SILVERTOWN TUNNEL

SUPPORTING TECHNICAL DOCUMENTATION

PRELIMINARY SUSTAINABILITY STATEMENT

October 2015

This report is an appraisal of the Scheme's sustainability credentials. It assesses the Scheme using TfL's Sustainability Assessment Toolkit, the Mayor of London's Sustainable Design and Construction SPG, and CEEQUAL – the assessment and awards scheme for improving sustainability in civil engineering and infrastructure projects.

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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 Sustainability Statement

October 2015

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Silvertown Tunnel

Preliminary Sustainability Statement

Planning Act 2008

Infrastructure Planning

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Rev.	Date	Approved By	Signature	Description
1	02/10/2015	David Rowe (TfL Lead Sponsor)		For Consultation
		Richard De Cani (TfL MD Planning)		

Contents

List of Abbreviations

CCS	Considerate Constructors Scheme
CDE	Construction, Demolition and Excavation
CEMP	Construction Environmental Management Plan
CHP	Combined Heat and Power
CLP	Construction Logistics Plan
CoCP	Code of Construction Practice
CTMP	Construction Traffic Management Plan
DBFM	Design Build Finance and Maintain
DCLG	Department for Communities and Local Government
DCO	Development Consent Order
DLR	Docklands Light Railway
EA	Environment Agency
EAR	Economic Assessment Report
EIA	Environmental Impact Assessment

EqIA	Equality Impact Assessment
ESR	East and south-east region
FRA	Flood Risk Assessment
GLA	Greater London Authority
GPS	Greenwich Power Station
HAP	Health Action Plan
HGV	Heavy Goods Vehicle
KPI	Key Performance Indicator
LCAP	London Congestion Analysis Project
LED	Light-Emitting Diode
LDF	Local Development Framework
LIP	Local Implementation Plan
MDD	Managing Development Document
MMP	Materials Management Plan
MTS	Mayor's Transport Strategy

NMU	Non-Motorised Users
NN NPS	National Networks National Policy Statement
NPPF	National Planning Policy Framework
NSIP	Nationally Significant Infrastructure Project
PES	Preliminary Energy Statement
PHIA	Preliminary Health Impact Assessment
PP	Passage Plan
PPG	Planning Policy Guidance
PSS	Preliminary Sustainability Statement
PTA	Preliminary Transport Assessment
PTAL	Public Transport Access Level
PV	Photovoltaics
SPG	Supplementary Planning Guidance
SRN	Strategic Road Network

SWMP	Site Waste Management Plan
TBM	Tunnel Boring Machine
TfL	Transport for London
TLRN	Transport for London Road Network
TUBA	Transport User Benefit Appraisal
UK	United Kingdom
WI	Wider Impacts
WRAP	Waste and Resources Action Programme

Glossary of Terms

Blackwall Tunnel	"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. 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."
CEEQUAL	CEEQUAL is an evidence-based sustainability assessment and awards scheme for civil engineering, infrastructure, landscaping and public realm schemes, which recognises the achievement of high environmental and social performance.
Contractor	Anyone who directly employs or engages construction workers or manages construction work. Contractors include sub-contractors, any individual self-employed worker or business that carries out, manages or controls construction work
Cut and cover	A method of construction for shallow tunnels where a trench is excavated and roofed over with an overhead support system strong enough to carry the load of what is to be built above the tunnel
Design, Build, Finance and Maintain (DBFM)	A DBFM company is typically a consortium of private sector companies, formed for the specific purpose of providing the services under the DBFM contract. This is also technically known as a Special Purpose Vehicle (SPV). The DBFM Company will obtain funding to design and build the new facilities and then undertake routine

	maintenance and capital replacement during the contract period, which is typically 25 to 30 years. The DBFO Company will repay funders from payments received from TfL during the lifespan of the contract. Receipt of payments from TfL will depend on the ability of the DBFO Company to deliver the services in accordance with the output specified in the contract and will be subject to deductions if performance is not satisfactory.”
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)	"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. http://infrastructure.planninginspectorate.gov.uk/help/glossary-of-terms/"
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

Earth Pressure Balance (EPB) Tunnel Boring Machine	A type of tunnel boring machine used in soft ground. The machine uses the excavated material to balance the pressure at the tunnel face. Pressure is maintained in the cutter head by controlling the rate of extraction of spoil through the removal Archimedes screw and the advance rate of the machine
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 3500kg

SUMMARY

1. This Preliminary Sustainability Statement (PSS) has been prepared to support the statutory consultation ahead of the Development Consent Order (DCO) for the Silvertown Tunnel (referred to as the Scheme). The PSS is a sustainability assessment of the current Scheme, based on the findings and information available until September 2015. The Scheme will be further assessed post consultation and a final Sustainability Statement will be produced to accompany the DCO application.

2. This PSS demonstrates how the Scheme would address the national, regional and local (the Royal Borough of Greenwich, London Borough of Newham and London Borough of Tower Hamlets) sustainability policies and objectives. The PSS follows the requirements of the Mayor's London Plan 2015[1] and the guidance provided in the Mayor of London's Sustainable Design and Construction Supplementary Planning Guidance (SPG) 2014[2].

3. In addition, the PSS has been structured around Transport for London's (TfL) Sustainability Framework (referred to as the Framework) and its topics. The PSS captures the policies and objectives in the above reports through the appraisal of the Scheme against the Framework's topics:

    - economic progress;
    - climate change;
    - safety and security;
    - quality of life; and
    - transport for all.

4. Throughout the process outlined above, a number of tools were utilised:

    - TfL's Sustainability Assessment Toolkit (Toolkit) (Appendix A), of which the themes are aligned with the Framework's topics;

[1] Greater London Authority, The London Plan, Spatial Development Strategy for Greater London, 2015

[2] Greater London Authority, The London Plan, Sustainable Design and Construction Supplementary Planning Guidance, 2014

- Mayor of London's Sustainable Design and Construction Supplementary Planning Guidance (SPG) Checklist (Appendix B); and
- CEEQUAL - it is intended that the project achieves at least the target of 'Very Good' and ideally 'Excellent' for the Whole Team Award.

5. As the Framework 'topics' align with the 'themes' of the Toolkit, the PSS has also been structured to assess the Scheme against the indicators and guiding questions of the Toolkit. The key beneficial impacts of the Scheme in relation to sustainability are summarised below:

Economic progress – supporting economic development and population growth

6. The Scheme would have an overall positive economic effect on Greater London as a whole, through direct and indirect employment generation, improving access to employment opportunities for residents and improving connectivity between employment areas.
7. Other potential economic benefits are:

    - decreased business costs as a result of reduced routine congestion caused by the Blackwall Tunnel. This would have a positive effect on reliability, reducing delays and disruptions to business operations;
    - better access to labour market for both employers and employees, creating more job opportunities on both sides of the river;
    - better cross-river connectivity for visitors and customers using retail or leisure facilities. This will have a positive effect on local businesses providing good opportunities for the companies to develop and grow; and
    - improved cross-river connectivity could encourage investment in the surrounding areas by making them more accessible and attractive for developers.

Climate change – reduce transport's contribution to climate change and improve its resilience

8. The Scheme design would optimise energy performance and CO_2 emissions during the construction stage through the minimisation of the use of diesel or petrol powered generators, powering down of equipment/plant when not in use, ensuring all vehicles and machinery are serviced at recommended

intervals, using fuel-efficient plant, machinery and vehicles and deploying correctly sized generators for electrical provision onsite.

9. The Scheme design would also optimise energy performance and CO_2 emissions during the operational stage through the optimisation of daylighting, orientation, site layout and energy efficient lighting.

10. The drainage system has been designed in a way which ensures pollution control measures are in place and flood risk is reduced.

11. Water consumption would be reduced through selection and specification of equipment to reduce the amount of water required, water reduction initiatives, collection of drainage water for dust suppression, installation of a water meter with a pulsed output on the mains supplies and leak detection system with an audible signal when a leak is detected.

12. The materials would be suitable and robust, with durable long-life properties.

13. A Preliminary Site Waste Management Plan has been developed as an internal waste management and monitoring tool. This would establish and implement a sustainable Resource and Waste Management Strategy and would support the monitoring of the Scheme's performance.

14. The Scheme has set a 95% target for recycling and reuse of the materials arising from the construction of the Scheme.

15. 'Green procurement' objectives would be defined and integrated into the procurement and specification process to use reused or recycled products and construction materials.

Safety and security – improve the safety and security of all users

16. The Scheme's design would seek to design out crime and to help people feel safe and therefore 'Secured by Design' principles would be observed.

17. The design of the tunnel would incorporate a range of security measures through the layout, lighting, alarm, closed-circuit television coverage and signage used to reduce the potential and perception of crime.

18. Other indirect benefit would be the reduced risk of road accidents due to traffic management measures, relieved congestion and appropriate design measures.

Quality of life – enhance the quality of life for all users

19. The Scheme would integrate existing cycle routes and accommodate new cycle routes, encouraging the shared space principle and creating uncluttered clearly defined cycle and pedestrian paths.

20. In addition to movement corridors, the landscaping area at the northern portal would provide seating. These seating areas are integrated into the landscaping and provide character to the area, with high quality street furniture which creates an attractive high quality public realm.

21. TfL would, as far as reasonably practicable, would seek to control and limit noise and vibration levels so that affected properties and other sensitive receptors are protected from excessive or prolonged noise and vibration associated with the construction activities.

22. The Scheme is located in an area of existing high noise levels. However, the Scheme would reduce operational noise impacts through the use of noise barriers and low noise surfacing where possible. Beneficial noise impacts are likely to be widespread, whist the adverse impacts are likely to be very localised.

23. The Scheme landscape design would contribute positively to the development of the area in terms of visual amenity. It wold also enhance the urban realm and improve the quality of life of the local residents.

24. The proposed green infrastructure will have a positive restorative effect on many other elements such as water, pollution, heat and climate change attenuation including public health and wellbeing in general.

25. The implementation of the Scheme is predicted to result in both improvements and deterioration in air quality at worst case receptors. In general there are more receptors where concentrations of NO_2, PM_{10} and $PM_{2.5}$ are predicted to decrease than receptors where concentrations are predicted increase. This is likely to result in a net benefit.

26. The Scheme would also improve the certainty of journey time and therefore is likely to reduce driver stress. The reduction in incidents currently occurring in the Blackwall Tunnel would also have a strong positive impact on drivers' perception of safety.

27. Other indirect benefits would be the safety and security of the tunnel with both direct benefits on both physical and mental health and the in increased job

opportunities and improved accessibility to jobs with indirect benefits on mental health and well-being.

Transport for all – improve transport opportunities for all users

28. Key public transport access routes at the northern side of the Scheme would remain open for the duration of the works. Access to Greenwich Bus Station would be maintained for all modes of transport during construction of the Scheme, however there would be some diversions to existing bus routes during the Greenwich construction phase.

29. A Public Transport Accessibility Level (PTAL) assessment was also undertaken to measure the impact on accessibility of potential enhancements to the bus network as a result of the Scheme. PTAL shows that new cross-river bus links would lead to wider travel horizons for residents of some nearby regeneration areas, providing low-cost travel options to access employment and education opportunities on the opposite side of the River Thames.

30. The introduction of user charging on both the Blackwall and Silvertown Tunnels would have a direct impact on the affordability of travel by car and public transport for some users. However, the Economic Assessment Report identifies that users would have significant time saving benefits, the monetary value of which is greater than the cost of user charges.

31. Enhancements to bus services 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.

32. Other benefits would include:

    - faster journey times for businesses - with time savings of up to 20 minutes in the peak periods (excluding any additional reliability benefits);

    - more reliable journey times -by reducing congestion and improving journey time reliability, businesses would have more certainty over their route planning, have more control over their costs and be able to pursue potential opportunities more effectively;

    - improvements in access to labour market - with the Silvertown Tunnel, employers north of the River Thames would see more than a 10%

increase in the size of their labour market catchments living within a 45 minute drive;

- improvements in access to customers - the Silvertown Tunnel would increase catchment areas for businesses;
- improvements in access to suppliers - firms would be able to access to a greater range of suppliers. This can increase competition, drive down costs and support innovation;
- improvements in access to jobs - the number of jobs accessible by highway is projected to significantly increase in south-east London as a direct result of decreased congestion at Blackwall Tunnel; and
- higher levels of inward investment and faster rates of development - tangible impacts in the efficiency of the local economy, improved access to jobs and services, as well as improvements in the perception of the area, could mean that future levels of development, including housing, may be higher as a result of the Scheme.

Conclusions

33. The Preliminary Sustainability Statement demonstrated that the Scheme currently achieves a balanced level of sustainability over the TfL Sustainability Framework categories, which demonstrates that social, environmental and economic factors have been considered thorough the design process.

34. To secure that the Scheme's objectives are implemented the Scheme would continue with the implementation of the CEEQUAL and the TfL Sustainability Toolkit requirements relevant to this stage of the design process.

35. TfL would assess and benchmark the Scheme against the CEEQUAL Whole Project award and would aim to achieve at least the target of 'Very Good' and ideally 'Excellent'.

1. INTRODUCTION

1.1 Preliminary Sustainability Statement

1.1.1 This Preliminary Sustainability Statement (PSS) has been prepared to support the statutory consultation ahead of the Development Consent Order (DCO) for the Silvertown Tunnel (referred to as the Scheme). It assesses the Scheme based on information available up to September 2015. The Scheme will be further assessed post consultation and a final Sustainability Statement will be produced to accompany the DCO application.

1.1.2 This PSS presents the sustainability credentials of the Scheme and has been based on consultation with the design team, Transport for London (TfL) and through the use of information included in the documents that form part of the consultation documents for the Scheme.

1.1.3 In addition, the PSS sets out how TfL took into account the relevant sustainability policies and guidance included in Section 3.

1.1.4 Consequently, this PSS:

- demonstrates TfL's support for sustainable scheme development; ensuring the consideration of social, environmental and economic factors and informing the design and construction process;
- demonstrates the sustainability performance of the Scheme in terms of compliance with the relevant requirements of national, regional and the relevant local authorities policy on sustainability; and
- establishes the sustainability performance of the Scheme by assessing it against a number of evaluation tools (including the Toolkit and the Mayor of London Supplementary Planning Guidance (SPG) on Sustainable Design and Construction Checklist), and achieving at least the target of 'Very Good' and ideally 'Excellent' for the whole team award using CEEQUAL, the assessment and awards scheme for improving sustainability in civil engineering and infrastructure projects.

1.2 TfL's Sustainability Framework

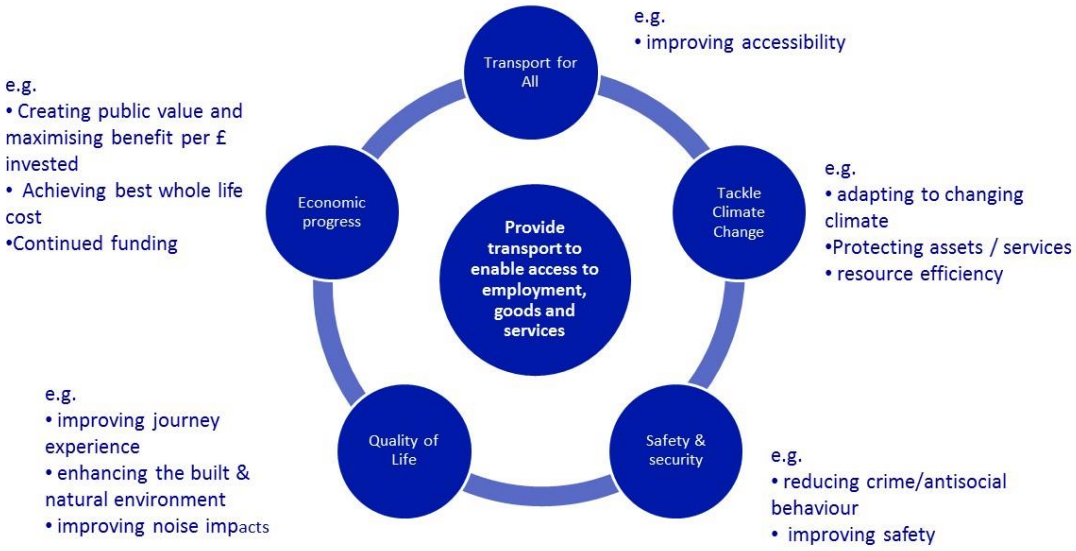
1.2.1 TfL makes sustainability central to its work by using a structured and systematic approach. This ensures that the economic, social and

environmental aspects of its activities are balanced and optimised, based upon the TfL's Sustainability Framework (referred to as the Framework).

1.2.2 In line with the above and with the Mayor's Transport Strategy (MTS) goals, the Framework has been used as a basis for evaluating the sustainability performance of the current Scheme. It has also been used as a basis for highlighting the opportunities and limitations that apply when planning for sustainability related design targets.

1.2.3 The Framework is illustrated in Figure 1-1.

Figure 1-1 TfL's sustainability Framework



1.2.4 The Framework recognises that in providing transport that enables access to employment, goods and services, it is important to:

- support economic development and population growth;
- reduce transport's contribution to climate change and improve its resilience;
- improve safety and security;
- enhance the quality of life for all Londoners; and
- improve transport opportunities.

1.2.5 The PSS is structured around the Framework and covers sustainability topics derived from the relevant planning policies and industry best practice sustainability guidance documents and assessment methods.

1.3 Structure of the document

1.3.1 The remainder of this document is structured as follows:

Section 2	Overview of the Scheme: this provides an overview of the Scheme's proposals and their construction and summarises the Scheme's sustainability-related aims and objectives.
Section 3	Planning policy overview: provides a summary of the relevant policy context, key sustainability drivers and how the Scheme is going to meet them.
Section 4	Assessment methodology: outlines the adopted sustainability assessment methodology.
Section 5	Sustainability assessment: aligned to each of the 'themes' and 'indicators' in the Toolkit and sets out the sustainability initiatives the Scheme would commit to
Section 6	Sustainability Tools - Results

1.3.2 This PSS is accompanied by a series of appendices, which contain supporting technical information, as follow:

Appendix A	Presents a comprehensive review of the policy context.
Appendix B	Responds to each of the objectives included in the Sustainable Design and Construction SPG 2014
Appendix C	Presents the summary outputs of the Sustainability Workshop held in July 2015.
Appendix D	Includes the completed assessment using the TfL's Sustainability Assessment Toolkit.

1.4 Limitations and uncertainties

1.4.1 Where the conclusions and recommendations contained in this report are based upon information provided by others it is upon the assumption that the information is accurate. This report covers work that has been undertaken to date and is based on the information available at the time. Certain statements made in the report that are not facts may constitute estimates, projections or other forward-looking statements and even though they are based on reasonable assumptions as of the date of the

report, such forward-looking statements by their nature involve risks and uncertainties.

2. OVERVIEW OF THE SILVERTOWN TUNNEL

2.1 Existing context

2.1.1 The existing cross-river road network in east London does not have the capacity to accommodate current road traffic demand, and is also not sufficiently resilient when incidents occur. Four road crossings within east London (Tower Bridge, the Rotherhithe Tunnel, the Blackwall Tunnel and the Dartford Crossing) are all currently at or over capacity during peak times.

2.1.2 Population and employment is expected to rise rapidly across London between 2011 and 2031, and the three Silvertown Tunnel host boroughs (London Borough of Newham, Tower Hamlets and the Royal Borough of Greenwich) are expected to see higher forecast growth in particular. In the absence of new road crossings, there will be limited capacity for growth in road vehicle trips in the future, with average journey times and delays expected to increase significantly and knock-on negative impacts for network resilience and connectivity to labour markets and jobs.

2.1.3 The Scheme - is proposed in response to the three transport problems which exist at the Blackwall Tunnel: congestion, frequent closures and a lack of resilience (owing to the lack of proximate alternative crossings). These issues lead to adverse effects on the economy and local environment. In the context of continued significant growth, these problems can only get worse, and in turn their secondary impacts would increase. Failing to address these problems could hamper the sustainable and optimal growth of London and the United Kingdom (UK).

2.2 Silvertown Tunnel

2.2.1 The Scheme involves the construction of a twin bore road tunnel providing a new connection between the A102 Blackwall Tunnel Approach on Greenwich Peninsula (London Borough of Greenwich) and the Tidal Basin roundabout junction on the A1020 Lower Lea Crossing/A1011 Silvertown Way (London Borough of Newham) by means of twin tunnel bores under the River Thames and associated approach roads. The Silvertown Tunnel would be approximately 1.4km long and would accommodate large vehicles including double-deck buses.

2.2.2 On the north side, the tunnel approach road connects to the Tidal Basin Roundabout, which would be altered to create a new signal-controlled

roundabout linking the A1011 Silvertown Way, Dock Road and the A1020 Lower Lea Crossing. Dock Road would be realigned to accommodate the new tunnel and approach road. On the south side, the A102 would be widened to create new slip-road links to the Silvertown Tunnel. A new flyover would be built to take southbound traffic exiting the Blackwall Tunnel over the northbound approach to the Silvertown Tunnel. The Boord Street footbridge over the A102 would be replaced with a pedestrian and cycle bridge.

2.2.3 New portal buildings would be located close to each portal to house the plant and equipment necessary to operate the tunnel, including ventilation equipment.

2.2.4 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.

2.2.5 The design of the tunnel would include a dedicated bus/coach and heave goods vehicle (HGV) lane, which would provide opportunities for TfL to provide additional cross-river bus routes.

2.2.6 Main construction works would likely commence in 2018 and would last approximately 4 years with the new tunnel opening in 2022/23. A Tunnel Boring Machine (TBM) would be used to bore the main tunnel sections under the river with shorter sections of cut and cover tunnel at either end linking to the portals. The proposal is to erect and launch the TBM from specially constructed chambers at Silvertown and Greenwich Peninsula where the bored and cut and cover sections connect. The main site construction compound would be located at Silvertown to utilise Thames Wharf to facilitate the removal of spoil and delivery of materials by river. A secondary site compound would be located adjacent to the alignment of the proposed cut and cover tunnel on the Greenwich peninsula.

3. PLANNING POLICY CONTEXT OVERVIEW

3.1 Introduction

3.1.1 Fundamental to ensuring a sustainable approach is to understand how the Scheme relates to key policy and guidance, and ensure that the appropriate standards and principles are adopted. This chapter presents an overview of national, regional and local policy relative to sustainability. Appendix A presents a detailed review of relevant national, regional and local policies and guidance documents which the Scheme is required to respond to, following rising international and national aspirations on enhancing sustainability.

3.2 National Planning Policy

National Policy Statement for National Networks, Department for Transport, 2014[3]

3.2.1 Critical to the DCO application is adherence to the National Networks National Policy Statement (NN NPS). The NN NPS sets the policy against which the Secretary of State for Transport will make decisions on applications for development consent for Nationally Significant Infrastructure Projects (NSIP) on the road and rail networks and strategic rail freight interchanges.

3.2.2 It provides planning guidance for promoters of NSIPs on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State.

3.2.3 The NN NPS recognises that for development of the national road and rail networks to be sustainable these should be designed to minimise social and environmental impacts and improve quality of life. Sustainable transport and applying ‘good design’ to national network projects will need to produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction, matched by an appearance that demonstrates good aesthetics as far as possible:

[3] See sections 1.9, 1.10, 1.11 and 1.12 of the National Policy Statement for National Networks presented to Parliament pursuant to Section 9(8) and Section 5(4) of the Planning Act 2008

'Scheme design will be a material consideration in decision making. The Secretary of State needs to be satisfied that national networks infrastructure projects are sustainable and as aesthetically sensitive, durable, adaptable and resilient as they can reasonably be (having regard to regulatory and other constraints and including accounting for natural hazards such as flooding).'

3.2.4 The Government has chosen the policy set out in the NN NPS as it strikes the best balance between the Government's economic, environment and social objectives.

National Planning Policy Framework, Department for Communities and Local Government, 2012

3.2.5 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. The NPPF is an important part of the Government's reforms to make the planning system less complex and easier to understand. It also presents a series of policies that constitute the Government's view of what sustainable development in England means in practice for the planning system.

3.2.6 At the heart of the NPPF is a presumption in favour of sustainable development. Policies in local plans should follow the approach of the presumption in favour of sustainable development so that it is clear that development which is sustainable can be approved without delay

Planning Practice Guidance on Climate Change, Department for Communities and Local Government, 2014

3.2.7 In March 2014, the Department for Communities and Local Government (DCLG) published the national Planning Practice Guidance (PPG). This comprises a single online resource that replaces a number of older national planning guidance notes and complements the NPPF.

3.2.8 The new online resource of streamlined planning guidance documents includes guidance on a range of issues, including climate change (Document Reference ID: 6-001-20140306).

3.2.9 The Government has launched measures to combat global warming, climate change and promote reductions in energy or CO_2, and other greenhouse gas emissions.

Energy Act, Her Majesty's Stationery Office, 2013

3.2.10 The Energy Act makes a provision for the setting of a decarbonisation target range, duties in relation to it and for the reforming of the electricity market for the purposes of encouraging low carbon electricity generation.

Climate Change Act, Her Majesty's Stationery Office, 2008

3.2.11 The Climate Change Act sets up a framework for the UK to achieve its long term goals of reducing greenhouse gas emissions by 34% over the 1990s baseline by 2020 and by 80% by 2050 and to ensure steps are taken towards adapting to the impact of climate change. The act introduces a system of carbon budgeting which constrains the total amount of emissions in a given time period, and sets out a procedure for assessing the risk of the impact of climate change for the UK, and a requirement on the Government to develop an adaptation programme.

Climate Change and Sustainable Energy Act, Her Majesty's Stationery Office, 2006

3.2.12 This Act enhances the contribution of the UK to combating climate change and securing a diverse and viable long-term energy supply.

Our Energy Future - Creating a Low Carbon Economy, Department for Transport, 2003

3.2.13 This White Paper sets a target for 20% of electricity to be produced from renewable sources nationally by 2020, with a 60% reduction in CO_2 emissions by 2050 (from 2003 levels).

The Carbon Plan: Delivering Our Low Carbon Future, Department of Energy and Climate Change, 2011

3.2.14 The Carbon Plan sets out the Government's plans for achieving the emissions reductions commitment made in the Climate Change Act 2008. A pathway consistent with meeting the 2050 target is outlined.

3.2.15 This publication brings together the Government's strategy to curb greenhouse gas emissions and deliver climate change targets, as well as the updated versions of actions and milestones for five years, replacing the draft Carbon Plan published earlier that year.(March 2011).

3.3 Regional Policy

The London Plan, Greater London Authority, 2015

3.3.1 The London Plan establishes policy over the next 20 – 25 years, and retains the fundamental objective of accommodating London's population and economic growth through sustainable development.

3.3.2 The Mayor's vision is for London to achieve the highest environmental standards and quality of life and lead the world in its approach to tackling the urban challenges of the 21st century, particularly that of climate change.

3.3.3 The London Plan sets out policy and guidance in the London context and identifies six objectives related to improving the living and working conditions in London, giving more detail about how the vision should be implemented and ensuring London is:

- a city that meets the challenges of economic and population growth;
- an internationally competitive and successful city;
- a city of diverse, strong, secure and accessible neighbourhoods;
- a city that delights the senses;
- a city that becomes a world leader in improving the environment; and
- a city where it is easy, safe and convenient for everyone to access jobs, opportunities and facilities.

3.3.4 Appendix B lists London Plan's policies relevant to the Scheme.

The Mayor's Transport Strategy, Greater London Authority, 2010 with alterations since 2011

3.3.5 The MTS 2010, as amended sets out the Mayor's transport vision and describes how TfL and its partners, including the London boroughs, will deliver integrated and dynamic 21st century transport systems.

3.3.6 The MTS was developed alongside The London Plan as part of a strategic policy framework intended to support and shape the economic and social development of London over the next 20 years.

3.3.7 MTS is shaped by the Mayor's transport vision:

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

3.3.8 Achieving this vision for an integrated and dynamic 21st century transport system can be broken down in to the following aims:

- enhanced capacity and connectivity;
- efficient and integrated;
- encourages mode shift to cycling, walking and public transport;
- easily accessible and fair to users;
- ensuring value for money;
- environment and quality of life are improved; and
- extends opportunities for all Londoners.

3.3.9 The MTS states that schemes delivered by TfL will encompass sustainability principles governing design, procurement, construction and operation. TfL will adhere to any statutory procedures and consents such as Planning Policy Statement 5: Planning for the Historic Environment, Strategic Environmental Assessment and Environmental Impact Assessment and also to best practice assessment for equalities, health, etc.

Sustainable Design and Construction, Greater London Authority, 2014

3.3.10 The Mayor's SPG provides guidance on sustainable design and construction. The SPG aims to support developers, local planning authorities and neighbourhoods to achieve sustainable development. It provides guidance on how to achieve The London Plan objectives effectively, supporting the Mayor's aims for growth, including the delivery of housing and infrastructure.

3.3.11 The document sets out the 'Mayor's Priorities' and 'Mayor's Best Practice' standards that apply to all major developments in London.

3.3.12 Appendix B sets out in further detail a response to these standards.

3.4 Local planning policy

Royal Borough of Greenwich Core Strategy, 2014

3.4.1 The Royal Greenwich Local Plan: Core Strategy with detailed policies (Core Strategy in short) was adopted on 30 July 2014. This document sets out the strategic objectives for Royal Greenwich as well as the more detailed development management policies and the implementation framework required to deliver the strategy.

3.4.2 It is the key strategic planning document for Greenwich and is used to help shape development and determine planning applications. It also ensures that the Royal Borough's open spaces and rich historic heritage are protected and enhanced.

3.4.3 The Core Strategy establishes that sustainability measures, to meet challenges such as climate change and flooding, will have to be incorporated into new developments. These measures will have reduced spoil, water and energy consumption and zero carbon and low carbon developments will be the norm thus ensuring a cleaner, greener Royal Greenwich.

Local Implementation Plan for Transportation, Royal Borough of Greenwich, 2011

3.4.4 This document represents the Council's Second Local Implementation Plan (LIP), and replaces the first LIP which was adopted in 2007. It sets out the proposals considered appropriate for implementation of the MTS and the eastern sub-regional plan and like the MTS looks forward to 2031. The second LIP has been produced in accordance with the 1999 Greater London Authority (GLA) Act, which requires each borough to prepare a LIP. The document has been prepared in line with the LIP Guidance published by TfL in May 2010.

3.4.5 The Council's vision is built on three key principles of inclusion and cohesion, sustainability and prosperity. Increases in traffic levels can reduce safety, particularly for vulnerable users and can also impact on the health of residents by affecting air quality. Promotion of sustainable transport to mitigate the effects of climate change is a key theme of this document.

London Borough of Newham Core Strategy, 2012

3.4.6 The Core Strategy is the most important part of a new plan for Newham - called the Local Development Framework (LDF). This will replace the Unitary Development Plan. It will ensure that new development will achieve the Council's objective to make Newham a place where people will choose to live, work and stay.

3.4.7 Core policies for sustainability and climate change include:

- SC1 Climate change – Newham will mitigate and adapt to climate change by transforming the borough into a more sustainable place;
- SC2 Energy – Newham will be transformed into a low carbon borough by minimising the demand for energy in the built environment and by switching to renewable and low carbon sources; and
- SC3 Flood risk – development must be shown to be floor resistant and regeneration should improve the resilience of those parts of the borough at risk from flooding.

London Borough of Tower Hamlets Core Strategy, 2010

3.4.8 The Core Strategy is not a stand-alone document; it is one piece of a wider spatial framework for the borough. The Core Strategy is the key spatial planning document for London Borough of Tower Hamlets, setting out the spatial vision for the borough and how it will be achieved. The Core Strategy sets out an ambitious and long-term spatial strategy to deliver the aspirations set out in the Community Plan. It sets out broad areas and principles, and where, how and when development should be delivered across the borough until 2025. It is also outcome-focused, and does not solely relate to development decisions.

3.4.9 To understand the overall vision and how the Core Strategy aims to achieve it, the document needs to be understood in its entirety. However, the document has also been structured for ease of use. The five spatial themes form the bulk of the document.

- refocusing on our town centres;
- strengthening neighbourhood well-being;
- enabling prosperous communities;

- designing a high-quality city; and
- delivering place-making.

