

SILVERTOWN TUNNEL

SUPPORTING TECHNICAL DOCUMENTATION

PRELIMINARY DISTRIBUTIONAL IMPACTS APPRAISAL

October 2015

This report considers the extent to which the Scheme could impact on specific social groups. These include children, older people, people with a disability, Black, Asian and Minority Ethnic communities, people without access to a car and people on low incomes. It assesses eight transport benefit indicators: users benefits, noise, air quality, accidents, security, severance, accessibility and personal affordability. This report forms part of the Preliminary Outline Business Case.

This report forms part of a suite of documents that support the statutory public consultation for Silvertown Tunnel in October – November 2015. This document should be read in conjunction with other documents in the suite that provide evidential inputs and/or rely on outputs or findings.

The suite of documents with brief descriptions is listed below:-

- **Preliminary Case for the Scheme**
 - Preliminary Monitoring and Mitigation Strategy
- **Preliminary Charging Report**
- **Preliminary Transport Assessment**
- **Preliminary Design and Access Statement**
- **Preliminary Engineering Report**
- **Preliminary Maps, Plans and Drawings**
- **Preliminary Environmental Information Report (PEIR)**
 - Preliminary Non Technical Summary
 - Preliminary Code of Construction Practice
 - Preliminary Site Waste Management Plan
 - Preliminary Energy Statement
- **Preliminary Sustainability Statement**
- **Preliminary Equality Impact Assessment**
- **Preliminary Health Impact Assessment**
- **Preliminary Outline Business Case**
 - Preliminary Distributional Impacts Appraisal
 - Preliminary Social Impacts Appraisal
 - Preliminary Economic Assessment Report
 - Preliminary Regeneration and Development Impact Assessment

SILVERTOWN TUNNEL

Preliminary Distributional Impacts Appraisal

October 2015

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Silvertown Tunnel

Preliminary Distributional Impacts Appraisal



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Infrastructure Planning

The Infrastructure Planning (Applications: Prescribed Forms and Procedure)
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List of Abbreviations

BAME	Black, Asian and Minority Ethnic
COBA-LT	Cost and Benefit to Accidents - Light Touch
DCO	Development Consent Order
DfT	Department for Transport
DI	Distributional Impacts
DLR	Docklands Light Railway
DMRB	Design Manual for Roads and Bridges
EAL	Emirates Air Line
EAR	Economic Assessment Report
EIA	Environmental Impact Assessment
ELHAM	East London Highway Assignment Model
EqIA	Equality Impact Assessment
FALP	Further Alterations to the London Plan
HGV	Heavy Goods Vehicle
HIA	Health Impact Assessment
IoD	Index of Deprivation
IoMD	Index of Multiple Deprivation
LAD	Local Authority District
LB	London Borough
LTDS	London Travel Demand Survey
MTS	Mayor's Transport Strategy
OBC	Outline Business Case
ONS	Office for National Statistics
PT	Public Transport
RB	Royal Borough
RXHAM	River Crossings Highway Assignment Model
TA	Transport Assessment
TAG	Transport Assessment Guidance
TfL	Transport for London
TUBA	Transport User Benefit Appraisal

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Glossary of Terms

Term	Explanation
Assessed Case	The basis on which all assessment and modelling has been carried out
Blackwall Tunnel	<p>A road tunnel underneath the River Thames in east London, linking the London Borough of Tower Hamlets with the Royal Borough of Greenwich, comprising two bores each with two lanes of traffic.</p> <p>The tunnel was originally opened as a single bore in 1897, as a major transport project to improve commerce and trade in London's east end. By the 1930s, capacity was becoming inadequate, and consequently, a second bore opened in 1967, handling southbound traffic while the earlier 19th century tunnel handled northbound.</p>
Department for Transport (DfT)	The government department responsible for the English transport network and a limited number of transport matters in Scotland, Wales and Northern Ireland that have not been devolved.
Detailed Design	Design that delivers the required outcomes and is used as the basis of a contract for delivery of the physical outputs
Development Consent Order (DCO)	<p>This is a statutory order which provides consent for the project and means that a range of other consents, such as planning permission and listed building consent, will not be required. A DCO can also include provisions authorising the compulsory acquisition of land or of interests in or rights over land which is the subject of an application.</p> <p>http://infrastructure.planninginspectorate.gov.uk/help/glossary-of-terms/</p>
Docklands Light Railway (DLR)	An automated light metro system serving the Docklands and east London area. The DLR is operated under concession awarded by Transport for London to KeolisAmey Docklands, a joint venture between transport operator Keolis and infrastructure specialists Amey plc
Emirates Air Line (EAL)	A cable car service across the River Thames in east London, linking the Greenwich peninsula to the Royal Victoria Dock. The service is managed by TfL, and is part of the TfL transport network
Heavy Goods Vehicle (HGV)	European Union term for any vehicle with a gross combination mass of over 3,500kg
The O2	A large entertainment district on the Greenwich peninsular, including an indoor arena, cinema, bars and restaurants. It is built largely within the former Millennium Dome

Term	Explanation
The Scheme	The construction of a new bored tunnel under the River Thames between the Greenwich peninsula and Silvertown, as well as necessary alterations to the connecting road network and the introduction of user charging at both Silvertown and Blackwall tunnels
Transport for London (TfL)	<p>A local government body responsible for most aspects of the transport system in Greater London. Its role is to implement transport strategy and to manage transport services across London.</p> <p>These services include: buses, the Underground network, Docklands Light Railway, Overground and Trams. TfL also runs Santander Cycles, London River Services, Victoria Coach Station and the Emirates Air Line.</p> <p>As well as controlling a 580km network of main roads and the city's 6,000 traffic lights, TfL regulates London's private hire vehicles and the Congestion Charge scheme.</p>
The Tunnel, Silvertown Tunnel	A new bored tunnel under the River Thames between the Greenwich peninsula and Silvertown
Woolwich Ferry	<p>The Woolwich Ferry links Woolwich (Royal Borough of Greenwich) and North Woolwich (London Borough of Newham). It also links two ends of the inner London orbital road routes; the North Circular and South Circular.</p> <p>It runs every 5-10 minutes throughout the day, from Monday to Friday and every 15 minutes on Saturdays and Sundays. It carries pedestrians, cyclists, cars, vans and lorries. The ferry is operated by Briggs Marine and Environmental on behalf of TfL.</p>

SUMMARY

1. Introduction

1.1 Transport for London (TfL) is proposing to construct a new bored tunnel under the River Thames between the Greenwich Peninsula and Silvertown ('the Silvertown Tunnel', 'the Scheme'). This document reports on the Distributional Impact Assessment and is one of several documents prepared for the October 2015 statutory consultation preceding the proposed application for a Development Consent Order (DCO) for the Silvertown Tunnel in early 2016. It builds on the initial Distributional Impact Assessment document prepared for public consultation that took place in October 2014.

1.2 The benefits and disbenefits of the Scheme may be experienced to different extents by different specific social groups. These may include: children, older people, people with a disability, Black, Asian and Minority Ethnic (BAME) communities, people without access to a car and people on low incomes. It is important to make sure that people who belong to vulnerable groups are not disadvantaged further by receiving a disproportionately low share of the Scheme benefits, or a disproportionately high share of the Scheme disbenefits

1.3 The distributional impacts appraisal compares the distribution of Scheme benefits against the distributions of specific social group populations to assess the extent to which Scheme benefits are experienced by those groups compared with the general population.

2. Assessment

2.1 This assessment has been prepared in accordance with the Department for Transport (DfT) TAG guidance (unit A4.2).

2.1 There are eight transport benefit indicators that are assessed in the distributional impact appraisal - these are as follows:

- user benefits;
- noise;
- air quality;
- accidents;
- security;

- severance;
- accessibility; and
- personal affordability.

2.3 The geographic distribution of the indicators described above has been compared with the geographic distribution of concentrations of groups that may be particularly susceptible to the positive or negative impacts.

3. Conclusions

3.1 The outputs from the distributional impacts assessments are summarised in the table.

Indicator	Assessment	Conclusion
User benefits	Overall net user benefits of £14.2m (initial assessment) and £16.2m (including reliability benefits in 2021 (2010 prices)). The impact is strong beneficial for low income users and slight beneficial for medium-high income users.	Moderate beneficial
Noise	An initial assessment indicates a slight overall decrease in noise levels for children and people on low incomes.	Slight beneficial
Air quality	An initial assessment indicates that improvements in air quality would particularly benefit children and people in the most income-deprived areas. People in other areas would experience beneficial or neutral air quality impacts.	Moderate beneficial
Accidents	There would be a reduction in overall accident numbers within the impact area. For most vulnerable groups the impacts are scored as moderate or large beneficial.	Moderate beneficial
Security	Initial screening indicated that the Scheme would have no material impacts on security.	N/A
Severance	High concentrations of vulnerable groups on minor roads with decreases in vehicle flow would enhance the small positive impacts for those groups.	Slight beneficial

Silvertown Tunnel
Preliminary Distributional Impacts Appraisal

Indicator	Assessment	Conclusion
Accessibility	Accessibility impacts are scored as beneficial for all assessments. The impact area contains a high proportion of non-car-owning households.	Moderate beneficial
Personal Affordability	User charges would have a slight adverse impact on people on low incomes and mainly impact people on higher incomes. Benefits from public transport modes would mainly benefit people on low incomes. This does not take into account the monetary value of time savings and reliability, which the user benefit estimate above shows are greater than the level of user charges.	Neutral

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1. INTRODUCTION

1.1 Purpose of report

1.1.1 Transport for London (TfL) is proposing to construct a new highway tunnel under the River Thames between the Greenwich Peninsula and Silvertown ('the Silvertown Tunnel', 'the Scheme').

1.1.2 The Scheme, like all transport interventions, would have social impacts upon travellers using the crossings and people living or working in its vicinity.

1.1.3 The Distributional Impacts Appraisal is closely linked with the Social Impacts Appraisal. The Social Impacts Appraisal looks at the overall impact of a range of indicators that are not already part of economic or environmental assessments. The Distributional Impacts Appraisal looks at the extent to which the Scheme impacts affect different specific social groups. These may include: children, older people, people with a disability, Black, Asian and Minority Ethnic (BAME) communities, people without access to a car and people on low incomes. It also informs the Health Impact Assessment (HIA) and Equality Impact Assessment (EqIA).

1.1.4 An initial Distributional Impact (DI) Appraisal was undertaken in October 2014 as part of the Preliminary Outline Business Case¹ (OBC), one of several documents published for public consultation at that time. This has now been superseded by this document, which is based on an updated and revised transport model and additional analysis.

1.1.5 The assessment has been prepared in line with current guidance: Department for Transport, Distributional Impact Appraisal TAG Unit A4.2.

1.2 Project objectives

1.2.1 Scheme objectives were identified with reference to the need for the Scheme, and also draw from the National Policy Statement for National Networks, Mayoral policy as defined in the London Plan and Mayor's Transport Strategy (MTS), and Scheme development work undertaken to-date and described in more detail later in this chapter. The following Scheme objectives have been adopted:

- PO1: to improve the resilience of the river crossings in the highway network in east and southeast London to cope with planned and unplanned events and incidents;

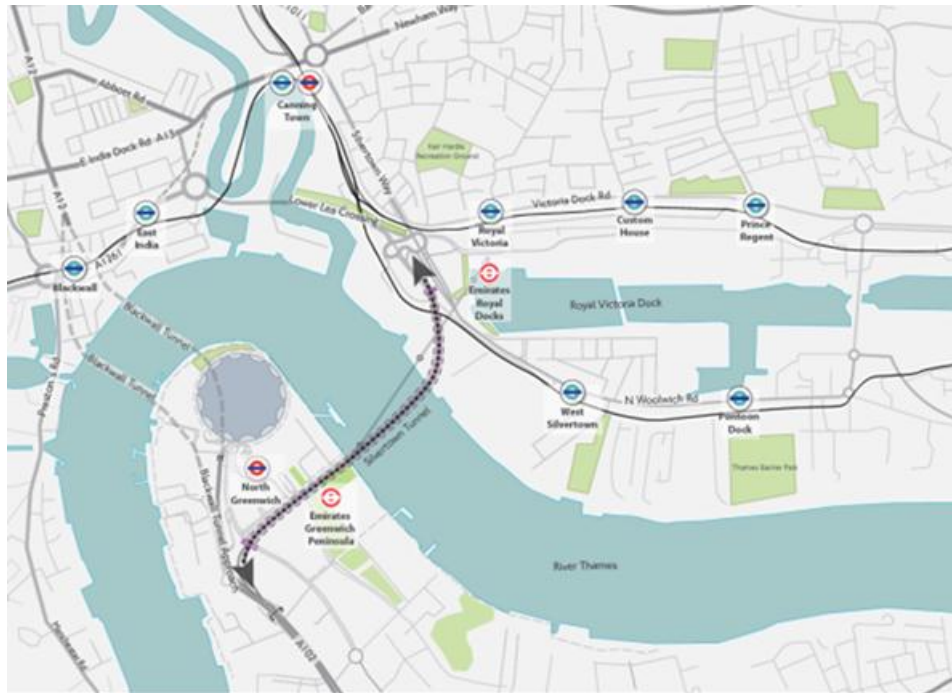
¹ Silvertown Tunnel Outline Business Case, TfL, September 2014

- PO2: to improve the road network performance of the Blackwall Tunnel and its approach roads;
- PO3: to support economic and population growth, in particular in east and southeast London by providing improved cross-river transport links;
- PO4: to integrate with local and strategic land use policies;
- PO5: to minimise any adverse impacts of any proposals on communities, health, safety and the environment;
- PO6: to ensure where possible that any proposals are acceptable in principle to key stakeholders, including affected boroughs; and
- PO7: to achieve value for money and, through road user charging, to manage congestion.

1.3 Project description

1.3.1 The Scheme would comprise a new dual two-lane connection between the A102 Blackwall Tunnel Approach on Greenwich Peninsula (Royal Borough of Greenwich) and the Tidal Basin Roundabout junction on the A1020 Lower Lea Crossing/Silvertown Way (London Borough of Newham) by means of twin tunnel bores under the River Thames and associated approach roads. As shown in Figure 1.1, the Silvertown Tunnel would be approximately 1.4km long. The Boord Street footbridge over the A102 would be replaced with a pedestrian and cycle bridge.

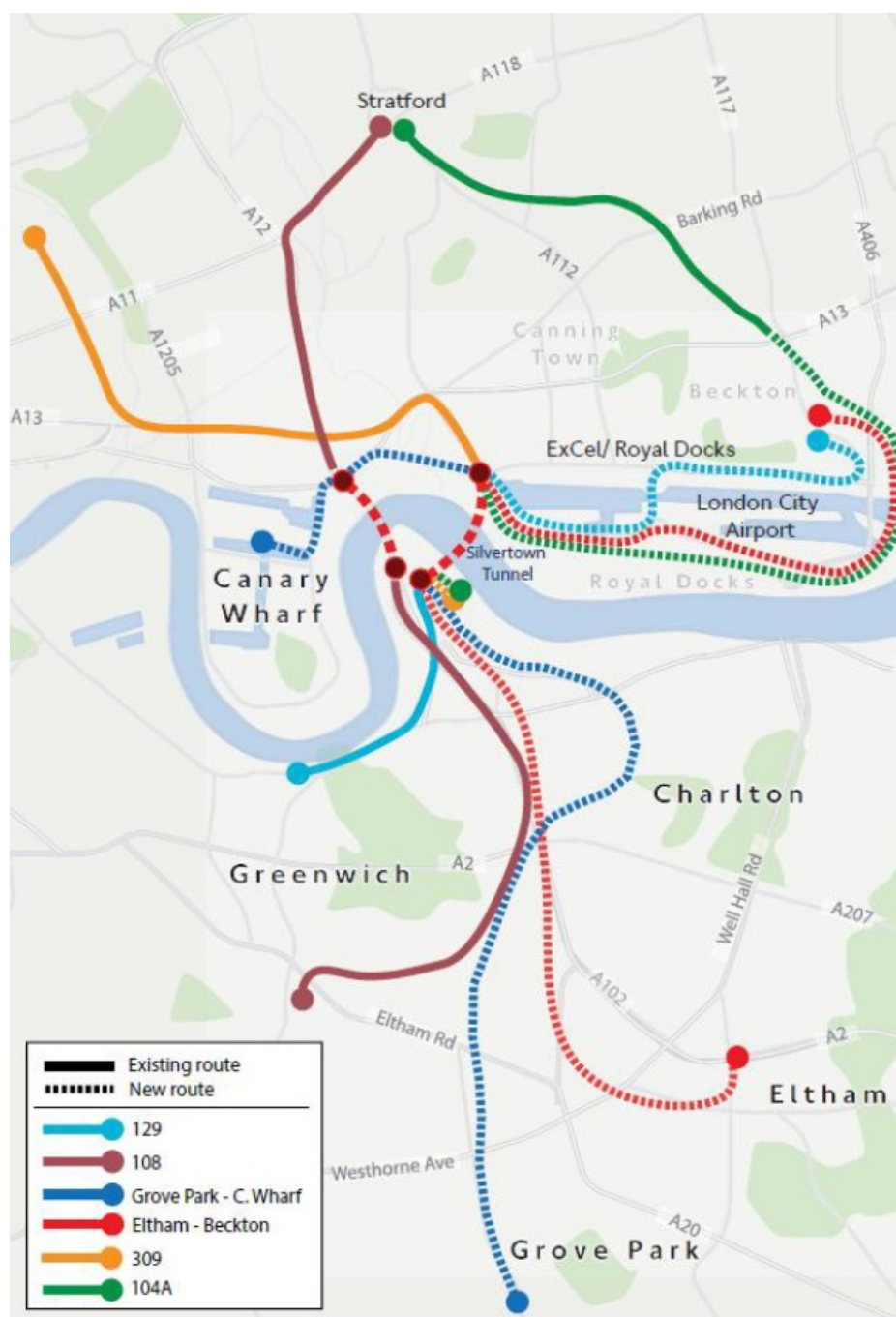
Figure 1.1 Silvertown Tunnel location plan



- 1.3.2 New buildings would be located close to each portal to house the plant and equipment necessary to operate the tunnel, including ventilation equipment.
- 1.3.3 The introduction of free-flow user charging on both the Blackwall and Silvertown Tunnels would play a fundamental part in managing traffic demand. It would also support the financing of the construction and operation of the Silvertown Tunnel.
- 1.3.4 Main construction works would likely commence in 2018 and would last approximately 4 years with the new tunnel opening in 2022/23.
- 1.3.5 The Scheme would create opportunities for new cross-river bus services to improve public transport links between southeast and east London, notably the growing employment areas in the Royal Docks and Canary Wharf. The Silvertown Tunnel is designed to accommodate double-deck buses, thus providing operational flexibility for the bus routes that could be extended across the River Thames, as well as greater capacity.
- 1.3.6 It is currently proposed that one lane in each direction through the tunnel bores would be reserved for buses and Heavy Goods Vehicles (HGVs), which would further enhance reliability and reduce bus journey times.
- 1.3.7 However, since the Silvertown Tunnel has an assumed opening date of 2022/23, any plans for the bus network at this time can only be indicative

and for the purpose of assessing operational feasibility. Services would be finalised around two years before opening, but TfL has identified two potential new services and enhancements to four existing services (predominantly though cross-river extensions) for modelling purposes, as shown in Figure 1.2.

Figure 1.2 Improvements to bus services



1.4 Scope of Distributional Impacts Appraisal

- 1.4.1 The benefits and disbenefits of a transport scheme may be experienced to different extents by different groups of people. For example, people without access to a car may experience more benefit from improvements to local public transport services than those who have access to a car.
- 1.4.2 It is important that people who belong to vulnerable groups are not disadvantaged further by receiving a disproportionately low share of the scheme benefits, or a disproportionately high share of the scheme disbenefits.
- 1.4.3 The Distributional Impacts Appraisal compares the distribution of Scheme benefits against the distributions of different social groups to assess the extent to which Scheme benefits are experienced by those groups compared with the general population.
- 1.4.4 There are eight transport benefit indicators that are assessed in the Distributional Impacts Appraisal - these are as follows:
- user benefits;
 - noise;
 - air quality;
 - accidents;
 - security;
 - severance;
 - accessibility; and
 - personal affordability.
- 1.4.5 Table 1.1 sets out the groups of people that TAG indicates should be identified in the analysis for each indicator.

