permission for this, not sure of delivery strategy. If possible this should be a pre-2012 project due to importance of route for legacy.	Pre 2014	Waltham Forest
64	Jupp Road Bridge	Improvements to the existing pedestrian bridge to create a higher quality, more legible and direct link from Carpenters Road area to Meridian Square and Stratford Town Centre.	Pre 2014	Newham
65	New vehicular bridge link to Bromley-by-Bow from Sugarhouse Lane	Provision of new bridge between Sugarhouse Lane and Bromley-by-Bow to accommodate pedestrians, cyclists and 2 way bus movements.	Pre 2014	Tower Hamlets
66	New pedestrian/cycle bridge from Wallis Rd to Legacy road network	Deliver new cycle/pedestrian bridge linking Wallis Road to the new movement network on the eastern side of the Lea Navigation	Pre 2014	Hackney
67	New all modes bridge Monier Rd	Deliver a new all modes bridge linking Monier Road with the new road network to the east of the Lea Navigation	Pre 2014	Tower Hamlets
68	Fish Island pedestrian/cycle link to station	Deliver new north-south route linking the footbridge north of Roach Road to Whitepost Lane and the new entrance to Hackney Wick station, to avoid reliance on tow path detour	Pre 2014	Tower Hamlets
69	Old Ford Lock connection	Improve pedestrian and cycle crossing over the Lea Navigation at Old Ford Lock	Pre 2014	Tower Hamlets
70	Connection across Greenway in Fish Island	Create new connections from the Old Ford Lock Area over Greenway to the southern part of Fish Island	Pre 2014	Tower Hamlets

71	Hackney Wick station reconfiguration and enhancement (first phase enabling works)	Deliver a new improved station entrance, potentially in a new location east of current location as part of a new a new pedestrian and cycle underpass providing and single station entrance	Pre 2014	Hackney
72	Old Ford Junction cycle improvements	Improve pedestrian and cycle access over the A12 at Old Ford Junction	Pre 2014	Tower Hamlets
73	Replace Pedestrian Crossing over A12 at Crown Close	Replace existing pedestrian and cycle route at Crown Close with new all modes bridge over A12 towards Roman Road	Pre 2014	Tower Hamlets
74	Ruckholt Rd bridge	reconstruction/widening of existing bridge adjacent to Olympic site	Pre 2014	Waltham Forest

Annex B: New connectivity schemes for the OLSPG area

No.	Name	Objectives	Schemes included/description	Phasing	Source	Borough
1	Roman Road Olympic Links	Improve links between Fish Island and Stratford City to support the regeneration of Fish Island. This would also help to improve links between the IPC/MBC to Stratford.	There are two proposed routes for this link: 1) Bridge across A12 - Roman Road to Maverton Road and Road link over the canal to the south of the Olympic Stadium 2) Bridge across A12 at Old Ford Road - upgrade existing footbridge to vehicular bridge and a bridge across River Lea at the historic Ford 3) Re-open towpath between Old Ford Lock and Stadium Island Further studies are required to understand the feasbility, alignment and modal access that is appriopriate for this area.	Long Term (1) Medium Term (2)	Tower Hamlets Connectivity Study	Tower Hamlets
2	West Ham Connectivity Improvements	Improve connections in the West Ham area to enable developments to come forward. This would also improve east west movement across the Jubilee and DLR lines south of Stratford High Street as well as help to reduce the barrier of the east-west rail corridor.	These could include: 1) Widen Abbey Road Bridge to upgrade footpath for pedestrian and add cycle facilities 2) Improve Greenway crossing at Canning Road 3) Sarsen Close bridge over the District Line for buses, pedestrian and cycle only 4) Stephenson Bridge Improvement 5) Crows Road Link	Short Term	Lower Lea Valley Connectivity Connections Study, Pell Frishmann, 2007	Newham

3	Improved all mode crossings of river between Poplar Riverside and Cody Road Industrial Area	Improve links over the River Lea south of Bromley-by-Bow to support the regeneration of both sides of the river and enable development to come forward. This would also improve east-west links to West Ham.	These could include: 1) Lochnagar Bridge - Bus, pedestrian and cycle only bridge over the River 2) Lochnagar - Cody Road road bridge (with sections for bus and cycle) 3) Leven Road Bridge - vehicular bridge over the river 4) Upgrade and link Bidder Street to Leven Road bridge	Medium Term	Lower Lea Valley Connectivity	Newham and Tower Hamlets
4	Stratford Town Centre Highway Improvements	Improve the highway network in Stratford Town Centre to reduce congestion and improve journey time reliability in the area. As well as, enabling an improved environment for pedestrians and cyclists to support the regeneration of Stratford Town Centre.	These could include: 1) Down-scale Warton Road Junction 2) Improvement and provision of new north-south connections over the eastwest rail corridor 3) Stratford Gyratory Improvements - Modifications to convert the gyratory system to two-way operations or major highway reconfiguration planning through holistic masterplan 4) Re-establish St John's Walk - Removal of bus routes and redesign of road into a narrower, shared surface. 5) West Ham Lane & Tramway Square - Closure of the bus only lane to allow for the creation of a new town square. 6) Stratford High Street downgrade - Removal of dedicated bus lanes east of Warton Road to improve cycle and pedestrian environment 7) Stratford Regional Station - new South entrance from Carpenters Estate 8) Creation of the Northern Parallel - particularly the establishment of the link from Jupp Road bridge to Pudding Mill	Short Term Medium Term (3)	Metropolitan Stratford Masterplan Fringe Masterplan	Newham

			Lane Station through Carpenters Estate			
5	Improve all modes access between Sugar House Lane and Three Mills	Improving access between the two development areas of Sugar House Lane and Three Mills to support development in the area and ensure that is it continuous development rather than two distinct and separate developments.	This could include: 1) Sugar House Lane/Three Mills area road enhancements 2) New bridge link between Bison Road and Sugar House Lane 3) New pedestrian/cycle bridge to Bromley-by-Bow from Hunts Lane	Short Term	Fringe Masterplan	Tower Hamlets amd Newham