London Borough of Tower Hamlets Managing Development Document, 2013

3.4.10 The Managing Development Document (MDD) is a Development Plan Document that provides the detail which the Core Strategy is not able to deliver (e.g. paragraph 1.2 of the Core Strategy). It helps to manage development across the borough through development management policies and provides strategic guidance for key development sites within site allocations.

3.4.11 The development management policies are required to help ensure the delivery of sustainable development, in terms of sustainable communities, supporting the local and regional economy and protecting and enhancing the borough's environment.

3.4.12 The MDD has been prepared using a proportionate evidence base to ensure it plans positively to meet the development and infrastructure needs of communities, as set out in the Core Strategy.

London Borough of Tower Hamlets Transport Implementation Plan, 2011

3.4.13 London Borough of Tower Hamlets' second LIP sets out the vision for transport in the borough to 2031 and a series of proposed local projects to be delivered by 2014.

3.4.14 The focus for the second LIP is on encouraging sustainable and active modes of travel, and working to break down barriers to travel. It wants to secure environmental and accessibility improvements, and health and wellbeing benefits, for everyone in London Borough of Tower Hamlets. The approach includes harnessing opportunities presented by major regeneration initiatives including the London 2012 Olympic and Paralympic Games and Legacy Proposals to encourage healthy and sustainable lifestyles. The second LIP seeks to strike a balance between the needs of all road users, and to deliver an improved and more efficient highway network to support a thriving local economy.

3.4.15 For further detail on the policies outlined above please refer to Appendix A.

4. ASSESSMENT METHODOLOGY

4.1 Introduction

4.1.1 TfL recognises that in order to deliver sustainable schemes it is necessary to embed an integrated approach to sustainability through planning, target setting, monitoring and reporting throughout the design, construction and operational phases of the Scheme. To ensure that all sustainability requirements and objectives of the Scheme were captured, the following approach for embedding sustainability was undertaken during the development of the PSS:

- Step1: review of relevant planning policy documents and guidance to inform and guide the Scheme's sustainability performance throughout its lifecycle (Appendix A);
- Step 2: consideration of the sustainability requirements and the opportunities for sustainable innovation for the Scheme through ongoing dialogue with the design team and a sustainability workshop with project engineers and sustainability specialists (held in June 2015) (Appendix C);
- Step 3: capturing evidence from studies prepared as part of the Environmental Impact Assessment (EIA) process; and
- Step 4: evaluation and appraisal of potential sustainability of measures and their performance.

4.2 TfL's Sustainability Framework

4.2.1 This report has been structured using the Framework and aims to capture the above four step process ensuring all the Framework's topics, indicated below and in Figure 1-1, are taken into consideration:

- economic progress;
- tackle climate change;
- safety and security;
- quality of life; and
- transport for all.

4.2.2 Throughout the process outlined above, a number of sustainability tools have been used to guide the Scheme's decisions, assess the Scheme, align the Scheme's assessment with planning requirements, and help the Scheme to at least achieve the target of 'Very Good' and ideally 'Excellent' CEEQUAL rating. The sustainability tools used are:

- TfL's Sustainability Assessment Toolkit (Appendix D);
- Mayor of London's Sustainable Design and Construction SPG 2014; and
- CEEQUAL.

4.2.3 Details of these tools are presented in the following sections, while Table 4-1 shows how the 'themes', indicators and standards covered by each of these tools align with the 'topics' of the Framework.

TfL's Sustainability Assessment Toolkit

4.2.4 TfL has developed a Toolkit to help assess major schemes at an early stage in line with the Framework. The Toolkit was developed to optimise the sustainability performance of the Scheme's design, construction and operation. The Toolkit provides constructive feedback on sustainability performance, allowing the management and mitigation of risks and targeting areas of under-performance.

4.2.5 The Toolkit comprises three tiers: tier 1: 'themes' (described below); tier 2: 'indicators', within each theme; and tier 3: 'guiding questions', for each indicator:

- economic progress – enable reliable, safe, comfortable and affordable access to goods, jobs, education, improve productivity and support wealth generation;
- climate change – reduce CO_2 emissions, be prepared for rising temperatures and increased flood risk;
- safety and security – reduce accidents or criminal acts on public transport and road network, anticipate and prepare for terrorist attacks, and improve community safety;
- quality of life - enable access to health and leisure facilities, improve passenger comfort, improve passenger and staff fitness, enhance

London's built and natural environment, improve air quality and reduce noise; and

- transport for all – ensure equal and fair treatment of all people, access to opportunities (housing, jobs, etc.), promote regeneration and tackle deprivation.

4.2.6 The Framework 'topics' align with the 'themes' of the Toolkit. The PSS has been prepared, through the responses to guiding questions in the Toolkit.

4.2.7 Based upon the responses to a series of guiding questions against each sustainability theme, a ranking was allocated. The ranking represents the Scheme's contribution to the indicator, as well as the magnitude and likelihood of the indicator occurring. Full details of the sustainability assessment of the Scheme, using the Toolkit is shown in Appendix D.

4.2.8 The Toolkit includes a spider graph (see Section 6) which shows the Scheme's contribution towards each sustainability theme and indicator. The spider graph also provides a visual indication of the strengths, weaknesses and gaps of the Scheme. The Toolkit ensures that the assessment gives equal consideration to all indicators, resulting in a balanced spider graph.

4.2.9 The spider graph provides feedback on sustainability performance throughout the design process up until the pre-application consultation.

Mayor of London's Sustainable Design and Construction SPG Checklist

4.2.10 In support of the policies included in the London Plan 2015, the Mayor of London 's Sustainable Design and Construction SPG 2014 has been used to evaluate and measure the sustainability of the Scheme.

4.2.11 The SPG includes a summary checklist table to provide clarity on how the standards identified in it are implemented. This PSS assesses the Scheme following the three topic areas of the SPG:

- Resource management:
- land;
- site layout;

- energy and carbon dioxide emissions;
- carbon dioxide off setting;
- retrofitting;
- monitoring energy use;
- supporting a resilient energy supply;
- water efficiency; and
- materials and spoil.
- Climate change adaptation:
- tackling increased temperatures and drought;
- increasing green cover; and
- flooding.
- Pollution management:
- land contamination;
- air quality;
- noise;
- light pollution; and
- water pollution.

4.2.12 To adhere to the most up to date requirements of the GLA, the policies of the London Plan 2015 have been incorporated in the SPG Checklist 2014 as part of this appraisal.

4.2.13 Appendix B of this PPS presents the Scheme response to the SPG's three topic areas (equivalent to the Toolkit's three themes), and includes only standards directly relevant to the Scheme.

CEEQUAL

4.2.14 CEEQUAL is an evidence-based sustainability assessment and awards scheme for civil engineering, infrastructure, landscaping and public realm

projects, which recognises the achievement of high environmental and social performance.

4.2.15 CEEQUAL rewards projects and design teams that go beyond the legal, environmental and social baseline standards to achieve distinctive environmental and social performance.

4.2.16 It is a self-assessment process that CEEQUAL trained assessors use to assess the schemes performance rigorously based on management and a range of environmental and social issues of concern.

4.2.17 The Scheme would be formally assessed under CEEQUAL Version 5 with a target score of at least 'Very Good' and ideally 'Excellent' for the Whole Team Award. The PSS supports the achievement of the available CEEQUAL points relevant to the early stages of the development process.

4.2.18 The PSS comprises commitments that TfL aims to deliver during the detailed design, construction and operational phases of the Scheme. In some cases, there is uncertainty whether particular sustainability initiatives could be delivered due to lack of detailed design information at this stage. TfL through this report provides recommendations for such instances, which will be tested and refined at appropriate stages as the Scheme develops.

4.2.19 The following sections set out a summary of the key sustainability drivers that have informed the Scheme's Sustainability Strategy.

4.3 Summary of key sustainability drivers

4.3.1 This section summarises the connection between the Framework's topics and the themes, indicators and standards covered by each of the tools above. In addition, some of the Toolkit's themes are linked between each other and their impact has been considered with the related sections in mind.

Table 4-1 Summary of key sustainability drivers

Framework topics	Topics under the Framework	Toolkit indicators	SPG 2014 and London Plan 2015	CEEQUAL
Economic progress	Supporting population and employment growth	Improving employment and earnings	• Policy 4.1 Developing London's economy • Policy 4.11 Encouraging a connected economy • Policy 4.12 Improving opportunities for all	
	Delivering an efficient and effective transport system	Tackling congestion and smoothing traffic flow	• Policy 6.1 Strategic approach • Policy 6.2 Providing public transport capacity and safeguarding land for transport • Policy 6.3 Assessing effects of development on transport capacity • Policy 6.4 Enhancing London's transport connectivity	
Tackle climate change	Reduction CO_2 emissions	Tackling CO_2 emissions	• Energy and CO_2 emissions • Monitoring energy use	Energy and carbon

Framework topics	Topics under the Framework	Toolkit indicators	SPG 2014 and London Plan 2015	CEEQUAL
			• CO_2 off-setting • Retrofitting • Policy 5.2 Minimising carbon	
	Climate change adaptation	Adapting to a climate change	• Tackling increased temperatures and drought • Increasing green cover • Flooding • Site Layout and tunnel design • Supporting and resilient energy supply • Policy 5.9 Overheating and cooling • Policy 5.10 Urban greening • Policy 5.11 Green roofs and development site environs • Policy 5.12 Flood risk management	Land use Water resources and the water environment

Framework topics	Topics under the Framework	Toolkit indicators	SPG 2014 and London Plan 2015	CEEQUAL
			• Policy 5.13 Sustainable drainage • Policy 5.14 Water quality and wastewater infrastructure • Policy 5.15 Water use and supplies	
		Improving resource efficiency	• Water efficiency • Material resources and waste • Policy 5.15 Water use and supply • Policy 5.16 Waste net self-sufficiency • Policy 5.17 Waste capacity • Policy 5.18 Construction, excavation and demolition waste • Policy 5.19 Hazardous waste • Policy 5.20 Aggregates	Material resources use
Quality of life	Enhancing the built and	Improving built structures and streetscapes	• Site layout and tunnel design	Land use

Framework topics	Topics under the Framework	Toolkit indicators	SPG 2014 and London Plan 2015	CEEQUAL
	natural environment	Improving greenspaces	• Light pollution • Policies within Chapter 7	Ecology and biodiversity
	Improving air quality	Enhancing physical wellbeing	• Air quality • Policy 7.14 Improving air quality	
	Improving noise impacts	Improving built structures and streetscapes Addressing noise levels	• Noise impacts • Policy 7.15 Reducing and managing noise, improving and enhancing the acoustic environment and promoting appropriate soundscapes	
	Improving health impacts	Enhancing physical wellbeing: • Improve passenger comfort • Access to health and leisure facilities	• Land contamination • Water pollution • Policy 3.2 Improving health and addressing health inequalities	

Framework topics	Topics under the Framework	Toolkit indicators	SPG 2014 and London Plan 2015	CEEQUAL
		• Improve passenger and staff fitness		
		Enhance London's built/ local residence and natural environment.		
	Improving journey experience	Enhancing physical wellbeing	• Policy 6.1 Strategic approach • Policy 6.2 Providing public transport capacity and safeguarding land for transport • Policy 6.3 Assessing effects of development on transport capacity • Policy 6.4 Enhancing London’s transport connectivity • Policy 6.5 Funding Crossrail and other strategically important transport infrastructure	People and communities
Safety and security	Reducing crime, fear of crime and	Tackling crime and disorder	• Policy 6.1 Strategic approach	

Framework topics	Topics under the Framework	Toolkit indicators	SPG 2014 and London Plan 2015	CEEQUAL
	antisocial behaviour		• Policy 6.2 Providing public transport capacity and safeguarding land for transport • Policy 6.3 Assessing effects of development on transport capacity • Policy 6.4 Enhancing London's transport connectivity • Policy 6.5 Funding Crossrail and other strategically important transport infrastructure • Policy 7.3 Designing Out Crime	
	Improving road and public safety	Improving security and resilience		
		Improving transport safety		
Transport for all	Improving accessibility	Improving access to the transport system	• Designing inclusive environments	People and communities Transport
	Improving connectivity			
	Supporting regeneration and tackling deprivation	Supporting regeneration and spatial development		
		Enhancing diversity		
		Equality and participation		

5. SUSTAINABILITY ASSESSMENT

5.1 Introduction

5.1.1 The following sections of the PSS set out the sustainable design and construction initiatives, and the commitments made by TfL and the design team for the Scheme in relation to the key policy, guidance and appropriate standards and principles. The initiatives and commitments for the Scheme will be further assessed as the Scheme develops post consultation.

5.1.2 The structure is based on the Framework as described in Section 1.2 and outlines how the Scheme has responded to the key drivers outlined. A number of appendices are provided to accompany this assessment that show specifically how the Scheme performs against the objectives of the Sustainable Design and Construction SPG (Appendix B), the themes and indicators of the Toolkit (Appendix D) and the target of achieving a CEEQUAL rating of 'Very Good' and ideally 'Excellent'.

5.1.3 The following Framework topics have been considered by addressing the Toolkit indicators and answering the relevant guiding questions presented in Appendix D.

- economic progress;
- tackle climate change;
- safety and security;
- quality of life; and
- transport for all.

5.2 Topic: Economic progress

Indicator: Tackling congestion and smoothing traffic flow

Construction phase

5.2.1 The Silvertown works site is likely to be the main works site as it would minimise the impact on current land uses and maximise the potential use

of river transport, as the construction of the Silvertown Tunnel would require the transport of a large volume of excavated material

5.2.2 As specified in the Preliminary Code of Construction Practice (CoCP) a Construction Logistics Plan (CLP) would be produced, co-ordinated and then implemented by the Design Build Finance Maintain (DBFM) contractor. The CLP would include details of the expected number of lorry movements per day during the construction phases, as well as:

- main access/egress points for the Silvertown and Greenwich sites;
- temporary and permanent closures and diversions of highways;
- traffic management strategy (including parking); and
- lorry holding areas, lorry route signing strategy, and means of monitoring lorry use and movements.

5.2.3 The CLP would manage all types of freight vehicle movement to and from the Scheme. Adoption of river transport for the construction materials and excavated materials would significantly reduce the HGV movements required on the local road network. It is estimated that spoil removal by barge could remove over 178,000 two-way lorry movements from the road network over the four year construction period.

5.2.4 The DBFM contractor would take measures to ensure that the CLP is utilised to the full potential where possible.

5.2.5 Lorry routings to the Silvertown and Greenwich sites would be assessed taking into account prohibited routes as identified by TfL, such as routes past local schools, hospitals and vulnerable road user accident black spots. The CLP would also ensure that safety measures are implemented to minimise road-related risks.

5.2.6 The main site access routes at both sites would be further detailed as the DBFM contractor develops the Scheme construction solutions to tackling congestion and smoothing traffic flow. Adopting data provided by TfL, the DBFM contractor would be able to determine suitable routes that make reference to the TfL Road Network (TLRN), Strategic Road Network (SRN) and borough roads.

Operational phase

5.2.7 As shown in the Preliminary Transport Assessment (PTA), the road network across London has a number of areas which are subject to significant delays during the peak periods. In the am peak, the approach to the Blackwall Tunnel (northbound) is the most heavily congested major traffic route in the whole London network. It also experiences some of the highest delays across London in the pm peak, and certainly the most in east and south-east region (ESR).

5.2.8 The PTA also outlines that the Blackwall Tunnel's maximum capacity has been reached in the northbound direction of the am peak and the southbound direction of the pm peak.

5.2.9 As set out above, congestion is particularly an issue in the vicinity of the Blackwall Tunnel, with extensive queuing and delay to traffic occurring on the main approaches to the Tunnel portals. The figures presented in the PTA show that significant delay, in excess of 1.5 minutes per km, is likely to affect many sections of the strategic network.

5.2.10 The Scheme is proposed in response to the three transport problems which exist at the Blackwall Tunnel: congestion, frequent closures and a lack of resilience (owing to the lack of proximate alternative crossings).

5.2.11 The Scheme would be expected to lead to a reduction in the length of the morning and afternoon peak periods, principally as a result of the reduced congestion and additional capacity that the Scheme would provide. Effectively, the Scheme would enable more motorists to travel at the times they wish, rather than earlier or later to avoid the worst of the traffic. With reduced congestion, the scheme would also result in an overall reduction in travel times across the network.

5.2.12 All users of the Blackwall and Silvertown Tunnels would experience shorter journey times to cross the River Thames as a result of the Scheme, with journey time savings on the immediate approaches to the tunnel of up to 20 minutes in peak periods. This excludes any journey time benefits the Scheme would provide through improved reliability, and essentially reflects the savings during 'incident free' periods.

5.2.13 In east London it is known that the overall reliability and resilience of the strategic road network is sub-optimal due, in part, to the small number of river crossings and the significant distances between them. The relative scarcity of crossings means that cross-river traffic from across the entire

east London sub-region converges at only three crossings, of which Blackwall Tunnel has the highest capacity and is of most strategic importance. This limits resilience and compounds traffic congestion and safety issues when incidents occur due to poor reliability of existing crossings.

5.2.14 The factors which negatively impact on the reliability and resilience of the existing cross-river highway network in east London can be summarised as follows:

- lack of alternative crossings and the distance between them – this primarily affects resilience;
- the capacity of existing crossings to meet demand – this affects both resilience and reliability; and
- the susceptibility of existing crossings to closure – this primarily affects reliability.

5.2.15 Reliability is expected to be one of the most significant benefits of the Scheme and is of particular importance to business users including freight. The design of the Silvertown Tunnel would allow for full clearance by higher vehicles, including HGVs and double-decker buses. It therefore would reduce the propensity for certain types of incidents to occur, including those relating to congestion and those involving over-height vehicles attempting to use the northbound Blackwall Tunnel bore and would offer freight operators more route choices. Much lower congestion would also reduce congestion-related incidents such as vehicle shunt accidents.

5.2.16 When there are closures at the Blackwall Tunnel, the journey times and congestion impacts on the wider road network and on adjacent river crossings would be lessened because there is an alternative crossing available. This includes relatively short closures as well as potential longer-term closures associated with major incidents.

5.2.17 The Scheme would provide both short- and long-term resilience, another benefit particularly important to businesses. TfL would use signage and information to encourage tall vehicles to use the new tunnel, thereby reducing the number of closures at the Blackwall Tunnel. However, when Blackwall Tunnel is closed, Silvertown Tunnel would provide an alternative to which vehicles – sharing the same approach road – could easily switch.

5.2.18 In the long-term, the presence of the Silvertown Tunnel increases the scope for allowing refurbishment of the Blackwall Tunnel, notably the northbound bore, which is over 115 years old.

5.2.19 The Scheme would also create opportunities for significant improvements in cross-river bus services, which are vital to the ability of residents in the regeneration areas to access employment opportunities. Lower-income residents of London have very low levels of access to cars and vans and there is therefore a much higher dependence on the use of public transport for access to employment.

5.2.20 In addition to cross-river bus service improvements, the Economic Assessment Report (EAR) shows that there would be very significant improvements to the journey time and reliability of the extensive network of commuter coaches which serve the City and Canary Wharf from Kent and the Medway towns.

5.2.21 Many other local bus routes which currently suffer delays on the surrounding road network when the Blackwall Tunnel is closed or congested would also benefit from the more reliable network with the Silvertown Tunnel in place.

Indicator: Improving productivity and competitiveness

5.2.22 The Preliminary Regeneration Report identifies that there is a strong and positive relationship between new investment in transport and the growth of a local economy and development. East London is a highly deprived area that has considerable potential to accommodate the housing and commercial development needed to support London's economy, yet the River Thames remains a major barrier to cross-river traffic.

5.2.23 The Scheme would provide the additional capacity and connectivity to support national and local economic activity and facilitate growth, job creation and regeneration within one of the UK's most disadvantaged areas. The Scheme is also anticipated to lead both to improvements in accessibility and material reductions in congestion and unreliability.

5.2.24 All users of the Blackwall and Silvertown tunnels would experience shorter journey times to cross the River Thames as a result of the Scheme, with journey time savings on the immediate approaches to the tunnels of up to 20 minutes in peak periods, thereby increasing staff productivity.

5.2.25 In addition, the job creation can occur by opening up new labour markets due to improved connectivity or by reducing travel times and costs or improving reliability. A larger labour catchment area can then lead to increases in productivity as employers and employees can better match skill requirements and offerings. This in turn results in improved economic efficiency and growth and more employment.

Indicator: Improving employment and earnings

5.2.26 The Scheme would create opportunities for new cross-river bus services to improve public transport links between south-east 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 in the bus routes that could be extended across the River Thames, as well as greater capacity.

5.2.27 Paragraph 9.4.10 of the Distributional Impact Assessment 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 PTA and Preliminary OBS.

5.3 Topic: Tackle Climate Change

Indicator: Tackling CO_2 emissions

5.3.1 The Scheme would generate CO_2 emissions from the construction phase activities, and also indirectly from the material resources, particularly from concrete and steel. The PSS draws from the Scheme's Preliminary CoCP and Preliminary Energy Statement (PES) to explain how emissions have been assessed and energy efficiency has been maximised to contribute to the Scheme's sustainability.

Construction stage

5.3.2 TfL would ensure that energy management considerations are integral to the design of the works and to the construction strategy. To achieve this, a PES has been developed, which includes the following measures:

- minimising the use of diesel or petrol powered generators and instead using mains electricity or battery powered equipment;

- power down of equipment/plant during periods of non-utilisation;
- ensure all vehicles and machinery is serviced at recommended intervals to guarantee optimum engine efficiencies and reduce waste energy;
- fuel-efficient plant, machinery and vehicles used wherever possible;
- SMART targets for consumption during construction. Workforce should be educated regarding the information displayed. Targets to be made visible to workforce at all times;
- deploy correctly sized generators for electrical provision onsite, where applicable. An accurate approach is to identify the processes and associated electrical equipment in use at each stage of the project, and then apply a 'diversity' factor to each item to allow for its intermittent and partial power usage. This would give a profile of the power requirement which would have a reduced peak; and
- provide appropriate levels of thermal insulation to the relevant areas of site accommodation to reduce energy demand for heating. Efficient heating mechanism would further reduce energy consumption.

5.3.3 In addition, a Preliminary CoCP has been developed for the Scheme, which sets out a framework to control possible impacts arising from the construction of the Scheme. The Preliminary CoCP states that TfL would implement working methods that reduce energy consumption and continually seek to improve energy efficiency onsite during the construction.

Operation stage

5.3.4 A PES has been produced based on the principles set out in the Mayor's Energy Hierarchy (i.e. use less energy, then supply energy efficiently, and finally use renewable energy) and the London Plan 2015. The PES includes an assessment of anticipated energy demand, measures to be employed to minimise demand, and details on how this demand would be met.

5.3.5 The Scheme would be designed to achieve reductions in operation energy consumption through the implementation of passive design and energy efficiency measures.

5.3.6 However, as the Scheme is not well suited to the employment of many passive measures typically applied to buildings, no reductions against the baseline would be assumed at this stage (so as to represent a worse-case scenario) with the exception of those achieved through the enhanced lighting strategy.

5.3.7 The resulting savings in CO_2 emissions due to the proposed Light Emitting Diode (LED) scheme could be a 29% over the baseline Scheme. An additional 15-20% saving could be achieved due to the incorporation of the active control savings.

5.3.8 The potential for connection to any existing neighbouring low carbon heat distribution networks including combined heat and power (CHP) was investigated and is currently being considered.

5.3.9 TfL receives technical support via the GLA's "Decentralised Energy for London" programme, for which Arup operate as the programme delivery unit. In this capacity, Arup undertook a small study considering how utilities routed through the new tunnels (within dedicated service corridors) could be arranged in order to safeguard the space required for future installation of district heating pipework. Silvertown Tunnel represents an ideal opportunity in this regard and therefore there is potential for the Scheme to be connected.

5.3.10 The viability of connection to any energy network would be determined at later stages when design has progressed sufficiently to allow detailed feasibility analyses. However, TfL have developed a proposal to make use of the under-utilised space at the Greenwich Power Station (GPS) to install CHP engines which would supply low carbon and cheaper electricity to the Scheme.

5.3.11 To further reduce CO_2 emissions, an analysis of the feasibility of cooling network for the Scheme would be undertaken. The cooling network has been discounted for the time being, as it will be largely driven by how much load can be achieved, but should certainly be considered further down the line as a means to meeting a proportion of the significant cooling demands for the Scheme.

5.3.12 In addition, an analysis of feasibility of renewable energy technologies for the Scheme has been undertaken. Overall, there is potential for a small amount of solar photovoltaics (PV) at the portal entrances. However, it is unlikely that sufficient space would be made available to make a

significant contribution to CO_2 emissions reductions. It would therefore be difficult to justify the high expenditure associated with this option.

Indicator: Adapting to a climate change

Climate change adaptation and mitigation

5.3.13 The latest UK climate change scenarios indicate that summers will become hotter and drier. There will be an intensification of the urban heat island effect; winters will be milder and wetter leading to increased flood risk. Extreme climate events such as very hot days and intense downpours of rain will become more common.

5.3.14 Adaptation, along with mitigation, is an essential part of addressing the challenges associated with climate change. While adaptation addresses the impacts resulting from a changing climate, mitigation refers to efforts to limit the anthropogenic effects of climate change.

5.3.15 The Materials Chapter (Chapter 13 of PEIR Volume I) and a PES have been produced as part of the pre-application consultation documents. The Materials Chapter reports on the estimated carbon emissions that would be produced by the Scheme during construction and the PES throughout operation. Potential adaptation mitigation measures to reduce these estimated emissions are included within the Preliminary Code of Construction Practice and presented within Chapter 13: Materials Chapter of PEIR Volume I and the PES.

5.4 Flooding

5.4.1 A Flood Risk Assessment (FRA) is provided in Appendix 16.A of Volume 3 of the PEIR. The FRA prepared for the Scheme details the full assessment of flood risk from all sources (fluvial, tidal, surface waters, sewers, groundwater and artificial waterbodies) and the proposed mitigation measures.

5.4.2 The northern and southern portals of the Scheme are located within defended Flood Zone 3, subject to a high residual risk of flooding from the River Thames. The Scheme’s design is such that there would be no construction phase impact on the integrity of existing flood defences, for example, any clash with river wall foundations would be avoided and settlement from tunnel boring would be minimised and monitored. Therefore during the construction phase of the Scheme, as detailed in the

FRA, baseline standards of fluvial/tidal flood protection would be maintained.

5.4.3 Hydrodynamic modelling of the temporary jetty has been undertaken and has shown that that jetty would not have a significant impact on flow velocities or sediment transport. The jetty would not impact on water levels in the River Thames so would not have an impact on flood risk.

5.4.4 According to the FRA, the majority of the Scheme is located in an area of 'very low' surface water flood risk. There are some small isolated areas where the Scheme is at low, medium and high risk of surface water flooding, for example, the road which forms the southern portal of the tunnel is classed as at low risk of surface water flooding.

5.4.5 The existing flood defences provide a high standard of flood protection from the River Thames. The tunnel element of the Scheme would pass beneath the river wall defences on both banks of the river and any clash with river wall foundations would be avoided.

5.4.6 Existing land drainage is facilitated by an integrated network of combined sewers and highway drainage infrastructure that is maintained by Thames Water and that ultimately discharge into the River Thames. During the construction stage of the Scheme works would be undertaken to provide a drainage system which would improve surface water drainage.

5.4.7 Water management would be an important part of the tunnelling operation. Temporary site drainage would be put in place to retain surface runoff within the land to be acquired or used, where practicable.

5.4.8 The potential for an impact on the integrity of the flood defences protecting the Scheme and wider areas due to settlement would also be addressed. To minimise the impact of settlement, good tunnelling practice would be implemented including continuous working, erecting linings immediately after excavation, grouting, management of the tunnel face pressures and the measurement of excavated material quantities. Settlement monitoring would also be undertaken during the tunnelling works and would be carried out for a period of up to two years post construction. Good tunnelling practice and settlement monitoring would be specified within the DBFM contract.

5.4.9 Site drainage, including surface runoff and dewatering effluents, would be discharged to sewers or existing watercourses where appropriate and

relevant discharge consents would be obtained from the sewerage undertaker or the Environment Agency (EA).

5.5 Water pollution

Construction stage

5.5.1 During the construction phase a drainage system would be operational which would help control the potential for pollution of surface waters associated with construction site runoff having elevated concentrations of silt or contamination from fuels, oils, cement etc. The drainage system would incorporate pollution control systems built as early in the construction sequence as is practicable, for example oil interceptors and facilities to control runoff from earthworks and allow silt to settle before discharge within consented parameters.

5.5.2 At the Silvertown site existing drainage systems are failing, resulting in pollution of the water environment. Construction of Silvertown Tunnel would involve removing all of these polluting land uses and introduce new drainage across the site. During the construction phase of the Scheme, works would be undertaken to provide a drainage system that is fit for purpose for the Scheme, improving the quality of drainage discharges to receiving waters, namely the Cut[4] and the River Thames.

5.5.3 Other pollution prevention and control measures are documented in the Preliminary CoCP, which sets out the framework for a Construction Environmental Management Plan (CEMP) to be prepared by the DBFM contractor of the Scheme.

5.5.4 The CEMP would document good practice pollution prevention methods for activities such as excavation and dewatering, storage of fuels, chemicals and oils, vehicle washing, pollution control, and emergency contingency. Access to pollution control equipment and spillage clean up facilities would be provided and a Spillage Prevention Plan would be in place. This would include measures to be taken to prevent pollution caused by severe weather.

[4] Minor watercourse, known as '*The Cut*', that has an open channel section located approximately 120m south-west of Dock Road within the Silvertown site and an associated balancing pond.

5.5.5 In addition, the Preliminary CoCP includes the following considerations that would be taken into account during construction to ensure that an effective surface water drainage system would be operational throughout construction and risks of pollution would be appropriately controlled:

- new drainage outfalls, storage and pollution control systems should be built as early in the construction sequence as is practicable;
- during the construction phase the drainage systems should be inspected regularly and maintained as necessary to ensure the carriageway operates to the appropriate standard. Inspection and maintenance should be required more often in areas with a high level of construction activity;
- access to pollution control and spillage facilities should be maintained and a Spillage Prevention Plan should be implemented;
- consideration should be given to protecting any existing drainage when storing fill materials, aggregates and plant to prevent potential drainage and pollution issues; and
- all refuelling, oiling and greasing would take place above drip trays or on an impermeable surface which provides protection to underground strata and watercourses and away from drains as far as reasonably practicable. Vehicles would not be left unattended during refuelling.

5.5.6 There is potential to encounter contaminated soils during construction activities such as boring and other earthworks. This has an associated risk of mobilising pollutants that could enter surface waterbodies to the detriment of their water quality. The working practices that would be put in place to prevent and manage this issue are described in Geology and Soils Chapter (Chapter 12 of PEIR Volume I) and would be included in the final CoCP along with measures to minimise effects from dredging.

5.5.7 A jetty may be constructed to permit the operation of the proposed marine spoil disposal system. Jetty design has minimised the potential for this structure to temporarily impact on the existing flow hydraulics and hydrodynamics of the River Thames and appropriate construction phase pollution control measures would be put in place to mitigate any potential water quality impacts.

Operational stage

5.5.8 Pollution sources arising during the operational phase, which could affect surface and groundwater comprise leaks, spillages and contamination from in-situ materials.

5.5.9 During the operation of the Scheme a pump would be used to discharge surface water runoff into the existing Thames Water sewer network. Surface water runoff collected by the northern portal drainage network would be discharged into an existing watercourse (The Cut) and to existing Thames Water sewers. A Class 1 bypass petrol interceptor is to be provided to fully treat all flows generated by rainfall rates of up to 6.5 mm/hour. This covers most rainfall events. Flows above this rate are allowed to bypass the interceptor. Manually operated penstock catch pits are required to provide a shutoff facility in the event of emergency major spillage. The spillage would be contained within an emergency impoundment facility for a containment volume of 25m^3.

5.5.10 In addition, to prevent the potential for pollution associated with a spillage in the tunnel, the design incorporates spillage containment facilities. Any spillage would be collected from the carriageways using a side entry kerb drainage system, with minimum travel along the carriageway. The spill would then travel to the main sumps, located at the low point of each bore. These facilities would be sized to accommodate the contents of a fuel tanker (approximately 30,000 litres).