Table 1.1 Scope of social-demographic analysis for distributional impacts

Social group Data set	User benefits	Noise	Air quality	Accidents	Security	Severance	Accessibility	Affordability
Income distribution	✓	✓	✓				✓	✓
Children: proportion of population aged <16		✓	✓	✓	✓	✓	✓	
Young adults: proportion of population aged 16-25				✓			✓	
Older people: proportion of population aged 70+				✓	✓	✓	✓	
Proportion of population with a disability					✓	✓	✓	
Proportion of population of Black, Asian and Minority Ethnic (BAME) origin					✓		✓	
Proportion of households without access to a car						✓	✓	
Carers: proportion of households with dependent children							✓	

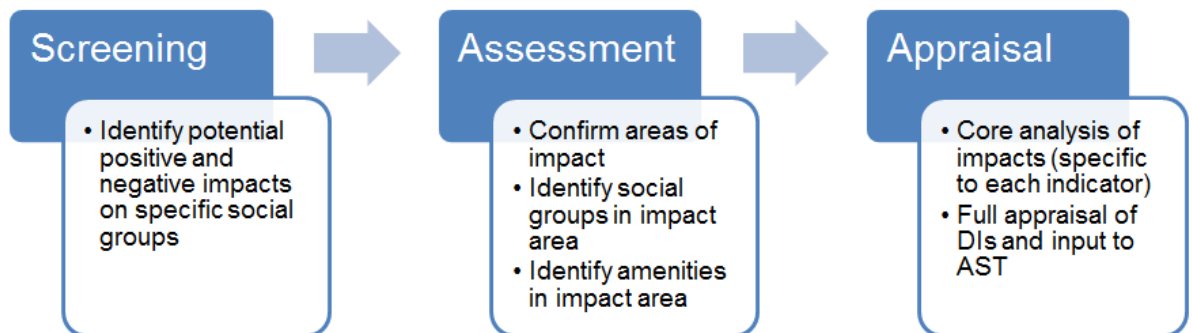
1.4.6 Distributional impacts are assessed on a seven-point scale, described in Table 1.2. For example, if a particular group accounts for 25% of the population but receives more than 30% of the benefit then the impact for that group is scored as large beneficial; if a group that accounts for 25% of the population receives less than 20% of the benefit then the impact is scored as slight beneficial.

Table 1.2 Distributional impacts scoring system

Description	Assessment	symbol
Beneficial and 5% or more greater than the proportion of the group in the total population	Large beneficial	✓✓✓
Beneficial and in line (+/-5%) with the proportion of the group in the total population	Moderate beneficial	✓✓
Beneficial and 5% or more smaller than the proportion of the group in the total population	Slight beneficial	✓
There are no benefits or disbenefits experienced	Neutral	○
A disbenefit which is 5% or more smaller than the proportion of the group in the total population	Slight adverse	×
A disbenefit which is in line (+/-5%) with the proportion of the group in the total population	Moderate adverse	××
A disbenefit which is 5% or more greater than the proportion of the group in the total population	Large adverse	×××

1.4.7 Figure 1.3 provides an overview of the distributional impacts assessment methodology.

Figure 1.3 Distributional Impacts appraisal methodology



1.4.8 The findings of the distributional impacts assessments are entered in the Appraisal Summary Table (AST) in the Preliminary Outline Business Case (OBC)².

1.5 Modelling and other information

1.5.1 The DI report is based on information supplied by other work streams relating to the Preliminary Outline Business Case, in particular modelling and work on user charging.

² Silvertown Tunnel Preliminary Outline Business Case, TfL, September 2015

1.5.2 Strategic transport modelling of the Scheme, reported in the Silvertown Tunnel Preliminary Transport Assessment³ (TA), has been undertaken to predict the Scheme impacts, and economic assessment (reported in the Preliminary Economic Assessment Report⁴ (EAR)) has been undertaken to appraise the transport benefits, transport disbenefits, revenues and scheme costs. Transport models have been prepared for 2021, 2031 and 2041 to assess the transport impacts in the light of population growth, background changes in travel behaviour and committed. The assumed opening year for the tunnel is 2022/23, and the modelling year of 2031 has been used in the assessment.

1.5.3 The Scheme is evaluated against an assumed future Reference Case ('Do-Minimum') scenario. The Silvertown Tunnel Preliminary Charging Report⁵ sets out a range of charging options to manage demand for the river crossings. Under the Assessed Case, both the Silvertown and Blackwall Tunnels assume the same levels of charge as each other at all times.

1.6 Area of assessment

1.6.1 The area of assessment has been defined for each indicator based upon the latest modelling results, with the focus being on areas where material changes are likely.

³ Silvertown Tunnel Preliminary Transport Assessment, TfL, September 2015

⁴ Silvertown Tunnel Preliminary Economic Assessment. TfL, September 2015

⁵ Silvertown Tunnel Preliminary Charging Report, TfL, September 2015

2. EXISTING CONDITIONS

2.1 Introduction

2.1.1 This section presents the existing transport and movement networks in the vicinity of the proposed Scheme and describes in summary the role of the Blackwall Tunnel in the existing road network. A broad indication of existing volumes of cross-river movements by all modes is described, expressed in both the number of person trips and the number of vehicles, and a summary of current network operating conditions is described. A more detailed analysis of the operational issues encountered at the Blackwall Tunnel is provided in the TA.

2.2 Transport provision

2.2.1 There has been a period of sustained investment in public transport capacity across the whole of east London over the past 20 years and this will continue with the introduction of Crossrail services from 2018. Conversely, there has been little investment in the road network in east London with only three existing crossings in 23km between Tower Bridge and the M25 (Dartford).

2.2.2 As a result in the morning peak hour, there are over 69,000 cross-river trips in east London in the peak northbound direction, of which over 57,000 are by public transport modes. The limited numbers of road crossings east of London Bridge carry just over 12,000 northbound car, taxi or goods vehicle person trips.

2.2.3 In terms of use by longer-distance traffic and high volumes, the only current 'strategic' cross-river highway link between central London and the M25 is the Blackwall Tunnel. It is an essential river crossing for freight and servicing vehicles and it also carries a significant number of peak commuter coach trips to Canary Wharf and central London. However it suffers from excessive congestion and long delays during peak periods, with queues of many hundreds of vehicles – journey times are also very unreliable due to the number and effect of incidents in the tunnels and on the approach roads.

2.2.4 A single scheduled bus service uses the Blackwall Tunnel, route 108, which is a 24-hour service scheduled to operate around every 10 minutes during the day between Stratford and Lewisham. This service is also impacted by the delays and reliability issues noted above and is limited to single deck vehicles due to height restrictions in the northbound tunnel. There are also many commuter coaches, primarily from Kent, which use

the Blackwall Tunnel in the peak periods and experience delay and congestion.

2.2.5 The Blackwall Tunnel consists of two separate tunnel bores- the northbound tunnel is characterised by more vehicle restrictions and lower capacity than the southbound tunnel. Unplanned closures of the Blackwall Tunnel regularly have an impact on network resilience.

2.3 Socio-economic profiles in the locality of the Scheme

2.3.1 Table 2.1 shows the concentrations of key social groups, based on census 2011 data, in the three host boroughs of the Scheme: Royal Borough of (RB) Greenwich, London Borough of (LB) Newham and LB Tower Hamlets.

Table 2.1 Concentrations of key social groups

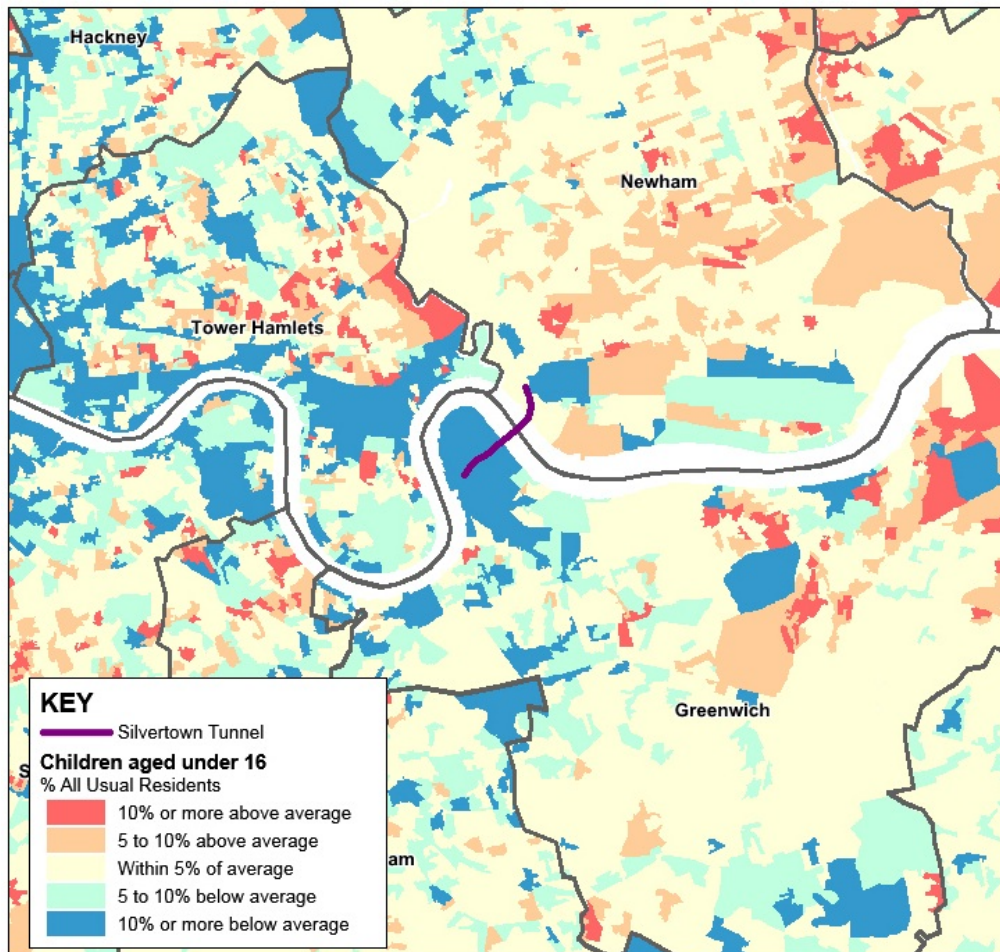
Values	RB Greenwich	LB Newham	LB Tower Hamlets	Average across all three boroughs	Whole of London
Children under 16 (% all usual residents)	22	23	20	21	20
Young people aged 16-25 (% all usual residents)	15	19	20	18	14
Older people aged 70+ (% all usual residents)	7	5	4	5	8
Disabled people (% all usual residents)	15	14	14	14	14
Black, Asian and Minority Ethnic (% all usual residents)	38	71	55	56	40
Households with no car (% households)	42	52	63	52	42
Households with one or more dependent children (% households)	34	39	27	33	31

2.3.2 The figures below compare the concentrations of key demographic groups at census Output Area⁶ (OA) level against the average concentrations across the three scheme host boroughs as a whole.

⁶ Census Output Areas are the smallest area boundary definitions for which disaggregated Census data is available

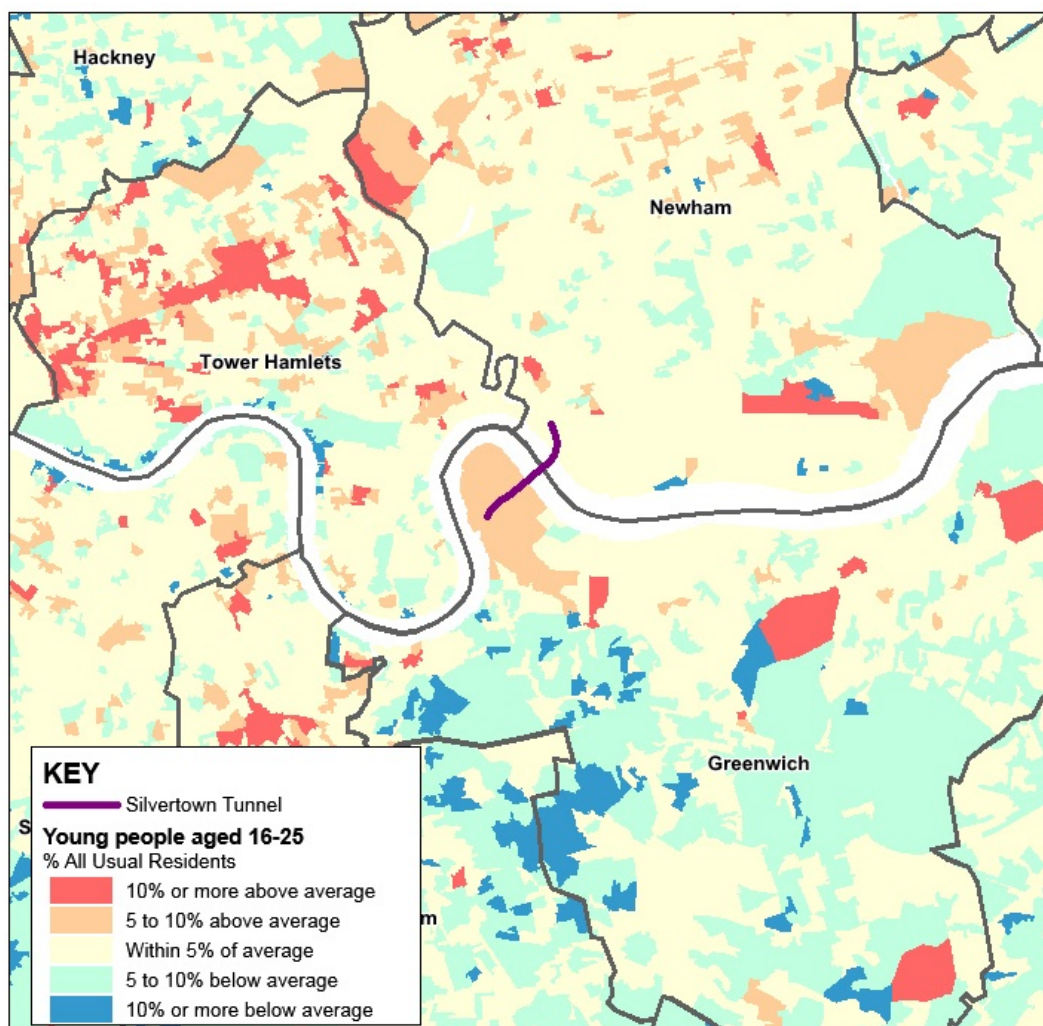
2.3.3 Children aged under 16 are a key demographic group considered in six out of eight distributional impacts assessments. Figure 2.1 shows the percentage of the population aged under 16 in each census output area against the average of 21% across the three host boroughs. The concentrations of children in the areas closest to the Scheme tend to be in line with or lower than the average.

Figure 2.1 Population aged under 16



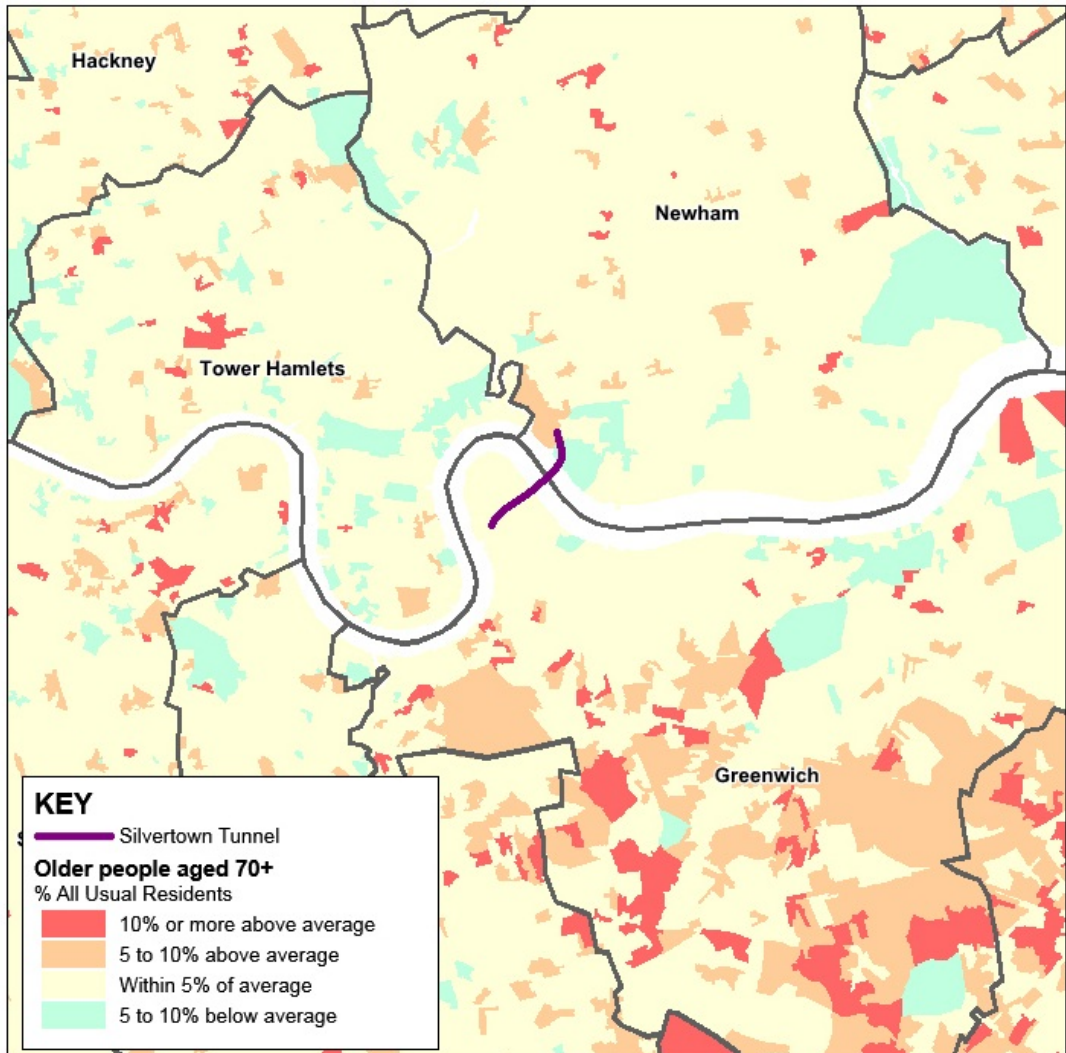
2.3.4 The proportion of young adults aged 16-25 is a key demographic group considered in the assessment of distributional impacts of accidents and accessibility. Figure 2.2 shows the percentage of population aged 16-25 in each LSOA against the average across the three boroughs. There is a higher than average concentration of young people close to the Scheme in the Greenwich Peninsula.