6	Ruckholt Road links to Leyton	Improve existing poor configuration of roundabouts and grade separated junctions so that it becomes a high quality, direct and legible route to provide a high quality mixed use area which better connects Leyton to the Legacy Masterplan Framework area.	This could include: 1) Reconfiguration of Ruckholt Road between railway cutting and Leyton High Road 2) Comprehensive redevelopment of site east of railway cutting	Short Term	Fringe Masterplan	Waltham Forest
7	Link between Eaton Manor and Leyton Station	Enabling improved pedestrian/cycle access from Eaton Manor to Leyton Station leading to improved access to services and employment for residents of Eaton Manor.	Pedestrian/cycle link	Medium Term	Fringe Masterplan	Waltham Forest
8	Wayfinding strategy across the whole SPG area	Improved wayfinding for walking and cycling across the area to maximise the benefits of the connections being made and support increased mode share for walking and cycling.	Using Legible London and City ID work to improve local wayfinding across the SPG area and linking to schemes outside the area, for example, Hackney Central.	Short Term	5 Host Boroughs	Tower Hamlets Newham Waltham Forest Hackney
9	Hackney Central/Hackney Downs Interchange	Improving the interchange between Hackney Central and Hackney Downs will support increased use of the public transport	Direct pedestrian link between Hackney Central and Hackney Downs	Short Term	5 Host Boroughs	Hackney

		network and enable access to a wider range of services and employment for users. It will also reduce journey time.				
10	Improvements to Hackney Wick Station	Hackney Wick is an area expected to see a substantial increase in population and employment. Hackney Wick station currently has identified problems with poor interchange and walk routes to the station. Improving the station is will support the development growth in the area.	Improvements to general station layout, public transport connections, and walking and cycling access. This should take into account the outcome of the revised safeguarding of the Chelsea-Hackney line and possible interchange at Hackney Wick.	Medium Term	A12 Study Hackney Wick Masterplan	Hackney
11	Improvements to Bromley-by-Bow Station	Bromley-by-Bow is an area expected to see a substantial increase in population and employment. Bromley-by-Bow station currently has identified problems with poor walk routes to the station. Improving the station will support the development growth in the area.	Improvements to general station layout, public transport connections, and walking and cycling access	Medium to Long Term	A12 Study and London Thames Gateway Development Corporation Plans	Tower Hamlets

12	Improve walking access to and from public transport stations	In order to support increased usage of the public transport network and a move away from private transport it is key that the walking access to and from public transport stations is improved.	Generally across all stations.	Short Term	OPTEMS	Tower Hamlets Newham Waltham Forest Hackney
13	Walking route improvements across the whole SPG area	Improved walking infrastructure will support an increased walking mode share in the area and improve the links between the different areas.		Short Term	OPTEMS	Tower Hamlets Newham Waltham Forest Hackney
14	Cycle route improvements across the whole SPG area	Improved cycling infrastructure will support an increased cycling mode share in the area and improve the links between the different areas.	This could include: 1) Stratford High Street 'Quiet' Route avoiding Stratford High Street; 2) Exel Centre to the Olympic Park via Manor Road; 3) The Elevated Greenway. 4) Further or extensions to Cycle Superhighways 5) Cycle Hire	Short Term	OPTEMS Tower Hamlets	Tower Hamlets Newham Waltham Forest Hackney

15	Pedestrian and cycle links across the A12	The A12 causes significance severance between the east and west. This reduces the availability of services and employment opportunities for residents either side of the A12. Increasing the ease of crossing the road will support the regeneration of the area.	This could include: 1) A13/A12 junction 2) A12/Dee Street Junction 3) A12/Abbott Road 4) A12/Twelvetrees Crescent 5) Pedestrian improvements between Bromley North and Bromley High Street 6) Pedestrian/cycle bridge over A12 at Wrexham Road 7) Connection to Hackney Marshes	Short to Long Term	A12 Study Bromley North Masterplan Hackney Wick Masterplan	Tower Hamlets and Hackney
16	Sugar House Lane Improvements	Improving access into the Sugar House Lane development for buses to enable increased services when demand is sufficient.	This could include: 1) Sugar House Lane bus bridge 2) A118/Sugar House Lane junction	Medium to Long Term	A12 Study	Newham and Tower Hamlets
17	Further improvements at Bow Roundabout (after short term OPTEMS improvements)	Improving the working of the highway network in the Bow Roundabout area to support both highway traffic movement and pedestrian crossings.	This could include removal of flyover with possible improvements to Pudding Mill Lane Junction and the creation of a new four-way junction linking Sugar House Lane with Pudding Mill Lane	Long Term	A12 Study	Newham and Tower Hamlets
18	Improve sub- regional connectivity from Stratford to the north	Stratford is well connected at a sub-regional level though there is a gap north to Waltham Forest.	This could include increasing services north from Stratford such as West Anglia main line upgrade and/or Hall Farm Curve and/or infrastructure improvements at Tottenham Hale	Long Term	East Sub- regional transport plan	Waltham Forest / Newham
19	Improved links between Hackney Wick (south of the Hertford Union	Improve links between Hackney Wick south of the Hertford Union Canal across the River Lea Navigation to	This could include enhancements to the pedestrian/cycle bridge at Monier Road.	Medium Term		Hackney Tower Hamlets

	Canal across the River Lea Navigation)	improve pedestrian/cycle access to the Olympic Park area.				
20	Improved links between Hackney Wick (north of the Hertford Union Canal across the River Lea Navigation)	Improve links between Hackney Wick north of the Hertford Union Canal across the River Lea Navigation to improve pedestrian/cycle to the Olympic Park area.	This could include enhancements to the pedestrian/cycle bridge at Wallis Road	Medium Term		Hackney
21	North south connections along River Lea	Improve north south pedestrian/cycle connections through the area to support active travel and use of open space as well as supporting the development of a comprehensive walk and cycle network. This will also help to reduce the barrier of the east west rail line.	This could include: 1) Future phases of the "Fatwalk" 2) Connection to Lea River Park 3) Publically accessible western canal bank of the Lea Navigation. 4) Lea Interchange - improve ped/cycle access through this junction and provide north-south access between the Olympic Park and Hackney Marshes. 5) Maintaining a balance in the use of the Waterden Road and the Stratford "Lifeline" to ensure that the Waterden Road does not become a barrier to walking and cycling	Medium Term (No. 3) Short Term (No. 4)	Hackney Wick Masterplan Hackney	Tower Hamlets Newham Waltham Forest Hackney
22	New bus infrastructure links to serve development along the A12	Improve bus infrastructure around the A12 to enable improved bus services as demand increases as well as reducing reliance on car travel.	Including: 1) Gillender Street two way buses 2) St Andrews Way bus link (over the Limehouse Cut)	Medium Term	A12 Study	Tower Hamlets

23	Leyton station congestion relief and improved access	Improve the accessibility of the station and reduce the need to implement station control measures to support development growth and encourage the use of public transport.	This could include improvements to the station layout and capacity, namely larger entrance, ticket hall, stairways and the potential addition of step free access. It could also incorporate improvements to the station walking and cycling access.	Long Term	Waltham Forest Option Review Report	Waltham Forest
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Annex C: Outcomes of the Strategic Assessment Framework of the proposed connectivity schemes