Indicator: Improving resource efficiency

Management of materials

5.5.11 TfL's procurement policy that will be applied to the delivery of the Scheme states that:

> *'Where possible environmental benefits will be considered as part of the procurement process with consideration given to all relevant aspects of whole life-cycle costs of products. TfL is committed to specific environmental obligations as a signatory of the Mayor's Green Procurement Code.'*

5.5.12 The Preliminary CoCP requires the DBFM contractor to maximise opportunities for the potential reusing and recycling of all material resources and to maximise the environmental and the Scheme's benefits from the use of surplus material resources.

5.5.13 Responsible sourcing would encourage contractors to apply good practice standards to source material resources from suppliers with responsible sourcing certification as far as practicable. To this end, the DBFM contractor would adopt the BES 6001 Responsible Sourcing of construction products or other relevant standards.

5.5.14 The extraction of primary aggregates (e.g. sands and gravels) and lime from quarries will deplete finite material resources. The need to use primary aggregates would be minimised by the selection of secondary material resource, where possible. The maximum amount of secondary material resources would be specified for the concrete subject to not compromising its performance.

5.5.15 Where practicable, the specification of concrete replacements such as Ground Granulated Blast furnace Slag (GGBS) and Pulverised Fly Ash (PFA) would be considered to reduce embodied carbon.

5.5.16 Consideration of the durability of the material resources to be used by the Scheme (considering the 120 year design life of the tunnel) would be provided at a later stage of the design.

5.5.17 Modular construction (e.g. precast concrete instead of cast in situ concrete) would be utilised for the tunnel lining segments; improving quality, reducing onsite activities and installation time whilst utilising a controlled, spoil optimised construction environment.

5.5.18 The Scheme's gantries would be manufactured off-site (whenever possible) improving quality, reducing onsite activities and installation time whilst utilising a controlled, spoil optimised construction environment.

5.5.19 In addition, the Silvertown Tunnel segments would be procured from the existing UK market when possible.

Construction stage

5.5.20 The Scheme has adopted principles of designing out waste (DoW) during the construction to minimise material resources' use and construction spoil arisings. The Scheme would also adopt a stringent spoil control strategy, with the intention of achieving a minimum quantity of spoil being taken off site to a licensed tip. Spoil management compounds would be set up to handle incoming spoil from construction activities.

5.5.21 There would be a number of activities along the length of the works that would generate spoil in addition to the bored tunnelling works. Examples are piling activities, cut and cover works, retained cuts, site clearance / demolition, landscaping and roadworks.

5.5.22 Some of the materials generated by these activities will be contaminated or hazardous and the Site Waste Management Plan (SWMP) would determine the course of action to be taken for each of these spoil streams.

5.5.23 TfL is exploring the use of the River Thames to transport construction materials and waste. While the exact configuration of the mooring has not been determined, a jetty has been proposed to enable the operation of HAV ships at Thames Wharf (provided and named after HAV shipping, a Norwegian limited holding company focused on short sea shipping).

5.5.24 It is likely that the non-contaminated excavated materials would require disposal by river and the hazardous and less standard materials by road rather than by river.

5.5.25 A Preliminary SWMP has been developed for the Scheme and would be refined and updated as the design and the Scheme progresses. The SWMP would consider how the waste hierarchy can be applied and details how all spoil is to be managed. The SWMP would also provide a framework for checking compliance with waste legislation and the Duty of Care.

5.5.26 The SWMP would support the monitoring of project performance against Key Performance Indicators (KPI). The following indicators would be measured in terms of forecast and actual:

- total spoil;
- total spoil to landfill;
- percentage spoil diverted from landfill; and
- percentage material resources reused onsite.

5.5.27 The Preliminary SWMP considers further opportunities to minimise and reduce spoil generation, such as:

- agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take back scheme;

- implementation of a ‘just in time‘ material delivery system to avoid materials being stockpiled on-site for long periods of time, increasing the risk of their damage and disposal as spoil;
- reuse of materials onsite wherever feasible;
- segregation of spoil at source where practical; and
- reuse and recycling of materials off-site where reuse on-site is not practical.

5.5.28 In addition, a Materials Management Plan (MMP) would be prepared by the DBFM contractor to ensure that materials are handled and used in a way that prevents harm to human health and pollution of the environment.

5.5.29 The Scheme would have a Waste Manager or Champion who would oversee the implementation of the spoil control strategy and the handling of any spoil material. The Waste Manager would be responsible for the safe storage of spoil materials and would also control the segregation of spoil materials to enable the collection and reuse of as many types of spoil as possible. The construction sites would provide large skips for segregation and smaller skips for general spoil.

5.5.30 Excavated materials such as soils would be carefully stored in segregated piles for subsequent reuse onsite, where possible. Any surplus materials would be removed from site for either direct beneficial use elsewhere (such as Wallasea Island or the Essex coastline) or for recycling or recovery at an appropriately permitted off-site facility. If the material is contaminated then it would be kept separate from the clean material and sent for either recycling or recovery, where appropriate, or disposal at appropriately permitted facilities.

5.5.31 Other unusable construction, demolition and excavation (CDE) spoil materials would be collected in receptacles with mixed construction and demolition spoil materials, for subsequent separation and disposal at an off-site facility.

5.5.32 The project has set a 95% target for recycling and reuse of the materials arising from the construction of the Scheme and operational infrastructure. ‘Green procurement’ objectives would be defined and integrated into the procurement and specification process to use reused or recycled products and construction materials.

Operational stage

5.5.33 Details for the material resources and spoil arisings from the operation and maintenance of the tunnel would be incorporated into the final Sustainability Statement as further information becomes available.

5.5.34 Conserve water resources

Construction stage

5.5.35 Processes during the construction phase of the Scheme would require significant volumes of water supply. These processes include:

- tunnel boring;
- concrete mixing;
- supply for washing down; and
- potable water for site offices, canteens and welfare facilities.

5.5.36 Water supply for demolition and construction phases may result in a short term increase in supply volumes to the site. Water saving measures would be advocated by the CEMP and adopted where possible thereby reducing the impact on the water supply network. Means of reducing water consumption that would be adopted include:

- selection and specification of equipment to reduce the amount of water required;
- implementation of water reduction initiatives such as turning off taps, plant and equipment when not in use both onsite and within site offices, canteens and laboratories;
- use of stored water collected by the drainage systems for dust suppression and if required, pumps would be provided at each storage lagoon for use in filling water bowsers; and
- use of water from Thames Water mains piped potable supplies for site offices, canteens and laboratories consumption and implementation of measures to encourage water use efficiency.

Operational stage

5.5.37 Once the construction stage is complete the demand on water resources would be reduced from that associated with the construction stage, with water use associated with periodic tunnel cleaning and supply of water required for firefighting.

5.5.38 Water for use in firefighting would be stored in a dedicated tank that would have an automatic top up from mains water supply if required.

5.6 Topic: Safety and security

Indicator: Improving security and resilience

5.6.1 The PTA indicates that all public transport waiting areas (PTWAS), especially isolated or secluded bus stops such as BS16, BS13, BS6 and BS9, would benefit from more provision of dedicated and advertised closed circuit television (CCTV), which would reinforce perceptions of safety and add to security measures.

5.6.2 With regards to pedestrian crossings and links, cyclical maintenance to tactile paving and dropped kerbs can be scheduled. Other potential but not essential improvements may include the provision of better bus stop shelters, installation of audible information at crossings and providing Real Time Information screens at all bus stops.

5.6.3 The PTA also describes how the reliability and resilience of the current cross-river highway network in east London is adversely impacted by a lack of alternative crossings, the ability of existing crossings to meet demand and their susceptibility to incidents and closures. These factors combined result in a sub-optimal network which leads to unreliable journey times for users and poor levels of service when incidents and closures occur.

5.6.4 The Scheme would provide a new high-capacity highway crossing with full dimensional clearance within close proximity to the Blackwall Tunnel, and as part of the scheme user charges would be implemented at both Silvertown and Blackwall Tunnels to manage levels of demand. The Scheme would help to improve the current reliability and resilience of the highway network, primarily by facilitating:

- reduced congestion;
- fewer incidents; and

- the ability to divert vehicles when incidents and closures occur.

5.6.5 In addition to the day-to-day benefits listed above, the Scheme would also enable improved asset management of the Blackwall Tunnel and considerably enhance network resilience in the event of a long-term closure of the Blackwall Tunnel.

Indicator: Improving transport safety

Construction stage

5.6.6 The current design for the Silvertown Tunnel and the proposed tie-in arrangements linking it to the road network on either side of the River Thames have been subject to a full Stage 1 Road Safety Audit. As part of this process a number of safety issues were identified and recommendations made for the purpose of maximising the road safety of the proposals. A further Road Safety Audit would be completed as the design of the Scheme is further developed.

5.6.7 The DBFM contractor would plan for the delivery of construction materials as part of their Construction Logistics Plan (CLP). When the DBFM contractor progresses with the development of detailed proposals for the Scheme and there is certainty of where the construction materials would be obtained from and waste materials sent to for disposal, the contractor would be in a position to identify those routes that would be required to undertake the works with the necessary support for deliveries.

5.6.8 To further improve the safety of vulnerable road users on London's roads, TfL has mandated in all new and existing contracts that the suppliers and their sub-contractors who deliver to, collect from or service a TfL project, premise or site must comply with certain safety requirements known as 'Work Related Road Risk' (WRRR). These requirements include:

- accreditation to the Fleet Operator Recognition Scheme (FORS);
- enhanced vehicle safety equipment;
- Safe Urban Driving training and regular Driver and Vehicle Licensing Agency (DVLA) licence checking; and
- collision and incident reporting.

5.6.9 Lorry routings to Silvertown and Greenwich sites would be assessed taking into account prohibited routes as identified by TfL, local schools,

hospitals and vulnerable road user accident black spots. The CTMP would also ensure that safety measures are implemented to minimise road-related risks, and in particular:

- appropriate driver training;
- suitable signage;
- use the safest vehicles available at the time;
- compliance with various good practices such as the Fleet operator recognition scheme (FORS); and
- cyclists warning device on lorries.

5.6.10 Once the quantities for the works and methods have been established, the DBFM contractor would develop a time related forecast of vehicle movements, based on the following principles:

- design – optimising the design solution at detailed design stage to minimise material requirements and spoil generated in order to reduce lorry movements. Minimising the extent of piling to reduce the spoil generated;
- construction techniques – reduce wastage minimises quantities to be removed from the Silvertown and Greenwich sites but also reduce the quantities to be delivered to site to complete the works;
- site Landscaping – once the cut and cover section roof slabs are completed there is the need to reinstate above the structures. Suitable planning of this landscaping could result in the reuse of the excavated material elsewhere and hence reducing the quantities of material that will require to be removed from the Silvertown and Greenwich sites;
- programme – Constructing one tunnel at a time will result in smoothing the demands for spoil removal and the precast segment deliveries, preventing unnecessary lorry queuing and parking; and
- delivery solutions – Potential adoption of onsite batching and movement through the tunnel from the Silvertown site to the Greenwich site could reduce lorry movements. Maximising the use of river logistics to minimise the required number of road movements.

Operational stage

5.6.11 Traffic data collected for TfL's London Congestion Analysis Project (LCAP) suggests that closures of the Blackwall Tunnel have noticeable impacts on alternative routes even if the closure only lasts a few minutes.

5.6.12 The majority of current closure incidents at the Blackwall Tunnel are caused by over-height vehicles attempting to access the northbound bore. By providing an adjacent alternative route with full dimensional clearance, supported by a signage strategy to direct over-height vehicles to use the Silvertown Tunnel, the Scheme is expected to considerably reduce the number of over-height vehicle incidents and the resultant delay these incidents cause. Congestion incidents would reduce significantly, whilst a modest reduction in other incidents (e.g. road traffic collisions) would also be expected to occur as a proportion of current Blackwall Tunnel traffic diverts to the Silvertown Tunnel.

5.6.13 Not only would the number of incidents be reduced, the impact of incidents that do occur would lessen considerably for both tunnel users and users of the wider network. This applies particularly in the case of relatively infrequent major incidents which result in a tunnel closure for periods in excess of a few minutes. In cases where a closure of the Blackwall Tunnel is required, users would be directed to use the Silvertown Tunnel – a diversion of around 3km depending on the users' origin and destination. This compares favourably with much lengthier diversions to other crossings, and would minimise delay caused to other road users when significant numbers of vehicles seek to divert from Blackwall Tunnel to other crossings.

Indicator: Tackling crime and disorder

5.6.14 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.

5.6.15 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. There are significant numbers of other users at all times of the day and indeed the level of congestion precludes obvious escape routes.

5.6.16 The Scheme is not expected to have any material impact on security issues in the area.

5.6.17 The design of the tunnel will incorporate a range of security measures through the layout, lighting, alarm, closed-circuit television (CCTV) coverage and signage used to reduce the potential and perception of crime.

5.7 Topic: Quality of life

Indicator: Improving built structures and streetscapes

Sustainable Construction

Construction stage

5.7.1 The Scheme, during the CDE phases, would involve many different types of activities including: demolition, site clearance, site investigation, remediation, tunnelling, piling, excavation, services diversion and new installations and highway works.

5.7.2 The Preliminary CoCP includes details of the environmental management procedures which will be followed for managing the environmental impacts of constructing the Scheme. The CoCP would embrace several management plans, which form part of the suite of mitigation measures.

5.7.3 The DBFM contractor would register with the Considerate Constructors Scheme (CCS) and apply for the CCS's National Site Award. The Scheme would aim to achieve the highest practicable score designed to encourage best practice beyond statutory requirements.

5.7.4 The DBFM contractor would update the management plans prior to commencement of works with measures to plan and co-ordinate activities to cause as little inconvenience as practicable and ensure safe movement. The CTMP would include details on traffic management, vehicle use, highway control measures access arrangements and pedestrian consideration.

5.7.5 The Scheme's CDE activities would be carried out with the aim to minimise disturbance to neighbouring properties, users and traffic impact, and to have minimal visual impact.

Operational stage

5.7.6 The proposed Scheme would integrate existing cycle routes and accommodate new cycle routes, encouraging the shared space principle and creating uncluttered clearly defined cycle and pedestrian paths. In addition to movement corridors, the landscaping area at the northern portal would provide seating for pedestrian travelling to their destinations. These seating areas are integrated into the landscaping and provide character to the area, with high quality street furniture which creates an attractive high quality public realm.

Improving noise impacts

5.7.7 Chapter 14: Noise and vibration of the PEIR Volume I indicates that the beneficial noise impacts are likely to be widespread, whist the adverse impacts are likely to be very localised.

Construction stage

5.7.8 The noise generated during construction may potentially have an impact on the local residents, workers and pedestrians. An assessment of the likely significant impacts of the Scheme with respect to noise and vibration has been carried out and is included in Chapter 14: Noise and Vibration of the PEIR Volume I.

5.7.9 This indicates that noise levels would depend on the different plant type used, percentage on-time and type of activity. However, daytime construction noise levels are predicted to be below the relevant threshold, extracted from BS 5228-1:2009, for all residential receptors within 300m throughout the construction period and therefore not considered as significant.

5.7.10 The required Construction Demolition Excavation activities would also have the potential to cause vibrational impacts on receptors within proximity of the working site. The vibration levels would be:

- below human perception from rotary bored piling; and
- perceivable by humans from percussive piling operations for the installation of the jetty on residential dwellings. However, they would

highly unlikely cause any impact, especially given that the duration would be short lived.

5.7.11 The noise impacts during the construction stage are temporary. However, the DBFM contractor would collect data for relevant intervals and periods, such that regulators, Environmental Health Officers (EHOs) and local public health teams can compare noise levels to WHO guide values as well as EA Horizontal Guidance and British Standards limit values.

5.7.12 The DBFM would also set a mechanism for responding to community concerns about construction noise from the Scheme.

5.7.13 The use of river transport is considered important. The PPS analysis assumes that river transport would be used for the bulk of excavated materials. This assumption greatly reduces the HGV noise exposure levels to vulnerable populations along the road haul route. River corridor transport has the benefit of fewer proximal sensitive receptors and lower baseline noise levels (being in a relatively more open and less traffic dense context than road routes).

Operational stage

5.7.14 Due to the introduction of user charging, the operation of the Silvertown Tunnel is not expected to result in an increase in road traffic in this part of London. As a result the Scheme would redistribute current levels of road transport noise.

5.7.15 The main changes are expected to be associated with less traffic, and therefore reduced noise, at the Blackwall tunnel approaches; and more traffic, and therefore increased noise, at the Silvertown Tunnel approaches.

5.7.16 Improvements to bus routes due to the Scheme may also increase public transport use, reducing private car related noise emissions.

5.7.17 The PEIR noise and vibration chapter modelling indicates that there would generally be negligible, or no-change, in road traffic noise at the majority of receptors in the day time. For a few receptors impacts may be greater. For example a moderate adverse impacts is predicted to occur at the east tower of the Hoola development due to an increase in percentage of HGVs.

5.7.18 Night-time noise modelling by the PEIR noise and vibration chapter indicates that, assuming all roads in the design year having a low noise surfaces, noise levels are expected to decrease for 8,582 dwellings. A long term increase in night-time noise is expected at 502 dwellings. However this remains an important positive outcome for the Scheme..

5.7.19 With regard to potential ventilation noise impacts both day time and night-time noise impacts are expected to be below both background levels and World Health Organisation (WHO) guideline values.

Built environment

Construction stage

5.7.20 Chapter 8: Cultural Heritage of the PEIR Volume I considers the potential impacts of the Scheme on the cultural heritage resource (the heritage assets) within a predetermined study area surrounding the application boundary. Heritage assets are defined as a building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in the planning process.

5.7.21 No World Heritage Sites or scheduled monuments have been identified within the limits of land to be acquired or used (LLAU) or the 1000m study area. However the northern edge of the Maritime Greenwich World Heritage Site is located approximately 1.5km to the south-west (see Volume 2 of the PEIR, Drawing 8.1). No listed buildings have been identified within the application site itself, although 22 Grade II listed buildings lie within the 1km study area.

5.7.22 The geoarchaeological deposit model (Appendix 8.B of the PEIR) has identified the potential for peat and former land surface containing prehistoric period archaeological and palaeoenvironmental remains to be present at the locations of the tunnel portals and cut and cover sections of the tunnels.

5.7.23 Whilst there are a number of listed buildings within 1km of the Scheme, it is not considered that there would be any discernible direct impacts to the settings of heritage assets during the construction and operational phases of the Scheme. Direct physical impacts to sub-surface archaeological remains may occur during the construction phase of the Scheme.

5.7.24 It would be possible to mitigate any impacts to sub-surface archaeological remains caused during the construction phase of the Scheme through

archaeological recording. This would take the form of archaeological excavation and watching briefs prior to and/or during construction. The approach to be taken would be agreed through ongoing consultation during the EIA process and secured in the DCO. The archaeological recording would be followed by an appropriate programme of assessment, analysis and reporting.

Operational stage

5.7.25 The possibility of incorporating living roofs is also being explored. There is potential for the Silvertown Tunnel to be ecologically sustainable both in the short and long term once mitigation and enhancement measures are put in place.

5.7.26 Green walls would provide a series of environmental, commercial and aesthetic benefits. In cities green walls can significantly enhance a building's appearance and reduce locally generated pollution by absorbing CO_2 emissions and releasing oxygen and by trapping dust and other pollutants.

5.7.27 Furthermore, green walls add a layer of insulation (both thermal and acoustic) making a positive impact for both building's occupants and the local environment. In areas where graffiti is a potential problem, green walls can act as an effective deterrent.

Indicator: Improving green spaces

5.7.28 As outlined in Chapter 14: Townscape and Visual Amenity of the PEIR Volume I, the Scheme falls within the National Character Area 81: Greater Thames Estuary. Key characteristics of this character area, which are relevant to the urban location of the Site, are as follows:

> *'…Highly urbanised areas within London and on marsh edges subject to chaotic activity of various major developments including ports, waste disposal, marine dredging, housing regeneration, mineral extraction and prominent power stations plus numerous other industry-related activities…Major historical and current transport link to Inner London provided by the River Thames, with an extensive network of road and rail bridges spanning its reaches within the city…'*

5.7.29 Newham Character Study (London Borough of Newham Council, 2011), which was undertaken to inform Newham Core Strategy, identifies that the

Scheme falls within the ‘Southern part of the borough, including the Royal Docks, (Silvertown, North Woolwich) and Beckton’, key features of which are identified as ‘the Royal Dock basins (from c.1885), airport and River Thames, industrial development around the Tate and Lyle factory and Thames Wharves and modern service industry development at Excel (hotels, exhibition centre); ex-railway lands (some incorporated as the modern road network); the Docklands Light Railway (DLR) and emerging Crossrail route.’ A character study has not been prepared at this stage for the Royal Borough of Greenwich.

Construction stage

5.7.30 The Scheme would employ best practice, during the construction phase, to minimise townscape and visual disruption (e.g. protection of existing vegetation to be retained and targeted use of hoarding to screen construction sites, as set out in the Preliminary CoCP).

5.7.31 Construction activities associated with the Scheme, namely the movement of plant and vehicles, creation of compounds, and material stockpiles, would introduce temporary elements within views. These activities would generally only be perceived in close proximity and are similar in nature to industrial activities in the Scheme locality, as a result wider visual amenity would not be notably disrupted.

5.7.32 The proposed infrastructure (including ventilation stack, if required) would sit within a surrounding context formed by existing highway and railway structures, and industrial areas. Views would be enhanced by additional areas of green space and planting.

Operational stage

5.7.33 The Scheme would include built form and landscape proposals that would be designed to integrate the proposals with the current Scheme location and contribute positively to the development of the area.

5.7.34 The Scheme landscape design would contribute positively to the development of the area in terms of visual amenity. Although the design is not fixed at this stage, the design would include a varied and visually interesting combination of trees and herbaceous plants, including wildflower meadow planting. At the northern portal, where at-grade pedestrian and cycle links are incorporated, the design includes areas of green space and brings together areas of hard surfacing with clusters of

tree planting and under-storey vegetation. This would enhance the urban realm and improve the quality of life of the local residents.

5.7.35 Furthermore, the proposed green infrastructure would have a positive restorative effect on many other elements such as water, pollution, heat and climate change attenuation including public health and wellbeing in general.

5.7.36 The illustrative planting for the Silvertown Portal is predominantly birch trees clustered on a grid formation which have been overlaid across the whole site to help bring a sense of coherence and urban character to the individual pockets of land.

5.7.37 There is then an under-storey of wild flowers and low maintenance grasses which would provide colour and seasonal visual interest. This is planted in the largest spaces, taking into account sightline requirements for the roadways. Additional planting around the perimeter would allow the Scheme to tie back into the existing rough grassland or provide positive edges for future development of the adjacent land parcels.

5.7.38 The illustrative planting for the Greenwich Portal is predominantly birch trees clustered on the island formed by the new flyover. These would be a mixture of birch trees to match the scheme on the north side of tunnel. There would be no wildflower mixes used on the south, with grass instead being a low maintenance standard mix which is more suited to the verges that would typify the design on the southern side.

Indicator: Enhancing physical wellbeing

Improving journey experience

5.7.39 The Department for Transport (DfT) Transport Analysis Guidance (TAG) (Unit A4.1) defines journey quality as ‘a measure of the real and perceived physical and social environment experienced while travelling’. The main journey quality impacts would be experienced by existing users of the Blackwall Tunnel, some of whom would switch to the Silvertown Tunnel.

5.7.40 There could also be journey quality impacts on users of local roads (pedestrians, cyclists and drivers) as a result of significant changes in traffic flows or the design of the tunnel approach infrastructure.

5.7.41 The River Crossings Residents Survey provides some evidence of local residents’ perceptions of cross-river travel. For example:

- 43% of respondents gave positive scores for how easy it is to cross the river (24% negative, 17% neutral and 15% did not cross the river);
- the main factor for those who found it difficult to cross the river was congestion: 60% of those who said it was difficult to cross the river cited congestion, 20% cited availability or choice of crossings, 19% cited availability of public transport; and
- 53% agreed that they would benefit from new bus services crossing the river while 29% disagreed

5.7.42 TAG Unit A4.1 identifies three main categories of journey quality impact, as described below:

- traveller care (cleanliness, facilities and information) - The Scheme would have no material impact on this aspect of journey experience;
- traveller's views - There would be no material difference in the views (or lack of them) experienced by drivers in the Silvertown Tunnel, in comparison to those in the Blackwall Tunnel; and
- traveller stress (frustration, fear of accidents and route uncertainty - Total user net benefits (time and operating cost benefits less any charges paid) are positive in total and for each user group (commuters, business and other travellers). The improved certainty of journey time is likely to reduce driver stress. The reduction in incidents currently occurring in the Blackwall Tunnel would also have a strong positive impact on drivers' perception of safety. The Blackwall Tunnel northbound bore is currently a very stressful environment for drivers due to its geometry, height restrictions and the need to pay attention to large vehicles on the tight corners. The availability of a tunnel with more comfortable driving conditions and the transfer of larger vehicles from Blackwall to the safer Silvertown Tunnel would reduce this stress. The additional bus provision would provide more certainty and reduce delays and stress for bus passengers.

Improving Air Quality

5.7.43 The PEIR assesses the overall magnitude of change in air quality impact from the operation of the Scheme as 'low'. However, a net positive impact is expected: the number of modelled receptors where concentrations of NO2, PM10 and PM2.5 are predicted to decrease is higher than the number of modelled receptors where concentrations are predicted to

increase. Further assessment will be undertaken in relation to the levels of exposure that people are predicted to experience during construction and operation.

Construction stage

5.7.44 During construction works it is anticipated that emissions to air will be associated with road traffic movements (deliveries and movement of building materials), construction equipment and vehicles, and excavated materials movement and construction operations (construction dust). Chapter 6: Air Quality of the PEIR provides an assessment of the potential impacts on local air quality from these sources of pollution.

5.7.45 The Preliminary CoCP includes measures, which ensure mitigation measures are implemented during construction. According to the Preliminary CoCP, the DBFM contractor should, as far as reasonably practicable, seek to control and limit emissions to the atmosphere in terms of gaseous and particulate pollutants from vehicles and plant used on the sites, and dust from construction, demolition, vehicles and plant activities.

5.7.46 Vehicle and plant emissions would be controlled by implementing the following measures:

- production of a CLP to manage the sustainable delivery of goods and materials;
- engines of all vehicles, mobile and fixed plant on site are not left running/idling unnecessarily;
- using low emission vehicles and plant fitted with catalysts, diesel particulate filters or similar devices;
- using ultra low sulphur fuels in plant and vehicles;
- plant will be well maintained, with routine servicing of plant and vehicles to be completed in accordance with the manufacturer's recommendations and records maintained for the work undertaken;
- minimising the use of diesel or petrol powered generators and using mains electricity or battery powered equipment where practicable;
- maximising energy efficiency (this may include using alternative modes of transport, maximising vehicle utilisation by ensuring full loading and efficient routing);

- the contractor's and delivery vehicles would be required to comply with the London Low Emission Zone applicable to the site at the time of tendering; and
- all members of the contractor's staff who drive vehicles under the DBFM contract would undertake a fuel-efficient driver training course within three months of the commencement of the contract. The training course shall consist of theoretical training and practical implementation skills and shall be a minimum duration of one hour. Throughout the duration of the contract, any new staff employed by the DBFM contractor who drives for work shall also be required to undertake fuel-efficient driver training. The DBFM contractor shall encourage its sub-contractors to undertake similar fuel efficient driver training.

5.7.47 The Institute of Air Quality Management (IAQM) guidance provides a number of potential mitigation measures to reduce dust impacts during the construction stage. These are summarised in Table 3 1 of the Preliminary CoCP and include measures for communications, site management and monitoring. These would be reviewed and developed by the DBFM contractor prior to the commencement of construction works and incorporated into the CEMP.

5.7.48 An Air Quality and Dust Management Plan would be developed, which would detail controls to limit dust emissions, including damping down, the consideration of using green walls, screening and other green infrastructure to minimise the impact of dust and pollution and also how to improve the local ambience during construction.

Operational stage

5.7.49 The need for mitigation would be determined once the full air quality modelling results are available as part of the ES. If the air quality assessment deems that the Scheme would lead to a significant impact then mitigation measures would be investigated to determine whether the impacts can be mitigated. The types of mitigation measures that would be considered would include:

- varying the charge to the tunnel to influence traffic flows;
- speed control to constrain increases in traffic flow; and
- measures to promote cleaner vehicles.

Improving health impacts

5.7.50 It is recognised that transport and the physical environment of our cities both play a major role in the amount of physical activity that people do on a day-to-day basis.

5.7.51 TfL published its Health Action Plan in 2014. In one of the ten key actions identified, TfL states that “we will evaluate the health impacts of our programmes”. Assessment of the physical activity impacts forms part of the Preliminary Health Impact Assessment (HIA).

5.7.52 The Preliminary HIA reports the effects on physical activity for residents local to the Scheme. It notes that there is currently considerable severance in the pedestrian and cycling networks around the proposed Silvertown Tunnel portals on both the north and south of the River Thames. Although the Scheme would have no direct impact on cross river pedestrian and cyclist routes (the tunnel being an unsuitable environment for these modes of travel), the Scheme does aim to improve the pedestrian and cycle realm for lateral movement along both banks including to existing crossings for pedestrians and cyclists.

5.7.53 The enhancements of existing bus services and additional services are both expected to increase public transport use and associated physical activity and counteract any small shift in mode share from public transport to car.

5.7.54 In addition, a Health Action Plan (HAP) would be produced to develop the HIA's recommendations into a protocol for implementing the recommendations and monitoring relevant health outcomes. The HAP would aim to further reduce potential negative health impacts, and enhance potential health benefits.

5.7.55 The HAP would also form part of the overarching management plans for the Scheme. The HAP would establish the proposed actions needed to mitigate identified impacts and promote health opportunities in the Scheme. The HAP would assign actions, timeframes, resources, responsibilities and collaborating organizations to the mitigation and enhancement measures identified in the HIA. The HAP would include a monitoring system designed to track implementation progress and selected outcomes. The monitoring system would include appropriate key performance indicators and an early-warning system for any problems occurring at the community level. Evaluation and verification protocols would also be included to determine when successful implementation has

been accomplished. The HAP would be reviewed by key stakeholders prior to construction activities commencing. Key features of the HAP would include:

- allocation of responsibility;
- timeframes for implementation;
- resource requirements;
- collaborating organizations;
- monitoring system;
- key performance indicators;
- evaluation and verification protocols; and
- stakeholder consultation.

5.7.56 The HAP itself would also be the subject of ongoing monitoring to ensure that it continues to be relevant to the Scheme and the affected population. Responsibility for monitoring the Health Action Plan would lie with TfL and the boroughs.

5.8 Topic: Transport for all

Indicator: Improving access to the transport system

Accessibility

5.8.1 A key factor for the Scheme is the degree to which it impacts on accessibility or connectivity to and from business and labour markets, facilitating a change in economic activity. A quantitative assessment of the impact of the Scheme in terms of travel times, costs and reliability has been carried out in the Preliminary Regeneration Report.

Construction stage

5.8.2 The Preliminary TA considers the likely construction effects on individual modes of transport. Key findings from an accessibility perspective include the following:

- key public transport access routes at the northern side of the Scheme would remain open for the duration of the works. Access to Greenwich Bus Station would be maintained for all modes of transport during

construction of the Scheme, however there would be some diversions to existing bus routes during the Greenwich construction phase;

- bus routes likely to be affected are route 108 towards Stratford, route 108 towards Molesworth Street, route 188 towards north Greenwich and route 188 towards Russell Square;
- with regard to pedestrian access, a number of routes would be affected by construction of the Scheme. These would include pedestrian access to Dock Road from the Tidal Basin Roundabout; suitable alternative routes would be identified;
- construction works at the Greenwich site would necessitate diversion of pedestrian routes along Millennium Way; alternative routes are likely to only be marginally longer; and
- the Boord Street footbridge is proposed to be replaced as part of the Scheme. The replacement footbridge would be located approximately 45m south-east of the existing footbridge, following the line of Boord Street, to make it more visible to users approaching from that direction. It is unlikely that step-free access would be provided for up to 6 months during the construction period at this crossing point, thus creating a potential impact for disabled users as well as parents/ carers with babies and young children in prams and pushchairs. A survey to capture user numbers of the footbridge (weekday and weekend time periods) did not identify any wheelchair usage at this point; whilst it is acknowledged that the survey period covered two days and therefore cannot be regarded as conclusive, it is likely that the number of disabled users potentially affected by the loss of ramped access at this point is relatively low and therefore not significant.