Figure 2.2 Population aged 16-25



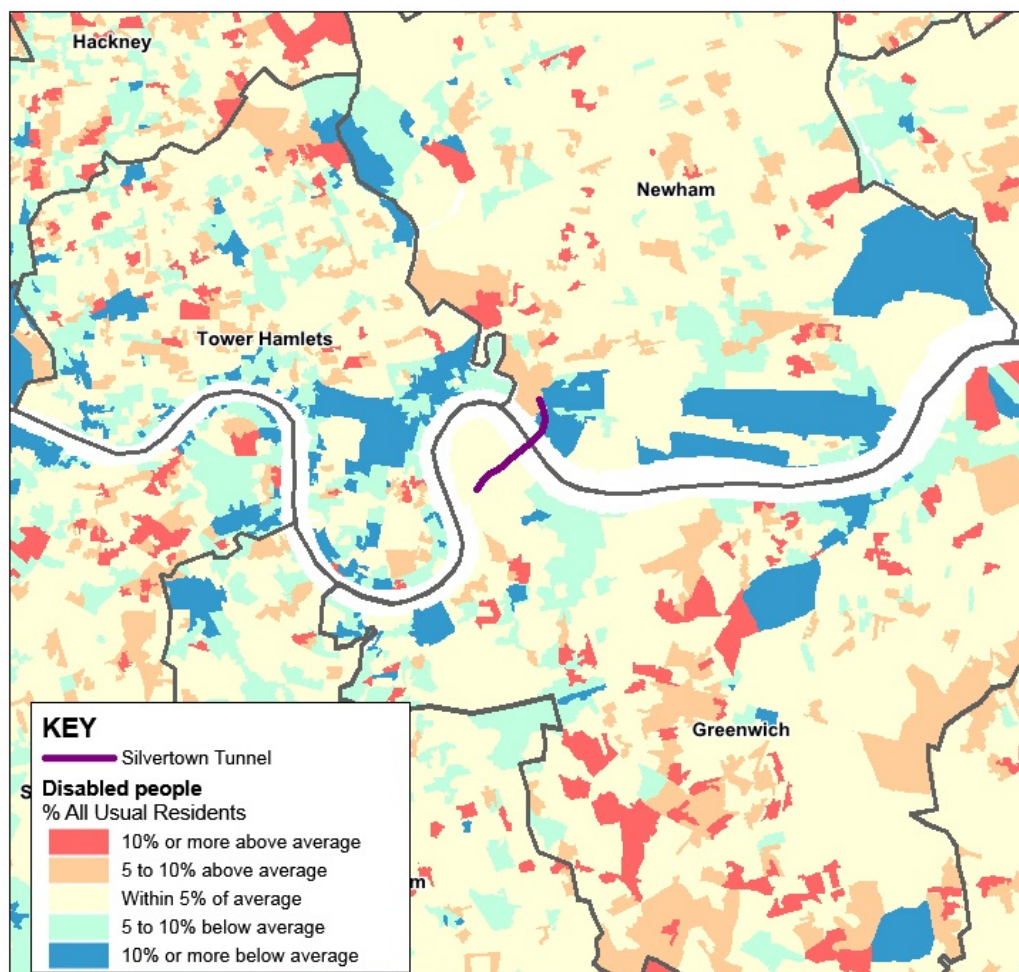
2.3.5 Older people are a key demographic group considered in the assessment of distributional impacts of accidents, security, severance and accessibility. Figure 2.3 shows the percentage of population aged 70 plus in each census output area against the average of 5% across the three host boroughs. In most areas the concentration of older people is in line with the average, however there is a relatively high concentration of older people close to the Silvertown Tunnel north portal.

Figure 2.3 Population aged 70 plus



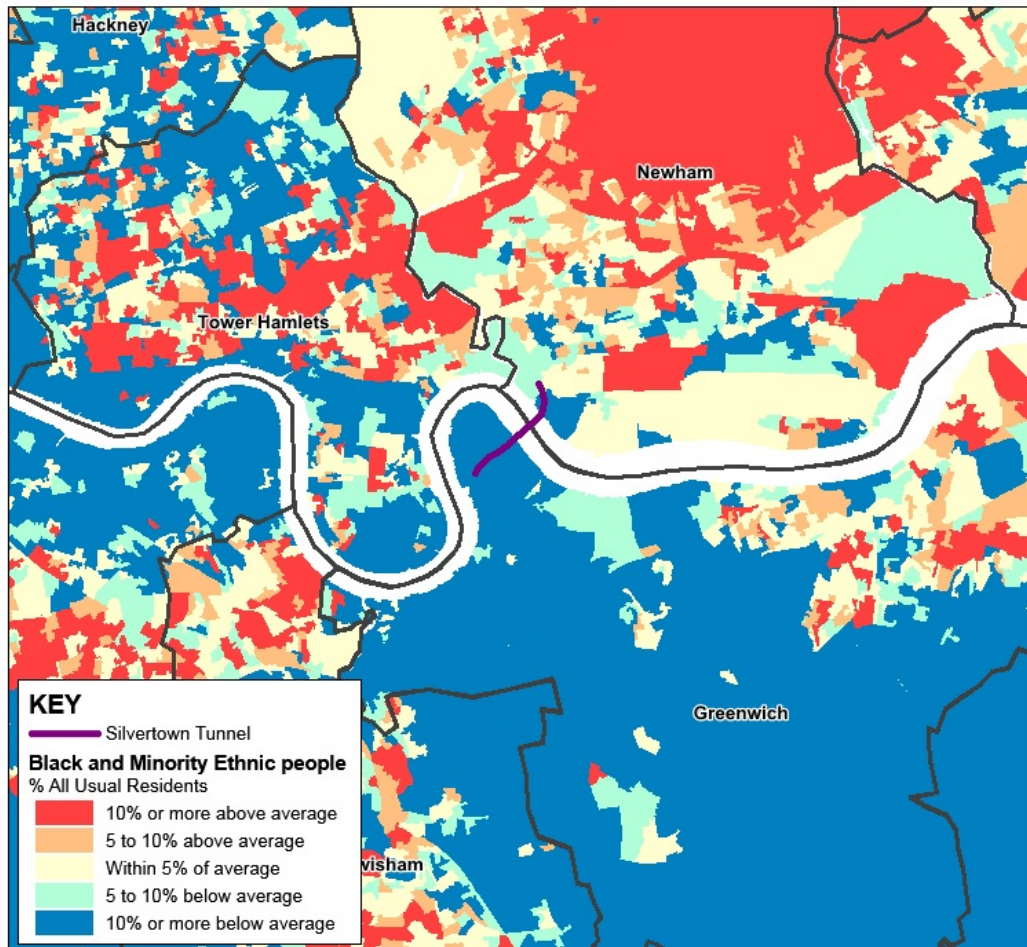
2.3.6 Disabled people are a key demographic group considered in the assessment of distributional impacts of security, severance and accessibility. Figure 2.4 shows the percentage of the population in each output area whose day-to-day activities are limited a little or a lot by a disability or long term health issue, compared with an average of 14% across the three host boroughs. The proportion of the population with a disability in areas closest to the Scheme tends to be in line with the average.

Figure 2.4 Population with a disability or long term health issue



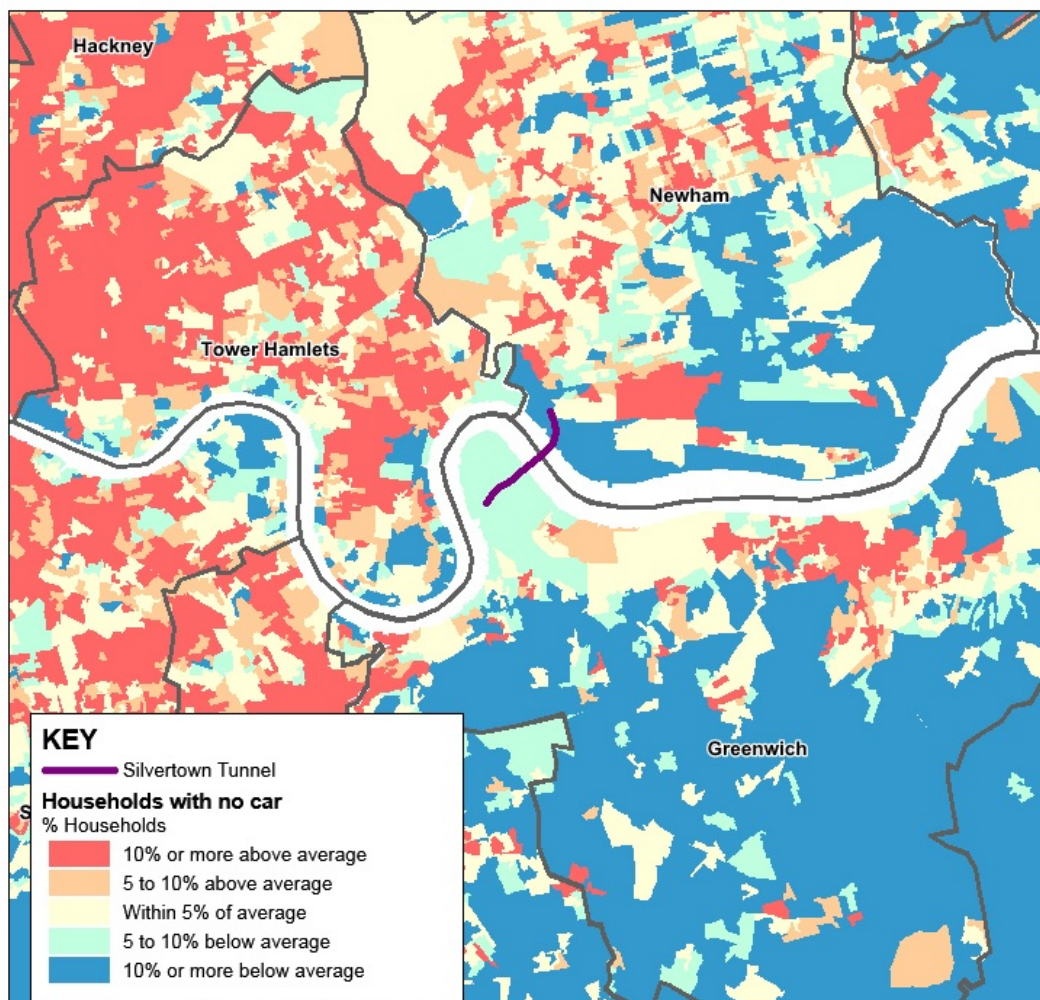
2.3.7 People of Black, Asian and Minority Ethnic (BAME) origin is a key demographic group considered in the assessment of distributional impacts of security and accessibility. Figure 2.5 shows the percentage of the population in each output area of BAME origin, compared with the average of 56% across the three host boroughs. Most of the areas closest to the Scheme are in line with or lower than the average; there are high concentrations of population of BAME origin across parts of the London Boroughs of Newham and Tower Hamlets.

Figure 2.5 Population of BAME origin



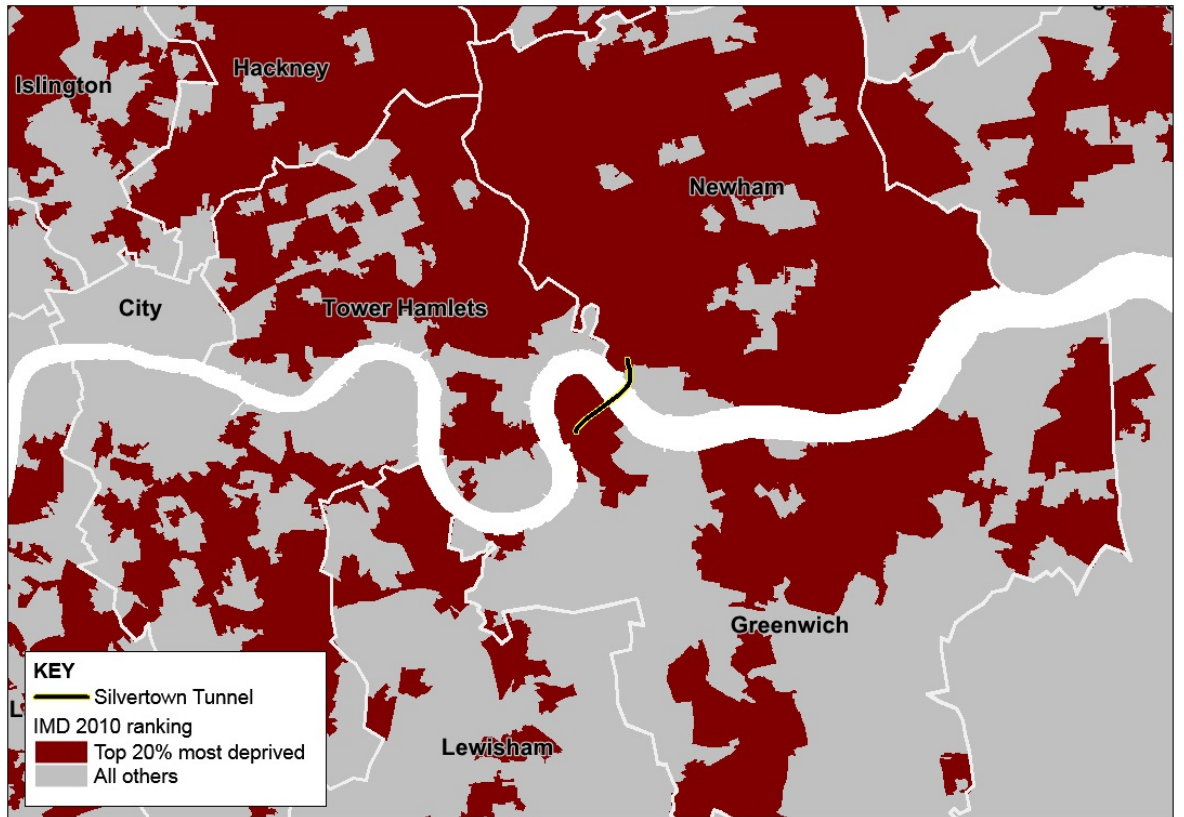
2.3.8 Households without access to a car are a key demographic group considered in the assessment of severance and accessibility impacts. Figure 2.6 shows the percentage of households in each output area with no access to a car or van compared to the average of 52% across the three host boroughs. The areas closest to the Scheme are in line with or lower than the average. Large parts of LB Tower Hamlets have high concentrations of households without access to a car. As well as being taken into account explicitly in two distributional impact assessments, the proportion of residents with no access to a car is also an indicator of economic deprivation, which is considered in a further six distributional impact assessments.

Figure 2.6 Proportion of households with no access to a car or van



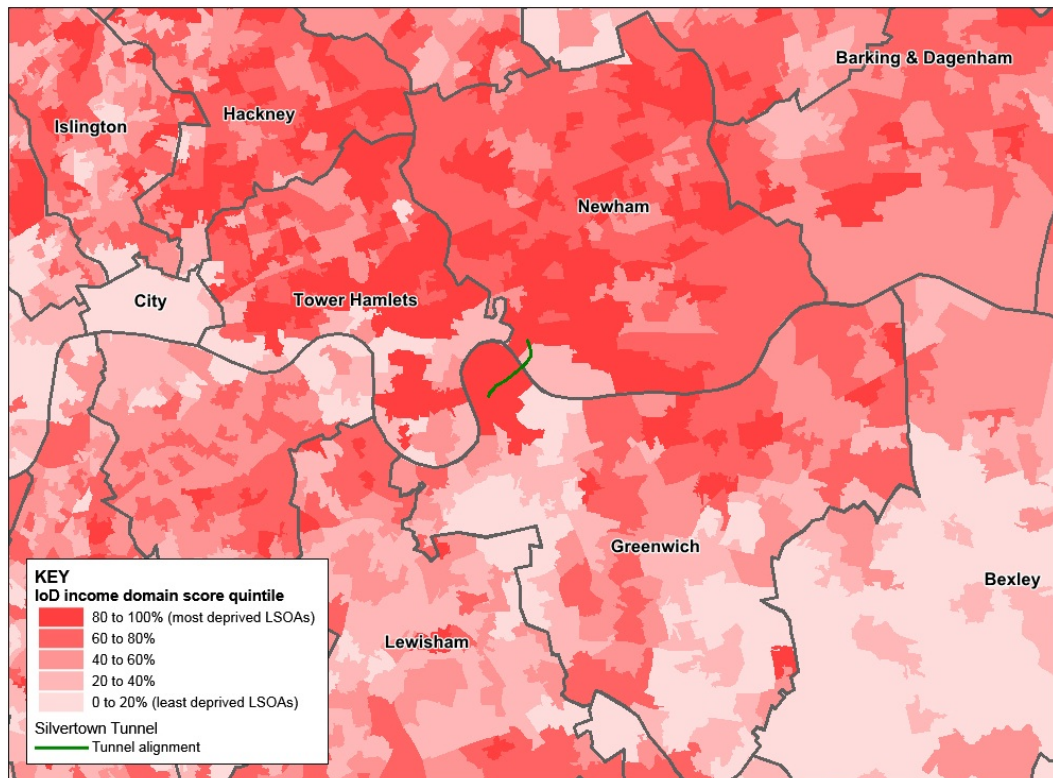
2.3.9 Figure 2.7 shows areas with high levels of deprivation close to the Scheme, as measured by the Index of Multiple Deprivation (IoMD) 2010. There are several areas close to the Scheme that fall within the 20% most deprived; these include most of LB Newham and large areas in LB Tower Hamlets and RB Greenwich.

Figure 2.7 High levels of deprivation close to Silvertown Tunnel



2.3.10 Income distribution is a key indicator in the assessments of the distributional impacts of user benefits and personal affordability. Since income distribution data is not readily available at a small area level the proportions of population experiencing income deprivation in an area are used as a proxy. The English Indices of Deprivation (IoD) income domain provides a measure of income deprivation based on the proportion of residents on means tested benefits. Figure 2.8 shows how the areas close to the Silvertown Tunnel rank on the IoD income domain score. Large parts of Newham to the northeast of the tunnel are among the most income deprived areas.

Figure 2.8 loD income for areas close to Silvertown

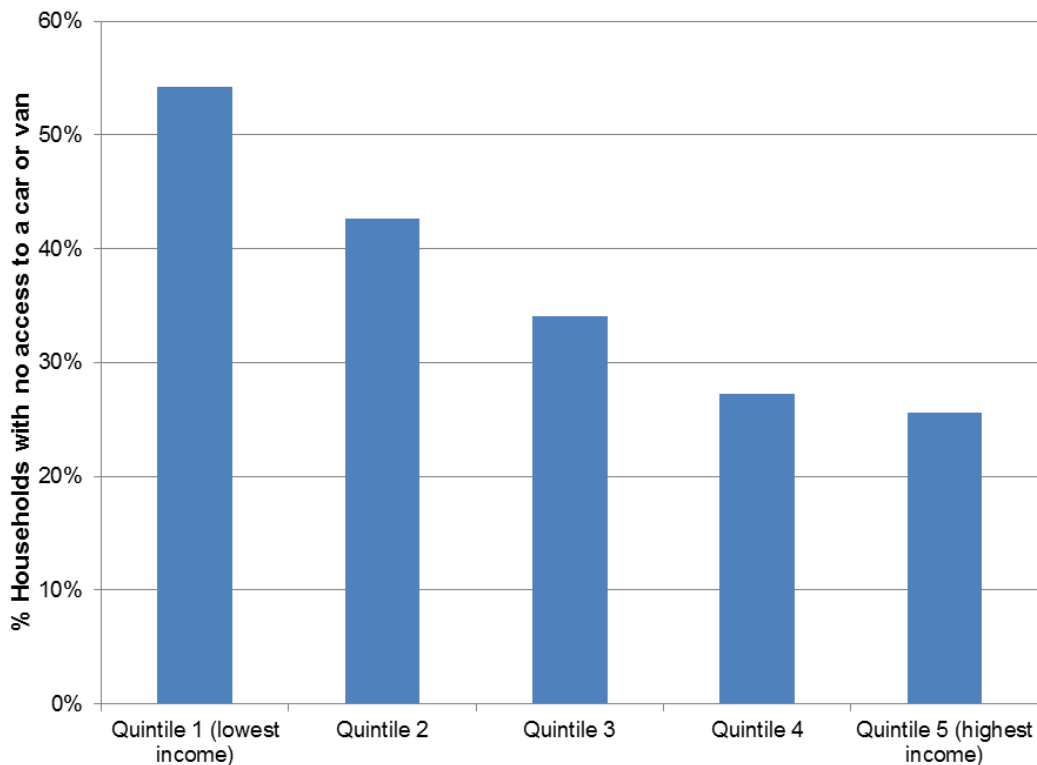


3. USER BENEFITS

3.1 Introduction

3.1.1 User benefits of transport schemes are experienced to different extents by different groups of people. For example, there is evidence that car ownership rates are lower among low income households, as demonstrated in Figure 3.1, which shows the average proportion of households without a car in each income quintile, for the whole of London, based on census 2011 data. Hence schemes which impact car owners would disproportionately impact higher income groups.