AIII.	CX C	J. Outo		_		•		111		01 (1		LLV Connectivity			
			Source Scheme	1	A work for Tower Hamlets man Road to Olympic Stadium vehicle link		A work for Tower Hamlets man Road to Pudding Mill Lane vehicle link		LLV Connectivity 25 Abbey Road Bridge		LLV Connectivity 26 Canning Road		LLV Connectivity n Bridge - general improvements /cycle crossing of District Line	crossings	LLV Connectivity , 31, 32 Improved all mode of river - links between Poplar and Cody Road Industrial Area
			Description		nks between Fish Island and City to support regeneration of		nks between Fish Island and City to support regeneration of	to enable This schei Road brid	onnections in the West Ham area developments to come forward. ne comprises widening Abbey ge to upgrade the footpath for s and to add cycle facilities.	to enable This scher	onnections in the West Ham area developments to come forward. ne comprises improving the crossing at Canning Road.	to enable This schei	onnections in the West Ham area developments to come forward. me comprises upgrading the idge for buses, pedestrians and y.	of Bromley regenerati and enable forward. T	nks over the River Lea south -by-Bow to support the on of both sides of the river e development to come nis would also improve east- to West Ham.
MTS Goals	MTS	MTS Outcomes	Included in scheme grouping: Overlap with	1 Score	Comments and Justification	1 Score	Comments and Justification	2 Score	Comments and Justification	2 Score	Comments and Justification	2 Score	Comments and Justification	3 Score	Comments and Justification
	challenges		SPG principles	(2,1,0,-1,-2)		(2,1,0,-1,-2)		(2,1,0,-1,-2)		(2,1,0,-1,-2)		(2,1,0,-1,-2)		(2,1,0,-1,-2)	
Supporting economic development and population growth	Supporting sustainable population and employment growth	Balancing capacity and demand for travel through increasing public transport capacity and/or reducing the need to travel	4	-1	Adding an additional road link will encourage car use. Though this will also increase the opportunity to run buses on this route.	-1	Adding an additional road link will encourage car use. Though this will also increase the opportunity to run buses on this route.	2	These schemes will reduce the need to travel within the OLSPG area by reducing severance and improving local accessibility and therefore reducing the need to travel by public transport or car.	2	These schemes will reduce the need to travel within the OLSPG area by reducing severance and improving local accessibility and therefore reducing the need to travel by public transport or car.	2	These schemes will reduce the need to travel within the OLSPG area by reducing severance and improving local accessibility and therefore reducing the need to travel by car. As buses will also be able to use this bridge it will support bus services to serve the demand in this area.	-1	Adding an additional road link will encourage car use. Though this will also increase the opportunity to run buses on this route and improve walking and cycling access.
	Improving transport connectivity	Improving employees access to jobs	4	1	Increasing access to jobs in Stratford City	1	Increasing access to jobs in Stratford City	(((Serve the demand in this drea.	O	
		Improving access to commercial markets for freight		O		0		(((0	
		(managing road congestion and reducing traffic journey time		· ·		0		(,		(Û	
	system for people and goods	variability) Improving public transport reliability		C		0		((1		1	
		Reducing operating costs		C		0		((1		1	
		Bringing and maintaining all assets to a good state of repair		1		1		1		1		1		1	
2) Quality of	Improving	Enhancing the use of the Thames for people and goods Improving public transport		0		0		((1	A new bus link in the area will enable	1	A new bus link in the area will
life	journey experience	customer satisfaction Improving road user		1		1		1	This scheme would improve the	1	This scheme would improve the	1	bus services to meet demand better. This scheme would improve the	2	enable bus services to meet demand better. This scheme would impact all road
		satisfaction (drivers, pedestrians, cyclists) Reducing public transport crowding		0		0		(environment for pedestrians and cyclists.	(environment for pedestrians and cyclists.	(environment for pedestrians and cyclists.	0	users.
		Enhancing streetscape, improving the perception	3	1	This scheme would include improvements to the streetscape in the	1	This scheme would include improvements to the streetscape in the	1	This scheme would include improvements to the streetscape in the	1	This scheme would include improvements to the streetscape in the	1	This scheme would include improvements to the streetscape in the	1	
		of urban realm and developing 'better streets' initiatives Protecting and enhancing	3.5		area compared to the current situation.		area compared to the current situation.		area compared to the current situation.		area compared to the current situation.		area compared to the current situation.		
	Improving air quality	the natural environment Reducing air pollutant emissions from ground	3	0		0		(((0	
	Improving	based transport, contributing to EU air quality targets Improving perceptions												0	
		and reducing impacts of Facilitating an increase in walking and cycling	3	1		1		2	This scheme encourages walking and cycling by improving local accessibility.	2	This scheme encourages walking and cycling by improving local accessibility.	2	This scheme encourages walking and cycling by improving local accessibility.	1	This scheme encourages walking and cycling by improving local
Safety and Security		Reducing crime rates (and improving		C		0			The perception of safety would be increased by improving or providing an		The perception of safety would be increased by improving or providing an		The perception of safety would be increased by improving or providing an	1	accessibility. Though the additional vehicle link will encourage car trips. The perception of safety would be increased by improving or providing
Jecunity	crime and anti social behaviour	perceptions of personal safety and security)							alternative to the current access to the station.		alternative to the current access to the station.		alternative to the current access to the station.		an alternative to the current access to the station.
	Improving road safety	Reducing the numbers of road traffic casualties		-1	Adding additional road capacity will increase traffic and therefore road casualtities.	-1	Adding additional road capacity will increase traffic and therefore road casualtities.	1	The improvements to the streetscape from this scheme will be designed to reduce the number of road traffic casualties.	1	The improvements to the streetscape from this scheme will be designed to reduce the number of road traffic casualties.	1	The improvements to the streetscape from this scheme will be designed to reduce the number of road traffic casualties.	-1	Adding additional road capacity will increase traffic and therefore road casualtities.
	Improving public transport	Reducing casualties on public transport network		C		0		((1	The improvements to the streetscape from this scheme will be designed to reduce casualties on the public	0	
Transport Opportunities	safety Improving accessibility	Improving access to services Improving physical	4	1		1		1		1		1	transport network.	1	
		accessibility of the transport system						Ì							
	Supporting regeneration and tackling deprivation	Supporting wider regeneration		1		1		1		1		1		1	
5) Climate Change	Reducing CO ₂ emissions	Reducing CO ₂ emissions from ground based transport contributing to a London-wide 60% reduction by 2025		C		0		(((0	
	climate change	Maintaining the reliability of transport networks		C		0		(((0	
 Support delivery of the London 2012 Olympic 	implementing	Supporting regeneration and convergence between the outcomes for the five Olympic boroughs		,		1		1		,		,		1	
and Paralympic Games and	sustainable	and the rest of London Physical transport legacy		1		1		((1		1	
its legacy Total Score		Behavioural transport legacy		1		1		1		1		1		1	
Deliverability	Complexity of delivery	Engineering feasibility Consent risk		-1 -1		-1 -1		-1 -1		-1 -1		-1		-1 -1	
	Value for money Funding	Cost High, medium, low Committed/ identified/ unknown		High -1		High -1		Medium -1		Medium -1		High -1		High -1	
	Stage of scheme	Concept/ feasibility & design/ approvals sought		-1		-1		-1		-1		-1		-1	
	Stakeholder and public	Stakeholder acceptability Public acceptability Short (2014, 2020)		1		1		1		1 1		1 1 Media :-		1 1	
	Timescale	Short (2014-2020), medium (2020-2025) or long (2025 onwards)		Long		Long		Short		Short		Medium		Medium	