Operational stage

5.8.3 Some groups of people are affected more by accessibility issues than others, for example, low-income groups tend to have lower levels of car ownership and can therefore disproportionately benefit from an improvement in public transport availability.

5.8.4 Much has already been done to improve public transport in the area with more on the way. The London Overground, DLR extensions and upgraded Jubilee line have all made it easier to get across the river by public transport, and by 2018, Crossrail would provide another connection with a station close to the northern portal at Custom House. TfL are also

continuing to explore how public transport, such as bus routes, can be improved both on existing and future crossings including the Silvertown Tunnel.

5.8.5 The Emirates Air Line crossing opened in summer 2012, and provides a convenient way for pedestrians and cyclists to cross the River Thames between the Royal Docks and Greenwich Peninsula. As the Silvertown Tunnel would not have provision for non-motorised users (NMUs) such as pedestrians and cyclists, improvements to the local surface routes to better provide access to the Emirates Air Line would be an integral part of the Scheme.

5.8.6 The Social Impact Appraisal presents a summary assessment of accessibility in the context of the following barriers:

- the availability and physical accessibility of transport: the Scheme includes improvements to four existing bus routes and additional cross-river bus links, which would be of particular benefit to older or mobility impaired persons who may find interchange at North Greenwich difficult; and
- cost of transport: the Scheme would have some negative impacts on lower income car drivers due to the road user charges planned (see Personal Affordability impacts in Chapter 9 of the PEIR Volume I). There would be a positive impact on some lower income public transport users since new cross-river bus links would reduce the need to interchange to the (more expensive) Underground or Emirates Air Line services.

5.8.7 In addition, a Public Transport Accessibility Level (PTAL) assessment was also undertaken to measure the impact on accessibility of potential enhancements to the bus network as a result of the Scheme. PTAL shows that new cross-river bus links would lead to wider travel horizons for residents of some nearby regeneration areas, providing low-cost travel options to access employment and education opportunities on the opposite side of the River Thames.

Modal shift to or from more sustainable forms of travel

5.8.8 Modal shift covers users who switch between modes (e.g. public transport) following implementation of the Scheme. Users may switch to car from public transport, and vice versa, due to the combination of the

new Silvertown Tunnel, the user charge, and improved cross-river bus connections.

5.8.9 There is potential for some switching from car use to public transport as the Scheme would present a significant opportunity for introducing fast and reliable cross-river bus services to a range of destinations both south and north of the River Thames, and could also make coach trips more attractive.

Affordability

5.8.10 The introduction of user charging on both the Blackwall and Silvertown Tunnels would have a direct impact on the affordability of travel by car and public transport for some users.

5.8.11 Personal affordability is a key distributional impact that may affect different groups of people positively or negatively to different extents. For example, lower income groups experience the impacts of travel affordability more strongly than higher income groups.

5.8.12 The 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.

5.8.13 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. People with disabilities may also suffer significant disbenefits when faced with higher costs, due to limited transport choices, whilst unemployed adults also have difficulties in accessing services (including training), again due to low incomes.

5.8.14 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 Air Line or the Underground.

5.8.15 In addition, a community fund would be available to the host boroughs who would be able to decide on its exact function and distribution. The community fund is an opportunity to deliver transport, environmental and social enhancements to local communities. The size of this fund and the way in which this fund is distributed would contribute to the social and the economic effects of the Scheme.

5.8.16 The Scheme would result in a net benefit for car user fuel and non-fuel combined VOC of £1.2m in 2021 (2010 prices).

5.8.17 The Scheme would result in a net decrease in car user costs of £1.2m and a net increase in users charges of £10.5m for car users (in 2031), resulting in a net cost increase of £9.3m. The costs impact mainly on high and medium income car users and to a lesser extent on low income car users.

5.8.18 Public transport passengers are not required to pay user charges or vehicle costs, but 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 on National Rail or the Underground. This benefit would impact mainly on low income public transport users and, to a lesser extent, on medium and high income users.

5.8.19 It has not been possible to assess the effect of changes in public transport fares on personal affordability, as the model used does not provide fare impacts at a sufficient level of detail. However it is likely to be of a smaller order of magnitude than the increase in car user costs.

Indicator: Supporting regeneration and spatial development

5.8.20 A key aim of the Scheme is to facilitate sustainable regeneration and development.

5.8.21 With urban road schemes, the accessibility impacts are much more widely spread throughout the highway network, this wide spread of benefits makes it much harder for the development sector to identify particular sites that would benefit from a road enhancement scheme. However, the potential impacts from the Scheme are set below:

- faster journey times for businesses - with time savings of up to 20 minutes in the peak periods (excluding any additional reliability benefits);
- more reliable journey times -by reducing congestion and improving journey time reliability, businesses would have more certainty over their route planning, have more control over their costs and be able to pursue potential opportunities more effectively;
- public transport corridor - fundamental to the Scheme is the creation of a new strategic bus corridor with the capacity to carry up to 9,000

people in each direction during the peak period. This would significantly improve connectivity between south-east and east London, particularly to parts of the Royal Docks;

- improvements in access to labour market - with the Silvertown Tunnel, employers north of the River Thames would see more than a 10% increase in the size of their labour market catchments living within a 45 minute drive time due to the faster journey times for those living south of the river wishing to access job opportunities to the north.
- improvements in access to customers - the Silvertown Tunnel would increase catchment areas for businesses.
- improvements in access to suppliers - the other side of businesses being able to access more customers is that firms also have access to a greater range of suppliers. This can increase competition, drive down costs and support innovation;
- improvements in access to jobs - under a do-nothing scenario the number of jobs accessible by highway is projected to significantly decrease in south-east London as a direct result of increased congestion at Blackwall Tunnel, resulting in reduced employment opportunities in some highly deprived areas; and
- higher levels of inward investment and faster rates of development - tangible impacts in the efficiency of the local economy, improved access to jobs and services, as well as improvements in the perception of the area, could mean that future levels of development, including housing, may be higher as a result of the Scheme.

Indicator: Enhancing diversity

5.8.22 The Scheme brings improvements in future access across the river to facilities and amenities (education, leisure, social networks, food choice, etc.).

5.8.23 Although traffic demand for the crossing is to be managed by the user charge, the effects of charging on low income groups would be mediated by the availability of improved affordable public transport. However for some people, particularly those who are dependent on car travel, the Scheme would have an impact due to the introduction of the charging scheme at the Blackwall Tunnel.

Indicator: Equality and participation

5.8.24 Stakeholder engagement through public consultation and key stakeholder involvement in a steering group would be undertaken throughout the project and would help shape the design.

5.8.25 In 2012 TfL ran a four week consultation with members of the public and stakeholders on proposals to enhance highway river crossings in east and south-east London, which included a new tunnel at Silvertown to ease congestion and provide additional resilience at Blackwall Tunnel. Information about the proposals was made available online, including an online questionnaire; the consultation was promoted in a range of local and pan-London press titles, via social media and via emails direct to stakeholders and members of the public who had registered to receive email updates. The outcome of the consultation demonstrated that there was widespread support for TfL to continue to develop the Silvertown Tunnel proposals, which were then taken forward.

5.8.26 A further round of formal consultation took place between October 2012 and February 2013 which sought the views of the public and stakeholders on a number of issues relating to river crossings, including the introduction of a new tunnel at Silvertown. The consultation included the issue of nearly 200,000 information letters to local addresses, two separate emails to approximately 350,000 customers in TfL's customer services database, and advertising in London-wide and local press titles and on the DLR network. Twelve consultation roadshow events were held at locations around the affected areas. The consultation was publicised to a large number of stakeholders, including relevant local authorities, political representatives and transport campaign groups.

5.8.27 Public and stakeholder consultation was also undertaken from September to October 2014. This consultation included the Introductory Environmental Report, which provided initial detail about the Scheme and the potential effects arising from it. During this consultation, roadshow events took place at local venues. Consultation responses have been taken into account and are reflected in the current scheme proposals, for example measures would be implemented to improve public transport provision in the vicinity of the Scheme. Further details of the consultation are documented in the Silvertown Tunnel Public Consultation Analysis Report (2015).

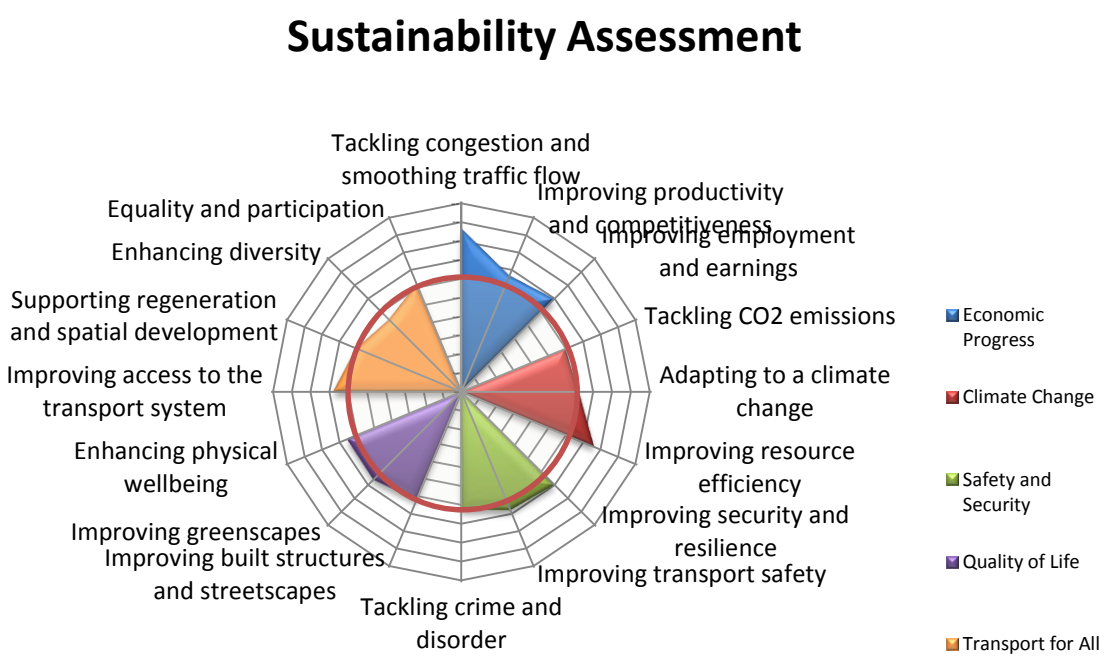
5.8.28 Consultation has continued with relevant local authorities, major businesses and statutory stakeholders in addition to members of the public.

6. SUSTAINABILITY TOOLS RESULTS

6.1 Introduction

6.1.1 Overall, the Toolkit spider graph shows that the Scheme achieved a relatively balanced score over all indicators and themes, which demonstrates that social, environmental and economic factors have been considered thorough the design process.

Figure 6-1 TfL's sustainability framework spider graph



6.1.2 The best performing core sustainability theme is Economic Progress, which aligns with the primary objectives and design requirements of the Scheme.

6.1.3 The best performing indicator is Tackling congestion and smoothing traffic flow. This is in line with the Scheme's targets and is reflecting TfL's focus and the design team's effort towards improved transport capacity and journey times.

6.1.4 The weakest performance is displayed under the theme Transport for all.

Appendix A DETAILED POLICY CONTEXT

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Policy	Policy Section / Paragraph	Summary
National Policy Statement		
NPS	Section 2	Networks which support the delivery of environmental goals and the move to a low carbon economy.
NPS	Section 2	Networks which join up our communities and link effectively to each other.
NPS	Section 3.2	The Government recognises that for development of the national road and rail networks to be sustainable these should be designed to minimise social and environmental impacts and improve quality of life.
NPS	Section 3.3	In delivering new schemes, the Government will expect applicants to avoid and mitigate environmental and social impacts in line with the principles set out in the NPPF and the Government's planning guidance. Applicants should also provide evidence that they have considered reasonable opportunities to deliver environmental and social benefits as part of schemes. The Government's detailed policy on environmental mitigations for developments is set out in Chapter 5 of this document.
NPS	Section 3.4	The Appraisal of Sustainability accompanying this NPS recognises that some developments will have some adverse local impacts on noise, emissions, landscape/visual amenity, biodiversity, cultural heritage and water resources. The significance of these effects and the effectiveness of mitigation is uncertain at the strategic and non-locational specific level of this NPS. Therefore, whilst applicants should deliver developments in accordance with Government policy and in an environmentally sensitive way, including considering opportunities to deliver environmental benefits, some adverse local effects of development may remain.
NPS	Section 4.22	Prior to granting a Development Consent Order, the Secretary of State must, under the Habitats Regulations, consider whether it is possible that the project could have a significant effect on the objectives of a European site, or on any site to which the same protection is applied as a matter of policy, either alone or in combination with other plans or projects. Applicants should also refer to paragraphs 5.20 to 5.38 of this national policy statement on biodiversity and geological conservation and to paragraphs 5.3 to 5.15 on air quality. The applicant should seek the advice of Natural England and, where appropriate, for cross-boundary impacts, Natural Resources Wales and Scottish Natural Heritage to ensure that impacts on European sites in Wales and Scotland are adequately considered.

Policy	Policy Section / Paragraph	Summary
NPS	Section 4.23	Applicants are required to provide sufficient information with their applications for development consent to enable the Secretary of State to carry out an Appropriate Assessment if required. This information should include details of any measures that are proposed to minimise or avoid any likely significant effects on a European site. The information provided may also assist the Secretary of State in concluding that an appropriate assessment is not required because significant effects on European sites are sufficiently unlikely that they can be excluded.
NPS	Section 4.26	Applicants should comply with all legal requirements and any policy requirements set out in this NPS on the assessment of alternatives. In particular: • The EIA Directive requires projects with significant environmental effects to include an outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant¡¦s choice, taking into account the environmental effects. • There may also be other specific legal requirements for the consideration of alternatives, for example, under the Habitats and Water Framework Directives. • There may also be policy requirements in this NPS, for example the flood risk sequential test and the assessment of alternatives for developments in National Parks, the Broads and Areas of Outstanding Natural Beauty (AONB).
NPS	Section 4.4	New national networks infrastructure will be typically long-term investments which will need to remain operational over many decades, in the face of a changing climate. Consequently, applicants must consider the impacts of climate change when planning location, design, build and operation. Any accompanying environment statement should set out how the proposal will take account of the projected impacts of climate change.
NPS	Section 4.41	Where transport infrastructure has safety-critical elements and the design life of the asset is 60 years or greater, the applicant should apply the UK Climate Projections 2009 (UKCP09) high emissions scenario (high impact, low likelihood) against the 2080 projections at the 50% probability level.

Policy	Policy Section / Paragraph	Summary
NPS	Section 4.42	The applicant should take into account the potential impacts of climate change using the latest UK Climate Projections available at the time and ensure any environment statement that is prepared identifies appropriate mitigation or adaptation measures. This should cover the estimated lifetime of the new infrastructure. Should a new set of UK Climate Projections become available after the preparation of any environment statement, the Examining Authority should consider whether they need to request additional information from the applicant.
NPS	Section 4.43	The applicant should demonstrate that there are no critical features of the design of new national networks infrastructure which may be seriously affected by more radical changes to the climate beyond that projected in the latest set of UK climate projections. Any potential critical features should be assessed taking account of the latest credible scientific evidence on, for example, sea level rise (e.g. by referring to additional maximum credible scenarios such as from the Intergovernmental Panel on Climate Change or Environment Agency) and on the basis that necessary action can be taken to ensure the operation of the infrastructure over its estimated lifetime through potential further mitigation or adaptation.
NPS	Section 4.44	Any adaptation measures should be based on the latest set of UK Climate Projections, the Government's national Climate Change Risk Assessment and consultation with statutory consultation bodies. Any adaptation measures must themselves also be assessed as part of any environmental impact assessment and included in the environment statement, which should set out how and where such measures are proposed to be secured.
NPS	Section 4.47	Where adaptation measures are necessary to deal with the impact of climate change, and that measure would have an adverse effect on other aspects of the project and/or surrounding environment (e.g. coastal processes), the Secretary of State may consider requiring the applicant to ensure that the adaptation measure could be implemented should the need arise, rather than at the outset of the development (e.g. reserving land for future extension, increasing the height of an existing sea wall, or requiring a new sea wall).

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.6	Where the impacts of the project (both on and off-scheme) are likely to have significant air quality effects in relation to meeting EIA requirements and / or affect the UKs ability to comply with the Air Quality Directive, the applicant should undertake an assessment of the impacts of the proposed project as part of the environmental statement.
NPS	Section 5.7	The environmental statement should describe: • existing air quality levels; • forecasts of air quality at the time of opening, assuming that the scheme is not built (the future baseline) and taking account of the impact of the scheme; and • any significant air quality effects, their mitigation and any residual effects, distinguishing between the construction and operation stages and taking account of the impact of road traffic generated by the project.
NPS	Section 5.8	Defra publishes future national projections of air quality based on evidence of future emissions, traffic and vehicle fleet. Projections are updated as the evidence base changes. Applicant's assessment should be consistent with this but may include more detailed modelling to demonstrate local impacts.
NPS	Section 5.9	In addition to information on the likely significant effects of a project in relation to EIA, the Secretary of State must be provided with a judgement on the risk as to whether the project would affect the UK's ability to comply with the Air Quality Directive.
NPS	Section 5.10	The Secretary of State should consider air quality impacts over the wider area likely to be affected, as well as in the near vicinity of the scheme. In all cases the Secretary of State must take account of relevant statutory air quality thresholds set out in domestic and European legislation. Where a project is likely to lead to a breach of the air quality thresholds, the applicant should work with the relevant authorities to secure appropriate mitigation measures with a view to ensuring so far as possible that those thresholds are not breached.

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.11	"Air quality considerations are likely to be particularly relevant where schemes are proposed: within or adjacent to Air Quality Management Areas (AQMA); roads identified as being above Limit Values or nature conservation sites (including Natura 2000 sites and SSSIs, including those outside England); and where changes are sufficient to bring about the need for a new AQMA or change the size of an existing AQMA; or bring about changes to exceedences of the Limit Values, or where they may have the potential to impact on nature conservation sites."
NPS	Section 5.12	The Secretary of State must give air quality considerations substantial weight where, after taking into account mitigation, a project would lead to a significant air quality impact in relation to EIA and / or where they lead to a deterioration in air quality in a zone/ agglomeration.
NPS	Section 5.13	The Secretary of State should refuse consent where, after taking into account mitigation, the air quality impacts of the scheme will: • result in a zone/agglomeration which is currently reported as being compliant with the Air Quality Directive becoming non-compliant; or • affect the ability of a non-compliant area to achieve compliance within the most recent timescales reported to the European Commission at the time of the decision.
NPS	Section 5.14	The Secretary of State should consider whether mitigation measures put forward by the applicant are acceptable. A management plan may help codify mitigation at this stage. The proposed mitigation measures should ensure that the net impact of a project does not delay the point at which a zone will meet compliance timescales.
NPS	Section 5.15	"Mitigation measures may affect the project design, layout, construction, operation and/or may comprise measures to improve air quality in pollution hotspots beyond the immediate locality of the scheme. Measures could include, but are not limited to, changes to the route of the new scheme, changes to the proximity of vehicles to local receptors in the existing route, physical means including barriers to trap or better disperse emissions, and speed control. The implementation of mitigation measures may require working with partners to support their delivery."

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.17	Carbon impacts will be considered as part of the appraisal of scheme options (in the business case), prior to the submission of an application for DCO. Where the development is subject to EIA, any Environmental Statement will need to describe an assessment of any likely significant climate factors in accordance with the requirements in the EIA Directive. It is very unlikely that the impact of a road project will, in isolation, affect the ability of Government to meet its carbon reduction plan targets. However, for road projects applicants should provide evidence of the carbon impact of the project and an assessment against the Government's carbon budgets.
NPS	Section 5.18	Therefore, any increase in carbon emissions is not a reason to refuse development consent, unless the increase in carbon emissions resulting from the proposed scheme are so significant that it would have a material impact on the ability of Government to meet its carbon reduction targets.
NPS	Section 5.19	Evidence of appropriate mitigation measures (incorporating engineering plans on configuration and layout, and use of materials) in both design and construction should be presented. The Secretary of State will consider the effectiveness of such mitigation measures in order to ensure that, in relation to design and construction, the carbon footprint is not unnecessarily high. The Secretary of State's view of the adequacy of the mitigation measures relating to design and construction will be a material factor in the decision making process.
NPS	Section 5.22	Where the project is subject to EIA the applicant should ensure that the environmental statement clearly sets out any likely significant effects on internationally, nationally and locally designated sites of ecological or geological conservation importance (including those outside England) on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity and that the statement considers the full range of potential impacts on ecosystems.
NPS	Section 5.23	The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests.

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.25	As a general principle, and subject to the specific policies below, development should avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives. The applicant may also wish to make use of biodiversity offsetting in devising compensation proposals to counteract any impacts on biodiversity which cannot be avoided or mitigated. Where significant harm cannot be avoided or mitigated, as a last resort, appropriate compensation measures should be sought.
NPS	Section 5.26	In taking decisions, the Secretary of State should ensure that appropriate weight is attached to designated sites of international, national and local importance, protected species, habitats and other species of principal importance for the conservation of biodiversity, and to biodiversity and geological interests within the wider environment.
NPS	Section 5.27	"The most important sites for biodiversity are those identified through international conventions and European Directives. The Habitats Regulations provide statutory protection for European sites (see also paragraphs 4.22 to 4.25). The National Planning Policy Framework states that the following wildlife sites should have the same protection as European sites: potential Special Protection Areas and possible Special Areas of Conservation; listed or proposed Ramsar sites; and sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation and listed or proposed Ramsar sites."

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.29	Where a proposed development on land within or outside a SSSI is likely to have an adverse effect on an SSSI (either individually or in combination with other developments), development consent should not normally be granted. Where an adverse effect on the site's notified special interest features is likely, an exception should be made only where the benefits of the development at this site clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest, and any broader impacts on the national network of SSSIs. The Secretary of State should ensure that the applicant's proposals to mitigate the harmful aspects of the development and, where possible, to ensure the conservation and enhancement of the site's biodiversity or geological interest, are acceptable. Where necessary, requirements and/or planning obligations should be used to ensure these proposals are delivered.
NPS	Section 5.31	Sites of regional and local biodiversity and geological interest (which include Local Geological Sites, Local Nature Reserves and Local Wildlife Sites and Nature Improvement Areas) have a fundamental role to play in meeting overall national biodiversity targets, in contributing to the quality of life and the well-being of the community, and in supporting research and education. The Secretary of State should give due consideration to such regional or local designations. However, given the need for new infrastructure, these designations should not be used in themselves to refuse development consent.
NPS	Section 5.33	Development proposals potentially provide many opportunities for building in beneficial biodiversity or geological features as part of good design. When considering proposals, the Secretary of State should consider whether the applicant has maximised such opportunities in and around developments. The Secretary of State may use requirements or planning obligations where appropriate in order to ensure that such beneficial features are delivered.

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.35	Other species and habitats have been identified as being of principal importance for the conservation of biodiversity in England and Wales and therefore requiring conservation action. The Secretary of State should ensure that applicants have taken measures to ensure these species and habitats are protected from the adverse effects of development. Where appropriate, requirements or planning obligations may be used in order to deliver this protection. The Secretary of State should refuse consent where harm to the habitats or species and their habitats would result, unless the benefits of the development (including need) clearly outweigh that harm.
NPS	Section 5.36	Applicants should include appropriate mitigation measures as an integral part of their proposed development, including identifying where and how these will be secured. In particular, the applicant should demonstrate that: • during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works; • during construction and operation, best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised (including as a consequence of transport access arrangements); • habitats will, where practicable, be restored after construction works have finished; • developments will be designed and landscaped to provide green corridors and minimise habitat fragmentation where reasonable; and • opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals, for example through techniques such as the 'greening' of existing network crossing points, the use of green bridges and the habitat improvement of the network verge."
NPS	Section 5.38	The Secretary of State will need to take account of what mitigation measures may have been agreed between the applicant and Natural England and/or the MMO, and whether Natural England and/or or the MMO has granted or refused, or intends to grant or refuse, any relevant licences, including protected species mitigation licences.

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.82	Because of the potential effects of these emissions and in view of the availability of the defence of statutory authority against nuisance claims described previously, it is important that the potential for these impacts is considered by the applicant in their application, by the Examining Authority in examining applications and by the Secretary of State in taking decisions on development consents.
NPS	Section 5.83	For nationally significant infrastructure projects of the type covered by this NPS, some impact on amenity for local communities is likely to be unavoidable. Impacts should be kept to a minimum and should be at a level that is acceptable.
NPS	Section 5.84	Where the development is subject to an Environmental Impact Assessment, the applicant should assess any likely significant effects on amenity from emissions of odour, dust, steam, smoke and artificial light and describe these in the Environmental Statement.
NPS	Section 5.85	In particular, the assessment provided by the applicant should describe: the type and quantity of emissions; • aspects of the development which may give rise to emissions during construction, operation and decommissioning; • premises or locations that may be affected by the emissions; • effects of the emission on identified premises or locations; and • measures to be employed in preventing or mitigating the emissions.
NPS	Section 5.87	The Secretary of State should be satisfied that all reasonable steps have been taken, and will be taken, to minimise any detrimental impact on amenity from emissions of odour, dust, steam, smoke and artificial light. This includes the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.88	If development consent is granted for a project, the Secretary of State should consider whether there is a justification for all of the authorised project (including any associated development) being covered by a defence of statutory authority against nuisance claims. If the Secretary of State cannot conclude that this is justified, then the defence should be disapplied, in whole or in part, through a provision in the Development Consent Order.
NPS	Section 5.89	The Secretary of State should ensure the applicant has provided sufficient information to show that any necessary mitigation will be put into place. In particular, the Secretary of State should consider whether to require the applicant to abide by a scheme of management and mitigation concerning emissions of odour, dust, steam, smoke, artificial light from the development to reduce any loss to amenity which might arise during the construction and operation of the development. A construction management plan may help codify mitigation.
NPS	Section 5.93	This should identify and assess the risks of all forms of flooding to and from the project and demonstrate how these flood risks will be managed, taking climate change into account.

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.94	In preparing an FRA the applicant should: • consider the risk of all forms of flooding arising from the project (including in adjacent parts of the United Kingdom), in addition to • the risk of flooding to the project, and demonstrate how these risks will be managed and, where relevant, mitigated, so that the development remains safe throughout its lifetime; • take the impacts of climate change into account, clearly stating the development lifetime over which the assessment has been made; • consider the vulnerability of those using the infrastructure including arrangements for safe access and exit; • include the assessment of the remaining (known as 'residual') risk after risk reduction measures have been taken into account and • demonstrate that this is acceptable for the particular project; • consider if there is a need to remain operational during a worst case flood event over the development's lifetime; and • provide the evidence for the Secretary of State to apply the Sequential Test and Exception Test, as appropriate.
NPS	Section 5.98	Where flood risk is a factor in determining an application for development consent, the Secretary of State should be satisfied that, where relevant: • the application is supported by an appropriate FRA; • the Sequential Test (see the National Planning Policy Framework) has been applied as part of site selection and, if required, the Exception Test (see the National Planning Policy Framework).

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.99	When determining an application the Secretary of State should be satisfied that flood risk will not be increased elsewhere and only consider development appropriate in areas at risk of flooding where (informed by a flood risk assessment, following the Sequential Test and, if required, the Exception Test), it can be demonstrated that: • within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location; and • development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed, including by emergency planning; and priority is given to the use of sustainable drainage systems.
NPS	Section 5.100	For construction work which has drainage implications, approval for the project's drainage system will form part of any development consent issued by the Secretary of State. The Secretary of State will therefore need to be satisfied that the proposed drainage system complies with any National Standards published by Ministers under Paragraph 5(1) of Schedule 3 to the Flood and Water Management Act 2010.93 In addition, the development consent order, or any associated planning obligations, will need to make provision for the adoption and maintenance of any Sustainable Drainage Systems (SuDS), including any necessary access rights to property. The Secretary of State, should be satisfied that the most appropriate body is being given the responsibility for maintaining any SuDs, taking into account the nature and security of the infrastructure on the proposed site. The responsible body could include, for example, the applicant, the landowner, the relevant local authority, or another body such as the Internal Drainage Board.

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.102	The Secretary of State should expect that reasonable steps have been taken to avoid, limit and reduce the risk of flooding to the proposed infrastructure and others. However, the nature of linear infrastructure means that there will be cases where: • upgrades are made to existing infrastructure in an area at risk of flooding; • infrastructure in a flood risk area is being replaced; • infrastructure is being provided to serve a flood risk area; and • infrastructure is being provided connecting two points that are not in flood risk areas, but where the most viable route between the two passes through such an area.
NPS	Section 5.104	Where linear infrastructure has been proposed in a flood risk area, the Secretary of State should expect reasonable mitigation measures to have been made, to ensure that the infrastructure remains functional in the event of predicted flooding.
NPS	Section 5.110	To satisfactorily manage flood risk and the impact of the natural water cycle on people, property and ecosystems, good design and infrastructure may need to be secured using requirements or planning obligations. This may include the use of sustainable drainage systems but could also include vegetation to help to slow runoff, hold back peak flows and make landscapes more able to absorb the impact of severe weather events.
NPS	Section 5.124	Non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to Scheduled Monuments, should be considered subject to the policies for designated heritage assets. The absence of designation for such heritage assets does not indicate lower significance.
NPS	Section 5.125	The Secretary of State should also consider the impacts on other non-designated heritage assets (as identified either through the development plan process by local authorities, including ‘local listing’, or through the nationally significant infrastructure project examination and decision making process) on the basis of clear evidence that the assets have a significance that merit consideration in that process, even though those assets are of lesser value than designated heritage assets.

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.126	Where the development is subject to EIA the applicant should undertake an assessment of any likely significant heritage impacts of the proposed project as part of the Environmental Impact Assessment and describe these in the environmental statement.
NPS	Section 5.127	The applicant should describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the asset's importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant Historic Environment Record should have been consulted and the heritage assets assessed using appropriate expertise. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, the applicant should include an appropriate desk-based assessment and, where necessary, a field evaluation.
NPS	Section 5.128	In determining applications, the Secretary of State should seek to identify and assess the particular significance of any heritage asset that may be affected by the proposed development (including by development affecting the setting of a heritage asset), taking account of the available evidence and any necessary expertise from: • relevant information provided with the application and, where applicable, relevant information submitted during examination of the application; • any designation records; • the relevant Historic Environment Record(s), and similar sources of information; • representations made by interested parties during the examination; and • expert advice, where appropriate, and when the need to understand the significance of the heritage asset demands it.
NPS	Section 5.129	In considering the impact of a proposed development on any heritage assets, the Secretary of State should take into account the particular nature of the significance of the heritage asset and the value that they hold for this and future generations. This understanding should be used to avoid or minimise conflict between their conservation and any aspect of the proposal.