Figure 3.1 Households in London with no access to a car or van, by income group



3.1.2 People on low incomes are likely to benefit more from improvements to local public transport services than the general population, or suffer more as a result of a decline in these services. Consequently it is important to understand the pattern of user benefits and disbenefits generated by the transport intervention as it develops.

3.1.3 This appraisal concerns the differences in user benefits experienced by people with different levels of income. As described in Chapter 2, income data is not readily available at a small area level so level of income deprivation is used as a proxy. This analysis compares the proportions of user benefits received against the proportion of the population living in

areas of differing levels of income deprivation within a defined area of impact.

- 3.1.4 The user benefits assessment considers the change in the cost of travel for users of the transport network. Transport user benefits have been estimated using Transport User Benefit Appraisal (TUBA), the DfT's appraisal software. Costs are expressed in 2010 prices.
- 3.1.5 Significant user benefits are expected to be derived from the bus service improvements included in the Scheme. The public transport benefits from these have been assessed outside of TUBA using a TAG-based methodology. The two assessments have been combined to give an overall score for the distributional impacts of user benefits.

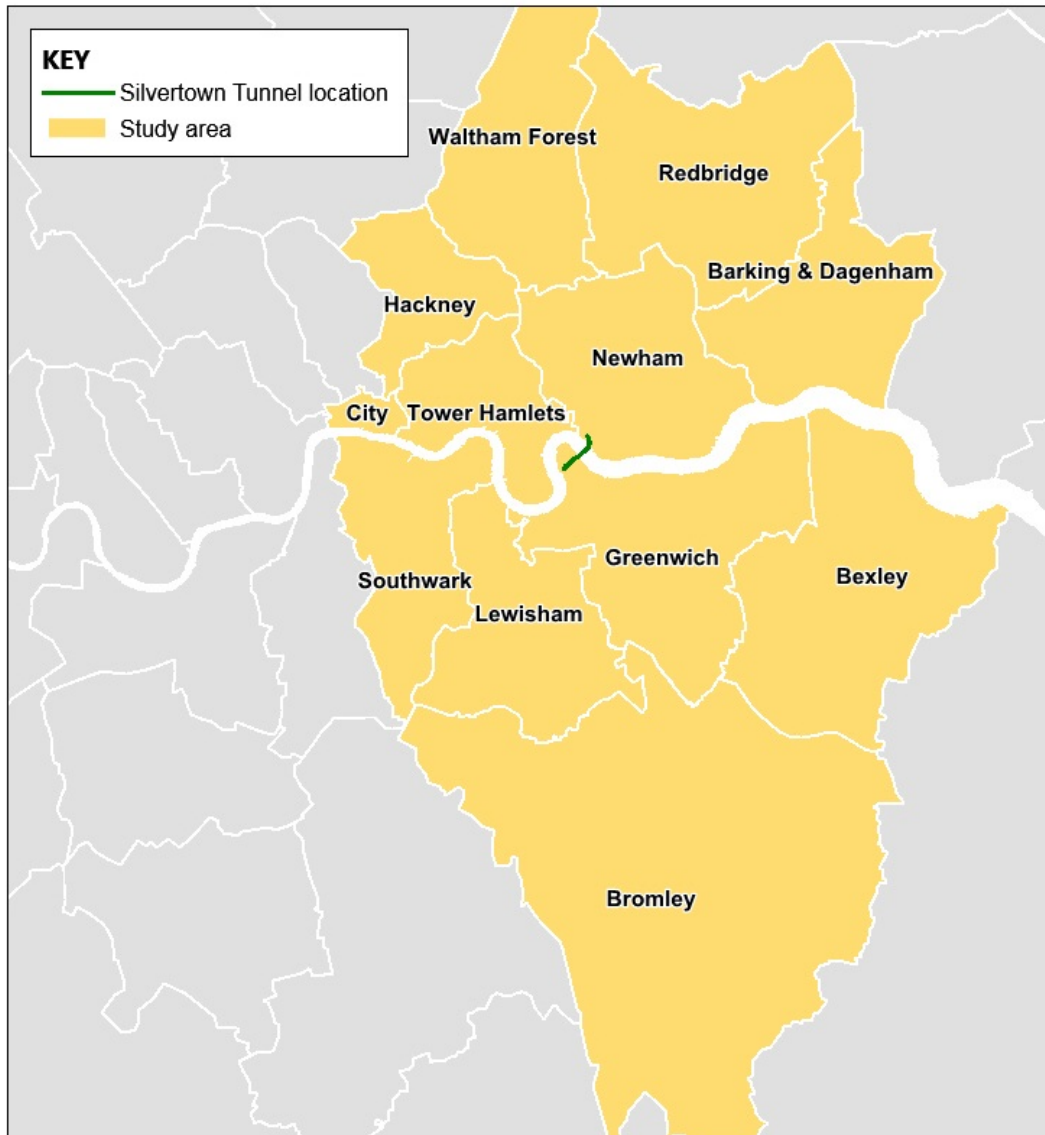
3.2 Screening

- 3.2.1 A broad initial screening was undertaken, looking at user benefits and disbenefits in TUBA. The analysis of user benefits is used to inform the distribution of impacts on non-business journeys only. Distributional impacts are not assessed for business journeys, because these are experienced by businesses and not individuals. Therefore the transport benefits of business trips have been removed from the TUBA output data set in this appraisal.

3.3 Assessment area

- 3.3.1 Figure 3.2 shows the study area for analysis of the distributional impacts of user benefits. This is the area in which the transport intervention would result in most of the changes to the generalised cost of travel for users of the transport network.

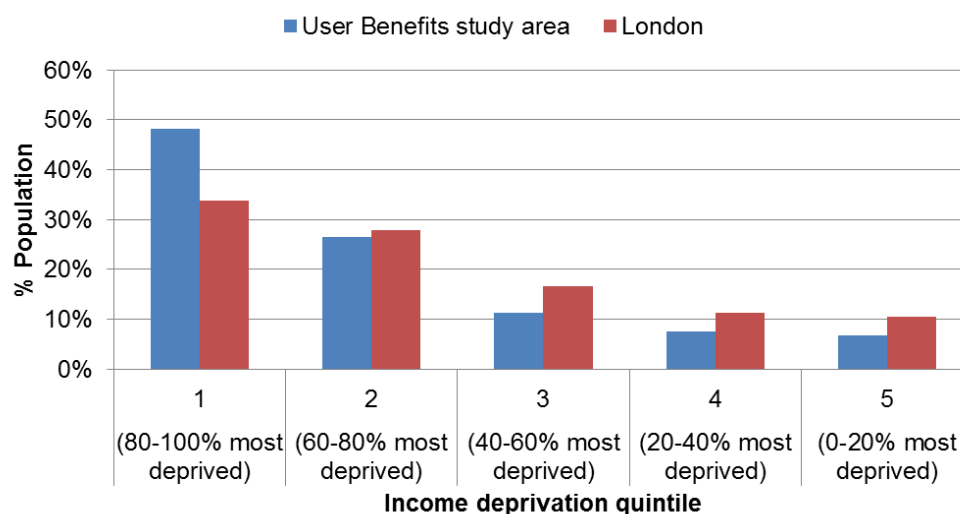
Figure 3.2 DI user benefits study area



3.3.2 Within this area a comprehensive analysis has been undertaken, assessing the user benefits for the different levels of income deprivation. The study area contains a resident population of 2.9m, of which 820,000 live in the three host boroughs.

3.3.3 Figure 3.3 shows the proportion of study area residents by income deprivation quintile compared with the population of London. The proportion of study area residents in the most income-deprived quintile is high compared with London as a whole.

Figure 3.3 Study area population by income deprivation quintile



3.3.4 Most of the population in the impact area are from low income groups, with 75% in quintiles one and two.

3.4 Assessment

3.4.1 Table 3.1 shows forecast demand for non-business trips by car in 2021 for the impact area residents by the River Crossings Highway Assignment Model (RXHAM) modelled income group in the Assessed Case. The lowest income group accounted for around one third of demand.

Table 3.1 Non-business car trips in the study area 2021

Income group	Proportion of demand
Low income <£20k	32%
Medium income £20k-£50k	43%
High income >£50k	25%

3.4.2 TAG suggests assigning benefits to an income group based on the income deprivation score for each area. However within the study area, which includes many areas considered to have high levels of deprivation, there are also substantial numbers of people on high incomes that live in areas that would be classed as income-deprived. Therefore a detailed assessment by income quintile was not appropriate and instead the distributions of benefits and population have been compared at a more aggregated level as follows:

- share of benefits for low income groups (<£20k) against share of population in quintiles 1 and 2; and

- share of benefits for medium and high income (>£20k) groups against share of population in quintiles 3,4 and 5.

3.4.3 The comparison is appropriate because the 40th percentile gross annual pay for the boroughs in the study area is reasonably close to the low income definition of £20,000 (based on evidence from the Office of National Statistics (ONS) Annual Survey of Businesses and Residents 2014).

3.4.4 Table 3.2 shows the initial time benefits and net user benefits (i.e. time and vehicle operating costs (VOC) benefits less any user charges) in 2010 prices for car users by income group. This a net disbenefit for both income groups analysed.

Table 3.2 User time and net user benefits for car users in the study area in 2021 (excluding reliability)

Group	Time benefits (£m, 2010 prices)	Net user benefit (£m, 2010 prices)
Low income	1.6	-0.9
Medium or high income	5.9	-0.9
Total	7.5	-1.8

3.4.5 However, in line with DfT TAG guidance, the figures in Table 3.2 are initial estimates which do not include reliability benefits. However, TAG recommends including reliability in the final assessment – improving reliability is of course a fundamental part of the Scheme, and therefore Table 3.3 shows the time benefits and net user benefits in 2010 prices for car users by income group, including reliability (calculated according to TAG methods).

Table 3.3 User time and net user benefits for car users in the study area in 2021 (including reliability)

Group	Time benefits (£m, 2010 prices)	Net user benefit (£m, 2010 prices)
Low income	3.0	0.5
Medium or high income	6.5	-0.2
Total	9.5	0.3

3.4.6 Table 3.3 shows that with the inclusion of reliability benefits, low income users are expected to have a net benefit from the Scheme.

3.4.7 For public transport users, time benefits in the study area have been valued at £15.9m. VOC and user charges do not apply to public transport users.

3.4.8 Table 3.4 shows the frequency of bus travel by London residents by household income group based on London Travel Demand Survey (LTDS) 2007/08 to 2009/10⁷. Across London, 60% of people from low income households (lowest two quintiles) are frequent bus users, compared with 44% of people from households with medium or high income (highest three quintiles).

Table 3.4 Percentages of users and frequent users of buses: London residents by household income group (LTDS 2007/08 to 2009/10)

	Equivalent household income quintile group				
	Lowest quintile	2nd quintile	3rd quintile	4th quintile	Highest quintile
Bus users					
Users %	91%	89%	88%	87%	88%
Frequent users %	64%	56%	49%	44%	39%

3.4.9 Table 3.5 shows public transport user benefits by income group, apportioned based on the percentages of frequent bus users by income group and the proportion of the study area population by income group.

Table 3.5 Public transport user time benefits by income group

	Low income	Medium or high income
PT user time benefits (£m)	12.8	3.2
PT user time benefits (%)	80%	20%

3.4.10 Combining the benefits for both road users and public transport users, there is an overall net user benefit of £14.2m across the study area. Table 3.6 shows the DI assessment for net user benefits excluding reliability.

Table 3.6 DI net user benefits assessment, excluding reliability

	Low income	Medium or high income	Total
Net user benefits £m, 2010 prices (road users)	-0.9	-0.9	-1.8
Net user benefits £m, 2010 prices (public transport)	12.8	3.2	15.9
Total net user benefits £m, 2010 prices	11.9	2.3	14.2
% benefits	84%	16%	
Study area population %	75%	25%	
Score	Large beneficial	Slight beneficial	

⁷ Source: Travel In London Supplementary Report: London Travel Demand Survey (LTDS), TfL, 2011

3.4.11 For the low income group there is a net user benefit of £11.9m and for the medium and high income group there is a net user benefit of £2.3m. The share of the net benefit received by low income users (84%) is greater than the share of study area population (75%) in this group, so the impact for this group is scored as large beneficial. Similarly, the medium-high income group receive a share of the net benefits smaller than their share of the population so the impact for this group is scored as slight beneficial.

3.4.12 Table 3.7 shows the DI assessment for net user benefits, including reliability.

Table 3.7 DI net user benefits assessment, including reliability

	Low income	Medium or high income	Total
Net user benefits £m, 2010 prices (road users)	0.5	-0.2	0.3
Net user benefits £m, 2010 prices (public transport)	12.8	3.2	15.9
Total net user benefits £m, 2010 prices	13.3	2.9	16.2
% benefits	82%	18%	
Study area population %	75%	25%	
Score	Large beneficial	Slight beneficial	

3.4.13 With reliability benefits included there are greater net benefits for both income groups. However there is no material change in the distribution of benefits between income groups so the impact scores for each group remain the same. The low income group receive a greater share of the benefits relative to the share of the population within that group so the impact is scored as large beneficial; medium-high income users receive a smaller share of the benefits relative to their share of the population so the impact for them is scored as slight beneficial.

3.4.14 Considering the scores for both groups, the overall DI score for net user benefit is therefore assessed as moderate beneficial.

4. NOISE

4.1 Introduction

4.1.1 There is evidence that noise levels have an impact on children's concentration when learning. The distributional impacts assessment for noise compares the geographical distribution of noise impacts against the locations of areas with higher concentrations of residents aged under 16 and areas close to educational facilities. The assessment also considers how the distribution of noise impacts compares with the income distribution within the study area.

4.1.2 Noise analysis was undertaken by Hyder as part of the Preliminary Environmental Impacts Report⁸ (PEIR).

4.2 Screening

4.2.1 Noise analysis was undertaken by Hyder as part of the Preliminary Environmental Impacts Report⁹ (PEIR). Noise impacts are likely to occur where an intervention results in changes to traffic flows or speeds or where the physical gap between people and traffic is altered.

4.2.2 The Scheme design includes changes to road alignments and will result in changes in vehicle flow. Therefore it is necessary to analyse the distributional impacts of noise.

4.3 Assessment

4.3.1 A preliminary assessment of the distributional impacts has been made based on a visual inspection of drawings from the PEIR.

4.3.2 Figure 4.1 shows the short-term noise impacts of the scheme in the opening year. Moderate increases in noise are expected in the Royal Victoria Docks area, close to the north portal of the Silvertown Tunnel, and on the eastern side of the Greenwich Peninsula, close to the south portal of the Silvertown Tunnel. Moderate decreases in noise are expected on the western side of the Greenwich Peninsula, close to the south portal of the Blackwall Tunnel, and in the North Blackwall and Poplar areas.

⁸ Silvertown Tunnel Preliminary Environmental Impacts Report, TfL, September 2015

⁹ Silvertown Tunnel Preliminary Environmental Impacts Report, TfL, September 2015

Figure 4.1 Short term noise impacts



4.3.3 Figure 2.1 showed that there are high concentrations of children in the North Blackwall and Poplar areas in LB Tower Hamlets, where a moderate decrease in noise levels would be expected. This area also has several schools. There are relatively low concentrations of children in areas where increases in noise would be expected, close to the Royal Docks and on the Greenwich Peninsula. Since the decreases in noise levels coincide with areas with high concentrations of children the initial assessment of noise impacts on children is scored as moderate beneficial.

4.3.4 The areas with moderate changes (both increases and decreases) in noise levels mainly coincide with areas that are among the most income-deprived (see Figure 2.8) so both beneficial and adverse impacts can be considered to mainly affect people on low incomes. Based on a preliminary visual inspection of the distribution of noise impacts it is estimated that more people would experience a decrease in noise levels than an increase¹⁰. Therefore the impact for people on low incomes is

¹⁰ If required, this analysis can be expanded to quantify in more detail the populations affected by different levels of noise impacts.

assessed as moderate beneficial, while the impacts for people in other income groups are assessed as neutral.

- 4.3.5 Considering the assessments of noise impacts for children and each of the income groups, the overall preliminary assessment of distributional impacts of noise is assessed as slight beneficial.

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5. AIR QUALITY

5.1 Introduction

5.1.1 Poor air quality problems are often experienced in areas of deprivation, in which people already suffer relatively poor health. Evidence also suggests that children are more at risk from air pollution due to the fact that they tend to spend more time outside and therefore experience more exposure to harmful pollutants that impact on lung development. The distributional impacts assessment of air quality therefore focuses on children and income-deprived social groups.

5.1.2 The Air Quality Assessment (AQA), part of the Preliminary Environmental Information Report (PEIR), calculates change in PM₁₀ and nitrogen dioxide (NO₂) at worst case receptors as a result of the scheme in the opening year. This chapter presents an initial DI assessment based on the AQA.

5.2 Screening

5.2.1 Air quality impacts are likely to occur where an intervention results in changes to traffic flows or speeds or where the physical gap between people and traffic is altered.

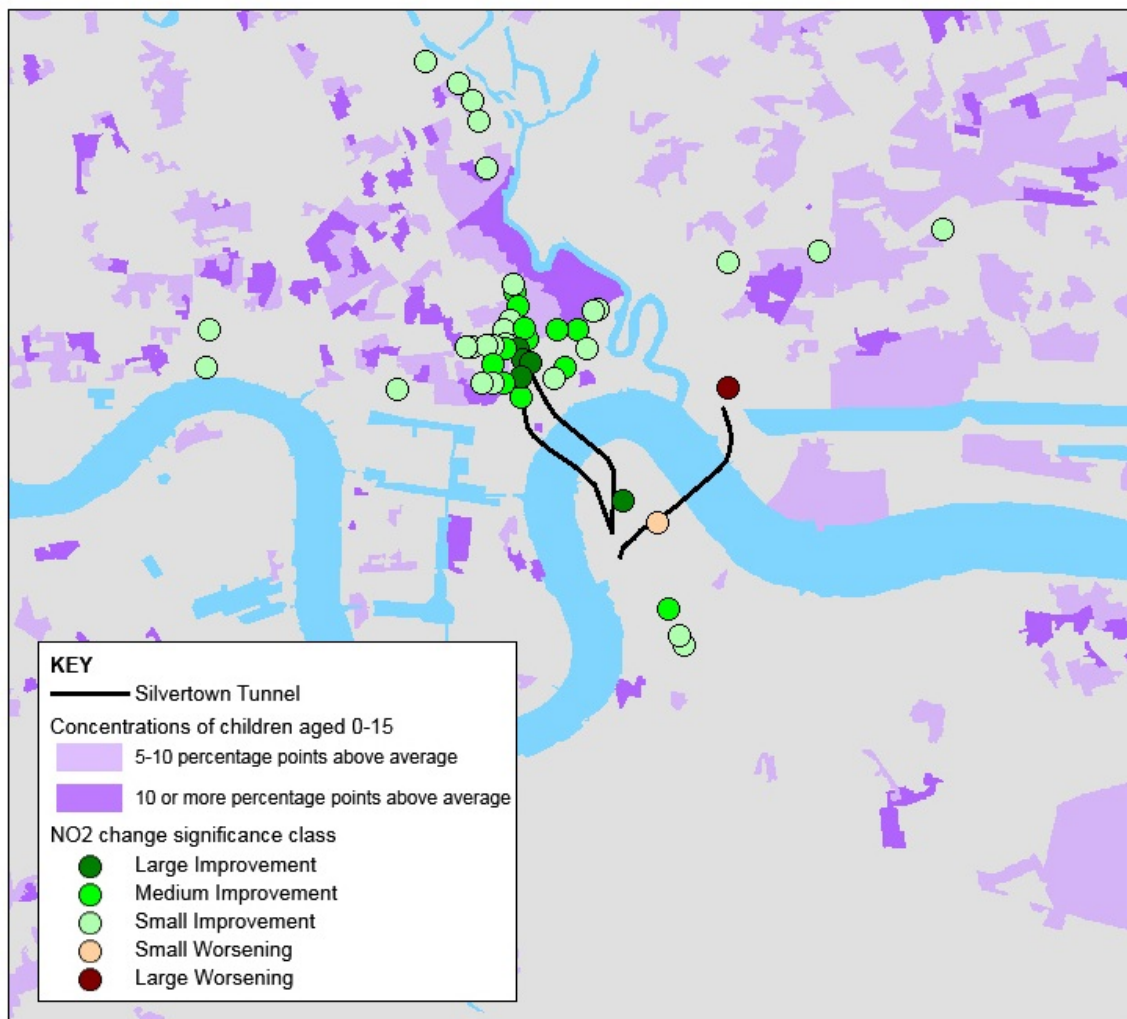
5.2.2 The scheme will result in changes to road alignment and traffic flows. In addition, the PEIR identified that there are a number of Air Quality Management Areas (AQMA) that cover the whole or parts of the Scheme host boroughs. Therefore a full distributional impact assessment of air quality assessment is required.