Re-estab	Fringe Masterplan lish St John's Walk, Stratford	s Walk, Stratford West Ham Lane & Tramway Squetwork in Stratford Improve the highway network in Strat					south connections over the east-west rail corridor		Fringe Masterplan 104, 105 Stratford Gyratory	Fringe Masterplan 110 Stratford High Street Downgrade Improve the highway network in Stratford			
Town Cent improve jou area. As we environment to support Town Cent This interver routes and	re to reduce congestion and urney time reliability in the ell as, enabling an improved nt for pedestrians and cyclists the regeneration of Stratford	Town Centimprove jourea. As we environme to support Town Centimes intervented bus on allow for the centimes in	tre to reduce congestion and urney time reliability in the ell as, enabling an improved nt for pedestrians and cyclists the regeneration of Stratford	Town Centimprove jo As well as, environme	e regeneration of Stratford Town	Town Centimprove jo As well as environme	e highway network in Stratford tre to reduce congestion and urney time reliability in the area. enabling an improved nt for pedestrians and cyclists to e regeneration of Stratford Town			As well as, enabling an improved o environment for pedestrians and co		Town Cen improve jo As well as environme support th Centre. This scheil	ne highway network in Stratford tre to reduce congestion and uruney time reliability in the area. , enabling an improved int for pedestrians and cyclists to e regeneration of Stratford Town me includes a new South o Stratford Regional Station from
Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification
(2,1,0,-1,-2)		(2,1,0,-1,-2)		(2,1,0,-1,-2)		(2,1,0,-1,-2)		(2,1,0,-1,-2)		(2,1,0,-1,-2)		(2,1,0,-1,-2)	
0		0		0		0		0		C		1	This will improve access to Stratford Regional Station and therefore improve access to jobs.
1	Scheme will reduce congestion and improve journey time reliability	1	Scheme will reduce congestion and improve journey time reliability	1	Scheme will reduce congestion and improve journey time reliability	1	Scheme will reduce congestion and improve journey time reliability	2	These schemes aim to reduce congestion on key stratgeic routes for not just this area but also the region.	1	Scheme will reduce congestion and improve journey time reliability	1	Scheme will reduce congestion and improve journey time reliability
0		0		1	Reducing congestion will support improved bus relability.	1	Reducing congestion will support improved bus relability.	1	Reducing congestion could help to improve bus journey time reliability.	-1	On it's own this scheme could reduce bus reliability. Though in reality this scheme would not be completed on its own.	(
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0		0		0		0		0		C		(
0		0		0		0		0		C		1	
1	This scheme would improve the environment for pedestrians and cyclists.	1	This scheme would improve the environment for pedestrians and cyclists.	1	Driver road user satisfaction is likely to increase as congestion decreases.	1	Driver road user satisfaction is likely to increase as congestion decreases.	2	These schemes aim to improve the journey quality for drivers, pedestrians and cyclists.	1	This scheme would improve the environment for pedestrians and cyclists.	(
0	The main aim of this scheme is to	0	The main aim of this scheme is to	0		0		0	These schemes will cover a wide area	0	This scheme would improve the		There will be improvements to the
0	improve the streetscape in this area.	0	improve the streetscape in this area.	0		0		0	of Stratford.	C	environment for pedestrians and cyclists.	C	streetscape immediately surrounding the entrance.
0		0		0		0		0		C		(
1		1		0		0		0	Improvements are expected in the quality of environment for walking and	2	Improvements are expected in the quality of environment for walking and	(
0		0		0		0		1	cycling. Improvements are expected in the	1	cycling. Improvements are expected in the	1	An improved station access may
0		0		0		0		0	quality of environment for walking and cycling which could help to reduce the perception of safety.	C	quality of environment for walking and cycling which could help to reduce the perception of safety.	C	improve perceptions of safety.
0		0		0		0		0		C		(
0		0		0		0		0		0		1	Assuming that the new entrance will be physically accessible.
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1 Short		1 Short		1 Medium		1 Medium		1 Medium		1 Medium		1 Medium	