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.130	The Secretary of State should take into account the desirability of sustaining and, where appropriate, enhancing the significance of heritage assets, the contribution of their settings and the positive contribution that their conservation can make to sustainable communities – including their economic vitality. The Secretary of State should also take into account the desirability of new development making a positive contribution to the character and local distinctiveness of the historic environment. The consideration of design should include scale, height, massing, alignment, materials, use and landscaping (for example, screen planting).
NPS	Section 5.131	When considering the impact of a proposed development on the significance of a designated heritage asset, the Secretary of State should give great weight to the asset's conservation. The more important the asset, the greater the weight should be. Once lost, heritage assets cannot be replaced and their loss has a cultural, environmental, economic and social impact. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting. Given that heritage assets are irreplaceable, harm or loss affecting any designated heritage asset should require clear and convincing justification. Substantial harm to or loss of a grade II Listed Building or a grade II Registered Park or Garden should be exceptional. Substantial harm to or loss of designated assets of the highest significance, including World Heritage Sites, Scheduled Monuments, grade I and II* Listed Buildings, Registered Battlefields, and grade I and II* Registered Parks and Gardens should be wholly exceptional.
NPS	Section 5.132	Any harmful impact on the significance of a designated heritage asset should be weighed against the public benefit of development, recognising that the greater the harm to the significance of the heritage asset, the greater the justification that will be needed for any loss.
NPS	Section 5.144	Where the development is subject to EIA the applicant should undertake an assessment of any likely significant landscape and visual impacts in the environmental impact assessment and describe these in the environmental assessment. A number of guides have been produced to assist in addressing landscape issues. The landscape and visual assessment should include reference to any landscape character assessment and associated studies, as a means of assessing landscape impacts relevant to the proposed project. The applicant's assessment should also take account of any relevant policies based on these assessments in local development documents in England.

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.145	The applicant's assessment should include any significant effects during construction of the project and/or the significant effects of the completed development and its operation on landscape components and landscape character (including historic landscape characterisation).
NPS	Section 5.146	The assessment should include the visibility and conspicuousness of the project during construction and of the presence and operation of the project and potential impacts on views and visual amenity. This should include any noise and light pollution effects, including on local amenity, tranquillity and nature conservation.
NPS	Section 5.149	Landscape effects depend on the nature of the existing landscape likely to be affected and nature of the effect likely to occur. Both of these factors need to be considered in judging the impact of a project on landscape. Projects need to be designed carefully, taking account of the potential impact on the landscape. Having regard to siting, operational and other relevant constraints, the aim should be to avoid or minimise harm to the landscape, providing reasonable mitigation where possible and appropriate.
NPS	Section 5.158	The Secretary of State will have to judge whether the visual effects on sensitive receptors, such as local residents, and other receptors, such as visitors to the local area, outweigh the benefits of the development. Coastal areas are particularly vulnerable to visual intrusion because of the potential high visibility of development on the foreshore, on the skyline and affecting views along stretches of undeveloped coast, especially those defined as Heritage Coast.
NPS	Section 5.159	Reducing the scale of a project or making changes to its operation can help to avoid or mitigate the visual and landscape effects of a proposed project. However, reducing the scale or otherwise amending the design or changing the operation of a proposed development may result in a significant operational constraint and reduction in function. There may, be exceptional circumstances, where mitigation could have a very significant benefit and warrant a small reduction in scale or function. In these circumstances, the Secretary of State may decide that the benefits of the mitigation to reduce the landscape effects outweigh the marginal loss of scale or function.

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.160	Adverse landscape and visual effects may be minimised through appropriate siting of infrastructure, design (including choice of materials), and landscaping schemes, depending on the size and type of proposed project. Materials and designs for infrastructure should always be given careful consideration
NPS	Section 5.161	Depending on the topography of the surrounding terrain and areas of population it may be appropriate to undertake landscaping off site, although if such landscaping was proposed to be consented by the development consent order, it would have to be included within the order limits for that application. For example, filling in gaps in existing tree and hedge lines would mitigate the impact when viewed from a more distant vista.
NPS	Section 5.189	Where a development is subject to EIA and significant noise impacts are likely to arise from the proposed development, the applicant should include the following in the noise assessment, which should form part of the environment statement: • a description of the noise sources including likely usage in terms of number of movements, fleet mix and diurnal pattern. For any associated fixed structures, such as ventilation fans for tunnels, information about the noise sources including the identification of any distinctive tonal, impulsive or low frequency characteristics of the noise; • identification of noise sensitive premises and noise sensitive areas that may be affected; • the characteristics of the existing noise environment; • a prediction on how the noise environment will change with the proposed development: • In the shorter term such as during the construction period; • in the longer term during the operating life of the infrastructure; • at particular times of the day, evening and night as appropriate. • an assessment of the effect of predicted changes in the noise environment on any noise sensitive premises and noise sensitive areas; and • measures to be employed in mitigating the effects of noise. Applicants should consider using best available techniques to reduce noise impacts."

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.190	The potential noise impact elsewhere that is directly associated with the development, such as changes in road and rail traffic movements elsewhere on the national networks, should be considered as appropriate.
NPS	Section 5.191	Operational noise, with respect to human receptors, should be assessed using the principles of the relevant British Standards and other guidance. The prediction of road traffic noise should be based on the method described in Calculation of Road Traffic Noise. The prediction of noise from new railways should be based on the method described in Calculation of Railway Noise. For the prediction, assessment and management of construction noise, reference should be made to any relevant British Standards and other guidance which also give examples of mitigation strategies.
NPS	Section 5.192	The applicant should consult Natural England with regard to assessment of noise on designated nature conservation sites, protected landscapes, protected species or other wildlife. The results of any noise surveys and predictions may inform the ecological assessment. The seasonality of potentially affected species in nearby sites may also need to be taken into account.
NPS	Section 5.193	Developments must be undertaken in accordance with statutory requirements for noise. Due regard must have been given to the relevant sections of the Noise Policy Statement for England, National Planning Policy Framework and the Government's associated planning guidance on noise.
NPS	Section 5.194	The project should demonstrate good design through optimisation of scheme layout to minimise noise emissions and, where possible, the use of landscaping, bunds or noise barriers to reduce noise transmission. The project should also consider the need for the mitigation of impacts elsewhere on the road and rail networks that have been identified as arising from the development, according to Government policy.

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.195	The Secretary of State should not grant development consent unless satisfied that the proposals will meet, the following aims, within the context of Government policy on sustainable development: • avoid significant adverse impacts on health and quality of life from noise as a result of the new development; and • mitigate and minimise other adverse impacts on health and quality of life from noise from the new development; and contribute to improvements to health and quality of life through the effective management and control of noise, where possible."
NPS	Section 5.196	In determining an application, the Secretary of State should consider whether requirements are needed which specify that the mitigation measures put forward by the applicant are put in place to ensure that the noise levels from the project do not exceed those described in the assessment or any other estimates on which the decision was based.
NPS	Section 5.197	The Examining Authority and the Secretary of State should consider whether mitigation measures are needed both for operational and construction noise over and above any which may form part of the project application. The Secretary of State may wish to impose requirements to ensure delivery of all mitigation measures.
NPS	Section 5.198	Mitigation measures for the project should be proportionate and reasonable and may include one or more of the following: • engineering: containment of noise generated; • materials: use of materials that reduce noise, (for example low noise road surfacing); • lay-out: adequate distance between source and noise-sensitive receptors; incorporating good design to minimise noise transmission through screening by natural or purpose built barriers; and • administration: specifying acceptable noise limits or times of use (e.g., in the case of railway station PA systems).

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.199	For most national network projects, the relevant Noise Insulation Regulations will apply. These place a duty on and provide powers to the relevant authority to offer noise mitigation through improved sound insulation to dwellings, with associated ventilation to deal with both construction and operational noise. An indication of the likely eligibility for such compensation should be included in the assessment. In extreme cases, the applicant may consider it appropriate to provide noise mitigation through the compulsory acquisition of affected properties in order to gain consent for what might otherwise be unacceptable development. Where mitigation is proposed to be dealt with through compulsory acquisition, such properties would have to be included within the development consent order land in relation to which compulsory acquisition powers are being sought.
NPS	Section 5.200	Applicants should consider opportunities to address the noise issues associated with the Important Areas as identified through the noise action planning process.
NPS	Section 5.206	For road and rail developments, if a development is subject to EIA and is likely to have significant environmental impacts arising from impacts on transport networks, the applicant's environmental statement should describe those impacts and mitigating commitments. In all other cases the applicant's assessment should include a proportionate assessment of the transport impacts on other networks as part of the application.
NPS	Section 5.222	For those projects that are improvements to the existing infrastructure, such as road widening, opportunities should be taken, where feasible, to improve upon the quality of existing discharges where these are identified and shown to contribute towards Water Framework Directive commitments.

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.223	Any environmental statement should describe: • the existing quality of waters affected by the proposed project; • existing water resources affected by the proposed project and the impacts of the proposed project on water resources; • existing physical characteristics of the water environment (including quantity and dynamics of flow) affected by the proposed project, and any impact of physical modifications to these characteristics; • any impacts of the proposed project on water bodies or protected areas under the Water Framework Directive and source protection zones (SPZs) around potable groundwater abstractions; and • any cumulative effects.
NPS	Section 5.224	Activities that discharge to the water environment are subject to pollution control. The considerations set out in paragraphs 4.48-4.56 on the interface between planning and pollution control therefore apply. These considerations will also apply in an analogous way to the abstraction licensing regime regulating activities that take water from the water environment, and to the control regimes relating to works to, and structures in, on, or under a controlled water.
NPS	Section 5.225	The Secretary of State will generally need to give impacts on the water environment more weight where a project would have adverse effects on the achievement of the environmental objectives established under the Water Framework Directive.
NPS	Section 5.226	The Secretary of State should be satisfied that a proposal has had regard to the River Basin Management Plans and the requirements of the Water Framework Directive (including Article 4.7) and its daughter directives, including those on priority substances and groundwater. The specific objectives for particular river basins are set out in River Basin Management Plans. In terms of Water Framework Directive compliance, the overall aim of projects should be no deterioration of ecological status in watercourses, ensuring that Article 4.7 of the Water Framework Directive Regulations does not need to be applied. The Secretary of State should also consider the interactions of the proposed project with other plans such as Water Resources Management Plans, Shoreline/Estuary Management Plans and Marine Plans.

Policy	Policy Section / Paragraph	Summary
NPS	Section 5.227	The Examining Authority and the Secretary of State should consider proposals put forward by the applicant to mitigate adverse effects on the water environment and whether appropriate requirements should be attached to any development consent and/or planning obligations. If the Environment Agency continues to have concerns and objects to the grant of development consent on the grounds of impacts on water quality/resources, the Secretary of State can grant consent, but will need to be satisfied before deciding whether or not to do so that all reasonable steps have been taken by the applicant and the Environment Agency to try to resolve the concerns, and that the Environment Agency is satisfied with the outcome.
NPS	Section 5.230	The project should adhere to any National Standards for sustainable drainage systems (SuDs). The National SuDs Standards will introduce a hierarchical approach to drainage design that promotes the most sustainable approach but recognises feasibility, and use of conventional drainage systems as part of a sustainable solution for any given site given its constraints.
Road Investment Strategy (RIS)		
RIS	Section 4 - Page 6, Supporting delivery of environmental goals and the move to a low carbon economy,	Roads have a significant impact on the environment. Their construction can impact the built and natural environment and threaten biodiversity, while traffic is a cause of air pollution and accounts for nearly a fifth of UK's carbon emissions. Yet, today, there are more options to mitigate environmental impact than ever before. Since 2001, for example, the average emissions of new cars has fallen by 29%. In April-June 2014, the average CO_2 emissions from new cars fell by 2.3% when compared with the same time period in 201313. ULEVs are becoming more common, and will dramatically reduce carbon and other emissions generated on the SRN. Improved construction standards and better road design can improve the aesthetic appearance of the network, mitigate biodiversity impacts and reduce the effect on the built and natural environment. Retrofitting the SRN with low-noise surfacing can also reduce the impact of roads on local communities.
National Planning Policy Framework (NPPF)		

Policy	Policy Section / Paragraph	Summary
NPPF	Achieving sustainable development, Para 7	There are three dimensions to sustainable development: economic, social and environmental. These dimensions give rise to the need for the planning system to perform a number of roles: • an economic role – contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure; • a social role – supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being; and • an environmental role – contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy.
NPPF	Achieving sustainable development, Para 9	Pursuing sustainable development involves seeking positive improvements in the quality of the built, natural and historic environment, as well as in people's quality of life

NPPF	Achieving sustainable development, Para 17	Within the overarching roles that the planning system ought to play, a set of core land-use planning principles should underpin both plan-making and decision-taking. These 12 principles are that planning should: • be genuinely plan-led, empowering local people to shape their surroundings, with succinct local and neighbourhood plans setting out a positive vision for the future of the area. Plans should be kept up-to-date, and be based on joint working and co-operation to address larger than local issues. They should provide a practical framework within which decisions on planning applications can be made with a high degree of predictability and efficiency; • not simply be about scrutiny, but instead be a creative exercise in finding ways to enhance and improve the places in which people live their lives; • proactively drive and support sustainable economic development to deliver the homes, business and industrial units, infrastructure and thriving local places that the country needs. Every effort should be made objectively to identify and then meet the housing, business and other development needs of an area, and respond positively to wider opportunities for growth. Plans should take account of market signals, such as land prices and housing affordability, and set out a clear strategy for allocating sufficient land which is suitable for development in their area, taking account of the needs of the residential and business communities; • always seek to secure high quality design and a good standard of amenity for all existing and future occupants of land and buildings; • take account of the different roles and character of different areas, promoting the vitality of our main urban areas, protecting the Green Belts around them, recognising the intrinsic character and beauty of the countryside and supporting thriving rural communities within it; • support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change, and encourage the reuse of existing resources, including conversion of existing buildings, and encourage the use of renewable resources (for example, by the development of renewable energy); • contribute to conserving and enhancing the natural environment and reducing pollution. Allocations of land for development should prefer land of lesser environmental value, where consistent with other

Policy	Policy Section / Paragraph	Summary
		policies in this Framework;●encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value; • promote mixed use developments, and encourage multiple benefits from the use of land in urban and rural areas, recognising that some open land can perform many functions (such as for wildlife, recreation, flood risk mitigation, carbon storage, or food production); • conserve heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of this and future generations; • actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable; and • take account of and support local strategies to improve health, social and cultural wellbeing for all, and deliver sufficient community and cultural facilities and services to meet local needs.
NPPF	Section 1, Para 18	The Government is committed to securing economic growth in order to create jobs and prosperity, building on the country's inherent strengths, and to meeting the twin challenges of global competition and of a low carbon future.
NPPF	Section 1, Para 19	...Planning should operate to encourage and not act as an impediment to sustainable growth. Therefore significant weight should be placed on the need to support economic growth through the planning system…
NPPF	Section 1, Para 20	To help achieve economic growth, local planning authorities should plan proactively to meet the development needs of business and support an economy fit for the 21st century
NPPF	Section 1, para 21	'Investment in business should not be over-burdened by the combined requirements of planning policy expectations. Planning policies should recognise and seek to address potential barriers to investment, including a poor environment or any lack of infrastructure…'
NPPF	Section 2, Para 24	Local planning authorities should… require applications for main town centre uses to be located in town centres

Policy	Policy Section / Paragraph	Summary
NPPF	Section 2, Para 29	Transport policies have an important role to play in facilitating sustainable development but also in contributing to wider sustainability and health objectives. Smarter use of technologies can reduce the need to travel. The transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how they travel. However, the Government recognises that different policies and measures will be required in different communities and opportunities to maximise sustainable transport solutions will vary from urban to rural areas.
NPPF	Section 4, Para 30	Encouragement should be given to solutions which support reductions in greenhouse gas emissions and reduce congestion. In preparing Local Plans, local planning authorities should therefore support a pattern of development which, where reasonable to do so, facilitates the use of sustainable modes of transport.
NPPF	Section 4, Para 31	Local authorities should work with neighbouring authorities and transport providers to develop strategies for the provision of viable infrastructure necessary to support sustainable development, including […] transport investment necessary to support strategies for the growth of ports, airports or other major generators of travel demand in their areas".
NPPF	Section 4, Para 32	All developments that generate significant amounts of movement should be supported by a Transport Statement or Transport Assessment. Plans and decisions should take account of whether: • the opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure; • safe and suitable access to the site can be achieved for all people; and • improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.
NPPF	Section 4, Para 34	ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised.

Policy	Policy Section / Paragraph	Summary
NPPF	Section 4, Para 35	… developments should be located and designed where practical to • accommodate the efficient delivery of goods and supplies; • give priority to pedestrian and cycle movements, and have access to high quality public transport facilities; • create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians, avoiding street clutter and where appropriate establishing home zones; • incorporate facilities for charging plug-in and other ultra-low emission vehicles; and • consider the needs of people with disabilities by all modes of transport
NPPF	Section 4, Para 36	All developments which generate significant amounts of movement should be required to provide a Travel Plan.
NPPF	Section 4, Para 41	Local planning authorities should identify and protect, where there is robust evidence, sites and routes which could be critical in developing infrastructure to widen transport choice
NPPF	Section 7, Para 56	Good design is a key aspect of sustainable development, is indivisible from good planning, and should contribute positively to making places better for people.

Policy	Policy Section / Paragraph	Summary
NPPF	Section 7, Para 58	…ensure that developments: • will function well and add to the overall quality of the area, not just for the short term but over the lifetime of the development; • establish a strong sense of place, using streetscapes and buildings to create attractive and comfortable places to live, work and visit; • optimise the potential of the site to accommodate development, create and sustain an appropriate mix of uses (including incorporation of green and other public space as part of developments) and support local facilities and transport networks; • respond to local character and history, and reflect the identity of local surroundings and materials, while not preventing or discouraging appropriate innovation; • create safe and accessible environments where crime and disorder, and the fear of crime, do not undermine quality of life or community cohesion; and • are visually attractive as a result of good architecture and appropriate landscaping.
NPPF	Section 7, Para 60	…seek to promote or reinforce local distinctiveness.
NPPF	Section 7, Para 61	Although visual appearance and the architecture of individual buildings are very important factors, securing high quality and inclusive design goes beyond aesthetic considerations… should address the connections between people and places and the integration of new development into the natural, built and historic environment.
NPPF	Section 7, Para 62	Local planning authorities should have local design review arrangements in place to provide assessment and support to ensure high standards of design. They should also when appropriate refer major projects for a national design review.13 In general, early engagement on design produces the greatest benefits. In assessing applications, local planning authorities should have regard to the recommendations from the design review panel.
NPPF	Section 7, Para 63	In determining applications, great weight should be given to outstanding or innovative designs which help raise the standard of design more generally in the area.

Policy	Policy Section / Paragraph	Summary
NPPF	Section 7, Para 64	Permission should be refused for development of poor design that fails to take the opportunities available for improving the character and quality of an area and the way it functions.
NPPF	Section 7, Para 65	Local planning authorities should not refuse planning permission for buildings or infrastructure which promote high levels of sustainability because of concerns about incompatibility with an existing townscape, if those concerns have been mitigated by good design (unless the concern relates to a designated heritage asset and the impact would cause material harm to the asset or its setting which is not outweighed by the proposal's economic, social and environmental benefits).
NPPF	Section 7, Para 66	Applicants will be expected to work closely with those directly affected by their proposals to evolve designs that take account of the views of the community. Proposals that can demonstrate this in developing the design of the new development should be looked on more favourably.
NPPF	Section 8, Para 69	The planning system can play an important role in facilitating social interaction and creating healthy, inclusive communities. Local planning authorities should create a shared vision with communities of the residential environment and facilities they wish to see. To support this, local planning authorities should aim to involve all sections of the community in the development of Local Plans and in planning decisions, and should facilitate neighbourhood planning. Planning policies and decisions, in turn, should aim to achieve places which promote: • opportunities for meetings between members of the community who might not otherwise come into contact with each other, including through mixed-use developments, strong neighbourhood centres and active street frontages which bring together those who work, live and play in the vicinity; • safe and accessible environments where crime and disorder, and the fear of crime, do not undermine quality of life or community cohesion; and • safe and accessible developments, containing clear and legible pedestrian routes, and high quality public space, which encourage the active and continual use of public areas.

Policy	Policy Section / Paragraph	Summary
NPPF	Section 8, Para 70	To deliver the social, recreational and cultural facilities and services the community needs, planning policies and decisions should: • plan positively for the provision and use of shared space, community facilities (such as local shops, meeting places, sports venues, cultural buildings, public houses and places of worship) and other local services to enhance the sustainability of communities and residential environments; • guard against the unnecessary loss of valued facilities and services, particularly where this would reduce the community's ability to meet its day-to-day needs; • ensure that established shops, facilities and services are able to develop and modernise in a way that is sustainable, and retained for the benefit of the community; and • ensure an integrated approach to considering the location of housing, economic uses and community facilities and services.
NPPF	Section 8, Para 75	Planning policies should protect and enhance public rights of way and access. Local authorities should seek opportunities to provide better facilities for users, for example by adding links to existing rights of way networks including National Trails.
NPPF	Section 10, Para 96	In determining planning applications, local planning authorities should expect new development to: comply with adopted Local Plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption.
NPPF	Section 10, Para 99	New development should be planned to avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable…
NPPF	Section 10, Para 100	Inappropriate development in areas at risk of flooding should be avoided
NPPF	Section 10, Para 101	Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding.

Policy	Policy Section / Paragraph	Summary
NPPF	Section 10, Para 103	local planning authorities should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where, informed by a site-specific flood risk assessment20 following the Sequential Test, and if required the Exception Test, it can be demonstrated that: • within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location; and • development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed, including by emergency planning; and it gives priority to the use of sustainable drainage systems.
NPPF	Section 11, Para 109	… contribute to and enhance the natural and local environment by:… preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability;…
NPPF	Section 11, Para 111	...encourage the effective use of land by re-using land that has been previously developed (brownfield land)
NPPF	Section 11, Para 118	...opportunities to incorporate biodiversity in and around developments should be encouraged
NPPF	Section 11, Para 120	To prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.
NPPF	Section 11, Para 121	Ensure that adequate site investigation information, prepared by a competent person, is presented

Policy	Policy Section / Paragraph	Summary
NPPF	Section 11, Para 122	Local planning authorities should focus on whether the development itself is an acceptable use of the land, and the impact of the use, rather than the control of processes or emissions themselves where these are subject to approval under pollution control regimes.
NPPF	Section 11, Para 123	Planning policies and decisions should aim to: • avoid noise from giving rise to significant adverse impacts27 on health and quality of life as a result of new development; • mitigate and reduce to a minimum other adverse impacts27 on health and quality of life arising from noise from new development, including through the use of conditions; • recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established;28 and • identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason
NPPF	Section 11, Para 124	Ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan
NPPF	Section 11, Para 125	By encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.
NPPF	Section 12, Para 128	Describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes or has the potential to include heritage assets with archaeological interest, local planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.

Policy	Policy Section / Paragraph	Summary
NPPF	Section 12, Para 129	Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this assessment into account when considering the impact of a proposal on a heritage asset, to avoid or minimise conflict between the heritage asset's conservation and any aspect of the proposal.
NPPF	Section 12, Para 131	In determining planning applications, local planning authorities should take account of: • the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation; • the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and • the desirability of new development making a positive contribution to local character and distinctiveness.
NPPF	Section 12, Para 132	When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation. The more important the asset, the greater the weight should be. Significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting
NPPF	Section 12, Para 133	Where a proposed development will lead to substantial harm to or total loss of significance of a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply: • the nature of the heritage asset prevents all reasonable uses of the site; and • no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and • conservation by grant-funding or some form of charitable or public ownership is demonstrably not possible; and • the harm or loss is outweighed by the benefit of bringing the site back into use.

Policy	Policy Section / Paragraph	Summary
NPPF	Section 12, Para 134	Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal, including securing its optimum viable use.
NPPF	Section 12, Para 135	The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that affect directly or indirectly non designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.
NPPF	Section 12, Para 137	Local planning authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites and within the setting of heritage assets to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to or better reveal the significance of the asset should be treated favourably.
NPPF	Section 12, Para 138	Not all elements of a World Heritage Site or Conservation Area will necessarily contribute to its significance. Loss of a building (or other element) which makes a positive contribution to the significance of the Conservation Area or World Heritage Site should be treated either as substantial harm under paragraph 133 or less than substantial harm under paragraph 134, as appropriate, taking into account the relative significance of the element affected and its contribution to the significance of the Conservation Area or World Heritage Site as a whole.
NPPF	Section 12, Para 139	Non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets.
NPPF	Section 12, Para 140	Local planning authorities should assess whether the benefits of a proposal for enabling development, which would otherwise conflict with planning policies but which would secure the future conservation of a heritage asset, outweigh the disbenefits of departing from those policies.

Policy	Policy Section / Paragraph	Summary
NPPF	Section 12, Para 141	Local planning authorities should make information about the significance of the historic environment gathered as part of plan-making or development management publicly accessible. They should also require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible.30 However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted.
Mayor of London's London Plan		
London Plan	Policy 2.18 Green Infrastructure	It aims to protect, promote, expand and manage the extent and quality of, and access to, London's network of open and green spaces.
London Plan	Policy 3.2 Improving health and addressing health in equalities	New developments should be designed, constructed and managed in ways that improve health and promote healthy lifestyles to help to reduce health inequalities.
London Plan	Para 3.10A	This Plan also aims to create opportunities for employment and economic development to meet the needs of all the community; improve access to green and open spaces and leisure facilities (including using the planning system to secure new provision); support safe and sustainable transport systems (including walking and cycling);reduce road traffic casualties; improve air quality, reducing noise...
London Plan	Policy 4.1 Developing London's Economy	maximise the benefits from new infrastructure to secure sustainable growth and development

Policy	Policy Section / Paragraph	Summary
London Plan	Para 4.4A	Investment in new infrastructure is critical to securing sustainable growth and development. This Plan seeks to maximise the economic, social and environmental benefits from such investment in London. For the London economy, these benefits include economic output, employment, productivity, business opportunities, regeneration and the capital's contribution to the wider UK economy.
London Plan	Policy 5.1Climate change mitigation	A The Mayor seeks to achieve an overall reduction in London's carbon dioxide emissions of 60 % (below 1990 levels) by 2025.

Policy	Policy Section / Paragraph	Summary
London Plan	Policy 5.2 Minimising carbon dioxide emissions	Development proposals should make the fullest contribution to minimising carbon dioxide emissions in accordance with the following energy hierarchy: 1 Be lean: use less energy, 2 Be clean: supply energy efficiently and 3 Be green: use renewable energy. Non-domestic buildings: Year Improvement on 2010 Building Regulations: 2010 – 2013 25 %; 2013 – 2016 40 % and 2016 – 2019 As per building regulations requirements Major development proposals should include a detailed energy assessment to demonstrate how the targets for carbon dioxide emissions reduction outlined above are to be met within the framework of the energy hierarchy. As a minimum, energy assessments should include the following details: calculation of the energy demand and carbon dioxide emissions covered by the Building Regulations and, separately, the energy demand and carbon dioxide emissions from any other part of the development, including plant or equipment, that are not covered by the Building Regulations (see paragraph 5.22) at each stage of the energy hierarchy proposals to reduce carbon dioxide emissions through the energy efficient design of the site, buildings and services proposals to further reduce carbon dioxide emissions through the use of decentralised energy where feasible, such as district heating and cooling and CHP proposals to further reduce carbon dioxide emissions through the use of on-site renewable energy technologies. The carbon dioxide reduction targets should be met on-site. Where it is clearly demonstrated that the specific targets cannot be fully achieved on-site, any shortfall may be provided off-site or through a cash in lieu contribution to the relevant borough to be ring fenced to secure delivery of carbon dioxide savings elsewhere.

Policy	Policy Section / Paragraph	Summary
London Plan	Policy 5.3 Sustainable design and construction	B Development proposals should demonstrate that sustainable design standards are integral to the proposal, including its construction and operation, and ensure that they are considered at the beginning of the design process. C Major development proposals should meet the minimum standards outlined in the Mayor's supplementary planning guidance and this should be clearly demonstrated within a design and access statement. The standards include measures to achieve other policies in this Plan and the following sustainable design principles: a minimising carbon dioxide emissions across the site, including the building and services (such as heating and cooling systems) b avoiding internal overheating and contributing to the urban heat island effect c efficient use of natural resources (including water), including making the most of natural systems both within and around buildings d minimising pollution (including noise, air and urban run-off) e minimising the generation of waste and maximising reuse or recycling f avoiding impacts from natural hazards (including flooding) g ensuring developments are comfortable and secure for users, including avoiding the creation of adverse local climatic conditions h securing sustainable procurement of materials, using local supplies where feasible, and i promoting and protecting biodiversity and green infrastructure.
London Plan	Policy 5.5 Decentralised energy networks	A The Mayor expects 25 % of the heat and power used in London to be generated through the use of localised decentralised energy systems by 2025……boroughs should require developers to prioritise connection to existing or planned decentralised energy networks where feasible.

Policy	Policy Section / Paragraph	Summary
London Plan	Policy 5.6 Decentralised energy in development proposals	A Development proposals should evaluate the feasibility of CHP systems, and where a new CHP system is appropriate also examine opportunities to extend the system beyond the site boundary to adjacent sites. B Major development proposals should select energy systems in accordance with the following hierarchy: 1 Connection to existing heating or cooling networks, 2 Site wide CHP network and 3 Communal heating and cooling. C Potential opportunities to meet the first priority in this hierarchy are outlined in the London Heat Map tool. Where future network opportunities are identified, proposals should be designed to connect to these networks.
London Plan	Policy 5.7 Renewable energy	B Within the framework of the energy hierarchy (see Policy 5.2), major development proposals should provide a reduction in expected carbon dioxide emissions through the use of on-site renewable energy generation, where feasible. D All renewable energy systems should be located and designed to minimise any potential adverse impacts on biodiversity, the natural environment and historical assets, and to avoid any adverse impacts on air quality.
London Plan	Policy 5.8 Innovative energy technologies	It encourages the use of innovative energy technologies that will provide an alternative energy source and reduce carbon dioxide enissions.

Policy	Policy Section / Paragraph	Summary
London Plan	Policy 5.9 Overheating and cooling	Major development proposals should reduce potential overheating and reliance on air conditioning systems and demonstrate this in accordance with the following cooling hierarchy: 1 minimise internal heat generation through energy efficient design 2 reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, insulation and green roofs and walls 3 manage the heat within the building through exposed internal thermal mass and high ceilings 4 passive ventilation 5 mechanical ventilation 6 active cooling systems (ensuring they are the lowest carbon options). C Major development proposals should demonstrate how the design, materials, construction and operation of the development would minimise overheating and also meet its cooling needs. New development in London should also be designed to avoid the need for energy intensive air conditioning systems as much as possible.
London Plan	Policy 5.12 Flood risk management	B Development proposals must comply with the flood risk assessment and management requirements set out in PPS25 over the lifetime of the development and have regard to measures proposed in Thames Estuary 2100 (TE2100 – see paragraph 5.55) and Catchment Flood Management Plans.
London Plan	Policy 5.13 Sustainable drainage	A Development should utilise sustainable urban drainage systems (SUDS) unless there are practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the following drainage hierarchy: • store rainwater for later use • use infiltration techniques, such as porous surfaces in non-clay areas • attenuate rainwater in ponds or open water features for gradual release • attenuate rainwater by storing in tanks or sealed water features for gradual release • discharge rainwater direct to a watercourse • discharge rainwater to a surface water sewer/drain • discharge rainwater to the combined sewer.

Policy	Policy Section / Paragraph	Summary
London Plan	Policy 5.14 Water quality and waste water infrastructure	B Development proposals must ensure that adequate wastewater infrastructure capacity is available in tandem with development.
London Plan	Policy 5.15 Water use and supplies	B Development should minimise the use of mains water by: a incorporating water saving measures and equipment b designing residential development so that mains water consumption would meet a target of 105 litres or less per head per day.
London Plan	Policy 5.16 Waste Self Sufficiency	The Mayor will work to: a manage as much of London's waste within London as practicable, working towards managing the equivalent of 100 % of London's waste within London by 2031 b create positive environmental and economic impacts from waste processing
London Plan	Policy 5.18 Construction, excavation and demolition waste	b ensuring that major development sites are required to recycle CE&D waste onsite, wherever practicable, supported through planning conditions. B Waste should be removed from construction sites, and materials brought to the site, by water or rail transport wherever that is practicable.
London Plan	Policy 5.20 Aggregates	It set targets for, and encourages the recycling or reuse of DCE waste in London.
London Plan	Policy 5.21 Contaminated land	B Appropriate measures should be taken to ensure that development on previously contaminated land does not activate or spread contamination.
London Plan	Para 6.1	London should be a city where it is easy safe and convenient for everyone to access jobs, opportunities and facilities with an efficient and effective transport system…

Policy	Policy Section / Paragraph	Summary
London Plan	Policy 6.1 Strategic approach	A The Mayor will work with all relevant partners to encourage the closer integration of transport and development through the schemes and proposals shown in Table 6.1 and by: a encouraging patterns and nodes of development that reduce the need to travel, especially by car b seeking to improve the capacity and accessibility of public transport, walking and cycling, particularly in areas of greatest demand c supporting development that generates high levels of trips at locations with high public transport accessibility… d improving interchange between different forms of transport, particularly around major rail and Underground stations,.. j ensure that all parts of public transport can be used safely, easily and with dignity by all Londoners, including by securing step-free access where this is appropriate and practicable
London Plan	Policy 6.2 Providing public transport capacity and safeguarding land for transport	A The Mayor will work with strategic partners to increase the capacity of public transport in London over the Plan period by securing funding for and implementing the schemes and improvements
London Plan	Policy 6.3 Assessing effects of development on transport capacity	A Development proposals should ensure that impacts on transport capacity and the transport network, at both a corridor and local level, are fully assessed. Development should not adversely affect safety on the transport network… C Transport assessments will be required in accordance with TfL's Transport Assessment Best Practice Guidance for major planning applications. Workplace and/or residential travel plans should be provided for planning applications exceeding the thresholds in, and produced in accordance with, the relevant TfL guidance. Construction logistics plans and delivery and servicing plans should be secured in line with the London Freight Plan and should be co-ordinated with travel plans.