5.3 Assessment

5.3.1 Initial analysis indicates a number of locations where the Scheme will result in changes in NO₂ levels. The Scheme will result in reductions in NO₂ levels in several locations in the Scheme host boroughs, mainly clustered in the Blackwall area, but also in the Greenwich Peninsula and along the A13 and A12, key approach roads into the area. Increases in NO₂ levels are expected close to the Silvertown Tunnel portals.

5.3.2 Figure 5.1 compares the locations of changes in NO₂ against locations where a high proportion of residents are children aged under 16 (relative to the average of 21% across the three host boroughs).

Figure 5.1 Change in NO₂ levels vs concentrations of children¹¹

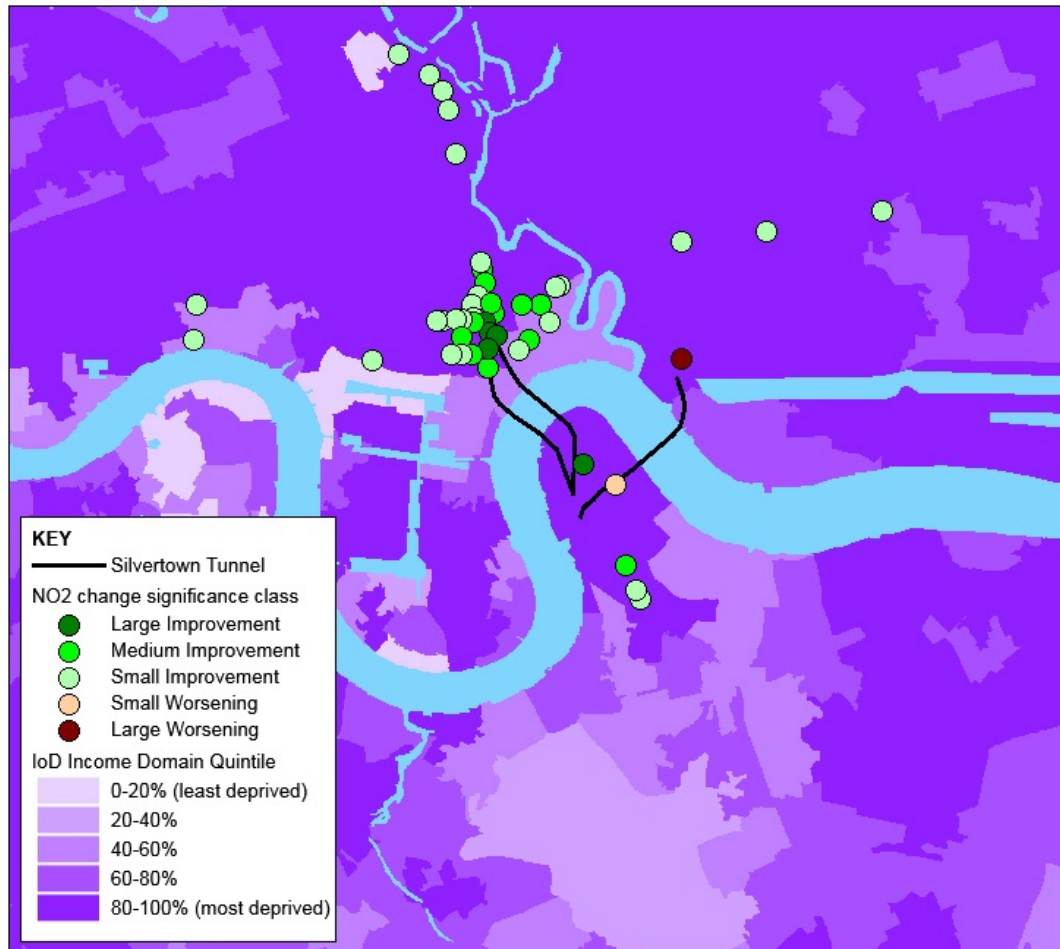


5.3.3 Initial analysis indicates a number of locations where the Scheme will result in changes in nitrogen dioxide (NO₂) levels. The Scheme will result in reductions in NO₂ levels in several locations in the Scheme host boroughs, mainly clustered in the Blackwall area, but also in the Greenwich Peninsula and along the A13 and A12, key approach roads into the area. Increases in NO₂ levels are expected close to the Silvertown Tunnel portals.

5.3.4 Figure 5.2 compares the locations of changes in NO₂ against locations where a high proportion of residents are children aged under 16 (relative to the average of 21% across the three host boroughs).

¹¹ Air quality data supplied by Hyder. It should be noted that only receptors with 40µg/m³ (either with or without the Scheme) that change by more than 0.4µg/m³ are shown. There are other receptors, especially around Silvertown, where concentrations increase by more than 0.4µg/m³ but are still under 40µg/m³.

Figure 5.2 Change in NO₂ levels vs levels of income deprivation¹¹



5.3.5 Most of the sites close to the Scheme that will experience a change in NO₂ levels are located in areas with the highest levels of income deprivation. The initial assessment scores for NO₂ levels vs income distribution, based on a visual comparison of the distribution of change in NO₂ levels against income deprivation quintiles, are shown in Table 5.1.

Table 5.1 DI assessments (change in NO₂) by income group

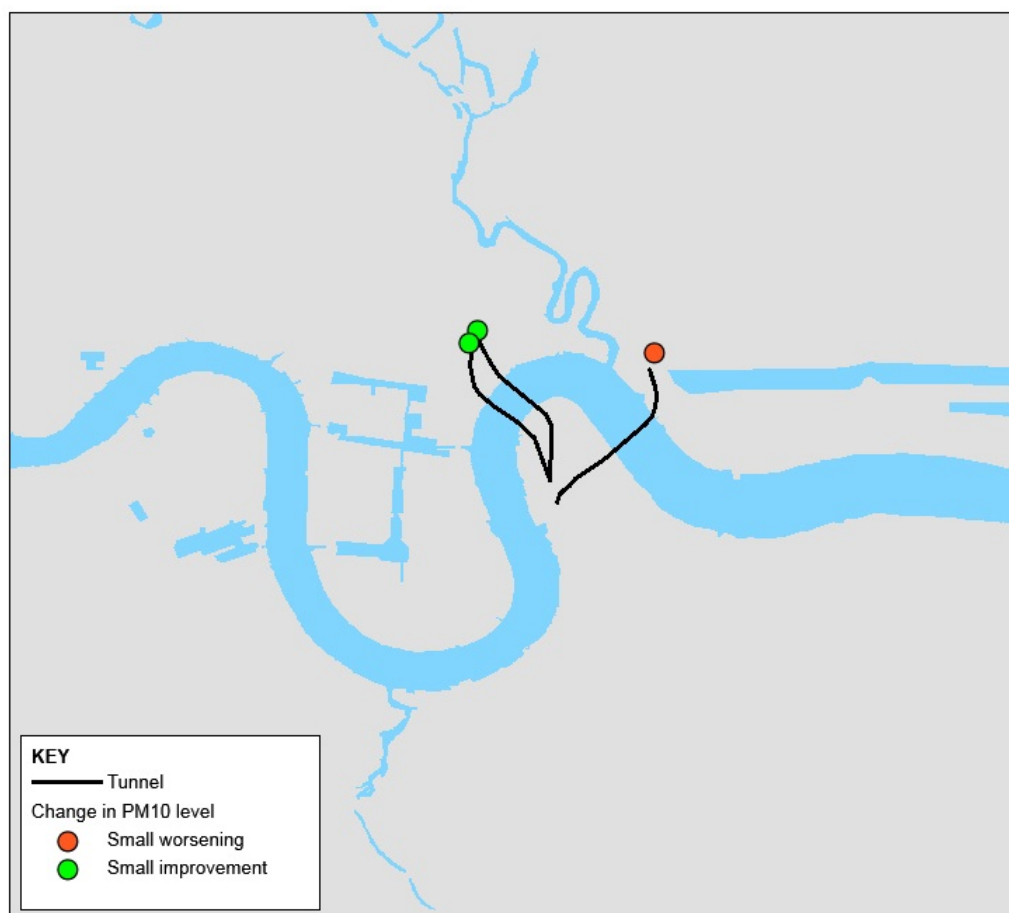
Income deprivation score quintile	Assessment
0-20% (least deprived)	Neutral
20-40%	Moderate beneficial
40-60%	Moderate beneficial
60-80%	Slight beneficial
80-100% (most deprived)	Large beneficial

5.3.6 The Scheme is expected to result in neutral or beneficial NO₂ impacts for the resident population across all income groups, with large beneficial impacts for the most income-deprived quintile. The initial overall

distributional impacts assessment for air quality by income group is therefore moderate beneficial.

5.3.7 Figure 5.3 shows the locations where substantial changes in PM₁₀ levels are expected.

Figure 5.3 Changes in PM10 levels



5.3.8 The Scheme will result in a reduction in PM₁₀ levels near to the north portal of Blackwall Tunnel and an increase in PM₁₀ levels near to the north portal of the Silvertown Tunnel. These locations coincide with locations that will experience corresponding changes in NO₂ levels.

5.3.9 Therefore based on the same assessment rationale as used for NO₂ above, the initial overall assessment for the distributional impacts of air quality has therefore been conservatively scored as moderate beneficial.

5.3.10 If required this analysis can be expanded to consider the population numbers affected by the air quality impacts, although overall impacts are expected to be beneficial.

6. ACCIDENTS

6.1 Introduction

6.1.1 Most transport-related accidents, injuries and deaths occur on the road network. Vulnerable groups (in terms of their accident risk) include children and older people (both particularly as pedestrians), young males and motorcyclists. There is also a strong link between deprivation and road accidents: children from social class V¹² are five times more likely to be involved in a fatal road accident than those from social class I. Young males are also relatively vulnerable as drivers, and this group should also be considered if there is evidence that they form a significant proportion of casualties on the road network.

6.1.2 An analysis of the impact of the Scheme on accidents has been undertaken using COBA-LT¹³, a specialist spreadsheet tool provided by the DfT. This link-based assessment predicts the change in the total number of accidents and casualties on each link within the network. The methodology is described in the EAR.

6.1.3 The Distributional Impacts assessment looks in more detail at where the accidents would occur and which population groups might be affected. It focuses on a small area where changes are likely to have a greater impact on the local community. TAG guidance recommends that the distributional impacts of accidents must be assessed when a scheme includes changes to road alignments or results in any significant changes (>10%) in vehicle flow, speed, heavy goods vehicle use or a significant change (>10%) in the number of pedestrians, cyclists or motorcyclists using the network.

6.1.4 The Social Impacts Appraisal¹⁴ reports that the Scheme would result in a small decrease in the total number of accidents overall and the impact is accordingly assessed as slight beneficial.

6.2 Screening

6.2.1 The Scheme includes changes to road alignments close to the Blackwall Tunnel and Silvertown Tunnel portals. It is also forecast to result in

¹² Social Class based on Occupation. Social Class V refers to workers in unskilled occupations. Social Class I refers to professional occupations.

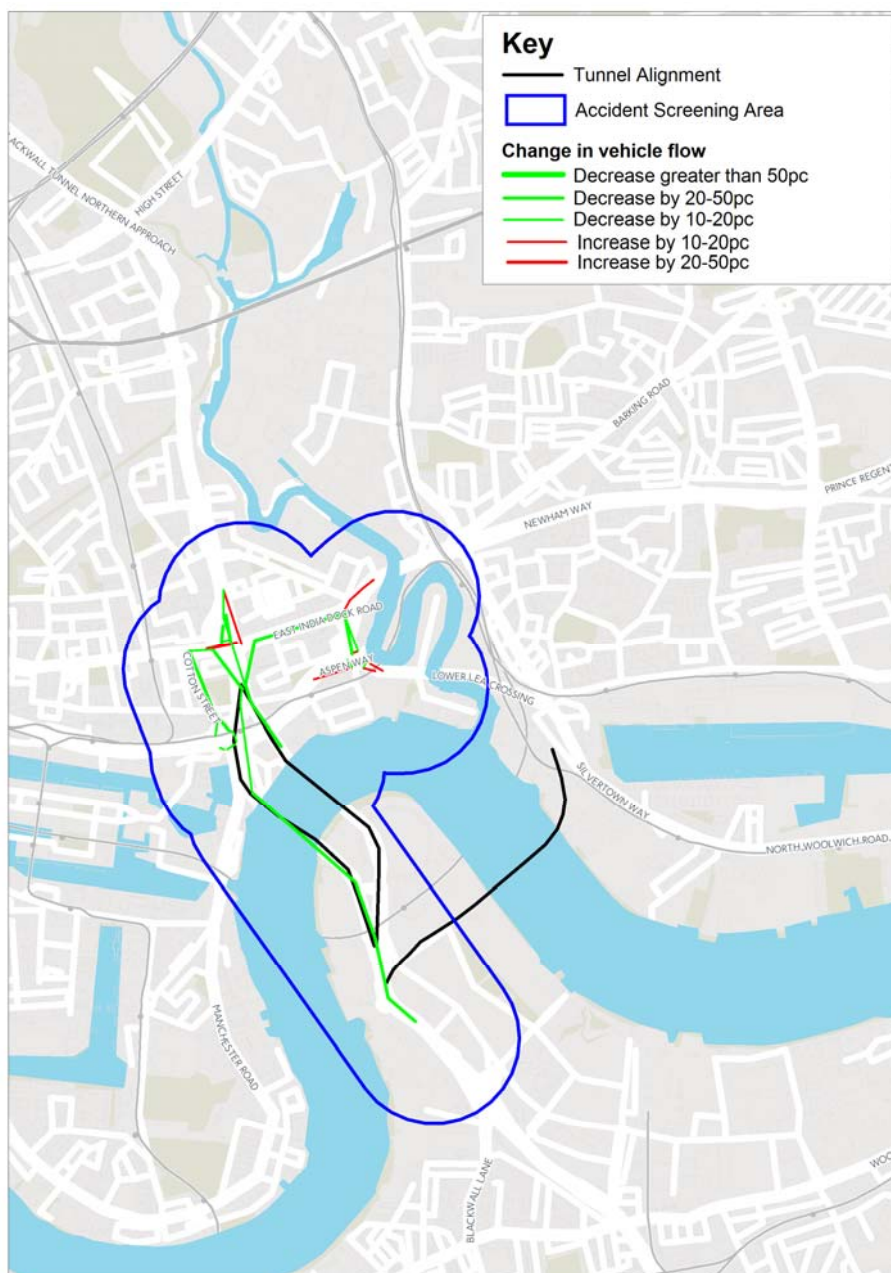
¹³ Cost and Benefit to Accidents - Light Touch, the DfT accident appraisal software

¹⁴ Silvertown Tunnel Preliminary Social Impacts Appraisal, TfL, September 2015

changes in traffic volumes (+/- 10%) on several sections of road located in the surrounding area of the Scheme.

6.2.2 Figure 6.1 shows the initial screening area for the assessment of accident distributional impacts. It includes sections of road near to the Scheme that would experience changes greater than 10% in vehicle flow as a result of the Scheme plus a 400m band around these areas to capture pedestrian walking catchments.

Figure 6.1 Accidents impacts initial screening area

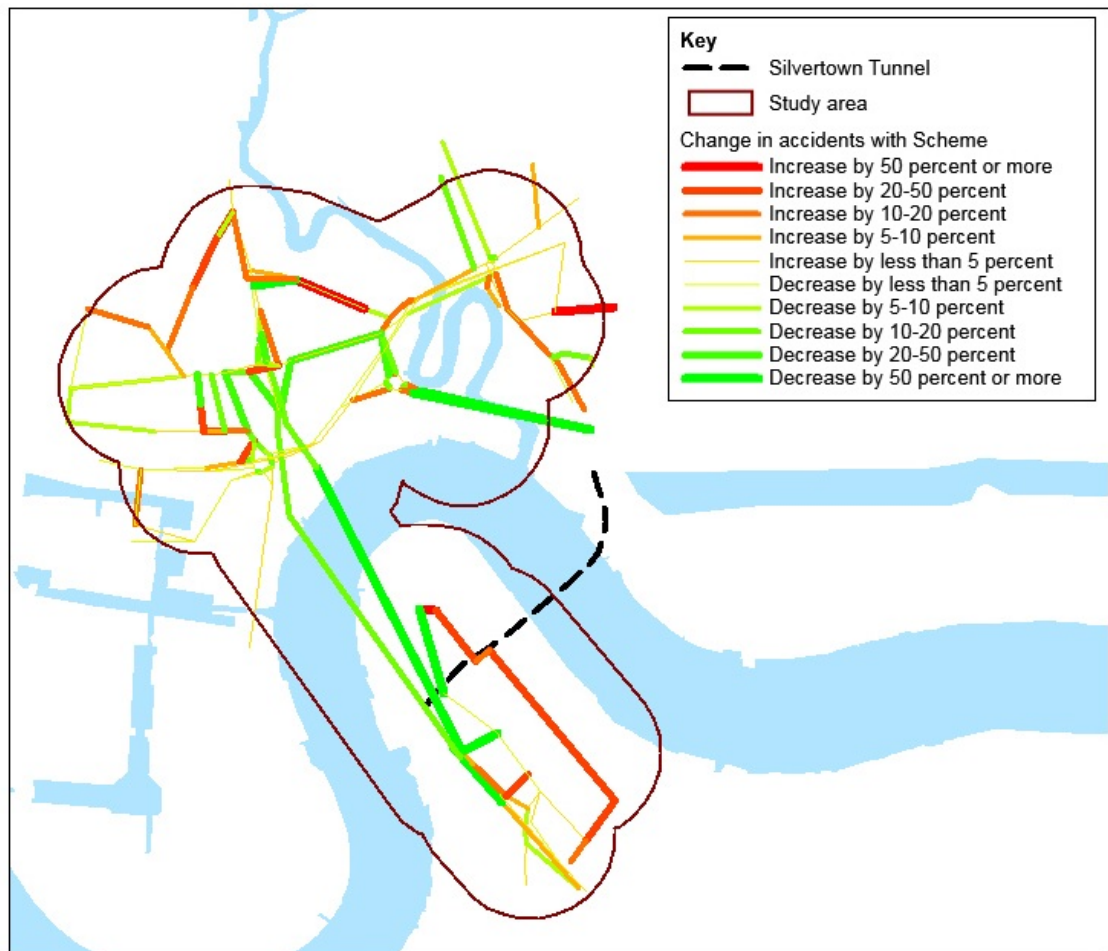


6.2.3 COBA-LT analysis identified several links within the screening area that would see changes of 5% or more in the number of accidents over 60 years with the Scheme. Therefore a full assessment of the distributional impacts of accidents is appropriate.

6.3 Areas of impact

6.3.1 The impact area for accidents analysis, shown in Figure 6.2, includes the links within the initial screening area that would experience a 5% change in the number of accidents over 60 years, plus surrounding areas to a distance of 400m to capture the potential impacts on pedestrians within a 5 minutes walk.