	-		Fringe Masterplan	Fringe Masterplan		Fringe Masterplan			Fringe Masterplan		Fringe Masterplan		5 Host Boroughs
Link be	tween Jupp Road Bridge and Pudding Mill Lane	134 New	ped/cycle bridge to Bromley-By- Bow from Hunts Lane	116 Sug	garhouse Lane/Three Mills area road enhacements	117 New	bridge link to Three Mills Green	127.12	8 Rockholt Road link to Leyton	136	Bridge link to Leyton Station		47 Wayfinding
Town Cen improve jo As well as, environme support the Centre. This scher Road Bride	e highway network in Stratford re to reduce congestion and rumey time reliability in the area. enabling an improved in for pedestrians and cyclists to e regeneration of Stratford Town ne includes a link between Jupp ge to Puddling Mill Lane Station impenters estate.	Improving developme and Three the area a developme separate c includes a Bromley-b	access between the two ent areas of Sugar House Lane Mills to support development in nd ensure that it is continuous ent rather than two distinct and developments. This scheme new pedestrian/cycle bridge to	developme and Three the area ai developme separate d This scher enhancem adjacent re bridge to T	access between the two int areas of Sugar House Lane Mills to support development in nd ensure that it is continuous ant rather than two distinct and levelopments. ne includes general ent of highways associated with adevelopment, including existing 'hree Mills.	Improving developme and Three the area a developm separate of This scher between E Lane.	access between the two ent areas of Sugar House Lane	Improve e roundabou so that it b legible rou use area v the Legac; This could 1) Reconfi- between ra Road 2) Compre- east of rail	xisting poor configuration of uts and grade separated junctions secomes a high quality, direct and tie to provide a high quality mixed which better connects Leyton to y Masterplan Framework area. I include: iguration of Ruckholt Road ailway cutting and Leyton High shensive redevelopment of site lway cutting	Enabling improved pedestrian/cycle access ctions from Eaton Manor to Leyton Station leading at and to improved access to services and mixed employment for residents of Eaton Manor. n to ea.			wayfinding for walking and
4 Score	Comments and Justification	5 Score	Comments and Justification	5 Score	Comments and Justification	5 Score	Comments and Justification	6 Score	Comments and Justification	7 Score	Comments and Justification	8 Score	Comments and Justification
(2,1,0,-1,-2)	Comments and Justinication	(2,1,0,-1,-2)	Comments and Justinication	(2,1,0,-1,-2)	Comments and Justineauon	(2,1,0,-1,-2)	Comments and Justinication	(2,1,0,-1,-2)		(2,1,0,-1,-2)		(2,1,0,-1,-2)	Comments and Justinication
0		2	This scheme provides a new pedestrian link between Sugar House Lane and Bromley-by-Bow.	0		2	This scheme provides a new pedestrian link between Sugar House Lane and Three Mills.	C			2 This scheme provides a new pedestrian/cycle access from Eaton Manor to Leyton Station.	2	Improvements to wayfinding will encourage walking in the OLSPG area and therefore reduce the need to travel.
1	Improve access to Puddling Mill Lane station	C		0		C	9	C			Through improved access to the station.	(0
0		C		0		C		C			0	()
0		C		0		C		C			0	(
0		C		1	May improve bus reliability by improving the efficiency of the highway network for bus routes.	C		C			o	(9
0		С		0		()	C)		0	(0
1		1		1		1		1			0		
0				0									
1		1	Improvements for pedestrians and	1	Improve drivers road user satisfaction.	1	Improvements for pedestrians and	2	This scheme would lead to		1 Improvements for pedestrians and		This scheme would improve the
0			cyclists.	0	improve arrow road door catastactors		cyclists.		improvements for all road users.		cyclists.		environment for pedestrians.
1		1		0		1		2	The aim of this scheme is to improve		1 This scheme would improve the		
									the streetscape to improve it's legibility.		environment for pedestrians and cyclists.		
0		C		0		(C			0	(
0		С		0		()	C)		0	()
1		2	This scheme provides a walk link between two key development sites.	0		2	This scheme provides a walk link between two key development sites.	1			1	2	2
1		C		0		C		C			The improved link may increase the erception of safety in the area.	(9
0		1	The improvements to the streetscape from this scheme will be designed to reduce the number of road traffic	0		1	The improvements to the streetscape from this scheme will be designed to reduce the number of road traffic	1	Improving the road layout will enable improvements to be made to increase safety due to road traffic collisions.		0	()
0		C	casualties.	0		C	casualties.	C			0	(
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-1 -1		-1 -1		-1 -1		-1		-1			1	-1	1

69 Hackney Central/Hackney Downs Interchange Improving the interchange between Hackney Central and Hackney Downs will support increased use of the public transport network and enable access to a wider range of services and employment for users. It will also reduce journey time.		acce Hackney V substantia employme currently h interchang Improving developme Improvement	ackney Wick is an area expected to see a bromley-ackney Wick is an area expected to see a ubstantial increase in population and mployment. Hackney Wick station urrently has identified problems with poor tterchange and walk routes to the station. In proving the station is will support the evelopment growth in the area. Improvements to general station layout, ublic transport connections, and walking and cycling access.		Station 25 Bromley-by-Bow Station arrangement ted to see a Bromley-by-Bow is an area expected to see if a substantial increase in population and employment. Bromley-by-Bow station s with poor the station is will support the estation is will support the development growth in the area. This scheme would include improvements to general station layout, public transport connections and walking and cycling access.		king improvements to and from rransport stations - post games ders the impact of improving all public transport stations.	Improved an increas	route improvements across the whole SPG area walking infrastructure will support ed walking mode share in the mprove the links between the reas.	This consist which wou improvement oPTEMs For Stratford avoiding Source Exel Center Manor Rose The Eleventhis could	Id improve cycle route ents across the whole area. Phase 2 – Post Games: High Street 'Quiet' Route tratford High Street; tre to the Olympic Park via	between the east and west. This reduces the availability of services and employment opportunities for residents either side of the A12. Increasing the ease of crossing the road will support the regeneration of the area.		
9		10				12		13		14		15		
Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification	
(2,1,0,-1,-2)		(2,1,0,-1,-2)	This scheme would increase the capacity and accessibility of a key London Overground station in the area.	(2,1,0,-1,-2)	This scheme would increase the capacity and accessibility of a key London Underground station in the area.	(2,1,0,-1,-2)	This scheme would increase the accessibility of a key London Underground station in the area.	(2,1,0,-1,-2)		2		(2,1,0,-1,-2)	These schemes will reduce the need to travel within the OLSPG area by reducing severance and therefore reducing the need to travel by public transport or car.	
1	Improving the interchange between these two stations will improve access	1	Through improved access to the rail station.	1	Improving access to the Bromley-by- Bow London Underground Station.	1	Improving access to rail stations will improve access to jobs	0		0		C	9	
0	inese two staturis will improve access to jobs	O O	Saturi.	C	DOW EURODI ORDERIJONIA SIGNOR.	C	inipiove access to jour	0		0		C		
0		1		1	Improvements to the station layout would reduce the possibility that the station would need to be closed due to being over capacity during peak periods.	C		0		0				
1		1		2		1		1		1		1		
0		C	2	C		C		0		0		C	2	
2		1	Through improvements to the station and surrounding area as well as	1	Through improvements to the station and surrounding area as well as	C		0		0		C		
0		1	interchange to local buses. This scheme would improve the environment for pedestrians and	1	interchange to local buses. This scheme would improve the environment for pedestrians and	1	This scheme would improve the environment for pedestrians and	1	This scheme would improve the environment for pedestrians.	1	This scheme would improve the environment for cyclists.	1	This scheme would improve the environment for pedestrians and	
0		C	cyclists.	1	cyclists. This should could help to reduce	C	cyclists.	0	environment for pedestrians.	0	environment for cyclists.	(cyclists.	
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			improvements to the streetscape in the area compared to the current situation.		improvements to the streetscape in the area compared to the current situation.		area compared to the current situation.		improvements to the streetscape in the area compared to the current situation.		improvements to the streetscape in the area compared to the current situation.		improvements to the streetscape in the area compared to the current situation.	
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0		1	This scheme would improve walking and cycling access.	1	This scheme will improve walking and cycling access to Bromley-by-Bow	1	This scheme will improve walking and cycling access to the listed station.	2	This intervention would significantly increase facilities for walking across	2		1	This scheme will improve walking and cycling across the A12.	
0		1	The perception of safety would be	1	station. The perception of safety would be	C	,	1	the whole area. The perception of safety would be	0		0)	
0		1	increased by improving or providing an alternative to the current access to the station. The improvements to the streetscape		increased by improving or providing an alternative to the current access to the station. The improvements to the streetscape		The improvements to the streetscape	1	increased by improving or providing an alternative to the current access to the station. The improvements to the streetscape	1	These schemes would encourage		The improvements to the streetscape	
			from this scheme will be designed to reduce the number of road traffic casualties.		from this scheme will be designed to reduce the number of road traffic casualties.		from this scheme will be designed to reduce the number of road traffic casualties.		from this scheme will be designed to reduce the number of road traffic casualties.		cyclists to use routes with fewer and slower motor vehicles.		from this scheme will be designed to reduce the number of road traffic casualties.	
0		1	The improvements to the streetscape from this scheme will be designed to reduce casualties on the public	1	The improvements to the streetscape from this scheme will be designed to reduce casualties on the public	1	The improvements to the streetscape from this scheme will be designed to reduce casualties on the public	0		0		1	The improvements to the streetscape from this scheme will be designed to reduce casualties on the public	
1		1	transport network.	1	transport network.	1	transport network.	1		1		1	transport network.	
1		1		1		1	By ensuring the walk routes are accessible.	0		0		C		
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OPTEMS