Policy	Policy Section / Paragraph	Summary
London Plan	Policy 6.4 Enhancing London's transport connectivity	B The Mayor will work with strategic partners to improve the public transport system in London… and increase public transport capacity by: b completing upgrades to, and extending, the London Underground network
London Plan	Policy 7.2 An inclusive environment	C Design and access statements submitted with development proposals should explain how, following engagement with relevant user groups, the principles of inclusive design, including the specific needs of older and disabled people, have been integrated into the proposed development, whether relevant best practice standards such as British Standard BS 8300:2009 have been complied with, and how inclusion will be maintained and managed.
London Plan	Policy 7.3 Designing out crime	B Development should reduce the opportunities for criminal behaviour and contribute to a sense of security without being overbearing or intimidating. In particular: a routes and spaces should be legible and well maintained, providing for convenient movement without compromising security b there should be an indication of whether a space is private, semi-public or public, with natural surveillance of publicly accessible spaces c design should encourage a level of human activity that is appropriate to the location, incorporating a mix of uses where appropriate, to maximize activity throughout the day and night, creating a reduced risk of crime and a sense of safety at all times d places should be well designed to promote a sense of ownership and respect e places, buildings and structures should incorporate appropriately designed security features f schemes should be designed with on-going management and future maintenance costs of the particular safety and security measures proposed in mind. The above measures should be incorporated at the design stage to ensure that overall design quality is not compromised.

Policy	Policy Section / Paragraph	Summary
London Plan	Policy 7.6 Architecture	A Architecture should make a positive contribution to a coherent public realm, streetscape and wider cityscape. It should incorporate the highest quality materials and design appropriate to its context. B Buildings and structures should: a be of the highest architectural quality b be of a proportion, composition, scale and orientation that enhances, activates and appropriately defines the public realm c comprise details and materials that complement, not necessarily replicate, the local architectural character d not cause unacceptable harm to the amenity of surrounding land and buildings, particularly residential buildings, in relation to privacy, overshadowing, wind and microclimate. This is particularly important for tall buildings e incorporate best practice in resource management and climate change mitigation and adaptation f provide high quality indoor and outdoor spaces and integrate well with the surrounding streets and open spaces g be adaptable to different activities and land uses, particularly at ground level h meet the principles of inclusive design i optimise the potential of sites.
London Plan	Policy 7.8 Heritage assets and archaeology	B Development should incorporate measures that identify, record, interpret, protect and, where appropriate, present the site's archaeology. C Development should identify, value, conserve, restore, re-use and incorporate heritage assets, where appropriate. D Development affecting heritage assets and their settings should conserve their significance, by being sympathetic to their form, scale, materials and architectural detail. E New development should make provision for the protection of archaeological resources, landscapes and significant memorials. The physical assets should, where possible, be made available to the public on-site. Where the archaeological asset or memorial cannot be preserved or managed on-site, provision must be made for the investigation, understanding, recording, dissemination and archiving of that asset.

Policy	Policy Section / Paragraph	Summary
London Plan	Policy 7.13 Safety, security and resilience to emergency	B Development proposals should contribute to the minimisation of potential physical risks, including those arising as a result of fire, flood and related hazards. Development should include measures to design out crime that, in proportion to the risk, deter terrorism, assist in the detection of terrorist activity and help defer its effects.
London Plan	Policy 7.14 Improving air quality	B Development proposals should: a minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within Air Quality Management Areas (AQMAs) and where development is likely to be used by large numbers of those particularly vulnerable to poor air quality, such as children or older people) such as by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plans (see Policy 6.3) b promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practice guidance in the GLA and London Councils' 'The control of dust and emissions from construction and demolition' c be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as Air Quality Management Areas (AQMAs). d ensure that where provision needs to be made to reduce emissions from a development, this is usually made on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, and that it is possible to put in place measures having clearly demonstrated equivalent air quality benefits, planning obligations or planning conditions should be used as appropriate to ensure this, whether on a scheme by scheme basis or through joint area-based approaches e where the development requires a detailed air quality assessment and biomass boilers are included, the assessment should forecast pollutant concentrations. Permission should only be granted if no adverse air quality impacts from the biomass boiler are identified

Policy	Policy Section / Paragraph	Summary
London Plan	Policy 7.15 Reducing noise and enhancing soundscapes	B Development proposals should seek to reduce noise by: a minimising the existing and potential adverse impacts of noise on, from, within, or in the vicinity of, development proposals b separating new noise sensitive development from major noise sources wherever practicable through the use of distance, screening, or internal layout in preference to sole reliance on sound insulation c promoting new technologies and improved practices to reduce noise at source.
London Plan	Policy 8.2 Planning obligations	B When considering planning applications of strategic importance, the Mayor will take into account, among other issues including economic viability of each development concerned, the existence and content of planning obligations. C Development proposals should address strategic as well as local priorities in planning obligations.
The Mayor's Transport Strategy (MTS)		
MTS	Section 1.1	The six goals the MTS seeks to achieve are: to support economic development and population growth; enhance the quality of life for all Londoners; improve the safety and security of all Londoners; improve transport opportunities for all Londoners; reduce transport's contribution to climate change, and improve its resilience; and support delivery of the London 2012 Olympic and Paralympic Games and its legacy.
MTS	Policy 1	The Mayor, through TfL, and working with the DfT, Defra and other government agencies, regional development agencies, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to develop London's transport system in order to accommodate sustainable population and employment growth.
MTS	Policy 5	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to ensure efficient and effective access for people and goods within central London through providing improved central London connectivity and appropriate capacity. This will include improving access to major public transport interchanges for pedestrians, cyclists and by public transport.

Policy	Policy Section / Paragraph	Summary
MTS	Policy 10	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders including the private sector, will seek to improve the efficiency and effectiveness of the operation of the transport system, bring transport assets to a good state of repair, and then maintain them in that condition.
MTS	Policy 13	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will expand the capacity and quality of public transport services, improve passenger comfort and customer satisfaction, reduce crowding, and improve road user satisfaction.
MTS	Policy 14	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, London boroughs and other stakeholders, will seek to improve transport's contribution to the built and natural environment.
MTS	Policy 15	The Mayor, through TfL, and working with Defra, the DfT, Network Rail, train operating companies, freight operators, London boroughs and other stakeholders, will seek to reduce emissions of air pollutants from transport.
MTS	Policy 16	The Mayor, through TfL, and working with the DfT, Network Rail, train operating companies, freight operators, London boroughs and other stakeholders, will seek to reduce noise impacts from transport.
MTS	Policy 24	The Mayor, through TfL, and working with the DfT, Defra and other government agencies, Network Rail, train operating companies, freight operators, London boroughs and other stakeholders, will take the necessary steps to deliver the required contribution from ground-based transport to achieve a 60 % reduction in London's CO_2 emissions by 2025 from a 1990 base; and to contribute to further targets that may be set by the Mayor from time to time.
MTS	Policy 25	The Mayor, through TfL, and working with the DfT, Defra and other government agencies, Network Rail, train operating companies, London boroughs and other stakeholders, will take necessary steps to adapt the transport system and improve its resilience and public safety to the anticipated impacts of climate change.

Policy	Policy Section / Paragraph	Summary
MTS	Proposal 86	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will target the provision of noise reduction measures and noise mitigation measures in areas significantly affected by transport noise, to improve perceptions of noise and reduce the impacts of noise on dwellings and people, by: • timely and effective rail maintenance and replacement works; • working to the TfL Health Safety and Environment policy; • ensuring all new transport projects consider noise mitigation; • introducing road maintenance programmes to replace road surfaces with low noise surfacing where possible; • improving traffic management and signal control techniques; • introducing speed enforcement measures which do not encourage noisy, rapid acceleration and deceleration; • introducing quieter buses; and • procuring new, quieter public sector service vehicles, potentially through joint procurement to achieve efficiency.
MTS	Proposal 87	The Mayor, through TfL, and working with London Councils, London boroughs, freight operators, and other stakeholders, will explore opportunities to use the London Lorry Control Scheme to encourage well as to promote improvements in air quality, and reduce $C0_2$ emissions.
MTS	Proposal 93	"The Mayor, through TfL, and working with the London boroughs and other stakeholders, will take further action to reduce private vehicle emissions, by: • supporting the uptake of low emission vehicles, such as electric cars and vans; • incentivising of low emission vehicles through pressing for changes to vehicle excise duty and parking regulations; and • working with the European Commission, the Government and vehicle manufacturers, the Mayor will encourage the development of new technologies which reduce vehicles emissions, such as better tyres which wear less, more sophisticated abatement technology and automatic hybrid-switching.

Policy	Policy Section / Paragraph	Summary
MTS	Proposal 94	The Mayor, through TfL, and working with the London boroughs and other stakeholders, will introduce targeted local measures at poor air quality priority locations to reduce emissions and improve local air quality.
MTS	Proposal 95	The Mayor, through TfL, will continue to operate the existing London Low Emission Zone. The Mayor will consider further tightening of the standards of the current LEZ, as well as the introduction of further emissions control schemes to encourage the use of cleaner vehicles in London: • the current LEZ scheme will continue to operate to reduce emissions from the heaviest vehicles, and tighter standards will be introduced in 2012 as planned; • the Mayor will defer extending the LEZ to LGVs and minibuses (which was due to commence in 2010) to 2012 • in 2015, the Mayor will, subject to technical feasibility, introduce an emissions standard for NOx (Euro IV) into the LEZ for HGVs, buses and coaches; • If necessary, the Mayor will consider introducing minimum requirements for other vehicles or tighter standards in particular locations within London ; and • The Mayor will work with boroughs that propose to take local action to address air quality through local low emission zones or similar measures.
Planning Practice Guidance (PPG)		
PPG	Environmental Impact Assessment - Section 2, paragraph 002	The aim of EIA is to protect the environment by ensuring that a local planning authority when deciding whether to grant planning permission for a project, which is likely to have significant effects on the environment, does so in the full knowledge of the likely significant effects, and takes this into account in the decision making process…the aim of EIA is also to ensure that the public are given early and effective opportunities to participate in the decision making procedures.

Policy	Policy Section / Paragraph	Summary
PPG	Design - Section 1, The importance of good design, Para 001	Good quality design is an integral part of sustainable development. The National Planning Policy Framework recognises that design quality matters and that planning should drive up standards across all forms of development. As a core planning principle, plan-makers and decision takers should always seek to secure high quality design. Achieving good design is about creating places, buildings, or spaces that work well for everyone, look good, last well, and will adapt to the needs of future generations. Good design responds in a practical and creative way to both the function and identity of a place. It puts land, water, drainage, energy, community, economic, infrastructure and other such resources to the best possible use – over the long as well as the short term. The PPG provides guidance on good design objectives, the importance of national and local design policy and good design processes. Town centre and street design issues are also covered.
PPG	Conserving and enhancing the historic environment - Section 3, Decision-taking: Historic environment, Para 009	Heritage assets may be affected by direct physical change or by change in their setting. Being able to properly assess the nature, extent and importance of the significance of a heritage asset, and the contribution of its setting, is very important to understanding the potential impact and acceptability of development proposals

Policy	Policy Section / Paragraph	Summary
PPG	Conserving and enhancing the historic environment - Section 3, Decision-taking: Historic environment, Para 013	A thorough assessment of the impact on setting needs to take into account, and be proportionate to, the significance of the heritage asset under consideration and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it. Setting is the surroundings in which an asset is experienced, and may therefore be more extensive than its curtilage. All heritage assets have a setting, irrespective of the form in which they survive and whether they are designated or not. The extent and importance of setting is often expressed by reference to visual considerations. Although views of or from an asset will play an important part, the way in which we experience an asset in its setting is also influenced by other environmental factors such as noise, dust and vibration from other land uses in the vicinity, and by our understanding of the historic relationship between places. For example, buildings that are in close proximity but are not visible from each other may have a historic or aesthetic connection that amplifies the experience of the significance of each. The contribution that setting makes to the significance of the heritage asset does not depend on there being public rights or an ability to access or experience that setting. This will vary over time and according to circumstance. When assessing any application for development which may affect the setting of a heritage asset, local planning authorities may need to consider the implications of cumulative change. They may also need to consider the fact that developments which materially detract from the asset's significance may also damage its economic viability now, or in the future, thereby threatening its ongoing conservation.

Policy	Policy Section / Paragraph	Summary
PPG	Conserving and enhancing the historic environment - Section 3, Decision-taking: Historic environment, Para 017	What matters in assessing if a proposal causes substantial harm is the impact on the significance of the heritage asset. As the National Planning Policy Framework makes clear, significance derives not only from a heritage asset's physical presence, but also from its setting. Whether a proposal causes substantial harm will be a judgment for the decision taker, having regard to the circumstances of the case and the policy in the National Planning Policy Framework. In general terms, substantial harm is a high test, so it may not arise in many cases. For example, in determining whether works to a listed building constitute substantial harm, an important consideration would be whether the adverse impact seriously affects a key element of its special architectural or historic interest. It is the degree of harm to the asset's significance rather than the scale of the development that is to be assessed. The harm may arise from works to the asset or from development within its setting. While the impact of total destruction is obvious, partial destruction is likely to have a considerable impact but, depending on the circumstances, it may still be less than substantial harm or conceivably not harmful at all, for example, when removing later inappropriate additions to historic buildings which harm their significance. Similarly, works that are moderate or minor in scale are likely to cause less than substantial harm or no harm at all. However, even minor works have the potential to cause substantial harm.
PPG	Conserving and enhancing the historic environment - Section 3, Decision-taking: Historic environment, Para 018	An unlisted building that makes a positive contribution to a conservation area is individually of lesser importance than a listed building (paragraph 132 of the National Planning Policy Framework). If the building is important or integral to the character or appearance of the conservation area then its demolition is more likely to amount to substantial harm to the conservation area, engaging the tests in paragraph 133 of the National Planning Policy Framework. However, the justification for its demolition will still be proportionate to the relative significance of the building and its contribution to the significance of the conservation area as a whole.

Policy	Policy Section / Paragraph	Summary
PPG	Conserving and enhancing the historic environment - Section 3, Decision-taking: Historic environment, Para 19	A clear understanding of the significance of a heritage asset and its setting is necessary to develop proposals which avoid or minimise harm. Early appraisals, a conservation plan or targeted specialist investigation can help to identify constraints and opportunities arising from the asset at an early stage. Such studies can reveal alternative development options, for example more sensitive designs or different orientations, that will deliver public benefits in a more sustainable and appropriate way.
PPG	Conserving and enhancing the historic environment - Section 4, Designated heritage assets, Summary	Section 4 of the PPG provides guidance and explanatory advice on designated assets. Explanation as to how heritage assets are designated is provided together with useful definitions of a listed building and conservation area. Local authorities are reminded of the need to review their conservation areas and are encouraged to undertake conservation area appraisals to help identify opportunities for beneficial change or the need for planning protection.

Policy	Policy Section / Paragraph	Summary
PPG	Conserving and enhancing the historic environment - Section 5, Non-designated heritage assets, Summary	The PPG provides guidance and explanatory advice regarding two categories of non-designated heritage assets of archaeological interest (as identified by the NPPF), these are: • Non-designated heritage assets of archaeological interest that are demonstrably of equivalent significance to scheduled monuments and are therefore considered subject to the same policies as those for designated heritage assets • Other non-designated heritage assets of archaeological interest which by comparison is a much larger category of lesser heritage significance. To determine whether a non-designated heritage asset of archaeological interest is demonstrably of equivalent significance to scheduled monuments or whether other non-designated heritage assets of archaeological interest should be moved to the first category, the guidance stipulates that where an initial assessment indicates that the site on which development is proposed includes or has potential to include heritage assets with archaeological interest, applicants should be required to submit an appropriate desk-based assessment and, where necessary, a field evaluation.
PPG	Air Quality - Section 1, Why should planning be concerned about air quality?, Para 001	The PPG provides a summary of air quality issues which comprise: • the harmful air pollutant (and greenhouse gas) ozone, formed of particulate matter and nitrogen dioxide which can be transported great distances by weather systems • the effect on biodiversity and associated impact on UK's international obligations under the Habitats Directive • odour and dust and their impact on local amenity The PPG advises that the potential impact of new development on air quality is taken into account in planning where the national assessment indicates that relevant limits have been exceeded or are near the limit.

Policy	Policy Section / Paragraph	Summary
PPG	Air Quality - Section 7, How detailed does an air quality assessment need to be?, Para 007	Assessments should be proportionate to the nature and scale of development proposed and the level of concern about air quality, and because of this are likely to be locationally specific. Air quality is a consideration in Environmental Impact Assessment, if one is required, and also in a Habitats Regulations Appropriate Assessment. The following could figure in an assessment and be usefully discussed and agreed between the local planning authority and applicant at the outset: • a description of baseline conditions and how these could change; • relevant air quality concerns; • the assessment methods to be adopted and any requirements around verification of modelling air quality; • sensitive locations; • the basis for assessing impact and determining the significance of an impact; • construction phase impact; and/or• acceptable mitigation measures.
PPG	Land affected by Contamination - Section 1, Para 001, 007, 009.	The PPG includes guidance on the sources of information on contamination and the approach that applicants should take if their sites could be affected by contamination and the use of planning conditions to manage remediation.
PPG	Socio-economic	The PPG includes guidance on economic development needs assessment and land availability assessment, which is aimed largely at local planning authorities and the discharging of their statutory planning functions.
PPG	Noise	The PPG covers the concepts of NOAEL (No Observed Adverse Effect Level), and UAEL (Unacceptable Adverse Effect Level).
PPG	Water Supply, Wastewater and Water Quality and Flood Risk	The PPG provides guidance and explanatory advice regarding Water Supply, Wastewater and Water Quality and Flood Risk and Coastal Change in support of NPPF policies and other published guidance. The PPG provides advice to local planning authorities regarding decision taking and consultation with statutory and national amenity groups in respect of planning and consent applications.

Policy	Policy Section / Paragraph	Summary
PPG	Transport	The PPG covers travel plans, transport assessments and statements in decision-taking, and advises on when transport assessments and transport statements are required, and what they should contain.
PPG	Health and Wellbeing	In paragraph 002 the PPG provides guidance on the range of issues that could be considered through the plan-making and decision-making processes, in respect of health and healthcare infrastructure
PPG	Sustainability and climate change	The PPG includes guidance on the implementation of climate change policy, including the integration of adaptation and mitigation approaches (paragraph 4).
Delivering London's Energy Future: the Mayor's climate change mitigation and energy strategy		
LEF	Objective 4	CO_2 emissions reduction targets
LEF	Policy 9	The Mayor will minimise CO_2 emissions from new buildings through outcome-based CO_2 emissions reduction targets in the London Plan, achieved through energy efficiency and energy supply measures, and an allowable solutions offsetting mechanism. This will be supported by guidance and best practice, as well as exemplar new developments.
Sustainable Design and Construction SPG (SDC SPG)		
SDC SPG		The SPG provides guidance on a range of sustainable design and construction issues with the objective of tackling climate change and implementing London Plan policy. The Guidance covers resource management, climate change adaptation and pollution management (including land, air, noise, light and water). The role of the SPG is to set clear targets and highlight efficient ways to reach those targets. Paragraph 2.2.1 states "The SPG provides guidance on optimising the use of land, including through optimising density and design and considering the accessibility of the site and its local context. Paragraph 2.7.17, states "This section sets out how to minimise waste by maximising the use of the existing materials on-site and through good site management during construction."
East London Sub-Regional Transport Plan (EL TP)		

Policy	Policy Section / Paragraph	Summary
EL TP	3 - Enhancing the quality of life for all Londoners	This Goal is comprised of five challenges: • Improving journey experience • Enhancing the built and natural environment • Improving air quality • Improving noise impacts • Improving health impacts
EL TP	3.3 – Improving air quality	This Transport Strategy challenge is concerned with reducing air pollutant emissions from transport and contributing to meeting EU air quality targets. This is important because long term exposure to pollutants, especially fine particulates, can contribute to the development of chronic diseases and increase the risk of respiratory illness. Particulate matter aggravates existing respiratory and cardiovascular conditions whilst high concentrations of NO2 can cause inflammation of the airways, and long term exposure may affect lung function and aggravate other respiratory conditions. Air pollutants may also have adverse impacts on ecosystems and vegetation and can lead to deterioration of the urban realm. Air quality in east sub-region In the east sub-region, air quality is generally poorest in the inner boroughs and alongside main roads and motorways, but also around many of the main centres. NO_2 concentrations are particularly high along the A12, A13, A124, Blackwall Tunnel and the A102. No PM10 hotspots have been identified. Opportunity areas such as the Lower Lea Valley, Stratford and the Royal Docks present challenges in terms of balancing economic and transport aspirations with air quality management. Action is needed at all levels, from the London-wide and sub-regional to the local level to reduce emissions and/or concentrations of poor air quality.

Policy	Policy Section / Paragraph	Summary
EL TP	3.3.1 - Air Quality	The Mayor's Air Quality Strategy (MAQS) proposes policies to reduce emissions from various sectors, including road transport. Major policy initiatives include the introduction of LEZ phase 3 for LGV operators and a proposed taxi age policy. MAQS also recognises the need to capture the benefits of other long term proposals as outlined in the Transport Strategy, such as measures to promote mode shift to physically active modes of travel. Other measures outlined within the Mayor's Transport Strategy that have wider benefits for air quality include: smoothing traffic through better traffic management and street works coordination through measures including the London Permit Scheme focusing on incentivising the adoption of the cleanest vehicles and new technologies including electric and electric-hybrid cars Freight Delivery and Service Plans that are being promoted by TfL to reduce unnecessary freight mileage and increase freight efficiency In addition to the overall strategy to improve air quality, additional measures may need to be considered to help reduce emissions locally and tackle poor air quality in focus areas.
EL TP	3.4 - Improving the noise impacts of transport	This Transport Strategy challenge emphasises the need to improve perceptions and reduce the impacts of noise. Noise creates annoyance, anxiety and leads to sleep deprivation, and can significantly affect health and wellbeing. Survey data shows that in the east sub-region, as in other sub-regions, transport's main contribution to noise is through road traffic, though roadworks also play a role. Road noise mapping shows noise levels are particularly intense along the main road corridors, including the A102 / A20, the A13, and the A406. High noise levels extend a significant distance from these roads.
EL TP	5.2 - Supporting regeneration and tackling deprivation	The needs of these communities must be considered in developing new transport schemes and their complementary measures. It is particularly important that in tackling deprivation, adequate measures are taken to prevent excessive car use as incomes rise.
Royal Borough of Greenwich Core Strategy (RBG CR)		

Policy	Policy Section / Paragraph	Summary
RBG CR		vii. benefit Royal Greenwich by helping mitigate and adapt to climate change; viii. enhance biodiversity consistent with the Greenwich Biodiversity Action Plan; ix. incorporate living roofs and/or walls in line with Policy E(f); x. demonstrate on-site waste management including evidence of waste reduction, use of recycled materials and dedicated recyclable waste storage space; xi. Demonstrate water efficiency and demand management measures; xii. wherever possible, building materials are responsibly sourced and minimise environmental impact; xiii. demonstrate measures that reduce surface water flood risk and landscape the environment in a way that provides for permeable surfaces; xiv. meet the requirements of Policy H5 for residential schemes; xv. integrate with existing path and circulation networks and patterns of activity particularly for pedestrians and cyclists; and xvi. for non-residential buildings in major developments, achieve a BREEAM rating of excellent.
RBG CR	DH(k) – Thames Policy Area	The Royal Borough will seek a high quality of design respecting the special character of the River Thames within the Thames Policy Area defined on the Proposals Map. Proposals within the Area will be expected to: i. Develop and enhance the area's links with the river, and contribute to the completion of a continuous public riverside footpath and cycleway (see Policy DH1 and IM4); ii. Incorporate sustainable modes of passenger, freight and tourist transport, including river transport, as appropriate; iii. Consider strategic and local views DH(g); iv. Protect and enhance the river and its foreshore for wildlife and nature conservation, avoid encroachment other than for river dependent uses and contribute positively to the improvement of the local environment; and v. Protect the integrity of existing flood defences to minimise flood risk (also see Policy E2 and E3).

Policy	Policy Section / Paragraph	Summary
RBG CR	OS4 "Biodiversity	Royal Greenwich's rich biodiversity and geodiversity will be protected, restored and enhanced, including the priority habitats and species identified in the Greenwich Biodiversity Action Plan. There will be a presumption against the development of: • Sites of Special Scientific Interest (SSSI) (as shown on the Proposals Map) • Sites of Importance for Nature Conservation (SINC) (as defined on the Proposals Map and set out in tables 12-15); • Local Nature Reserves (LNR) (as shown on the Proposals Map and set out in tables 12-15); • Royal Greenwich's Regionally Important Geological and Geomorphological Site(RIGS): Dog Rocks in Plumstead Common; and • Royal Greenwich's Locally Important Geological and Geomorphological Sites (LIGS): Bleak Hill Sandpits and Wickham Valley Brickworks complex • Biodiversity enhancements will be encouraged particularly in areas that are currently deficient in accessible wildlife sites."

Policy	Policy Section / Paragraph	Summary
RBG CR	OS(f) - Ecological factors	Development proposals will be expected to take account of ecological factors, in particular paying attention to the need for: i. Consideration of the biodiversity and geological features of the site and the surrounding area, including protected species (Refer to Policy OS4). These features should be respected and the area's natural character enhanced; ii. A survey of flora and fauna on Sites of Importance for Nature Conservation and on sites over one hectare to enable decisions to be made regarding their conservation; iii. An appropriate level of survey to enable decisions to be made about the existing trees on the site. Development decisions will be based on the requirement: To protect trees and their root systems from damage as a result of the development both during and after building operations; To achieve an appropriate replacement of trees taking account of size, coverage and species where it is agreed that existing trees can be felled; That landscaping schemes should include environmentally appropriate planting using locally native species and demonstrate appropriate irrigation plans for landscaping; and To ensure that planting design does not impact negatively on personal safety and accessibility; iv. The retention of trees and the protection and enhancement of natural and ecological features, tree ridge lines, green corridors, wildlife habitats, boundary walls, surface materials, hedges and other features where these will contribute to the biodiversity; and v. The protection, enhancement and restoration of natural river features and corridors by appropriate landscaping and design."

Policy	Policy Section / Paragraph	Summary
RBG CR	E(a) - Pollution	Planning permission will not normally be granted where a proposed development or change of use would generally have a significant adverse effect on the amenities of adjacent occupiers or uses, and especially where proposals would be likely to result in the unacceptable emission of noise, light, vibrations, odours, fumes, dust, water and soil pollutants or grit. Housing or other sensitive uses will not normally be permitted on sites adjacent to existing problem uses, unless ameliorating measures can reasonably be taken and which can be sought through the imposition of conditions. Planning permission will be granted for developments for new outdoor lights, where the applicant can demonstrate that the proposals are designed to minimise light pollution. Lighting proposals which would adversely affect residential dwellings, sites of nature conservation value and protected or priority species and their habitats will be regarded as unacceptable."
RBG CR	E(c) – Air pollution	Development proposals with the potential to result in any significant impact on air quality will be resisted unless measures to minimise the impact of air pollutants are included. Such planning applications should be accompanied by an assessment of the likely impact of the development on air quality. All new developments with a floor space greater than 500sqm or residential developments of 10 or more units are required to reduce carbon dioxide (CO_2), particulate matter (PM10) and nitrogen dioxide (NO2) emissions from transport through the use of measures such as those set out in DEFRA guidance 'Low Emissions Strategies: using the planning system to reduce transport emissions Good Practice Guidance - January 2010'. Residential development proposals within areas that are currently exposed to air quality concentrations above the National Air Quality Strategy (NAQS) Objectives for particulate matter (PM10) and nitrogen dioxide (NO2) should take into account the need to reduce exposure by the following design mitigation hierarchy: i. Separation by distance; ii. External layout; iii. Internal layout; and iv. Suitable ventilation."

Policy	Policy Section / Paragraph	Summary
RBG CR	E(e) – Contaminated Land	A preliminary site investigation, prior to the determination of a planning application, will normally be required if a site is known or is likely to have been in contaminative uses. Where contamination is found, the Royal Borough will need to be assured that the development can be built and occupied safely without any adverse environment or health impacts, otherwise conditions requiring full remedial action will be imposed to deal with: i. The particular type or types of contamination; ii. The problems of the ground exhalation of gases; iii. The protection of controlled waters; and iv. The restoration of land to beneficial use."
RBG CR	E(f) - Living Roofs and Walls	New build development proposals should be designed to incorporate living roofs or walls. Livings roofs are required to have a soil substrate depth of between 80mm and 150mm. The depth of the substrate is required to vary within this range to maximise the biodiversity benefits. The design, installation and maintenance of living roofs should be consistent with the most recent version of the GRO Green Roof Code."
London Borough of Newham Core Strategy (LBN CR)		

Policy	Policy Section / Paragraph	Summary
LBN CS	SP7 (part) – Quality movement corridors and linear gateways	The streets listed below will be the subject of public realm and regenerative improvements that reinforce their role as high quality movement corridors and linear gateways. To this end, proposals that address the following matters will be supported: 1. The desirability of reclaiming the streets for people through introducing active frontage to their edges that stimulates social activity and interaction along them; 2. The importance of consolidating ribbon developments of commercial and community uses into defined local and Town Centres and Local Shopping Parades, and in the case of hotels, in Stratford Metropolitan and the Royal Docks in line with Policies J1 (E5, E6, E9, E10 and E11), INF5, INF8 and SP6; 3. The general principles of good urban design expressed in Policies SP1 and SP3 and SP5, ensuring they are extended to edge treatments to positively contribute to the street scene and wayfinding; 4. The particular need in these environments to enclose the street and reduce the noise and air pollution impacts of passing traffic, without creating a 'tunnel' effect, maintaining the building line excepting overriding good design or highways considerations; 5. The need to significantly raise and easily maintain the quality of the public realm, with particular attention to de-cluttering, inclusive access, continuity of footways and materials, the value of tree planting to improve amenity and the desirability of introducing public art at appropriate locations; and 6. The importance of facilitating the smooth and efficient but safe movement of traffic in the context of an overall shift to sustainable transport in line with policy INF2. Key Movement Corridors and Linear Gateways (include): A1011 Silvertown Way and Silvertown Viaduct"
LBN CS	SC1 (part) – Climate Change	Development will respond to a changing climate through the following mitigation and adaptation measures: 8. Greening the borough through landscaping, tree planting and provision of natural environments and increased greenspace connectivity; and 9. Improving environments through soil improvement and the sustainable remediation of contaminated land."