Figure 6.2 Accident impacts study area



6.4 Social groups in the impact areas

6.4.1 The impact area has a resident population of 29,000. Table 6.1 shows the proportions of children, young people, older people and those who live within the most deprived 5% of areas. Figure 2.7 showed that there were several areas with high levels of deprivation close to the Scheme in LB

Tower Hamlets and LB Newham. Many of these areas are within the accident DI study area.

Table 6.1 Vulnerable population groups within accident DI study area

Population group	% study area population
Children under 16	22%
Young people aged 16-25	18%
Older people aged 70 plus	4%
IMD 5% most deprived areas	36%

6.5 Amenities in the impact areas

6.5.1 The concentration of vulnerable groups depends not only on the local resident population but on local amenities that may attract visitors from vulnerable groups into the area. The study area contains several amenities that may attract children, young people and older people from other areas.

6.5.2 Within the impact area there are five GP surgeries, 13 schools or colleges and ten places of worship. There are also some parks and sports centres and the O2. There are, however, no general hospitals or university campuses located within the impact area.

6.6 Appraisal of impacts

6.6.1 Table 6.2 shows the casualty rates within the impact area and across Great Britain as a whole for 2012, 2013 and 2014 combined, based on STATS19¹⁵ casualty data. During this period 502 accidents were recorded in the impact area, with a total of 633 casualties across all levels of severity.

Table 6.2 Casualty rates, 2012-2014 average

Casualty type	% Casualties in Impact area	% Casualties in Great Britain
Pedestrians	10%	13%
Cyclists	6%	10%
Motorcyclists (rider or passenger)	20%	10%
Children aged 0-15	6%	9%
Young people aged 16-25	23%	23% ¹⁶
Older people aged 70+	1%	6% ¹⁶

¹⁵ Accidents reported to the police are recorded on a STATS19 form. These provide detailed statistics about the circumstances of personal injury road accidents.

¹⁶ 2014 data for Road Casualties Great Britain is not yet available at this level of detail so this figure has been calculated based on 2012-2013 average

6.6.2 Within the impact area, cyclists and motorcyclists account for a greater proportion of casualties than the average across Great Britain. Any increase or decrease in accidents within the area could therefore be considered to affect cyclists and motorcyclists more strongly than other road user types.

6.6.3 Table 6.3 shows the number of accidents expected over 60 years within the DI accidents impact area only, with and without the Scheme.

Table 6.3 Change in accidents in 60 years within the DI study area

Without scheme	With scheme	Accidents Saved by scheme	% change in accidents
6,590	6,550	-40	-0.6%

6.6.4 There is a small reduction in accidents within the impact area. Since pedestrian casualty rates in the study area are in line with the national average, the impacts for pedestrians are assessed as moderate beneficial. The impacts for cyclists and motorcyclists are assessed as large beneficial because casualty rates for these groups are higher compared with the national average.

6.6.5 It is also important to consider whether there are any locations within the impact area where particularly high concentrations of these population groups coincide with individual links on which the number of accidents are expected to change.

6.6.6 There are high concentrations of children along the section of the A12 to the north of the junction with the A13 (see Figure 2.1). Sections of this road are expected to experience a decrease in accidents. Local roads to the south-west are also expected to experience a decrease in accidents. This neighbourhood has a high concentration of children and two schools. Overall the impact on areas with particularly high concentrations of children is therefore scored as large beneficial.

6.6.7 There are high concentrations of young people aged 16-25 near to the Blackwall Tunnel north portal (see Figure 2.2), surrounded by roads that would experience decreases in accidents with the Scheme. There are also high concentrations of young people on the Greenwich Peninsula where the increases in accidents broadly balance with the decreases in accidents. Overall the impacts on young people can be considered moderate beneficial.

6.6.8 The study area as a whole has a relatively low concentration of older people compared with the wider area however there is a high concentration of older people in parts of Canning Town on the edge of the impact area where there are some roads that would see a relative increase in accidents. Therefore the impacts on older people have been scored as slight adverse.

6.6.9 Table 6.4 summarises the assessments for each group of interest, which take into account both the impact area as a whole and the areas within that which have high concentrations of vulnerable populations.

Table 6.4 DI accidents assessments summary

Casualty type	Accidents DI assessment
Pedestrians	Moderate beneficial
Cyclists	Large beneficial
Motorcyclists (rider or passenger)	Large beneficial
Children aged 0-15	Large beneficial
Young people aged 16-25	Moderate beneficial
Older people aged 70+	Slight adverse

6.6.10 The Scheme results in moderate or large beneficial impacts for most of the groups considered, except for older people whose impact is scored as slight adverse. Therefore the overall assessment is scored as moderate beneficial.

7. SEVERANCE

7.1 Introduction

7.1.1 The severance impacts of a transport scheme indicate the extent to which the scheme impedes residents' access to local community facilities and services. TAG guidance requires an assessment of those using non-motorised modes, particularly pedestrians.

7.1.2 The Scheme provides new road and public transport links across one of London's largest physical barriers – the River Thames, and in the broadest sense 'severance' of communities would be reduced. However since it does not include any additional pedestrian cross-river provision this element is not considered in this section. This report describes elsewhere how improved cross-river public transport services are expected to reduce the 'severance' effect of the river on local communities.

7.1.3 Literature has highlighted the groups in society that are potentially vulnerable to the effects of severance as a result of the transport network. Such groups include people without access to a car, older people, and people with disabilities and parents/carers with pushchairs. Children are also considered to be potentially vulnerable to severance as they are more likely to cross the road at dangerous crossing points, and find it difficult to judge the speed of traffic, hence putting themselves at risk of road accidents.

7.1.4 These groups often experience longer journey times, or are often required to use pedestrian routes that are inappropriate and difficult to use. Mitigation measures such as footbridges and underpasses can also cause severance, by creating longer journey times for users, compared with at grade crossings.

7.2 Screening

7.2.1 An assessment of the severance impacts of the Silvertown Tunnel scheme was undertaken by considering the detailed drawings of the Scheme and forecast changes in vehicle flow. More detail on this assessment can be found in the Social Impact Appraisal report.

7.2.2 The scheme reference design includes some provision for improving pedestrian and cycle connections, which would have positive impacts on severance. The TA provides the specific details of these provisions. There are also some areas that would experience potential changes in severance as a result of increases or decreases in traffic volumes on

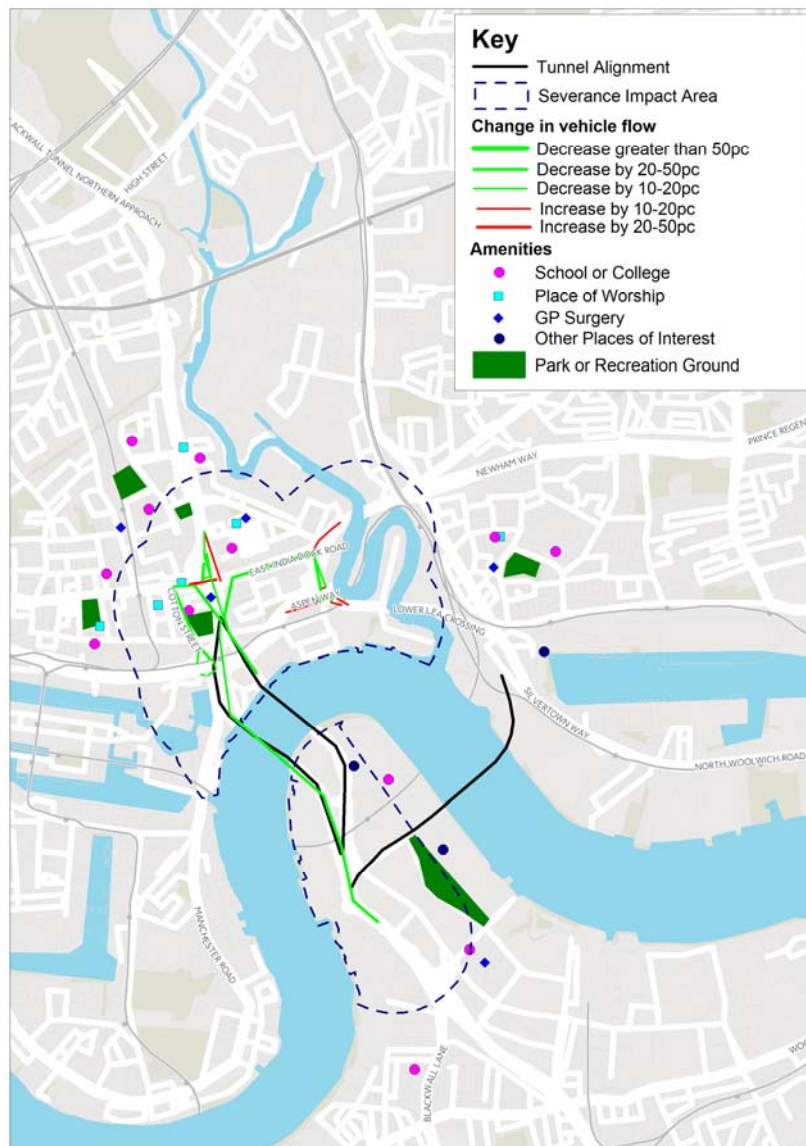
certain sections of road. Therefore it is appropriate to examine these areas more closely to understand the severance impacts for the highlighted vulnerable groups in society.

7.2.3 The screening process for severance impacts is summarised in the DI screening proforma in Appendix A.

7.3 Areas of impact

7.3.1 Figure 7.1 shows the impact areas defined through the severance analysis in the Social Impacts Appraisal. The impact areas cover a region within approximately 1km distance of the tunnel portals where there may be potential changes in severance due to changes in road alignment or vehicle flow.

Figure 7.1 Study areas for severance analysis



7.3.2 The severance analysis in the Social Impacts Appraisal provides an assessment of the overall severance impact in each area for the population as a whole. The severance impacts in each area as assessed in the Social Impacts Appraisal are shown in Table 7.1.

Table 7.1 Social Impacts Appraisal severance impacts by area

Impact area	Qualitative Comments	Change in severance
Blackwall and South Bromley by Bow	Overall more road links experience decreased vehicle flows than increased vehicle flows. However neighbourhoods in the area already suffer from severe severance due to being cut off by major roads with limited pedestrian access and this would not change under the Scheme.	Neutral
Greenwich Peninsula	Reduced vehicle flow on A102 Blackwall Tunnel Approach would have no material impact on severance although there would be positive impacts from provisions included in the reference scheme design.	Neutral

7.3.3 Both impact areas were assessed as having no changes in severance. Therefore the overall severance impact of the Scheme was assessed as neutral.

7.4 Social groups in the impact area

7.4.1 The scale of severance impacts can vary for different groups of people. For example, a change in road layout that significantly increases the distance that must be travelled to safely cross the road would have particularly serious impacts on older people or wheelchair users.

7.4.2 Table 7.2 shows the proportions of population in each impact area belonging to the social groups of interest.

Table 7.2 Proportions of vulnerable populations in severance impact areas

Impact area	% Children	% Older people	% Disabled people	% Households with no car
Blackwall and South Bromley by Bow	22%	3%	12%	63%
Greenwich Peninsula	10%	6%	13%	46%
Average across all severance impact areas	22%	3%	12%	62%
Average across three host boroughs	21%	5%	14%	52%

7.4.3 The Blackwall and South Bromley by Bow impact area has substantially higher proportions of children under 16 and households without cars than the Greenwich Peninsula impact area.

7.4.4 The two impact areas have slightly lower proportions of older people than the average across the three host boroughs. The proportion of disabled people is broadly in line across both impact areas and across the three host boroughs as a whole.

7.5 Amenities in the impact areas

7.5.1 The severance impact areas identified above contain several amenities that could attract trips from users in the wider area as well as local residents. Table 7.3 summarises the key amenities of interest found within each of the impact areas, shown in Figure 7.1.

Table 7.3 Key amenities found in severance impact areas

Impact area	GP surgeries	Schools/ Colleges	Places of worship	Parks, sports centres and recreation grounds
Blackwall and South Bromley by Bow	2	2	3	2
Greenwich Peninsula	0	1	0	1

7.5.2 As well as the key amenities, there are a number of other attractors located in the impact areas, including the O2.

7.6 Full appraisal of severance DIs

7.6.1 The areas considered in the assessment of severance distributional impacts include locations where the Scheme design includes changes in road alignment and links where there are substantial (>10%) changes in traffic flows.

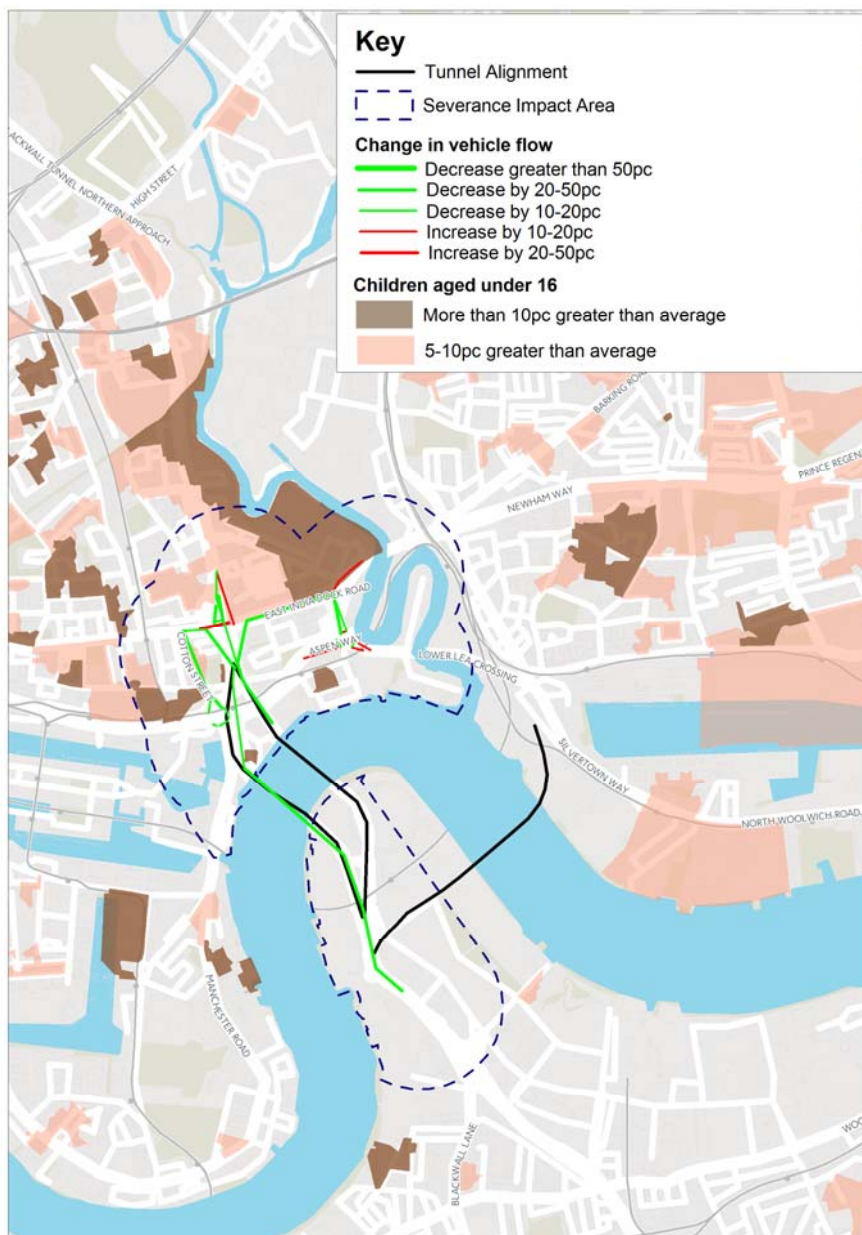
7.6.2 Many of the roads within the impact area are busy major roads, the alignments of which would continue to cause barriers to pedestrian movements regardless of a change in vehicle flows. However for minor roads changes in vehicle flow can affect their permeability, resulting in a small positive or negative impact on severance, particularly for residents or those visiting amenities in the immediate area.

7.6.3 Within the impact areas the populations of each group have been examined at census Output Area (OA) level to identify whether there are any areas with particularly high concentrations of vulnerable groups close to the links affected by changes vehicle flow. For the purpose of this

assessment, 'high' concentration has been defined as exceeding the average across the three host boroughs by 5% or more.

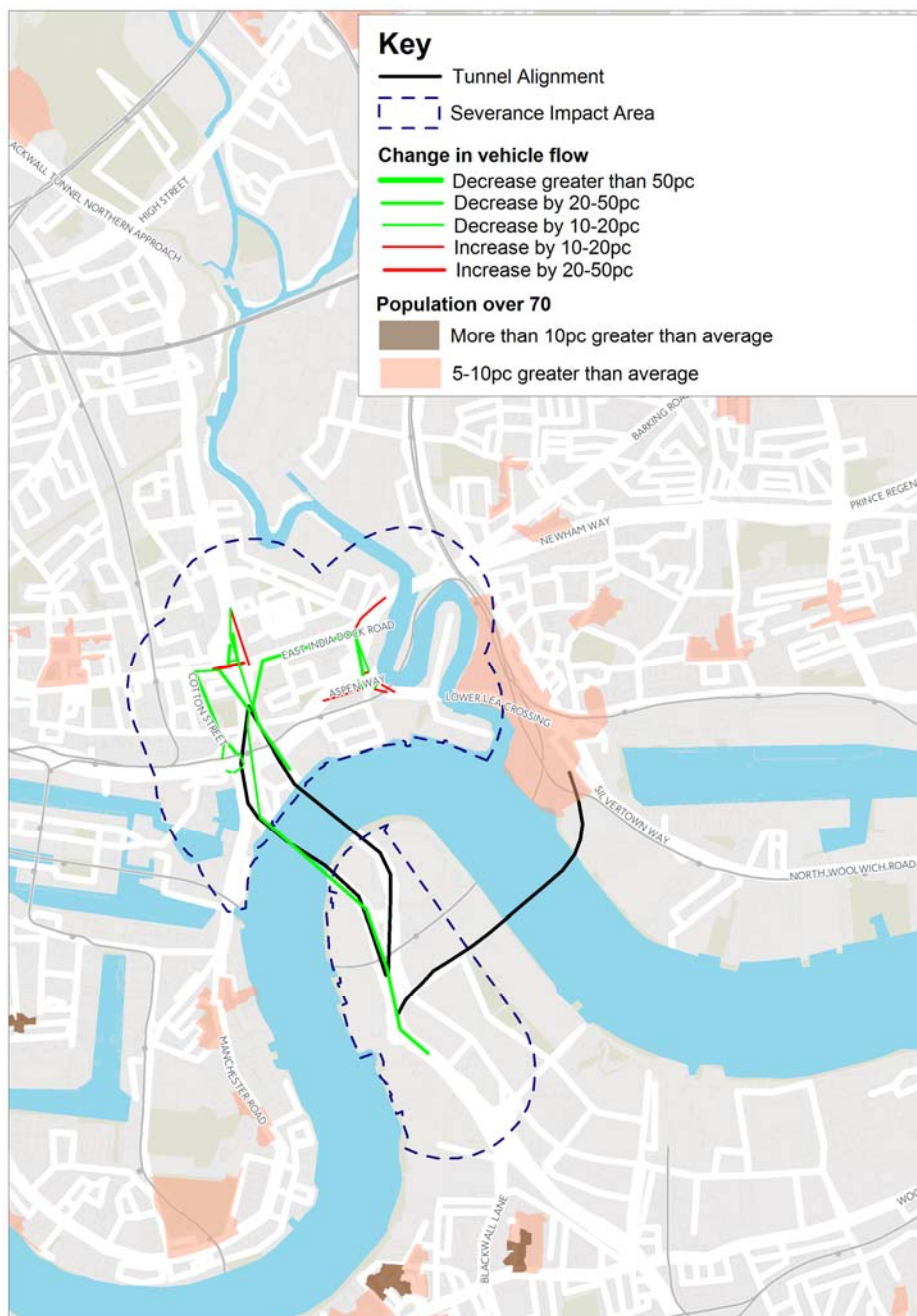
7.6.4 Children are considered vulnerable to severance as they are more likely to cross the road at unsafe locations and less able to judge speed and therefore more at risk of road accidents. Figure 7.2 shows areas that have high concentrations of children compared with the average across the three host boroughs. There are some high concentrations of children in Blackwall and South Bromley by Bow but not in Greenwich Peninsula.