OPTEMS

OPTEMS

Bromley North Masterplan added by Steve T

5 Host Boroughs

A12 Study

A12 Study

586 A13/A12 Junction

The A12 causes significance severance between the east and west. This reduces the availability of services and employment of poptrulinities for residents either side of the area.

This considers bus stop improvements and epidestrian enhancements.

This considers landbridge and footbridge pedestrian enhancements.

This considers landbridge and footbridge pedestrian enhancements.

The A12 causes significance severance between the east and west. This reduces the availability of services and employment the regeneration of the area.

This considers landbridge and footbridge pedestrian enhancements.

This considers landbridge and footbridge pedestrian enhancements.

This considers landbridge and footbridge pedestrian enhancements.

The A12 causes significance severance between the east and west. This reduces the availability of services and employment the regeneration of the area.

This considers landbridge and footbridge of poptrulines for residents either side of the area.

This considers landbridge and footbridge of poptrulines for residents either side of the area.

This considers landbridge and footbridge options.

This considers landbridge and footbridge options.

The A12 causes significance severance between the east and west. This reduces the availability of services and employment the acts and west. This reduces the availability of services and employment the acts and west. This reduces the availability of services and employment the acts and west. This reduces the availability of services and employment the acts and west. This reduces the availability of services and employment of poptrulinities for residents either side of the A12. Increasing the ease of crossing the acts of rossing the area.

This considers landbridge and footbridge of improvements to the current underpass.

This considers landbridge and footbridge of improvements to the current underpass.

This considers the three options of an all improvements to the current underpass.

This considers the west of the A12. Red Links

15		15		15		15		15		16		16	
Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification
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1	This scheme is outside the core OLSPG area though will have an impact on the area.	1	This scheme is outside the core OLSPG area though will have an impact on the area.	1	This scheme is outside the core OLSPG area though will have an impact on the area.	2	These schemes will reduce the need to travel within the OLSPG area by reducing severance and therefore reducing the need to travel by public transport or car.	2	These schemes will reduce the need to travel within the OLSPG area by reducing severance and therefore reducing the need to travel by public transport or car.	2	Enables improved bus services as demand increases as well as reducing reliance on car travel.	:	Enables improved bus services as demand increases as well as reducing reliance on car travel.
1	This scheme will improve access to the DLR stations to the south of the A13.	C		0		C		O		1	Improve access to jobs at Stratford.	(9
C	0	C		0		C		0		0		(
C	0	(0		C	The value of this indicator would	0		0		(
							depend on whether a junction, crossing or underpass were chosen as the preferred option.						
C		C		0		C		O		1	This scheme would improve bus routing and improve reliability by reducing convoluted routes needed to serve these areas currently.		This scheme would improve bus routing and improve reliability by reducing convoluted routes needed to serve these areas currently.
C		(0		C		0		1	Reducing length of bus routes needed to serve this area.		
				,		,		,		·			
C		C		0		C		a)	0		(
1	This scheme includes improvements to bus stops.	C		0		C		0		1	Though improvements to bus journey time relaibility and reducing convoluted		Though improvements to bus journey time relaibility.
1	This scheme would improve the environment for pedestrians and	1	This scheme would improve the environment for pedestrians and	1	This scheme would improve the environment for pedestrians and	1	This scheme would improve the environment for pedestrians and	1	This scheme would improve the environment for pedestrians and	0	bus routes.	2	All movements junction will improve access for all road users.
C	cyclists.	C	cyclists.	0	cyclists.	C	cyclists.	0	cyclists.	0		(
2	This scheme would include significant	2	This scheme would include significant	2	This scheme would include significant	2	This scheme would include significant	1	This scheme would include	0		1	This scheme would include
	improvements to the streetscape in the area and reduce the convoluted crossings currently required.		improvements to the streetscape in the area compared to the underpass which is currently in this area.		improvements to the streetscape in the area compared to the underpass which is currently in this area.		improvements to the streetscape in the area compared to the underpass which is currently in this area.		improvements to the streetscape in the area compared to the current situation.				improvements to the streetscape in the area compared to the current situation.
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1	This scheme will improve walking and	1	This scheme will improve walking and	1	This scheme will improve walking and	1	This scheme will improve walking and	1	This scheme will improve walking and	0			All movements junction wil enable
	cycling access at the A12/A13 junction.		cycling access at the A12/Dee Street junction.		cycling access at the A12/Abbott Street junction.		cycling access at the A12/Twelvetrees junction.		cycling across the A12.				improved pedestrian and cyclist movements
1	The improvements to the streetscape from this scheme will increase the perception of safety and would be designed to reduce the opportunities for crime.	1	The perception of safety would be increased by providing an alternative to the current underpass in this area.	1	The perception of safety would be increased by improving or providing an alternative to the current underpass.	1	The perception of safety would be increased by improving or providing an alternative to the current underpass.	0		0		(
1	The improvements to the streetscape from this scheme will be designed to reduce the number of road traffic casualties.	1	The improvements to the streetscape from this scheme will be designed to reduce the number of road traffic casualties.	1	The improvements to the streetscape from this scheme will be designed to reduce the number of road traffic casualties.	1	The improvements to the streetscape from this scheme will be designed to reduce the number of road traffic casualties	1	The improvements to the streetscape from this scheme will be designed to reduce the number of road traffic casualties	0			The improvements to the streetscape from this scheme will be designed to reduce the number of road traffic casualties
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1	reduce casualties on the public transport network.	1	reduce casualties on the public transport network.	1	reduce casualties on the public transport network.	1	reduce casualties on the public transport network.	1	reduce casualties on the public transport network.	1			reduce casualties on the public transport network.
1	Improvements to the bus stops as part of this scheme would improve the	C		0		C		0		0		()
	physical accessibility of the bus network in this area.												
1	This scheme will improve access in this area and improve access to employment opportunities through improving access to the DLR network.	1	Improvements in connectivity for this area will support wider regeneration.	1	Improvements in connectivity for this area will support wider regeneration.	1	Improvements in connectivity for this area will support wider regeneration.	1		1	This scheme would enable improvements in bus services as demand increases.	1	
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-1	Concept stage.	-1	Concept stage for the pedestrian	-1	The underpass improvements are at	-1	Concept	1	Proposal in LMF	-1	Initial feasibility work undertaken		of Sugar House Lane site PBA sketch of scheme prepared
1		1	crossing. Engineering feasibility completed for landbridge and footbridge.	1	the concept stage. There is no status for the footbridge.	1		1		1			
1 Short		1 Short		1 Short		1 Short		1 Medium		1 Medium		Medium	
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A12 Study A12 Study