Policy	Policy Section / Paragraph	Summary
LBN CS	SC4 - Biodiversity	Biodiversity will be protected and enhanced and development will contribute to a net gain in the quantity and quality of Newham's natural environment by the following measures: 1. Expecting that all major developments make a contribution to achieving the targets and actions for biodiversity, as set out in the Newham Biodiversity Action Plan, and in conjunction with provision of green infrastructure, as set out in Policy INF7; 2. Permitting development only where it can be demonstrated that significant adverse impact on species and habitats is avoided; 3. Sites of Importance for Nature Conservation (SINCs) will be protected, and the designation of new SINCs will be supported. Development should contribute to their qualitative enhancement, including improvements to access; 4. Incorporation of living roofs, landscaping and tree planting in developments, meeting the requirements of Policy SC1. In addition, allotments and Tree Preservation Orders (TPOs) should be recognised for their biodiversity value and development should contribute to their enhancement; and 5. Enhancing opportunities for biodiversity in the Blue Ribbon Network and waterside environments (providing measures are appropriate to their setting and do not hinder navigation) meeting the requirements of Policy INF7. The Council will also deliver the targets and actions of the Newham Biodiversity Action Plan through spatial planning, management of its land holdings and influencing other land managers. SINCs designated in the UDP have been retained and included on the Proposals Map.

Policy	Policy Section / Paragraph	Summary
LBN CS	INF7 – Blue ribbon network	The Council expects the following measures be addressed to achieve this objective: 1. Developments located adjacent to the Blue Ribbon Network should be set back from the waterway to integrate with and enhance the waterside environment and provide access and improved amenity to the waterfront to facilitate safe and active use of the waterspace; 2. Aquatic and riparian natural habitats will be protected and enhanced, achieving the targets and objectives set out within the Newham Biodiversity Action Plan where appropriate; 3. Landscape character, heritage, views and linear nature of the network will be protected and enhanced; and 4. Access to the Blue Ribbon Network will be improved, including enhanced infrastructure to support opportunities for walking, cycling, recreation and water-based activities and transport including river freight and links between the Lea River Park and River Thames. The Council has defined a Thames Policy Area, setting out priorities for those parts of the borough located adjacent to the River Thames, and contributing to sub-regional strategies and organisations to enable strategic management of the Thames Gateway."
LBN CS	EQ10 – Nature conservation	Development proposals on Sites of Nature Conservation Importance listed in Appendix EQ2 should include an ecological statement outlining compensatory mitigation measures to: A) Conserve existing wildlife habitats and features of nature conservation interest; and B) Take into account national and local biodiversity action plan priorities. The relocation of species or recreation of habitats will only be considered in exceptional circumstances where the reasons for the proposal clearly outweigh the nature conservation value of the site. The Council's priority is to conserve existing features/species as part of any development scheme (please refer to Policy EQ11 below The relocation, replacement or recreation of existing protected individual species of flora/fauna or entire habitats will only be considered in exceptional circumstances such as when this is necessary by reason of overriding public interest or where the proposed development will bring benefits of primary importance to the environment.

Policy	Policy Section / Paragraph	Summary
LBN CS	EQ15 - Trees	Where appropriate, the inclusion of a landscaping scheme, including tree planting, will be required in new developments and made a condition of any planning permission granted. In areas of deficiency in tree coverage, a higher density of tree cover may be required.
LBN CS	EQ45 – Environmental protection	Planning permission for any development, including a change of use, will be resisted where it would involve unacceptable levels of generation beyond the boundary of the site of one or more of the following: • Vibration; • Smell; • Fumes; • Dust; • Grit; • Air and water pollutants (please refer to Policy EQ46; Noise (please refer to Policies EQ47 & 48); • Vehicular or pedestrian traffic; • Ground/soil pollutants (please refer to Policy EQ49); and • Light spillage.
LBN CS	EQ47 – Noise impact	Where a proposed development is likely to produce a considerable increase in noise relating to its use, the Council will require an assessment of noise impact to be carried out of a developer for submission with the planning application.

Policy	Policy Section / Paragraph	Summary
LBN CS	EQ49 – Contaminated Land	Planning applications for development of a site known or reasonably suspected of being contaminated or containing landfill gas will be required to be accompanied by an assessment of the type and extent of contamination, as well as proposals for any necessary remedial measures required to deal with the hazards, before the application can be determined by the Council. In other cases, where the Council suspects that there may only be slight contamination, planning permission may be granted but conditions will be attached to make it clear that development will not be permitted to start until a safe investigation and assessment has been carried out and that the development itself will need to incorporate all the measures shown in the assessment to be necessary.
London Borough of Tower Hamlets Core Strategy (LBTH CR)		
LBTH CS	SP03 (2)	How we are going to get there: Address the impact of noise and air pollution in the borough by: • minimising and mitigating the impact of noise in identified hot spots, such as along main vehicular routes; • managing the impact of noise caused by the night-time economy through town centre and building design, and planning controls; • continuing to promote the use of public transport and reducing reliance on private motor vehicles; • managing and improving air quality along transport corridors and traffic-congestion points by working with Transport for London; and • implementing a “Clear Zone” in the borough to improve air quality.
LBTH CS	SO12 – Creating a green and blue grid	To create a high-quality, well-connected and sustainable natural environment of green and blue spaces that are rich in biodiversity and promote active and healthy lifestyles.

Policy	Policy Section / Paragraph	Summary
LBTH CS	DM9 (1) – Improving air quality	Major development will be required to submit an Air Quality Assessment demonstrating how it will prevent or reduce associated air pollution during construction or demolition. Minor development will be required to submit details outlining practices to prevent or reduce associated air pollution during construction or demolition.
LBTH CS	DM27 (4) - Archaeology	For proposed development that lies in or adjacent to Archaeological Priority Areas, the Council will require the proposal to include an Archaeological Evaluation Report and will require any nationally important remains to be preserved permanently in site, subject to consultation with English Heritage.
Royal Borough of Greenwich Local Implementation Plan (RBG LIP)		
RBG LIP	3.2 - Air Quality	Greenwich Council was the first local authority in the country to declare a Low Emission Zone (LEZ), implemented on the Greenwich Peninsula in 2004.
RBG LIP	Section 3.10.1 - Road and River Freight	The movement of goods by road through the Borough is a major contributor to poor air quality, especially in areas where there is a high density of goods vehicles and the potential for congestion and delay, for example in the approaches to the Blackwall Tunnel and the Woolwich Ferry. The plan shown as Figure 3.16 clearly shows the attraction for large vehicles for the A2 and Blackwall Tunnel, where their use of the highway is categorised as ‘high’. The Council is currently working on a local level to manage freight movement in new developments by requiring travel plans and strategic freight delivery plans as part of conditions attached to planning approvals. At the sub regional level, Greenwich Council is working with Thames Gateway London Partnership as part of cross borough group developing a Freight Quality Partnership aimed at improving the logistics of freight movement in the sub region.

Policy	Policy Section / Paragraph	Summary
RBG LIP	Page 79	At the sub-regional level, a new river crossing would improve the flow of road based traffic and reduce air pollutant concentrations such as the Blackwall Tunnel. However, local level targets set out in the Greenwich Strategy aim to significantly reduce emissions of carbon dioxide and other greenhouse gases in adherence to set baselines, which in part can be achieved through use of low carbon vehicles using clean, renewable energy fuels making up 25% of the Council's fleet. Greenwich Council has established the largest automatic monitoring network run by any local authority in the UK. These stations mainly monitor Nitrogen Dioxide and PM10, although, depending on location, we also look at PM2.5, 1, 3-butadiene, Sulphur Dioxide, Carbon Monoxide and Ozone. This system is backed up by 58 passive Nitrogen Dioxide diffusion tubes and 15 benzene tubes. By 2010, we expect there to be over 20 automatic stations looking at particle levels in the Borough. The Council has established the largest automatic monitoring network run by any local authority in the UK. These stations mainly monitor Nitrogen Dioxide and PM10, although, depending on location, we also look at PM2.5, 1, 3-butadiene, Sulphur Dioxide, Carbon Monoxide and Ozone. This system is backed up by 58 passive Nitrogen Dioxide diffusion tubes and 15 benzene tubes. The Greenwich Peninsula became the first Low Emission Zone (LEZ) in the UK. The Peninsula LEZ attempts to use criteria to both discourage the most polluting vehicles affected by the scheme, whilst using financial incentives to encourage the use of the cleanest vehicles. Controls are applied to all aspects of the development including private car ownership and commercial vehicles. Greenwich Peninsula's LEZ complements the London wide LEZ. The purpose of the Council's Air Quality Action Plan is to ensure that air quality is considered corporately and seeks to reduce air pollution within the Borough in line with the Government's air quality objectives and national strategy. The Council is however limited in its abilities to influence local air quality, firstly as a result of pollution arising elsewhere in London (and beyond) and secondly because it has limited responsibility for the main sources of emissions within the Borough. Major roads in the Borough are not the responsibility of the Council, however we are taking steps locally to reduce vehicle movements and therefore emissions.

Policy	Policy Section / Paragraph	Summary
RBG LIP	Table 4.19 - Objectives	1. Improve the condition of principal roads (to sit within the top quartile of London roads). A2041 Carlyle Road, SE28 2011/13 A206 Woolwich Church Street, 2011/12 A206 Woolwich Church Street, SE18 2011/12 A206 Trafalgar Road, SE10 2011/12 2. Improve the health of residents by promoting Active Travel - increasing walking and cycling. 4. Reduce the number of people killed and seriously injured on the Borough's roads, and reduce the overall number of pedestrian and cycle casualties. 6. Improve transport provision and the quality of the transport environment particularly in areas that show high indices of multiple deprivation. 7. Reduce Greenwich's contribution to climate change and work to improve the Borough's air quality. (Reduce transport-related CO_2 emissions, tackle congestion, smooth traffic flow and increase the proportion of trips made by sustainable modes). 8. Continue to promote and support a package of Thames River Crossings (including the development of a fixed crossing at Gallions Reach) and the further development of passenger River Services, to improve access to key employment areas and address severance in the East of the Borough and intensification of river use overall.
London Borough of Tower Hamlets Local Implementation Plan		
LBTH LIP	Tower Hamlets Challenge 6	There are high levels of NO_X and particulates around major roads in the boroughs and pollution is a key concern for residents. The challenge for Tower Hamlets will therefore be to reduce transport related air pollution to enhance quality of life, whilst still supporting economic growth of the borough.
LBTH LIP	Tower Hamlets Challenge 7	As with air quality, the challenge for Tower Hamlets will be to reduce transport related noise, whilst still supporting economic growth of the borough.

Policy	Policy Section / Paragraph	Summary
LBTH LIP	Tower Hamlets Challenge 15	To ensure long-term benefits for the borough's residents, by ensuring schemes support regeneration and improve connectivity within the fringe areas around the Olympic Park and encourage a transport behavioural legacy to deliver sustained environmental, health and wellbeing benefits.
LBTH LIP	Objective 4 "To reduce the impact of transport on the environment and wellbeing.	The approach to delivering this LIP Objective focuses on reducing transport's contribution to climate change in a manner consistent with MTS proposals to achieve the 2025 CO_2 reduction target set by the Mayor of London. The approach also seeks to contribute towards reducing transport-related noise and pollutants by reducing the number of private vehicles on roads within the borough, to deliver wider environmental benefits and also an enhanced level of health and wellbeing of the Borough's residents. The key actions and interventions considered necessary to achieve this objective are focussed around the following themes: • Encouraging carbon-efficient / 'greener' travel behaviour; • Operational efficiency; and • Managing demand.

Appendix B SPG 2014 STANDARDS, LONDON PLAN 2015

B.1 Introduction

B.1.1 The Supplementary Planning Guidance (SPG) summary table overleaf discusses only the ‘Mayor’s Priorities (P) and ‘Mayor’s Best Practice (BP) standards that are considered relevant to the Scheme.

B.1.2 Only the London Plan policies and sections relevant to the Scheme are included. For full text of the policies please refer to The London Plan March 2015 directly.

B.1.3 The performance of the Scheme discusses the Scheme’s requirements to meet current regulations and policies and to support the achievement of a CEEQUAL rating ‘Very Good’ and ideally ‘Excellent’ for the Whole Team Award rating.

B.2 Resource Management

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
Land	Optimising the use of land	**(P)** Through both their Local Plans and planning decisions, boroughs should ensure development patterns reflect the strategic spatial vision for London's growth as set out in Chapter 2 of the London Plan. **(P)** Through both their Local Plans and planning decisions, boroughs should aim for 100% of development to be delivered on previously developed land.	**Policy 1.1 Delivering the Strategic Vision and Objectives for London:** Growth will be supported and managed across all parts of London to ensure it takes place within the current boundaries of Greater London without: a) encroaching on the Green Belt, or on London's protected open spaces b) having unacceptable Impacts on the environment. London is a growing city with a limited supply of land for economic, residential, recreational and natural land uses. Therefore it is essential that developers make the most of the opportunities	The Project will utilise land that has been previously developed. The Scheme will improve the Blackwall Tunnel reliability. It is considered that the project will occupy the minimum amount of land needed for construction. Temporary worksites will be returned to their previous uses upon completion of the construction works.

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			provided by their site, based on its specific circumstances. **Policy 2.9 Inner London:** A The Mayor will, and boroughs and other stakeholders should, work to realise the potential of inner London in ways that sustain and enhance its recent economic and demographic growth while also improving its distinct environment, neighbourhoods and public realm, supporting and sustaining existing and new communities, addressing its unique concentrations of deprivation, ensuring the availability of appropriate workspaces for the area's changing economy and improving quality of life and	

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			health for those living, working, studying or visiting there.	
		(P) Developers should optimise the scale and density of their development, considering the local context, to make efficient use of London's limited land.	**Policy 6.2 Providing public transport capacity and safeguarding land for transport:** The Mayor will work with strategic partners to: a) improve the integration, reliability, quality, accessibility, frequency, attractiveness and environmental performance of the public transport system. b) co-ordinate measures to ensure that the transport network, now and in the future, is as safe and secure as reasonably practicable	The Scheme is located on previously developed land and will maximise the use of the spaces through improving vehicular flow enhancing its immediate surroundings. The Scheme has been designed to maximise the use of the site and minimise waste generation during construction. The Scheme will enable double decker buses to go through the new tunnel. This will significantly increase capacity and routes. The final outcome of the Scheme will be an effective tunnel, which will positively contribute to the overall London's network system.

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			c) increase the capacity of public transport in London over the Plan period by securing funding for and implementing the schemes and improvements set out in Table 6.1 of the London Plan. **Policy 7.1 Building London's Neighbourhoods and Communities:** In their neighbourhoods, people should have a good quality environment in an active and supportive local community with the best possible access to services, infrastructure and public transport to wider London. **Policy 7.6 Architecture:** Architecture should make a positive contribution to a coherent public realm,	

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			streetscape and wider cityscape. It should incorporate the highest quality materials and design appropriate to its context.	
	Basements and lightwells	**(BP)** Where there is pressure for basement developments, boroughs should consider whether there are any particular local geological or hydrological issues that could particularly effect their construction, and adopt appropriate policies to address any local conditions. **(P)** When planning a basement development, developers should consider the geological and hydrological conditions of the site and surrounding area, proportionate to the local conditions, the size of the basement and lightwell and	**Policy 5.12 Flood Risk Management:** Development proposals must comply with the flood risk assessment and management requirements set out in PPS25 over the lifetime of the development and have regard to measures proposed in Thames Estuary 2100 (TE2100 – see paragraph 5.55) and Catchment Flood Management Plans. **Policy 5.13 Sustainable Drainage:** Development should utilise sustainable urban drainage systems (SUDS) unless there are	The Scheme comprises predominantly works that will be undertaken below ground level. As such the geological and hydrological conditions of the site and surrounding area have been considered. As part of the PEIR and the Preliminary HIA, the effects of the design proposals have been evaluated and mitigation measures proposed. In regards to Policy 7.13, the philosophy of the design of the Scheme is to address safety and security issues identified from undertaking threat and vulnerability risk assessments. A fire strategy has been developed to ensure that the design

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		the sensitivity of adjoining buildings and uses, including green infrastructure. **(P)** When planning and constructing a basement development, developers should consider the amenity of neighbours.	practical reasons for not doing so, and should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible. **Policy 7.13 Safety. Security and Resilience to Emergency:** Development proposals should contribute to the minimisation of potential physical risks, including those arising as a result of fire, flood and related hazards. Development should include measures to design out crime that, in proportion to the risk, deter terrorism, assist in the detection of terrorist activity and help defer its effects.	provides for compliant fire and evacuation protection measures. In terms of flood risk, the northern and southern portals of the Scheme are located within defended Flood Zone 3, subject to a high residual risk of flooding from the River Thames.. However, the Scheme is not perceived to be at significant risk of flooding from groundwater, sewers or artificial sources. The main source of flooding to the Scheme is associated with breach of existing defences in combination with extreme tide levels. A Flood Emergency Plan has been produced, linked into the EA's advanced flood warning system, in order to manage the unlikely event of flooding on-site should a breach in the River Thames defences occur during

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
				the lifetime of the Scheme. The plan sets out evacuation procedures. This will need to be revised and updated by the DBFM contractor.
	Local food growing	**(P)** To protect existing established food growing spaces. **(BP)** To provide space for individual or communal food growing, where possible and appropriate. **(BP)** To take advantage of existing spaces to grow food, including adapting temporary spaces for food growing.	**Policy 2.18: Green Infrastructure:** The Network of Open and Green Spaces: Development proposals should: a) incorporate appropriate elements of green infrastructure that are integrated into the wider network; and b) encourage the linkage of green infrastructure including the Blue Ribbon Network, to the wider public realm to improve accessibility for all and develop new links, utilising green chains, street trees,	It is considered that provision of space for individual or communal food growing is not relevant to this application.

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			and other components of urban greening (Policy 5.10). **Policy 7.22: Land for Food:** The Mayor will seek to encourage and support thriving farming and land-based sectors in London, particularly in the Green Belt. Use of land for growing food will be encouraged nearer to urban communities via such mechanisms as 'Capital Growth'.	
Site layout and building design	Site layout and design	**(BP)** Any existing buildings that can be practically refurbished, retrofitted, altered, or extended should be retained and reused. **(BP)** A mix of uses, where suitable should be included to	**Policy 2.18: Green Infrastructure:** The Network of Open and Green Spaces: Development proposals should:	The Scheme is located on previously developed land as described under SPG Section Optimising the use of land above. As the project relates to below ground works and the introduction of a new tunnel,

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		provide a range of services commensurate to the public transport accessibility. **(P)** The design of the site and building layout, footprint, scale and height of buildings as well as the location of land uses should consider: ▪ Existing features ▪ the possible retention and reuse of existing buildings and structures; and ▪ the retention of existing green infrastructure, including trees and other ecological features, and potential for its improvement and extension; ▪ access routes to public transport and other facilities that minimise the use of private transport ;	a) incorporate appropriate elements of green infrastructure that are integrated into the wider network b) encourage the linkage of green infrastructure including the Blue Ribbon Network, to the wider public realm to improve accessibility for all and develop new links, utilising green chains, street trees, and other components of urban greening (Policy 5.10). **Policy 5.2 Minimising CO_2 Emissions:** Development proposals should make the fullest contribution to minimising CO_2 emissions in accordance with the following energy hierarchy: 1. Be lean: use less energy	there is limited existing green infrastructure to be retained. The Scheme landscape design will contribute positively to the development of the area in terms of visual amenity. The design includes a varied and visually interesting combination of trees and herbaceous plants, including wildflower meadow planting. At the northern portal, where at-grade pedestrian and cycle links are incorporated, the design includes areas of green space and brings together areas of hard surfacing with clusters of tree planting and under-storey vegetation. This will enhance the urban realm and improve the quality of life of the local residents. The Scheme will be constructed to a high standard to ensure durability over its lifetime,

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		New design of development ▪ the existing landform; ▪ the potential to take advantage of natural systems such as wind, sun and shading; ▪ the principles sets out London Plan policies 7.1 and 7.6; ▪ the potential for adaption and reuse in the future; ▪ potential for incorporating green infrastructure, including enhancing biodiversity; ▪ potential for incorporating open space, recreation space, child play space; ▪ energy demands and the ability to take advantage of natural systems and low and zero carbon energy sources;	2. Be clean: supply energy efficiently 3. Be green: use renewable energy **Policy 5.3 Sustainable Design and Construction:** Development proposals should demonstrate that sustainable design standards are integral to the proposal. **Policy 7.1 Building London's Neighbourhoods and Communities**: The design of new buildings and the spaces they create should help reinforce or enhance the character, legibility, permeability and accessibility of the neighbourhood.	although it should be considered that the Scheme will inevitably have to be designed for traffic movements and thus is not designed to accommodate for alternative uses. The design of the Scheme was developed with the aim to reduce operational CO_2 emissions as far as practicable. For more details refer to the PES. In terms of noise, the design incorporates 2.0m high visual /acoustic barrier around both northern and southern tunnel portals and low noise surface where ever possible within redline boundary. Best Practice Guidance in terms of air quality and dust control during construction in line with the Mayor's Air Quality Strategy will be adopted throughout the construction phase.

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		▪ •site wide infrastructure; ▪ access to low carbon transport modes; ▪ the promotion of low carbon transport modes, including walking and cycling; ▪ potential to address any local air quality, noise disturbance, flooding and land contamination issues; and ▪ the potential effect on the micro-climate.	**Policy 7.6: Buildings and structures should:** ▪ be of the highest architectural quality; ▪ be of a proportion, composition, scale and orientation that enhances, activates and appropriately defines the public realm; ▪ comprise details and materials that complement, not necessarily replicate, the local architectural character; ▪ not cause unacceptable harm to the amenity of surrounding land and buildings, particularly residential buildings, in relation to privacy, overshadowing, wind and microclimate. This is	In terms of flood risk, the site is located mainly within Flood Zone 3. Details on mitigation and prevention through design are shown in Chapter 15: Water Resources & Flood Risk of the PEIR. The Scheme will improve journey times especially current ones for the Blackwall Tunnel. Better design will provide more clearance, an alternative route and therefore better resilience in demand and traffic interruption. It is intended that the overall sustainability performance of the proposed Scheme will be demonstrated through the achievement of a 'Very Good' and ideally 'Excellent' CEEQUAL Whole Team Award rating.

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			particularly important for tall buildings; ▪ incorporate best practice in resource management and climate change mitigation and adaptation; ▪ provide high quality indoor and outdoor spaces and integrate well with the surrounding streets and open spaces; ▪ be adaptable to different activities and land uses, particularly at ground level; ▪ meet the principles of inclusive design; and ▪ optimise the potential of sites.	
		(P) The overall carbon dioxide emissions from a development should be	**Policy 5.2 Minimising CO_2 Emissions:** Development proposals should make the	The PES carried out for the Scheme demonstrates how the designers are considering the

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
Energy and CO_2 emissions	Energy and carbon emissions	minimised through the implementation of the energy hierarchy set out in London Plan policy 5.2.	fullest contribution to minimising CO_2 emissions in accordance with the following energy hierarchy: a) Be lean: use less energy. b) Be clean: supply energy efficiently. c) Be green: use renewable energy. **Policy 5.3 Minimising CO_2 Emissions:** a) The highest standards of sustainable design and construction should be achieved in London to improve the environmental performance of new developments and to adapt to the effects of climate change over their lifetime. b) Development proposals should demonstrate that sustainable design	aspirations set in The London Plan 2015 by following the Mayor's energy hierarchy and the detailed guidance provided in the GLA Energy Team Guidance on Planning Energy Assessments, and including: ▪ passive design and energy efficiency (i.e. 'be lean'); ▪ energy efficient supply of services (i.e. 'be clean'); and ▪ onsite renewable energy technologies to provide energy (i.e. 'be green').
		(P) Developments should be designed to meet the following Regulated carbon dioxide standards, in line with London Plan policy 5.2.		It should be noted that The London Plan CO_2 emissions targets are set against the Building Regulations. The Scheme will include only a very small proportion of areas falling under the remit of the Building Regulations. These areas would not qualify as a major

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			standards are integral to the proposal, including its construction and operation, and ensure that they are considered at the beginning of the design process. c) Major development proposals should meet the minimum standards outlined in the Mayor's supplementary planning guidance and this should be clearly demonstrated within a design and access statement. The standards include measures to achieve other policies in this Plan and the following sustainable design principles: 1) minimising carbon dioxide emissions across the site, including the building and services (such	development. Therefore the targets are not directly applicable to the Scheme. Nevertheless, the design of the Scheme was developed with the aim to reduce operational CO_2 emissions as far as practicable. Operational efficiency will be achieved through measures, such as: ▪ minimising the use of diesel or petrol powered generators and instead using mains electricity or battery powered equipment; ▪ power down of equipment/plant during periods of non-utilisation; ▪ ensure all vehicles and machinery is serviced at recommended intervals to guarantee optimum engine

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			as heating and cooling systems); 2) avoiding internal overheating and contributing to the urban heat island effect; 3) efficient use of natural resources (including water), including making the most of natural systems both within and around buildings; 4) minimising pollution (including noise, air and urban runoff); 5) minimising the generation of waste and maximising reuse or recycling; 6) avoiding impacts from natural hazards (including flooding); 7) ensuring developments are comfortable and secure	efficiencies and reduce waste energy; ▪ fuel-efficient plant, machinery and vehicles used wherever possible; ▪ ensuring all vehicles and plant are fully loaded before starting a cycle or trip to ensure minimum run-time and efficient use of capacity; ▪ SMART targets for consumption during construction, Workforce should be educated regarding the information displayed. Targets to be made visible to workforce at all times; ▪ monitoring of all non-plant related energy consumption. Consumption profile will enable more strategic thinking towards reduced energy demands;

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			for users, including avoiding the creation of adverse local climatic conditions; 8) securing sustainable procurement of materials, using local supplies where feasible; and 9) promoting and protecting biodiversity and green.	▪ timers and Motion sensors to reduce energy consumption when areas are not in use; ▪ lighting controls will be largely dependent on health and safety regulations within the tunnel itself however low-energy equivalents should be employed where possible; ▪ deploy correctly sized generators for electrical provision on-site, where applicable. An accurate approach is to identify the processes and associated electrical equipment in use at each stage of the project, and then apply a 'diversity' factor to each item to allow for its intermittent and partial power usage. This will give a profile of the power requirement which will have a reduced peak; and

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
				▪ provide appropriate levels of thermal insulation to the relevant areas of site accommodation to reduce energy demand for heating. Efficient heating mechanism will further reduce energy consumption.
		(BP) Developments should contribute to ensuring resilient energy infrastructure and a reliable energy supply, including from local low and zero carbon sources.	**Policy 5.6 Decentralised Energy in Development Proposals:** Major development proposals should select energy systems in accordance with the following hierarchy: a) Connection to existing heating or cooling networks (Where future network opportunities are identified, proposals should be designed to connect to these networks.);	The potential for connection to existing heating and cooling network, incorporation of an onsite Combined Heat and Power (CHP) plant, Combined Cooling Heat and Power (CCHP) plant or a system recovering waste heat from the tunnels have also been considered and investigated in detail. However, given the negligible heating demands of the Scheme, the potential for carbon savings through actual connection to any heat network will be minimal. The cost and embodied energy
		(BP) Developers are encouraged to include innovative low and zero carbon technologies to minimise carbon dioxide emissions within developments and keep up to date with rapidly improving technologies.		

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			b) Site wide CHP network; and c) Communal heating and cooling. **Policy 5.7 Renewable Energy:** Within the framework of the energy hierarchy (see Policy 5.2 of the London Plan), major development proposals should provide a reduction in expected CO_2 emissions through the use of on-site renewable energy generation, where feasible. **Policy 5.8 Innovative energy technologies:** The Mayor supports and	associated with the infrastructure required to allow this connection would therefore likely exceed the benefits of the connection. For further details refer to the PES. A feasibility analysis of renewable energy technologies has been also undertaken. Overall, there are a number of constraints associated with the Scheme when considering the installation of renewable energy and low carbon technologies. There is potential for a small amount of Solar PV at the Portal tunnel portal entrances. This will need to be investigated further however it is unlikely that sufficient space will be made available to make a significant contribution to carbon emissions
	Energy demand	**(P)** Development applications are to be accompanied by an energy demand assessment	**Policy 5.2 Minimising CO2 Emissions:** Major development proposals	A Baseline Energy Demand Assessment has been

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
	assessment		should include a detailed energy assessment to demonstrate how the London Plan targets for CO_2 emissions reduction are to be met within the framework of the energy hierarchy. **Policy 5.3 Sustainable Design and Construction:** Major development proposals should meet the minimum standards outlined in the Mayor's supplementary planning guidance and this should be clearly demonstrated within a design and access statement. The standards include measures to achieve other policies in this Plan and the following sustainable design principle of minimising CO_2	undertaken and is reported in PES. The PES was developed following the Mayor's energy hierarchy (i.e. be lean, be clean and be green) and The London Plan, which ensures that priority is given to passive design. The PES includes an assessment of anticipated energy demand, measures to be employed to minimise demand, and details on how this demand will be met.
	Use less energy	**(P)** The design of developments should prioritise passive measures.		
		(BP) Developers should aim to achieve Part L 2013 Building Regulations requirements through design and energy efficiency alone, as far as is practical.		As stated in the PES, the Scheme will include only a very small proportion of areas (<1,000m^2) falling under the remit of the energy efficiency requirements of the Building Regulations. These areas would not qualify as a major development and therefore for the purposes of the application

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			emissions across the site, including the building and services (such as heating and cooling systems)	have not been modelled for the Building Regulations compliance.
	Efficient energy supply	**(P)** Where borough heat maps have identified district heating opportunities, boroughs should prepare more detailed Energy Master Plans (EMPs) to establish the extent of market competitive district heating networks. **(P)** Developers should assess the potential for their development to: ▪ connect to an existing district heating or cooling network; ▪ expand an existing district heating or cooling network, and connect to it; or ▪ establish a site wide network, and enable the	Policy 5.6 Decentralised Energy in Development Proposals a Development proposals should evaluate the feasibility of Combined Heat and Power (CHP) systems, and where a new CHP system is appropriate also examine opportunities to extend the system beyond the site boundary to adjacent sites. b Major development proposals should select energy systems in accordance with the following hierarchy:	The potential for connection to existing heating and cooling network, incorporation of an onsite Combined Heat and Power (CHP) plant, Combined Cooling Heat and Power (CCHP) plant or a system recovering waste heat from the tunnels have also been considered and investigated in detail. However, given the negligible heating demands of the Scheme, the potential for carbon savings through actual connection to any heat network will be minimal. The cost and embodied energy associated with the infrastructure required to allow this connection would therefore likely exceed the

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		connection of existing buildings in the vicinity of the development. **(P)** Where opportunities arise, developers generating energy or waste heat should maximise long term carbon dioxide savings by feeding the decentralised energy network with low or zero carbon hot, and where required, cold water.	▪ Connection to existing heating or cooling networks; ▪ Site wide CHP network; ▪ Communal heating and cooling; c Potential opportunities to meet the first priority in this hierarchy are outlined in the London Heat Map tool. Where future network opportunities are identified, proposals should be designed to connect to these networks.	benefits of the connection. For further details refer to the PES.
	Renewable energy	**(P)** Boroughs and neighbourhoods should identify opportunities for the installation of renewable energy technologies in their	**Policy 5.7 Renewable Energy:** Within the framework of the energy hierarchy, major development proposals	Renewable technologies have been examined, however none of the assessed technologies were found feasible for installation as the majority of areas will be

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		boroughs and neighbourhoods. **(P)** Major developments should incorporate renewable energy technologies to minimise overall carbon dioxide emissions, where feasible.	should provide a reduction in expected CO2 emissions through the use of on-site renewable energy generation, where feasible. Note that although not required by a specific policy, there is a presumption within the London Plan that all major development proposals will seek to reduce CO_2 emissions by at least 20% through the use of on-site renewable energy generation wherever feasible.	underground (further detailed in the PES).
Carbon dioxide off-setting	Carbon dioxide off-setting	**(P)** Boroughs should establish a carbon off-set fund and identify suitable projects to be funded. **(P)** Where developments do not achieve the Mayor's	**Policy 5.2 Minimising CO_2 Emissions:** Development proposals should make the fullest contribution to minimising CO2 emissions in accordance with the following energy hierarchy:	Due to the non-building nature of the scheme, carbon off-setting policies are not applicable to the Scheme.