Figure 7.2 High concentrations of children in severance impact areas



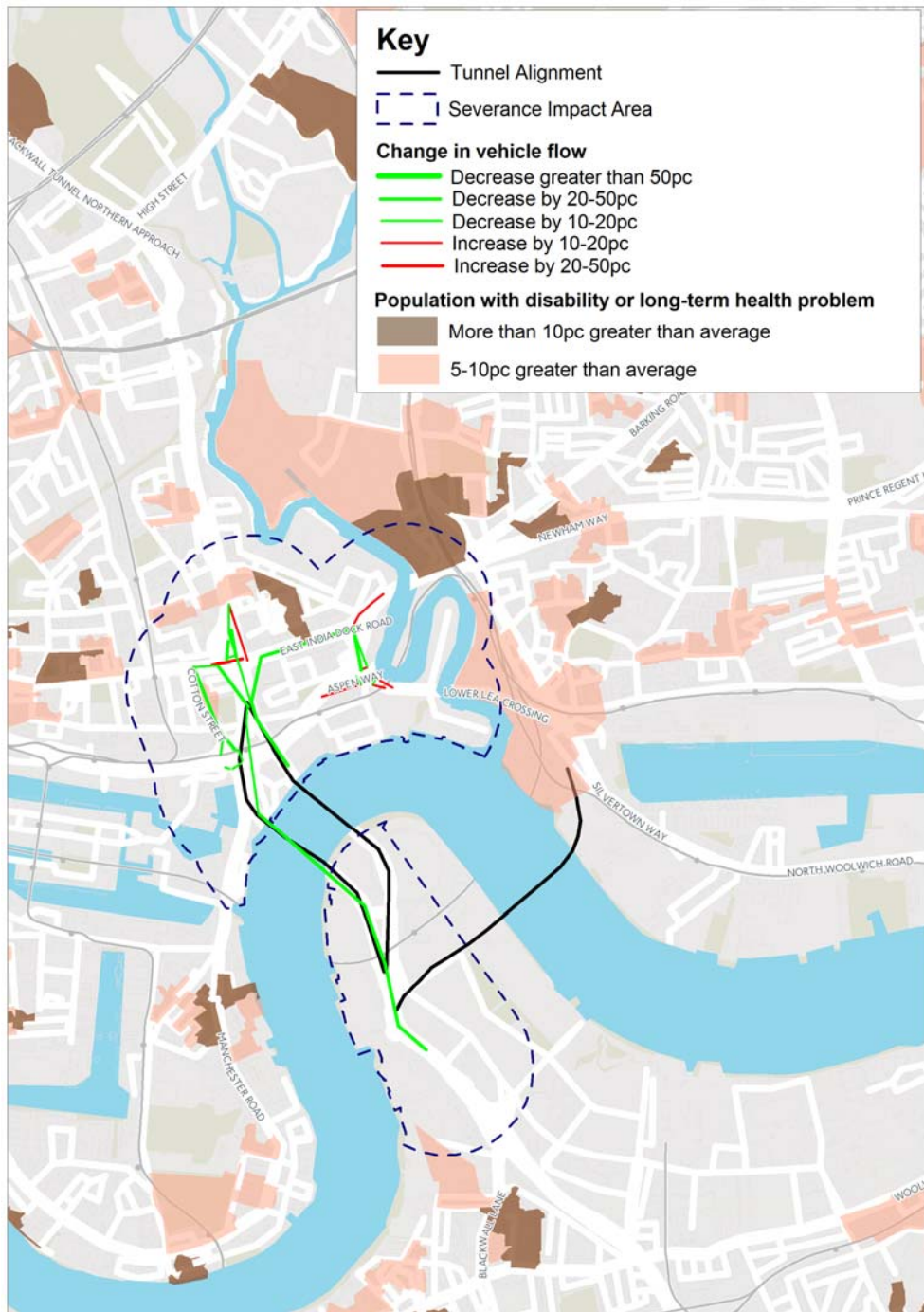
7.6.5 Figure 7.3 shows areas with higher than average concentrations of older people. There are high concentrations of older people close to the northern portal of the Silvertown tunnel on the edge of the Blackwall and Bromley by Bow areas.

Figure 7.3 High concentrations of older people in severance impact areas



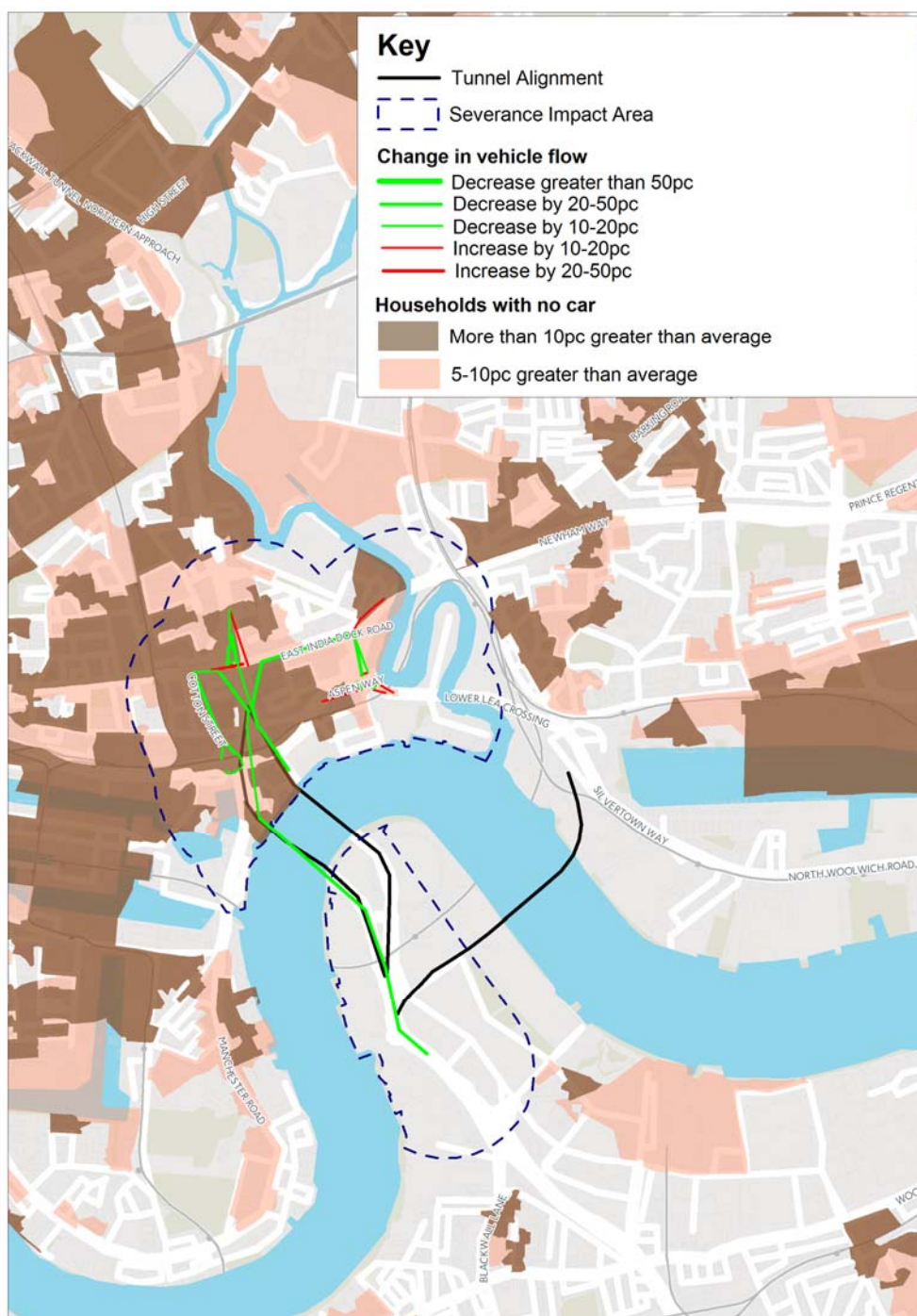
7.6.6 Figure 7.4 shows areas where the proportion of the population with a disability is high compared with the average across the three host boroughs. There are some small areas within the Blackwall and Bromley by Bow study area that have higher concentrations of disabled people.

Figure 7.4 High concentrations of disabled people in severance impact areas



7.6.7 Figure 7.5 shows that there are high concentrations of households without cars in the impact area north of the river.

Figure 7.5 High concentrations of households without a car in severance impact areas



7.6.8 In the Blackwall and South Bromley by Bow impact area the severe severance resulting from the area being intersected by the major roads A12, A13 and A1020 would remain, so the overall impact for the population as a whole is neutral. However there are high concentrations of children and no-car households that coincide with minor roads that experience decreases in vehicle flow, such as Newby Place and Bazely

Street. These groups in particular would experience some minor benefits due to the improved permeability on these streets.

7.6.9 In the Greenwich impact area there would be minor benefits for the population as a whole due to enhancements to pedestrian and cycle connections. There are no significant concentrations of vulnerable groups close to links that would be affected by changes in traffic flow so the benefits for all vulnerable groups are assumed to be in line with the wider population.

7.6.10 Table 7.4 summarises the Scheme severance distributional impacts for the vulnerable groups

Table 7.4 Severance distributional impacts summary

Impact area	Children	Older people	People with disability	No-car households
Blackwall and South Bromley by Bow	Slight positive	Neutral	Neutral	Slight positive
Greenwich Peninsula	Neutral	Neutral	Neutral	Neutral

7.6.11 Across the impact area there are slight positive impacts for children and no-car households. Therefore the overall distributional impact assessment on severance is considered to be slight beneficial.

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8. SECURITY

8.1 Introduction

8.1.1 Transport interventions can impact upon the personal security of transport users or other persons. The principal security impacts on road users relate to situations where they are required to leave their vehicle (e.g. car parks) or where they are forced to stop or travel at low speeds. For freight users, security impacts relate to both the security of drivers and goods carried. For public transport users certain social groups may suffer from greater anxiety when using public transport leading to the potential suppression of travel, which could reduce the effective accessibility of the transport system.

8.2 Screening

8.2.1 The initial screening for security distributional impacts is in Appendix A and is summarised below:

8.2.2 A security assessment was undertaken as part of the Social Impacts Appraisal.

8.2.3 The Scheme would not be expected to have any material impact on security issues in the area. While road users are typically more vulnerable to crime while vehicles are standing or slow-moving, there is no evidence that the A102 Blackwall Tunnel Approach is susceptible to crime and there are significant numbers of other users at all times of the day. Therefore no further assessment of security distributional impacts is required.

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9. PUBLIC TRANSPORT ACCESSIBILITY

9.1 Introduction

9.1.1 TAG guidance recommends that accessibility impacts of an intervention proposal should be considered throughout the appraisal process, since accessibility is of key importance in the operation of the transport system.

9.1.2 The appraisal of accessibility focuses on the public transport accessibility aspect of accessing employment, services and social networks. This provides a holistic approach to considering the accessibility needs of different groups of people, taking into account a wide range of factors, including journey times to reach key destinations, service frequencies and provision of accessible boarding at stops.

9.1.3 This links with severance impacts (see TAG Unit A4.1), which appraises barriers to accessibility within a local community, focusing on walking to local facilities, including access to the public transport stop. It also links with security, personal affordability, journey quality, and option values and non-use values impacts, because these impacts and issues themselves can act as barriers to accessibility.

9.1.4 The approach also considers the end-to-end journey, which includes the physical access on, to and within the public transport system (such as low floor access vehicles, capacity for wheelchairs) and aspects such as audio visual announcements informing passengers that the vehicle is stopping.

9.2 Screening

9.2.1 Screening for appraisal of accessibility considers changes in service, routings and timing and indirect impacts on accessibility to services. The proposed scheme includes several proposed improvements to local bus services, shown in Figure 1.2:

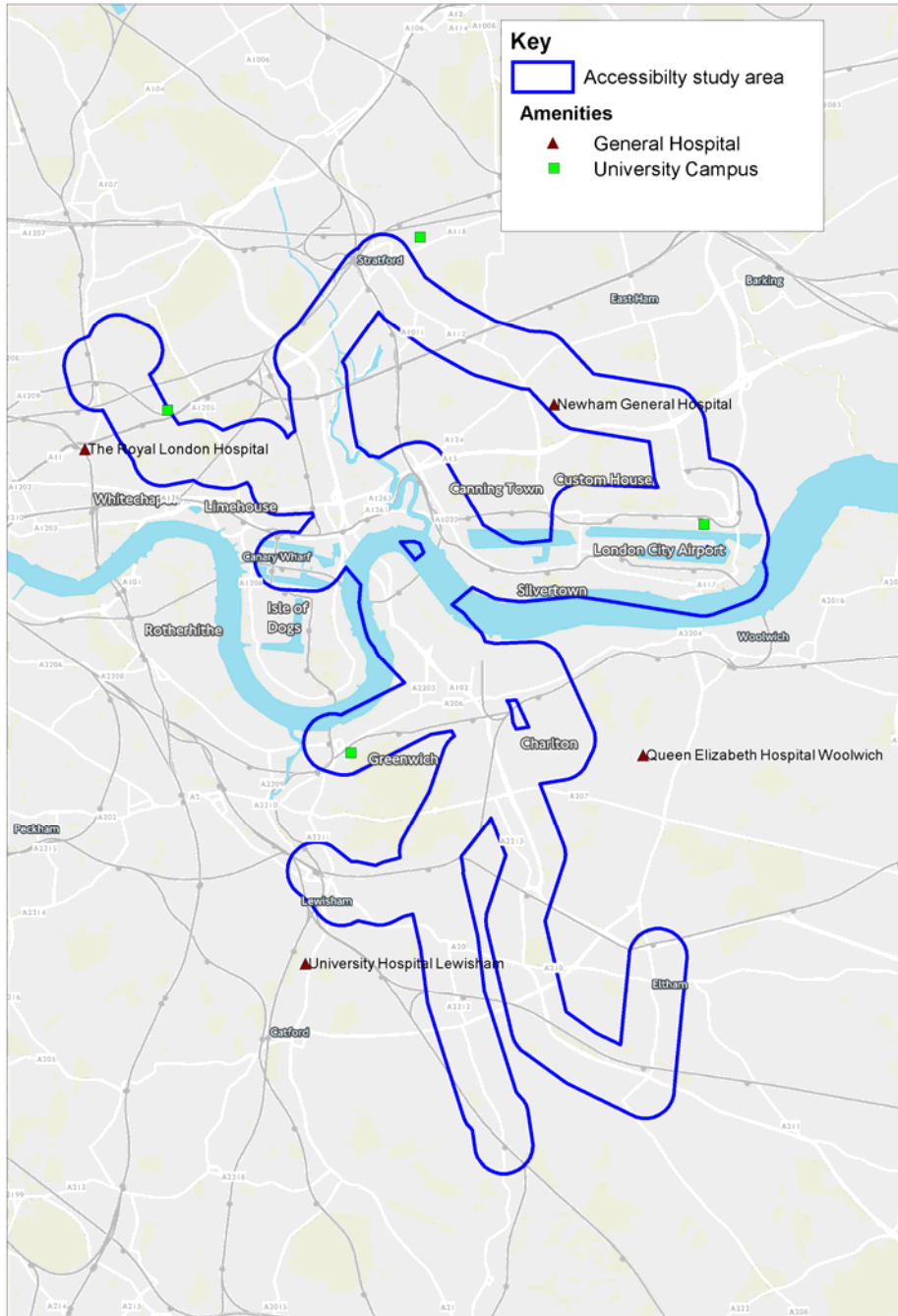
- enhanced frequency for route 108, the only route that goes through the Blackwall Tunnel;
- three existing bus routes to be extended or re-routed to provide services via the Silvertown Tunnel; and
- two new routes via the Silvertown Tunnel, Eltham – Beckton and Grove Park – Canary Wharf.

- 9.2.2 The addition of more direct cross-river bus links would be of particular benefit to older or mobility impaired persons who may find interchange at North Greenwich difficult.
- 9.2.3 There may be a positive impact on some lower income public transport users since new cross-river bus links may reduce the need to interchange to the (more expensive) Underground or Emirates Air Line services. However the Scheme is likely to have a negative impact on some lower income car drivers due to the road user charges planned (see personal affordability impacts in Chapter 10).
- 9.2.4 Taking the above into consideration, a detailed assessment of the distributional impacts of accessibility is appropriate.

9.3 Detailed assessment

- 9.3.1 The impact area has been defined as the catchment areas of the bus routes that would be enhanced or introduced under the Scheme, that is, 400m from the routes. It covers parts of RB Greenwich, LB Lewisham, LB Newham and LB Tower Hamlets. Figure 9.1 shows the impact area for the assessment.

Figure 9.1 Impact area for accessibility assessment



9.3.2 Table 9.1 compares the socio-demographic profile of study area residents against the average proportions across the boroughs covered by the study area. The profile is closely aligned with the averages across the four boroughs. Figures showing the concentrations of the various vulnerable population groups considered in this assessment can be found in section 2.3.

Table 9.1 Demographics within the study area

Summary for report	Study area	RB Greenwich	LB Lewisham	LB Newham	LB Tower Hamlets	Mean across four boroughs
Children under 16 (% population)	21	22	21	23	20	21
persons aged 16-25 (%population)	17	15	14	19	20	17
persons aged 70+ (%population)	6	7	7	5	4	6
Persons BAME (% population)	51	38	46	71	55	52
HH no car (% Households)	52	42	48	52	63	51
HH with dependent children (% households)	32	34	32	39	27	33

9.3.3 The assessment also takes into account amenities close to the impact area that may attract non-residents to the area. These include:

- Mile End Hospital, the London Chest Hospital and Queen Elizabeth Hospital Woolwich;
- campuses of the University of East London, Queen Mary University London and the University of Greenwich;
- Canary Wharf, Lewisham and Eltham, major town centres¹⁷; and
- Stratford, metropolitan town centre¹⁸.

9.3.4 The locations of these key amenities are shown in Figure 9.1.

9.4 Appraisal of impact

9.4.1 Strategic accessibility assessments identify changes in opportunity to access services and journey time changes to key destinations. The strategic accessibility assessments are based on public transport journey times during the AM peak. The following strategic accessibility assessments have been completed, for residents living in the study area:

- access to major town centre for older people aged 70+;
- access to major town centre for disabled people;

¹⁷ Major town centres as defined in the London Plan March 2015 (FALP) serve borough-wide catchment areas

¹⁸ Metropolitan town centres as defined in the London Plan March 2015 (FALP) serve catchments extending over several boroughs

- access to major town centre for no-car households;
- access to university campus for young people aged 16-25; and
- access to hospitals for no car households;

9.4.2 Table 9.2 indicates how public transport accessibility to the nearest major town centre would change with the Scheme, for all residents of the study area. The overall number of residents able to reach a major town centre within 45 minutes journey time is unchanged however there is a small shift of residents from the 15-20 minutes time band into the 10-15 minutes time band. Therefore the impact for this indicator is assessed as slight beneficial.