A12 Study
36,38 Further connectivity improvements at Bow Roundabout (after OPTEMS) including Flyover and Pudding Mill Lane Junction Improving the working of the highway network in the Bow Roundabout area to support both highway traffic movement and pedestrian crossings.

This could include improving links to Walthamstow using the proposed Hall pedestrian crossings.

Farm Curve rail link.

Farm Curve rail link.

Farm Curve rail link. Upgrade Olympic ped/cycle bridges to all modes in North Hackney Wick area, where appropriate.

Improve links between Hackney Wick north 44 Hertford Union Canal - Fish Island 3 Public accessible western canal bank of the Lea Navigation Improve north south pedestrian/cycle 44 Hertford Union Canal - Fish Island improve links between Hackney Wick south of the Hertford Union Canal across the River Lea Navigation to improve pedestrian/cycle access to the Olympic Park area.

This scheme consideres improved access to existing footbridge linking Hackney Wick and Fish Island, along with public realm enhancement.

modes in North Hackney Wick area, where appropriate.

Improve links between Hackney Wick north of the Hertford Union Canal across the River Lea Navigation to improve pedestrian/cycle access to the Olympic Park area.

This scheme consideres improved access to existing footbridge linking Hackney Wick area, where appropriate. Future phases of the "Fatwalk" prove north south pedestrian/cycle Connection to Lea River Park rove north south pedestrian/cycle Improve north south pedestrian/cycle connections through the area to support active travel and use of open space as well as supporting the development of a comprehensive walk and cycle network. This scheme would create a continuous public space along the Lea Navigation from Eastway to White Post Lane (Tower Hamlets) comprehensive walk and cycle network.

The development of a comprehensive walk and cycle network. connections through the area to support active travel and use of open space as we as supporting the development of a comprehensive walk and cycle network.

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Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification	Score	Comments and Justification					Score	Comments and Justification
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	Improvements to pedestrian and cycle facilities at this junction could reduce	1		2		2		2	This will reduce the need to travel by improving connectivity by walking and	2		2	This will reduce the need to travel by improving connectivity by walking and
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	1 Improvements to Bow roundabout would support highway movement.	0		O		C		()	0		C	<u> </u>
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	All movements junction will improve	^	improve customer sarisfaction for those currently making this journey.		This scheme would improve the		This scheme would improve the		This scheme would improve the		This scheme would improve the		This scheme would improve the
	2 All movements junction will improve access for all road users.	0		'	environment for pedestrians and cyclists.	'	environment for pedestrians and cyclists.		This scheme would improve the environment for pedestrians and cyclists.	1	This scheme would improve the environment for pedestrians and cyclists.		environment for pedestrians and cyclists.
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	improvements to the streetscape in the area compared to the current situation.	, and the second		·	improvements to the streetscape in the area compared to the current situation.		improvements to the streetscape in the area compared to the current situation.		improvements to the streetscape in the area compared to the current situation.		improvements to the streetscape in the area compared to the current situation.		improvements to the streetscape in the area compared to the current situation.
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	1 All movements junction wil enable	0		1	This scheme would improve walking	1	This scheme would improve walking	2	This scheme would improve walking	2	This scheme would improve walking	2	2 This scheme would improve walking
	improved pedestrian and cyclist movements				and cycling access.		and cycling access.		and cycling access.		and cycling access.		and cycling access.
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									increased by improving or providing an alternative to the current access to the		increased by improving or providing an alternative to the current access to the		increased by improving or providing an alternative to the current access to the
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	reduce the number of road traffic casualties.				reduce the number of road traffic casualties.		reduce the number of road traffic casualties.		reduce the number of road traffic casualties.		reduce the number of road traffic casualties.		reduce the number of road traffic casualties.
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	reduce casualties on the public transport network.				reduce casualties on the public transport network.		reduce casualties on the public transport network.						
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A12 Study Waltham Forest Option Report

Lea Interhonage - Improve pedestrian and cycle access through the junction	Maintain a balance in the use of the Eaterden Road and the Stratford "Lifeline"	17 Gillender Street Buses	19 St Andrews Way - two way bus link	Leyton Congestion Improvement
comprehensive walk and cycle network. This will provode a north-south access	as supporting the develonment of a comprehensive walk and cycle network. This will ensure that the Waterden Road does not become a barrier to walking and cycling.	reliance on car travel. In order to allow local bus services to serve the development sites to the east of the A12 between Twelvetrees Crescent and Lochnagar Street, the proposal is to remove existing Gillender Street - which is currently one way southbound (including bus lane) — and allow buses to use local access roads. A two way bus gate would be retained across Limehouse Cut which would link to the new access roads provided as part of the redevelopments north and south of the Cut.	Limehouse Cut at this location would strengthen links between Stratford and Docklands. This would provide better bus access and routing within the area.	Improve the accessibility of the station and reduce the need to implement station control measures to support development growth and encourage the use of public transport.
21	21	22	22	

		provided as	s part of the redevelopments south of the Cut.				
21	21	22		22		23	_
		Score (2,1,0,-1,-2)	Comments and Justification	Score (2,1,0,-1,-2)	Comments and Justification	Score (2,1,0,-1,-2)	Comments and Justification
1	1	2	Supports future bus services in development areas.	2	Enables improved bus services as demand increases as well as reducing relance on car travel.	2	This scheme would increase the capacity and accessibility of a key London Underground station in the area.
0	0	0		0		1	Through improved access to the rail station.
0	0	0		0		0	
			T				
0	0	2	This bus link would significantly improve the reliability of bus services using the route as it would remove the need to use the A12 and therefore reduce the impact of congestion on this road.	'	This scheme would improve bus routing and improve reliability by reducing convoluted routes needed to serve these areas currently.	·	Improvements to the station layout would reduce the possibility that the station would need to be closed due to being over capacity during peak periods.
1	0	1		1		2	
0	0	0		0		0	
0	0	1	Though improvements to bus journey time relaibility and reducing convoluted bus routes.	1	Though improvements to bus journey time relaibility and reducing convoluted bus routes.	1	Through improvements to the station and surrounding area as well as interchange to local buses.
1	1	0		0		1	This scheme would improve the environment for pedestrians and cyclists.
0	0	0		0		1	This should could help to reduce crowding at the LU station though would not impact on train crowding.
0	0	0	This scheme would reduce the use of Gilender Street as a way to jump the queue on the A12.	0		0	This scheme would include improvements to the streetscape in the area compared to the current situation.
0	0	0		0		0	
0	0	0		0		0	
1	1	0		0		1	This scheme will improve walking and cycling access to the station.
0	0	0		0		1	The perception of safety would be increased by improving or providing an alternative to the current access to the station.
1	1	1	This scheme would reduce the use of Gilender Street as a way to jump the queue on the A12.	0		1	The improvements to the streetscape from this scheme will be designed to reduce the number of road traffic casualties. The improvements to the streetscape
							from this scheme will be designed to reduce casualties on the public transport network.
0	0	0		0		1	
1	1	1	This scheme would enable	1	This scheme would enable	1	Improvements in connectivity for this
0	0	0	improvements in bus services as demand increases.	0	improvements in bus services as demand increases.	0	area will support wider regeneration.
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Annex D: Connectivity schemes included in the highway modelling to test the impact on the highway network

No.	Name	Objectives	Schemes included/description	Phasing	Source	Borough
1	Roman Road Olympic Links	Improve links between Fish Island and Stratford City to support the regeneration of Fish Island.	There are two proposed routes for this link: 1) Bridge across A12 - Roman Road to Maverton Road and Road link over the canal to the south of the Olympic Stadium 2) Bridge across A12 at Old Ford Road - upgrade existing footbridge to vehicular bridge and a bridge across River Lea at the historic Ford Further studies are required to understand the feasbility, alignment and modal access that is appriopriate for this area.	Long Term (1) Medium Term (2)	Tower Hamlets Connectivity Study	Tower Hamlets
3	Improved all mode crossings of river between Poplar Riverside and Cody Road Industrial Area	Improve links over the River Lea south of Bromley-by-Bow to support the regeneration of both sides of the river and enable development to come forward. This would also improve eastwest links to West Ham.	These could include: 1) Lochnagar Bridge - Bus, pedestrian and cycle only bridge over the River 2) Lochnagar - Cody Road road bridge (with sections for bus and cycle) 3) Leven Road Bridge - vehicular bridge over the river 4) Upgrade and link Bidder Street to Leven Road bridge	Medium Term	Lower Lea Valley Connectivity	Newham and Tower Hamlets

4	Stratford Town Centre Highway Improvements	Improve the highway network in Stratford Town Centre to reduce congestion and improve journey time reliability in the area. As well as, enabling an improved environment for pedestrians and cyclists to support the regeneration of Stratford Town Centre.	These could include: 1) Down-scale Warton Road Junction 2) Improvement and provision of new north-south connections over the east-west rail corridor 3) Stratford Gyratory Improvements - Modifications to convert the gyratory system to two-way operations or major highway reconfiguration planning through holistic masterplan 4) Re-establish St John's Walk - Removal of bus routes and redesign of road into a narrower, shared surface. 5) West Ham Lane & Tramway Square - Closure of the bus only lane to allow for the creation of a new town square. 6) Stratford High Street downgrade - Removal of dedicated bus lanes east of Warton Road to improve cycle and pedestrian environment 7) Stratford Regional Station - new South entrance from Carpenters Estate 8) Creation of the Northern Parallel - particularly the establishment of the link from Jupp Road bridge to Pudding Mill Lane Station through Carpenters Estate	Short Term Medium Term (3)	Metropolitan Stratford Masterplan Fringe Masterplan	Newham
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15	Pedestrian and cycle links across the A12	The A12 causes significance severance between the east and west. This reduces the availability of services and employment opportunities for residents either side of the A12. Increasing the ease of crossing the road will support the regeneration of the area.	This could include: 1) A13/A12 junction 2) A12/Dee Street Junction 3) A12/Abbott Road 4) A12/Twelvetrees Crescent 5) Pedestrian improvements between Bromley North and Bromley High Street 6) Pedestrian/cycle bridge over A12 at Wrexham Road 7) Connection to Hackney Marshes	Short to Long Term	A12 Study Bromley North Masterplan Hackney Wick Masterplan	Tower Hamlets and Hackney
16	Sugar House Lane Improvements	Improving access into the Sugar House Lane development for buses to enable increased services when demand is sufficient.	This could include: 1) Sugar House Lane bus bridge 2) A11/Sugar House Lane junction	Medium to Long Term	A12 Study	Newham and Tower Hamlets
17	Further improvements at Bow Roundabout (after short term OPTEMS improvements)	Improving the working of the highway network in the Bow Roundabout area to support both highway traffic movement and pedestrian crossings.	This could include removal of flyover with possible improvements to Pudding Mill Lane Junction and the creation of a new four-way junction linking Sugar House Lane with Pudding Mill Lane	Long Term	A12 Study	Newham and Tower Hamlets
19	Improved links between Hackney Wick (south of the Hertford Union Canal across the River Lea Navigation)	Improve links between Hackney Wick south of the Hertford Union Canal across the River Lea Navigation to improve pedestrian/cycle access to the Olympic Park area.	This could include enhancements to the pedestrian/cycle bridge at Monier Road.	Medium Term		Hackney Tower Hamlets

20	Improved links between Hackney Wick (north of the Hertford Union Canal across the River Lea Navigation)	Improve links between Hackney Wick north of the Hertford Union Canal across the River Lea Navigation to improve pedestrian/cycle to the Olympic Park area.	This could include enhancements to the pedestrian/cycle bridge at Wallis Road	Medium Term		Hackney
23	Leyton station congestion relief and improved access	Improve the accessibility of the station and reduce the need to implement station control measures to support development growth and encourage the use of public transport.	This could include improvements to the station layout and capacity, namely larger entrance, ticket hall, stairways and the potential addition of step free access. It could also incorporate improvements to the station walking and cycling access.	Long Term	Waltham Forest Option Review Report	Waltham Forest