Table 9.2 Access to major town centre by public transport for all study area residents

All population access to major town centre by journey time	Without Scheme	With Scheme	% Change
0 - 5 mins	4,400	4,400	0%
5 - 10 mins	11,100	11,100	0%
10 - 15 mins	45,010	47,300	+5%
15 - 20 mins	48,550	46,260	-5%
20 - 25 mins	89,280	89,280	0%
25 - 30 mins	44,030	44,030	0%
30 - 35 mins	21,220	21,220	0%
35 - 40 mins	70	70	0%
40 - 45 mins	10	10	0%
Total within 45 mins	263,670	263,670	0%

9.4.3 Table 9.3 shows accessibility to the nearest major town centre for study area residents who are aged 70 or older. There is a small shift in people from the 15-20 minutes time band to the 10-15 minutes time band. The overall impact for this group is therefore slight beneficial.

Table 9.3 Access to major town centre by public transport for older residents

Older persons access to major town centre by journey time	Without Scheme	With Scheme	% Change
0 - 5 mins	230	230	0%
5 - 10 mins	770	770	0%
10 - 15 mins	2,420	2,480	+2%
15 - 20 mins	2,520	2,460	-2%
20 - 25 mins	5,300	5,300	0%
25 - 30 mins	2,620	2,620	0%
30 - 35 mins	1,390	1,390	0%
35 - 40 mins	10	10	0%
40 - 45 mins	0	0	0%
Total within 45 mins	15,270	15,270	0%

9.4.4 Table 9.4 shows accessibility to the nearest major town centre for study area residents who are disabled. There is a small shift in people from the 15-20 minutes time band to the 10-15 minutes time band. The overall impact for this group is therefore slight beneficial.

Table 9.4 Access to major town centre by public transport- disabled residents

Disabled persons access to major town centre by journey time	Without Scheme	With Scheme	% Change
0 - 5 mins	580	580	0%
5 - 10 mins	1,480	1,480	0%
10 - 15 mins	6,160	6,430	+4%
15 - 20 mins	6,450	6,180	-4%
20 - 25 mins	13,080	13,080	0%
25 - 30 mins	6,370	6,370	0%
30 - 35 mins	3,180	3,180	0%
35 - 40 mins	10	10	0%
40 - 45 mins	0	0	0%
Total within 45 mins	37,310	37,310	0%

9.4.5 Table 9.5 shows public transport accessibility to the nearest major town centre for households without a car. There is a small shift in people from the 15-20 minutes time band to the 10-15 minutes time band so the overall impact for this group is scored as slight beneficial.

Table 9.5 Access to major town centre by public transport - households without a car

No-Car Households access to major town centre by journey time	Without Scheme	With Scheme	% Change
0 - 5 mins	1,150	1,150	0%
5 - 10 mins	2,040	2,040	0%
10 - 15 mins	9,100	9,690	+7%
15 - 20 mins	10,790	10,200	-5%
20 - 25 mins	17,510	17,510	0%
25 - 30 mins	8,590	8,590	0%
30 - 35 mins	4,560	4,560	0%
35 - 40 mins	10	10	0%
40 - 45 mins	0	0	0%
Total within 45 mins	53,760	53,760	0%

9.4.6 Table 9.6 shows public transport accessibility to the nearest university campus for residents aged 16-25. The overall number of residents aged 16-25 who live within 45 minutes of a nearby university campus is unchanged but there is a large movement of people into the 10-20 minutes time bands from longer journey time bands. This assessment is therefore scored as large beneficial.

Table 9.6 Access to university campus by public transport - residents aged 16-25

Persons aged 16-25 access to university campus	Without Scheme	With Scheme	% Change
0 - 5 mins	540	540	0%
5 - 10 mins	4,370	4,370	0%
10 - 15 mins	6,450	7,160	+11%
15 - 20 mins	4,200	5,910	+41%
20 - 25 mins	12,500	12,060	-3%
25 - 30 mins	9,950	9,070	-9%
30 - 35 mins	2,870	1,860	-35%
35 - 40 mins	920	840	-9%
40 - 45 mins	1,960	1,960	0%
Total Population within 60 mins	44,800	44,800	0%

9.4.7 Table 9.7 shows public transport accessibility to the nearest general hospital for households with no car. The overall number of no-car households within 45 minutes public transport journey time of a general hospital is unchanged but there is some movement from longer journey time bands to shorter journey times bands, for example 15-20 minus into 10-15 minutes. This assessment has therefore been scored as moderate beneficial.

Table 9.7 Access to nearest general hospital - households with no car

No-Car Households access to general hospital	Without Scheme	With Scheme	% Change
0 - 5 mins	1,036	1,036	0%
5 - 10 mins	324	324	0%
10 - 15 mins	6,463	7,067	+9%
15 - 20 mins	9,329	8,830	-5%
20 - 25 mins	12,770	12,990	+2%
25 - 30 mins	15,705	15,702	-0%
30 - 35 mins	4,625	4,550	-2%
35 - 40 mins	3,721	3,474	-7%
40 - 45 mins	2	2	0%
Total within 45 mins	53,975	53,975	0%

9.4.8 Table 9.8 shows the overall accessibility indicator scores for the amenities of interest, for the social groups of interest within the study area.

Table 9.8 Overall accessibility indicator scores for residents in the study area

Criteria	Overall score
Access to major town centre for older people	Slight beneficial
Access to major town centre for disabled people	Slight beneficial
Access to major town centre for no-car households	Slight beneficial
Access to university campus for young people	Large beneficial
Access to nearest general hospital for no-car households	Moderate beneficial

9.4.9 As well as residents within the impact area, the Scheme would also have positive impacts for people from outside the area that travel into the area to use local amenities, such as the four university campuses located in the area.

9.4.10 Table 9.1 shows that more than half of households within the impact area do not have access to a car. Improved public transport links would increase the access to employment opportunities for people living in the impact area and it follows that this would particularly benefit people living in households without a car. Public transport accessibility to employment has been explored in detail in the TA and OBC.

9.4.11 The scheme has no negative public transport accessibility assessment scores for any group. The scale of positive impacts varies depending on the destination and groups being considered. Taking into account the above assessments, the overall assessment of the distributional impacts is assessed as moderate beneficial.

10. PERSONAL AFFORDABILITY

10.1 Introduction

- 10.1.1 The introduction of user charging on both the Blackwall and Silvertown tunnels would have a direct impact on the affordability of travel by car for some users. Enhancements to bus services included with the Scheme would impact on the affordability of travel by public transport for those who would be able to take cross-river trips by bus instead of by more expensive modes such as the Emirates Airline or the Underground.
- 10.1.2 The most significant impacts of the costs of travel may be on young and old people, and low-income households, particularly when travelling to employment or education.
- 10.1.3 The Preliminary Economic Assessment Report identifies that users would have significant time saving benefits, the monetary value of which are greater than the cost of user charges. However, the personal affordability assessment is concerned only with changes in the monetary cost of travel that form part of the decision making processes for travellers. It does not take into account the benefits that users experience as a result of time savings. It mirrors the user benefit appraisal component and can be based on the user charge assessment as considered in the Transport Economic Efficiency analysis, but requires a further qualitative analysis to ensure that all key monetary impacts can be considered by impact group irrespective of their inclusion in formal modelling processes.
- 10.1.4 As the principles are similar to the derivation of transport user benefits and transport user charges, elements of the basic personal affordability assessment can be captured as an output from TUBA, in this case only for 'non-working time' (which includes travel to and from work).

10.2 Screening

- 10.2.1 A strategic personal affordability review was undertaken to identify aspects of the Scheme that may have positive or negative consequences on key cost areas.
- 10.2.2 The following elements of costs have been identified as potentially changing as a result of the Scheme:
- car fuel and non-fuel cost (a TUBA benefit);
 - user charges (a TUBA disbenefit); and
 - public transport cost due to mode shift.

10.3 Scope of changes

10.3.1 The primary group of interest in this appraisal is people on low incomes. These have been identified and assessed using the same methodology as the user benefits appraisal in chapter 3.

10.3.2 Table 10.1 summarises the results of desktop analysis to identify the scope of potential changes in costs of travel.

Table 10.1 Scope of potential changes in cost of travel

Mode	Cost change	Core impact	Change captured in TUBA
Car	Car fuel and non-fuel cost	Changes due to congestion relief and rerouting.	Yes
	Road user charges	Additional charges due to user charges introduces at Blackwall and Silvertown tunnels.	Yes
	Public parking charges – management	No	-
	Other car charge/costs	No	-
Public transport	Bus fares	No	-
	Rail fares	No	-
	Rapid transit fares	No	-
	Mode shift between public transport modes due to change in supply	Additional bus services provide potential mode shift opportunities.	No
	Concessionary fares	No	-
	Other public transport charges/costs	No	-
Non-motorised Modes	Walking costs	No	-
	Cycling costs	No	-

10.4 Assessment of car fuel and non-fuel cost

10.4.1 Across the study area there would be a net benefit for car user fuel and non-fuel combined VOC of £1.2m in 2021 (2010 prices).

10.4.2 Table 10.2 shows the Distributional Impact assessment for fuel and non-fuel VOC. The impacts are positive because both low income and medium-high income groups experience a net benefit. The share of benefits for the low income group (31%) is smaller than their share of population in the study area (75%) so the impact for that group is assessed as beneficial. The medium-high income group receive a larger share of the benefits relative to their proportion of the population so the impact for them is large beneficial.

Table 10.2 DI Fuel and non-fuel vehicle operating costs

Fuel and non-fuel VOC	Low income	Medium or high income	Total
Fuel and non-fuel VOC (£m, 2010 prices)	0.4	0.8	1.2
Fuel and non-fuel VOC %	31%	69%	
Study area population %	75%	25%	
Score	Slight beneficial	Large beneficial	

10.5 Assessment of user charges

10.5.1 Table 10.3 shows the DI assessment for user charges. The impacts are negative for both groups. The share of costs for the low income group (27%) is smaller than the share of population in the study area (75%) so the impact for that group is assessed as slight adverse. The medium-high income group pay a larger share of the costs relative to their proportion of the population so the impact for them is large adverse.

Table 10.3 DI assessment of user charges

User charges	Low income	Medium or high income	Total
User charges £m	-2.9	-7.6	-10.5
User charges %	27%	73%	
Study area population %	75%	25%	
Score	Slight adverse	Large adverse	

10.5.2 The impacts for user charges are therefore assessed as slight adverse for low income users and large adverse for higher income users, based on the relative shares of the disbenefits to the shares of the populations. Again, this does not take into account the monetary value of time savings and reliability, which chapter three identifies are greater than the level of user charges.

10.6 Assessment of public transport mode shift savings

10.6.1 The enhanced bus package would result in savings for some transport users who would be able to use buses to take journeys they would

otherwise have taken using more expensive modes such as trains or the tube.

10.6.2 It is difficult to assess accurately the extent of the potential savings because the forecasts for public transport usage also include new demand generated as a result of the enhanced services (i.e those who would not have taken the journey by any mode previously).

10.6.3 However it is reasonable to assume that any benefits arising from mode shift would be apportioned between income groups in the same way as public transport user time benefits. Table 10.4 shows the DI assessment of public transport mode shift fare benefits.

Table 10.4 DI assessment of public transport mode shift benefits

PT mode shift fare benefits	Low income	Medium or high income
Share of benefits %	80%	20%
Share of population %	75%	25%
Score	Large beneficial	Slight beneficial

10.6.4 The benefits are assessed as large beneficial for low income users because the share of benefits is greater than the share of the population, and slight beneficial for medium or high income users because the share of benefits is smaller than the share of the population.

10.7 Discussion and overall DI assessment

10.7.1 Table 10.5 summarises the DI assessments for all the personal affordability indicators.

Table 10.5 Personal affordability DI assessments summary

Summary scores	Low income	Medium or high income
Fuel + Non fuel VOC	Slight beneficial	Large beneficial
User charges	Slight adverse	Large adverse
PT mode shift benefits	Large beneficial	Slight beneficial

10.7.2 The primary group of interest in the assessment of personal affordability impacts is people on low incomes. User charges have the greatest impact on overall affordability, amounting to a total cost of £10.5m (in 2021) for all users in the study area (again, this does not take into account the monetary value of time savings and reliability, which chapter three identifies are greater than the level of user charges), however the impact of user charges on people on low incomes is only slight adverse. Public transport mode shift benefits are difficult to quantify but would primarily

benefit people on low incomes. The overall DI assessment of personal affordability is therefore scored as neutral.

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11. CONCLUSIONS

11.1 Introduction

11.1.1 The distributional impacts appraisal has been undertaken with reference to DfT guidance set out in TAG unit 4.2

11.2 Output summary

11.2.1 Table 11.1 summarises the outputs from the DI appraisals.

Table 11.1 DI output summary

Social group and amenities indicators			User Benefits	Noise	Air quality	Accidents	Security	Severance	Accessibility	Affordability	London	England
Resident population in the impact area	Income distribution quintiles	0-20%	48%							48%	34%	20%
		20-40%	26%							26%	28%	20%
		40-60%	11%							11%	17%	20%
		60-80%	8%							8%	11%	20%
		80-100%	7%							7%	10%	20%
	Children (<16)				22%	NA	22%	21%		20%	19%	
	Young people				18%			17%		14%	12%	
	Older people				4%	NA	3%	6%		8%	12%	
	People with a disability					NA	12%	14%		14%	18%	
	Black, Asian and Minority Ethnic							51%		40%	15%	
	No car households						62%	52%		42%	26%	
Households with dependent children							32%		31%	32%		
Indicator population in the impact area		2.9m			29,000	NA	16,000	260,000	2.9m	8.2m	53m	
Amenities present within the impact area	Schools / nurseries	.	.	.	✓	-	✓	✓	✓	-	-	
	Playgrounds	.	.	.	✓	-	✓	✓	✓	-	-	
	Parks and open spaces	.	.	.	✓	-	✓	✓	✓	-	-	
	Hospitals	.	.	.	-	-	-	✓	✓	-	-	
	Care homes / day centres	.	.	.	✓	-	✓	✓	✓	-	-	
	Community centre	.	.	.	✓	-	✓	✓	✓	-	-	

11.3 Conclusions

11.3.1 The findings of the distributional impacts appraisal are presented in Table 11.2.

Table 11.2 Distributional impacts appraisal findings

Indicator	Assessment	Conclusion
User benefits	Overall net user benefits of £14.2m (initial assessment) and £16.2m (including reliability benefits in 2021 (2010 prices)). The impact is strong beneficial for low income users and slight beneficial for medium-high income users.	Moderate beneficial
Noise	An initial assessment indicates a slight overall decrease in noise levels for children and people on low incomes.	Slight beneficial
Air quality	An initial assessment indicates that improvements in air quality would particularly benefit children and people in the most income-deprived areas. People in other areas would experience beneficial or neutral air quality impacts .	Moderate beneficial
Accidents	There would be a reduction in overall accident numbers within the impact area. For most vulnerable groups the impacts are scored as moderate or large beneficial.	Moderate beneficial
Security	Initial screening indicated that the Scheme would have no material impacts on security.	N/A
Severance	High concentrations of vulnerable groups on minor roads with decreases in vehicle flow would enhance the small positive impacts for those groups.	Slight beneficial
Accessibility	Accessibility impacts are scored as beneficial for all assessments. The impact area contains a high proportion of non-car-owning households.	Moderate beneficial

Indicator	Assessment	Conclusion
Personal Affordability	User charges would have a slight adverse impact on people on low incomes and mainly impact people on higher incomes. Benefits from public transport modes would mainly benefit people on low incomes. This does not take into account the monetary value of time savings and reliability, which the user benefit estimate above shows are greater than the level of user charges.	Neutral

11.3.2 These findings are included in the Appraisal Summary Table (AST) in the Preliminary Outline Business Case.

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Appendix A : DI screening table

Indicator	(a) Appraisal output criteria	(b) Potential impact (yes / no, positive/negative if known)	(c) Qualitative Comments	(d) Proceed to Step 2
User benefits	The TUBA user benefit analysis software or an equivalent process has been used in the appraisal; and/or the value of user benefits Transport Economic Efficiency (TEE) table is non-zero.	TUBA outputs give positive TEE impacts, and indicate a net user benefit, but some areas may experience disbenefit. Bus/coach benefits require further assessment	User benefits are spread over a wide geographic area and many socio-economic groups.	Yes A detailed assessment should be carried out across a refined study area.
Noise	Any change in alignment of transport corridor or any links with significant changes (>25% or <-20%) in vehicle flow, speed or %HDV content. Also note comment in TAG Unit A3.	Changes in traffic flows indicate that there would be potential noise impacts	TAG noise assessment was undertaken as part of the Environmental Assessment Report (EAR) which shows the number of properties experiencing an increase, decrease or no change in noise levels as a result of the Scheme in the opening year	Yes A detailed assessment should be carried out across a refined study area.
Air quality	Any change in alignment of transport corridor or any links with significant changes in vehicle flow, speed or %HDV content: <ul style="list-style-type: none"> • Change in 24 hour AADT of 1000 vehicles or more • Change in 24 hour AADT of HDV of 200 HDV vehicles or more • Change in daily average speed of 10kph or more • Change in peak hour speed of 20kph or more • Change in road alignment of 5m or more 	Changes in traffic flows indicate that there would be potential air quality impacts	TAG air quality assessment was undertaken as part of the Environmental Assessment Report (EAR) which shows the number of properties experiencing an increase, decrease or no change in PM10 and NO2 as a result of the Scheme in the opening year	Yes A detailed assessment should be carried out across a refined study area.

Silvertown Tunnel

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Indicator	(a) Appraisal output criteria	(b) Potential impact (yes / no, positive/negative if known)	(c) Qualitative Comments	(d) Proceed to Step 2
Accidents	Any change in alignment of transport corridor (or road layout) that may have positive or negative safety impacts, or any links with significant changes in vehicle flow, speed, %HGV content or any significant change (>10%) in the number of pedestrians, cyclists or motorcyclists using road network.	There are some increases above 10% in vehicle flow and speed on some roads in the immediate vicinity of the Scheme, and initial COBA-LT results indicate a decrease in accident rates.	Detailed analysis will be needed around the key areas of change	Yes A detailed assessment should be carried out across a refined study area.
Security	Any change in public transport waiting/interchange facilities including pedestrian access expected to affect user perceptions of personal security.	The proposed scheme does not include any changes to public transport waiting or interchange facilities.		No
Severance	Introduction or removal of barriers to pedestrian movement, either through changes to road crossing provision, or through introduction of new public transport or road corridors. Any areas with significant changes (>10%) in vehicle flow, speed, %HGV content.	Yes. Impacts from changes in traffic flow may be positive or negative.	The proposed scheme includes changes to road alignments and some specific and passive provision for improving pedestrian and cycle connections. Traffic forecasts indicate that there would be some areas with significant changes in vehicle flow.	Yes A detailed assessment should be carried out across a refined study area.
Accessibility	Changes in routings or timings of current public transport services, any changes to public transport provision, including routing, frequencies, waiting facilities (bus stops / rail stations) and rolling stock, or any indirect impacts on accessibility to services (e.g. demolition & re-location of a school).	yes	Improvements to local bus services: Enhanced frequency route 108. Extensions to routes 129, 309, 104A. New bus routes serving Eltham-Beckton and Grove Park - Canary Wharf. Negative impacts on lower income car drivers due to charges.	Yes A detailed assessment should be carried out across a refined study area.

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Indicator	(a) Appraisal output criteria	(b) Potential impact (yes / no, positive/negative if known)	(c) Qualitative Comments	(d) Proceed to Step 2
Affordability	In cases where the following charges will occur; Parking charges (including where changes in the allocation of free or reduced fee spaces may occur); Car fuel and non-fuel operating costs (where, for example, rerouting or changes in journey speeds and congestion occur resulting in changes in costs); Road user charges (including discounts and exemptions for different groups of travellers); Public transport fare changes (where, for example premium fares are set on new or existing modes or where multi-modal discounted travel tickets become available due to new ticketing technologies); or Public transport concession availability (where, for example concession arrangements vary as a result of a move in service provision from bus to light rail or heavy rail, where such concession entitlement is not maintained by the local authority[1]).	The scheme includes a road user charge for Silvertown Tunnel. TUBA outputs show changes in car fuel and non-fuel operating costs	User costs are spread over a relatively wide geographic area.	Yes A detailed assessment should be carried out across a refined study area.