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		carbon dioxide reduction targets set out in London Plan policy 5.2, the developer should make a contribution to the local borough's carbon dioxide off-setting fund.	1 Be lean: use less energy; 2 Be clean: supply energy efficiently 3 Be green: use renewable energy The CO_2 reduction targets should be met on-site. Where it is clearly demonstrated that the specific targets cannot be fully achieved on-site, any shortfall may be provided off-site or through a cash in lieu contribution to the relevant borough to be ring fenced to secure delivery of CO_2 savings elsewhere.	
	Retrofitting	**(P)** Boroughs should set out policies to encourage the retrofitting of carbon dioxide and water saving measures in their borough.	**Policy 5.4 Retrofitting:** The environmental impact of existing urban areas should be reduced through policies and programmes	The Scheme will improve the Blackwall Tunnel reliability. As part of the Scheme efficient equipment will be provided (e.g. lighting and lighting controls,

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		(P) Where works to existing developments are proposed developers should retrofit carbon dioxide and water saving measures.	that bring existing buildings up to the Mayor's standards on sustainable design and construction. In particular, programmes should reduce CO_2 emissions, improve the efficiency of resource use (such as water) and minimise the generation of pollution and waste from existing building stock.	pumps and fans and heating and cooling systems). It should be noted that potable water consumption of the Scheme is considered to be negligible.
	Monitoring energy use	**(BP)** Developers are encouraged to incorporate monitoring equipment, and systems where appropriate to enable occupiers to monitor and reduce their energy use.	**Policy 5.2 Minimising CO_2 Emission**s: Development proposals should make the fullest contribution to minimising CO_2 emissions in accordance with the energy hierarchy.	In line with the PES, one of the key energy saving measures to consider would be the building management system and sub-metering strategy.
	Supporting a resilient energy supply	**(BP)** Developers are encouraged to incorporate equipment that would enable their schemes to participate		It is considered that this issue is not directly applicable to the Scheme. Due to the nature of the Scheme, operational and maintenance safety and

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		in demand side response opportunities.		durability issues of the tunnel take precedent.
Water Efficiency	Water efficiency	**(P)** Developers should maximise the opportunities for water saving measures and appliances in all developments, including the reuse and using alternative sources of water.	**Policy 5.3 Sustainable design and construction:** Efficient use of natural resources (including water), including making the most of natural systems both within and around buildings. **Policy 5.15 Water use and supplies:** Development should minimise the use of mains water by: ▪ Incorporating water saving measures and equipment; ▪ Designing residential development so that mains water consumption would meet a target of 105 litres or less per head per day; and	Water use efficiency and water re-use is to be advocated by a CEMP. For example, stored water collected by the drainage systems would be used for dust suppression and for other construction phase tasks, such as operation of the Tunnel Boring Machine. If required, pumps would be provided at each storage lagoon for use in filling water bowsers. Water needed for site offices, canteens and laboratories would be taken from Thames Water mains piped potable supplies and measures to encourage water use efficiency would be adopted. Due to the nature of the Scheme, CEEQUAL has been selected as the most appropriate

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			▪ New development for sustainable water supply infrastructure, which has been selected within water companies' Water Resource Management Plans, will be supported.	methodology for appraising the sustainability performance of the overall infrastructure works.
		(P) New non-residential developments, including refurbishments, should aim to achieve the maximum number of water credits in a BREEAM assessment or the 'best practice' level of the AECB (Association of Environment Conscious Building) water standards.	**Policy 5.15 Water use and supplies:** Development should minimise the use of mains water by: ▪ Incorporating water saving measures and equipment ▪ Designing residential development so that mains water consumption would meet a target of 105 litres or less per head per day. New development for sustainable water supply infrastructure, which has	Due to the nature of the Scheme, CEEQUAL has been selected as the most appropriate methodology for appraising the sustainability performance of the overall infrastructure works. the target of achieving a CEEQUAL rating of 'Very Good' and ideally 'Excellent'.

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			been selected within water companies' Water Resource Management Plans, will be supported. **Policy 5.3 Sustainable design and construction:** a Efficient use of natural resources (including water), including making the most of natural systems both within and around buildings.	
		(P) Where a building is to be retained, water efficiency measures should be retrofitted.		Due to the non-existence of-buildings within the Scheme, retrofitted water efficiency measures are not applicable to the Scheme.
		(P) All developments should be designed to incorporate rainwater harvesting.	**Policy 5.15 Water use and supplies:** Note: Alternative sources of water, such as rainwater and greywater, particularly for uses other than drinking,	The Scheme will have no run off, and therefore no rainwater harvesting system is used.

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			will be increasingly important to reducing the consumption of mains water.	
Materials and Waste	Design phase	**(P)** The design of development should prioritise materials that: ▪ have a low embodied energy, including those that can be re-used intact or recycled; at least three of the key elements of the building envelope (external walls, windows roof, upper floor slabs, internal walls, floor finishes / coverings) are to achieve a rating of A+ to D in the BRE's The Green Guide of specification; ▪ can be sustainably sourced; at least 50% of timber and timber products should be sourced from	**Policy 5.3 Sustainable Design and Construction:** Major development proposals should meet the minimum standards outlined in the Mayor's supplementary planning guidance and this should be clearly demonstrated within a design and access statement. The standards include measures to achieve other policies in this Plan and the following sustainable design principles: ▪ efficient use of natural resources (including water), including making the most of natural	The Scheme has adopted the BES 6001 and TfL's Responsible Procurement Policy which provides a framework for purchasing, and ensures that wherever possible, recycled / reused materials are bought. Where possible environmental benefits will be considered as part of the procurement process with consideration given to all relevant aspects of whole life-cycle costs of products. TfL is committed to specific environmental obligations as a signatory of the Mayor's Green Procurement Code. The need to use primary aggregates will be minimised by

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		accredited Forest Stewardship Council (FSC) or Programme for the Endorsement of forestry Certification (PEFC) source; ▪ are durable to cater for their level of use and exposure; and ▪ will not release toxins into the internal and external environment, including those that deplete stratospheric ozone	systems both within and around buildings; ▪ minimising pollution (including noise, air and urban runoff); ▪ minimising the generation of waste and maximising reuse or recycling; ▪ securing sustainable procurement of materials, using local supplies where feasible, and ▪ promoting and protecting biodiversity and green infrastructure. **Policy 5.20 Aggregates:** The Mayor will work with all relevant partners to ensure an adequate supply of aggregates to support	the selection of secondary materials, where possible. The materials comprising the Scheme will respect the scale and setting of the surroundings. The materials will be suitable and robust, with durable long-life properties. Material finishes will consider long term maintenance as well as robustness requirements, avoiding materials that are damaged easily giving due consideration to the high pedestrian use and traffic. The use of insulants with a high Global Warming Potential will be avoided. All thermal insulation products used in the building are currently being considered to have a low embodied impact relative to their thermal properties and will be confirmed at detailed design stage.

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		(BP) The design of developments should maximise the potential to use pre-fabrication elements.	construction in London. This will be achieved by: ▪ encouraging re-use and recycling of construction, demolition and excavation waste within London; ▪ extraction of land-won aggregates within London; and ▪ importing aggregates to London by sustainable transport modes.	Wherever practicable pre-assembly and pre-fabrication of elements will be considered to minimise on-site waste and improve quality.
	Constructi on phase	**(P)** Developers should maximise the use of existing resources and materials and minimise waste generated during the demolition and construction process through the implementation of the waste hierarchy.	**Policy 5.3 Sustainable Design and Construction:** Major development proposals should meet the minimum standards outlined in the Mayor's supplementary planning guidance and this should be clearly demonstrated within a design and access	The waste hierarchy will be implemented during the demolition and construction. The Scheme adopts principles of designing out waste during the construction to minimise resource use and construction waste, the segregation of construction and excavation materials and the use of a

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			statement. The standards include measures to achieve other policies in this Plan and the following sustainable design principles: ▪ efficient use of natural resources (including water), including making the most of natural systems both within and around buildings; ▪ minimising pollution (including noise, air and urban runoff); ▪ minimising the generation of waste and maximising reuse or recycling; ▪ securing sustainable procurement of materials, using local	suitable waste contractor to maximise diversion from landfill via reuse, recycling and recovery. During the construction, the Scheme will follow a sustainable resource and waste management strategy as outlined in the Site Waste Management Plan (SWMP). The SWMP will set a 95% target for recycling and reuse of the materials arising from the construction of the tunnels and operational infrastructure. Furthermore, 'Green procurement' objectives will be defined and integrated into the procurement and specification process to use reused or recycled products and construction materials. Several Key Performance Indicators (KPI) have been

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			supplies where feasible, and ▪ promoting and protecting biodiversity and green infrastructure.	identified to enable monitoring in accordance with the 95% target for demolition, excavation and construction waste.
	Occupation phase	**(P)** Developers should provide sufficient internal space for the storage of recyclable and compostable materials and waste in their schemes. **(P)** The design of development should meet borough requirements for the size and location of recycling, composting and refuse storage and its removal.	**Policy 5.17: Waste Capacity:** Proposals for waste management should be evaluated against the following criteria: b locational suitability (see LDF preparation paragraphs F and G below); c proximity to the source of waste; d the nature of activity proposed and its scale; e a positive carbon outcome of waste treatment methods and technologies (including the transportation of	Recycling opportunities will be maximised through the provision of dedicated waste management facilities for the collection of the tunnel's recyclable waste streams from operation and maintenance, so that such waste is diverted from landfill. Due to the nature of the scheme, opportunities for waste treatment on site are not considered feasible.

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			waste, recyclates and waste derived products) resulting in greenhouse gas savings, particularly from treatment of waste derived products to generate energy; f the environmental impact on surrounding areas, particularly noise emissions, odour and visual impact and impact on water resources; and g the full transport and environmental impact of all collection, transfer and disposal movements and, in particular, the scope to maximise the use of rail and water transport using the Blue Ribbon Network.	

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
Nature conservation and biodiversity	Nature conservation and biodiversity	**(P)** There is no net loss in the quality and quantity of biodiversity. **(P)** Developers make a contribution to biodiversity on their development site.	**Policy 5.3: Sustainable Design and Construction:** Major development proposals should meet the minimum standards outlined in the Mayor's supplementary planning guidance and this should be clearly demonstrated within a design and access statement. The standards include measures to achieve other policies in this Plan and the following sustainable design principles:	There are no sites of nature conservation, or protected species in close proximity to the site considered as sensitive receptors. Therefore, the Scheme will have negligible impact to the natural environment and biodiversity during construction or operational phases. As the majority of the Scheme will be located below ground, the opportunities to contribute to biodiversity on the site are minimal.

B.4 Climate change adaptation

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
Tackling increased temperature and drought	Overheating	**(P)** Developers should include measures, in the design of their schemes, in line with the cooling hierarchy set out in London Plan policy 5.9 to prevent overheating over the scheme's lifetime	Policy 5.3 Sustainable Design and Construction: Major development proposals should meet the minimum standards outlined in the Mayor's supplementary planning guidance and this should be clearly demonstrated within a design and access statement. The standards include measures to achieve other policies in this Plan and to avoid internal overheating and contributing to the urban heat island effect.	The following assumptions have been made with regards to the service buildings, however these may vary as the design progresses: ▪ Greenwich Endsite Building 1 – This building will be predominantly un-manned staffed and contains plant space for water storage for the tunnel fire suppression systems with associated pump rooms and electrical rooms. Cooling will generally be by mechanical ventilation with direct expansion cooling and heating for the motor control centre rooms. Frost protection will be provided for the main plant areas using electric tubular heaters. Lighting will

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
				be passive infrared sensor controlled. ▪ Greenwich Endsite Building 2 – This building will be manned staffed on a permanent basis and contains welfare facilities, communications and radio rooms, uninterruptible power supplies and battery rooms, high voltage and low voltage plant rooms, transformers and switch rooms. Cooling for the plant areas will generally be by mechanical ventilation with direct expansion cooling and heating for the control room, offices, mess rooms and battery, UPS, communications and radio rooms. Frost protection will be provided for the main plant areas using electric tubular heaters. Lighting will be passive

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
				infrared sensor controlled to un-occupied areas. ▪ Silvertown endsite compound Building - This building will be predominantly un-manned staffed and contains communications room, uninterruptible power supplies and battery rooms, high voltage and low voltage plant rooms, isolation transformer and fire suppression room. A small back-up control room with a mess facility is also provided. Cooling for the plant areas will generally be by mechanical ventilation with direct expansion cooling and heating for the communications room, control/mess room, battery and uninterruptible power supplies rooms. Frost protection will be provided for

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
				the main plant areas using electric tubular heaters. Lighting will be passive infrared sensor controlled to un-occupied areas.
	Heat and drought resistant planting	**(BP)** The design of developments should prioritise landscape planting that is drought resistant and has a low water demand for supplementary watering.	Policy 5.15: Water Use Supplies: The Mayor will work in partnership with appropriate agencies within London and adjoining regional and local planning authorities to protect and conserve water supplies and resources in order to secure London's needs in a sustainable manner by minimising use of mains water.	No planting requiring supplementary watering is provided as part of the Scheme.
	Resilient foundations	**(BP)** Developers should consider any long term potential for extreme weather events to affect a building's	Policy 7.6 Architecture: Buildings and structures should: ▪ be of the highest architectural quality;	The existing risk of flood from fluvial, tidal, surface water, overland flow, groundwater and artificial sources has been assessed. The Flood Risk Assessment (FRA) has

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		foundations and to ensure they are robust.	▪ be of a proportion, composition, scale and orientation that enhances, activates and appropriately defines the public realm; ▪ comprise details and materials that complement, not necessarily replicate, the local architectural character; ▪ not cause unacceptable harm to the amenity of surrounding land and buildings, particularly residential buildings, in relation to privacy, overshadowing, wind and microclimate. This is particularly important for tall buildings; ▪ incorporate best practice in resource	concluded that the Southern portal is located wholly within Flood Zone 3 and the majority of the Northern portal is also located in Flood Zone 3 but a small area is located in Flood Zone 2. However, the Scheme is not perceived to be at significant risk of flooding from groundwater, sewers or artificial sources. The main source of flooding to the Scheme is associated with breach of existing defences in combination with extreme tide levels. A flood management plan for construction and covering the operational life time of the Scheme be developed which would link into the EA's advanced flood warning system.

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			management and climate change mitigation and adaptation; ▪ provide high quality indoor and outdoor spaces and integrate well with the surrounding streets and open spaces; and ▪ be adaptable to different activities and land uses, particularly at ground level.	
Increasing green cover	Urban greening	**(P)** Developers should integrate green infrastructure into development schemes, including by creating links with wider green infrastructure network. **(P)** Major developments in the Central London Activity Area (CAZ) should be designed to	Policy 2.18: Green Infrastructure: The network of Open and Green Spaces: Enhancements to London's green infrastructure should be sought from development and where a proposal falls within a regional or metropolitan park	The Scheme would include built form and landscape proposals that would be designed to integrate the proposals with the current Scheme location and contribute positively to the development of the area. The Scheme landscape design will contribute positively to the

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		contribute to the Mayor's target to increase green cover by 5% in this zone by 2030.	deficiency area (broadly corresponding to the areas identified as "regional park opportunities" on Map 2.8), it should contribute to addressing this need. Development proposals should: ▪ incorporate appropriate elements of green infrastructure that are integrated into the wider network; and ▪ encourage the linkage of green infrastructure including the Blue Ribbon Network, to the wider public realm to improve accessibility for all and develop new links, utilising green chains, street trees, and other components of urban greening.	development of the area in terms of visual amenity. The design includes a varied and visually interesting combination of trees and herbaceous plants, including wildflower meadow planting. At the northern portal, where at-grade pedestrian and cycle links are incorporated, the design includes areas of green space and brings together areas of hard surfacing with clusters of tree planting and under-storey vegetation. This will enhance the urban realm and improve the quality of life of the local residents. The illustrative planting for the Silvertown Portal is predominantly birch trees clustered on a grid formation which have been overlaid across the whole site to help bring a sense of coherence and urban

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			Policy 5.3 Sustainable Design and Construction: Major development proposals should meet the minimum standards outlined in the Mayor's supplementary planning guidance and this should be clearly demonstrated within a design and access statement. The standards include measures to achieve other policies in this Plan and to avoid internal overheating and contributing to the urban heat island effect. Policy 5.10 Urban Greening: Development proposals should integrate green infrastructure from the beginning of the design process to contribute to urban greening, including	character to the individual pockets of land. There is then an under-storey of wild flowers and low maintenance grasses which would provide colour and seasonal visual interest. This is planted in the largest spaces, taking into account sightline requirements for the roadways. Additional planting around the perimeter would allow the Scheme to tie back into the existing rough grassland or provide positive edges for future development of the adjacent land parcels. The illustrative planting for the Greenwich Portal is predominantly birch trees clustered on the island formed by the new flyover. These would be a mixture of birch trees to match the scheme on the north side of

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			the public realm. Elements that can contribute to this include tree planting, green roofs and walls, and soft landscaping. Major development proposals within the Central Activities Zone should demonstrate how green infrastructure has been incorporated.	tunnel. There would be no wildflower mixes used on the south, with grass instead being a low maintenance standard mix which is more suited to the verges that will typify the design on the southern side.
	Trees	**(P)** Developments should contribute to the Mayor's target to increase tree cover across London by 5% by 2025.	Policy 7.21 Trees and Woodlands: Existing trees of value should be retained and any loss as the result of development should be replaced following the principle of 'right place, right tree'. Wherever appropriate, the planting of additional trees should be included in new developments, particularly large-canopied species.	
		(P) Any loss of a tree/s resulting from development should be replaced with an appropriate tree or group of trees for the location, with the aim of providing the same canopy cover as that provided by the original tree/s.		

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
Flooding	Surface water flooding and Sustainable drainage	**(P)** Through their Local Flood Risk Management Strategies boroughs should identify areas where there are particular surface water management issues and develop policies and actions to address these risks	Policy 5.13 Sustainable Drainage: Development should utilise SUDS unless there are practical reasons for not doing so, and should aim to achieve Greenfield run-off rates The developments should ensure that surface water run-off is managed as close to its source as possible in line with the Mayors drainage hierarch:. ▪ store rainwater for later use; ▪ use infiltration techniques, such as porous surfaces in non-clay areas; ▪ attenuate rainwater in ponds or open water features for gradual release;	Cut-off drainage would be provided at the tunnel portals to prevent ingress of rainfall runoff from the approach roads into the tunnel. A drainage sump would be located at the tunnel portals which would provide an intercept and storage facility for collected surface water run-off, as well as a reception chamber for water being pumped back from the low-point sump in the tunnel. Surface water run-off from within the bored section of the tunnel would be collected via gullies or a combined drainage kerb system and collected in the sump, from where it would be pumped to the northern portal service building compound where an impounding foul sump would be provided under the car park. This would then ultimately discharge to sewer or to the River Thames
		(P) Developers should maximise all opportunities to achieve greenfield runoff rates in their developments		
		(P) When designing their schemes developers should follow the drainage hierarchy set out in London Plan policy 5.13		
		(P) Developers should design Sustainable Drainage Systems (SuDS) into their schemes that incorporate attenuation for surface water		

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		runoff as well as habitat, water quality and amenity benefits.	▪ attenuate rainwater by storing in tanks or sealed water features for gradual release; ▪ discharge rainwater direct to a watercourse; ▪ discharge rainwater to a surface water sewer/drain; and ▪ discharge rainwater to the combined sewer. Drainage should be designed and implemented in ways that deliver other policy objectives of the London Plan 2015, including water use efficiency and quality, biodiversity, amenity and recreation.	depending upon which is the most appropriate after taking into account factors such as discharge effluent quality. A second attenuation system, likely to take the form of oversized carrier drains or storage tanks, would be provided to store surface water runoff from the remaining catchment areas falling towards the portals. A flow-control device would control the outfall rate into the portal sump from the attenuation system. SuDs are considered to represent a more sustainable approach to drainage than traditional piped systems. They can be used to reduce the rate of surface water runoff through attenuation of flows by storage and conveyance of surface water, as well as improve surface water quality. SuDs principals have been

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
				incorporated into the surface water system as far as is practically possible due to Scheme constraints and the SuDs measures included provide both flow attenuation and treatment.
	Floor resilience and resistance of buildings in flood risk areas	**(P)** Development in areas at risk from any form of flooding should include flood resistance and resilience measures in line with industry best practice.	As above Policy 5.13. Policy 7.13 Safety, Security and Resilience to Emergency: Development proposals should contribute to the minimisation of potential physical risks, including those arising as a result of fire, flood and related hazards. Development should include measures to design out crime that, in proportion to the risk, deter terrorism, assist in the detection of terrorist activity and help defer its effects.	In terms of flood risk, the Southern portal is located wholly within Flood Zone 3 and the majority of the Northern portal is also located in Flood Zone 3 but a small area is located in Flood Zone 2. However, the Scheme is not perceived to be at significant risk of flooding from groundwater, sewers or artificial sources. The main source of flooding to the Scheme is associated with breach of existing defences in combination with extreme tide levels. A flood management plan for construction and covering the

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
				operational life time of the Scheme be developed which would link into the EA's advanced flood warning system. In regards to Policy 7.13, the tunnel will be capable of: ▪ being structurally sound with a life span of up to 125 years; ▪ enabling users to evacuate the tunnel safely under emergency conditions; and ▪ providing systems for ventilation, draught relief and emergency intervention.
	Floor risk management	**(P)** Developments are designed to be flexible and capable of being adapted to and mitigating the potential increase in flood risk as a result of climate change. **(P)** Developments incorporate the recommendation of the TE2100 plan for the future	Policy 5.12 Flood Risk Management: Development proposals must comply with the flood risk assessment and management requirements set out in PPS25 over the lifetime of the development and have regard to	The tunnel is not located in a local action zone under the current baseline and under the effects of climate change as identified by TE2100 Plan. In terms of flood risk, the Southern portal is located wholly within Flood Zone 3 and the majority of the Northern portal is

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		tidal flood risk management in the Thames estuary. **(P)** Where development is permitted in a flood risk zone, appropriate residual risk management measures are to be incorporated into the design to ensure resilience and the safety of occupiers.	measures proposed in Thames Estuary 2100 (TE2100 – see paragraph 5.55) and Catchment Flood Management Plans. Developments which are required to pass the PPS25 Exceptions Test will need to address flood resilient design and emergency planning by demonstrating that: a. the development will remain safe and operational under flood conditions; b. a strategy of either safe evacuation and/or safely remaining in the building is followed under flood conditions; c. key services including electricity, water etc. will	also located in Flood Zone 3 but a small area is located in Flood Zone 2. However, the Scheme is not perceived to be at significant risk of flooding from groundwater, sewers or artificial sources. The main source of flooding to the Scheme is associated with breach of existing defences in combination with extreme tide levels. The Scheme will adopt a Flood Warning and Evacuation Plan that covers the construction and operational phases. This will enable the staff and users to be aware of the residual risks, how to prepare for them and the protocols and procedures required to overcome the risk in the event of a flood.

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			continue to be provided under flood conditions; d. buildings are designed for quick recovery following a flood; and e. development adjacent to flood defences will be required to protect the integrity of existing flood defences and wherever possible should aim to be set back from the banks of watercourses and those defences to allow their management, maintenance and upgrading to be undertaken in a sustainable and cost effective way.	
	Other sources of flooding	**(P)** All sources of flooding need to be considered when designing and constructing developments.		The Scheme design would mitigate the risk of flooding from groundwater ingress and also ensure that surface water runoff from the Scheme is managed

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
				such that there would be no increase in flood risk from these sources

B.6 Pollution management

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
Land contamination	Land contamination	(P) Developers should set out how existing land contamination will be addressed prior to the commencement of their development. (P) Potentially polluting uses are to incorporate suitable mitigation measures.	Policy 3.2 Improving Health and Addressing Health Inequalities: New developments should be designed, constructed and managed in ways that improve health and promote healthy lifestyles to help to reduce health inequalities. Policy 5.21 Contaminated Land: Appropriate measures should be taken to ensure that development on previously contaminated land does not activate or spread contamination.	The potential for existing land contamination and the impacts during construction have been examined in Chapter 12: Geology and Soils of the PEIR Volume I. A number of measures have been incorporated into the Scheme design to avoid and reduce impacts on receptors. These comprise: ▪ assessment of contaminated land based on the information obtained from the site investigation; ▪ completion of risk assessments and a Remediation Strategy (if required) and adherence to them throughout the construction works;

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
				▪ adherence to the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009); ▪ use of a CoCP and CEMP; and ▪ optimise the design of the Scheme to reduce need for materials import and minimise waste. In addition, with the possibility that hydrocarbon contamination may yet still be encountered beneath the Greenwich site, during enabling works, a watching brief would be maintained with regards to currently unknown contamination. If visually contaminated or odorous material is encountered, the assistance of a suitably qualified and experienced person (a geo-environmental engineer) would be sought. Extra caution

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
				would be employed during the watching brief for the potential to encounter asbestos within soils.
Air quality	Air quality	(P) Developers are to design their schemes so that they are at least 'air quality neutral'.	Policy 7.14 Improving air quality: Development proposals should: ▪ minimise increased exposure to existing poor air quality and make provision to address local problems of air quality such as by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plans; ▪ promote sustainable design and construction to reduce emissions from the demolition and construction of	A definitive judgement was not made in terms of the overall significance of the Scheme in the construction and operational stages as all receptors would need to be modelled in line with the current guidance (particularly in relation to incorporating IAN 185/15 into the modelling methodology). A definitive judgement will be made in the ES when the air quality modelling has been updated speed banding of the traffic data has been completed and all receptors (rather than worst case receptors only), which exceed the Air Quality Strategy objectives in the affected road network, are modelled. Additionally the ES will

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			buildings following the best practice guidance; ▪ be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality; and ▪ ensure that where provision needs to be made to reduce emissions from a development, this is usually made on-site. Where the development requires a detailed air quality assessment and biomass boilers are included, the assessment should forecast pollutant concentrations. Permission should only be granted if no adverse air quality impacts from	incorporate ecological receptors, the construction phase impacts and the impact on regional air quality. However, the Preliminary CoCP includes measures, which ensure a high level of mitigation. According to the Preliminary CoCP, the DBFM contractor should, as far as reasonably practicable, seek to control and limit emissions to the atmosphere in terms of gaseous and particulate pollutants from vehicles and plant used on the sites, and dust from construction, demolition, vehicles and plant activities. In addition, vehicle and plant emissions would be controlled by implementing the following measures:

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			the biomass boiler are identified.	▪ production of a CLP to manage the sustainable delivery of goods and materials; ▪ engines of all vehicles, mobile and fixed plant on site are not left running/idling unnecessarily; ▪ using low emission vehicles and plant fitted with catalysts, diesel particulate filters or similar devices; ▪ using ultra low sulphur fuels in plant and vehicles; ▪ plant will be well maintained, with routine servicing of plant and vehicles to be completed in accordance with the manufacturer's recommendations and records maintained for the work undertaken; ▪ minimising the use of diesel or petrol powered generators and
		(P) Developments should be designed to minimise the generation of air pollution.	Policy 5.3 Sustainable design and construction	
		(P) Developments should be designed to minimise and mitigate against increased exposure to poor air quality.	Policy 5.3 Sustainable design and construction	

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
				using mains electricity or battery powered equipment where practicable; ▪ maximising energy efficiency (this may include using alternative modes of transport, maximising vehicle utilisation by ensuring full loading and efficient routing); ▪ the contractor's and delivery vehicles will be required to comply with the London Low Emission Zone applicable to the site at the time of tendering; and ▪ all members of the contractor's staff who drive vehicles under the DBFM contract would undertake a fuel-efficient driver training course within three months of the commencement of the contract. The training course shall consist of theoretical training and

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
				practical implementation skills and shall be a minimum duration of one hour. Throughout the duration of the contract, any new staff employed by the DBFM contractor who drives for work shall also be required to undertake fuel-efficient driver training. The DBFM contractor shall encourage its sub-contractors to undertake similar fuel efficient driver training.
		(P) Developers should select plant that meets the standards for emissions from combined heat and power and biomass plants.	Policy 7.14 Improving air quality:	At the time of writing this report, Pinnacle Power, who will own and operate the District Energy scheme on the Greenwich Peninsula, have designed the proposed building to take 10 MW of CHP. This is very much in the early design processes and therefore there are no performance figures available in

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
				order to accurately estimate potential carbon reductions for the Scheme.
		(P) Developers and contractors should follow the guidance set out in the emerging The Control of Dust and Emissions during Construction and Demolition SPG when constructing their development.	Policy 7.14 Improving air quality: Policy 5.3 Sustainable design and construction	Best Practice Guidance in terms of air quality and dust control during construction in line with the Mayor's Air Quality Strategy will be adopted throughout the construction phase. An extensive list of dust controls and mitigation measures, described within the Preliminary CoCP will be implemented throughout the Scheme.
Noise	Noise	(P) Areas identified as having positive sound features or as being tranquil should be protected from noise.	Policy 7.15 Reducing noise and enhancing soundscapes: Development proposals should seek to reduce noise by: ▪ minimising the existing and potential adverse impacts of noise on,	The Scheme will, as far as reasonably practicable, seek to control and limit noise and vibration levels so that affected receptors are protected from excessive or prolonged noise and vibration associated with construction and operational activities
		(P) Noise should be reduced at source, and then designed out of a scheme to reduce the need for mitigation measures.		

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			from, within, or in the vicinity of, development proposals; ▪ separating new noise sensitive development from major noise sources wherever practicable through the use of distance, screening, or internal layout in preference to sole reliance on sound insulation; and ▪ promoting new technologies and improved practices to reduce noise at source.	Acoustic measurements will be incorporated to ensure that acoustic levels are comfortable for users.
Light pollution	Light pollution	(P) Developments and lighting schemes should be designed to minimise light pollution.	Policy 7.5: Public Ream Note 7.19: The lighting of the public realm also needs careful consideration to ensure	External areas design will incorporate lighting specifications that address reduction of light pollution balanced with

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			places and spaces are appropriately lit, and there is an appropriate balance between issues of safety and security, and reducing light pollution.	requirements for safety and local character. A good practice approach would be to use two levels of lighting. A high level lighting network to provide the required levels for illuminating the carriageway, with a secondary network of lower level lighting at a more human scale to be used along the paths and off-road stretches of cycleway and footway. This approach would make the environment less harsh for non-motorised users, while at the same time providing adequate levels of lighting for personal safety.
Water pollution	Surface water runoff	(P) In their aim to achieve a greenfield runoff rate developers should incorporate sustainable urban drainage systems (SuDS) into their schemes	Policy 5.14 Water Quality and Wastewater Infrastructure: Development proposals must ensure that adequate wastewater	SuDs are considered to represent a more sustainable approach to drainage than traditional piped systems. They can be used to reduce the rate of surface water runoff through attenuation of

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
		which also provide benefits for water quality.	infrastructure capacity is available in tandem with development. Proposals that would benefit water quality, the delivery of the policies in this Plan and of the Thames River Basin Management Plan should be supported while those with adverse impacts should be refused. Development proposals to upgrade London's sewage (including sludge) treatment capacity should be supported provided they utilise best available techniques and energy capture. The development of the Thames Tideway Sewer	flows by storage and conveyance of surface water, as well as improve surface water quality. SuDs principals have been incorporated into the surface water system as far as is practically possible due to Scheme constraints and the SuDs measures included provide both flow attenuation and treatment.

SPG and Section		Mayor's Priority (P) and Best Practice (BP) Standards as per SPG 2014	London Plan 2015 key policies	Scheme's performance
			Tunnels to address London's combined	

Appendix C SUSTAINABILITY WORKSHOP

C.1 Introduction

C.1.1 A sustainable design review workshop was held on 18 June 2015 for the Silvertown Tunnel Scheme. The Scheme involves the construction of a twin bore road tunnel providing a new connection between the A102 Blackwall Tunnel Approach on Greenwich Peninsula (London Borough of Greenwich) and the Tidal Basin roundabout junction on the A1020 Lower Lea Crossing/A1011 Silvertown Way (London Borough of Newham) by means of twin tunnel bores under the River Thames and associated approach roads. The Silvertown Tunnel would be approximately 1.4km long and would accommodate large vehicles including double-deck buses.

C.1.2 The Scheme is at reference design stage, with construction due to start in October 2018. The designer is Atkins and the DBFM contractor is still to be appointed.

C.1.3 The workshop was attended by members of the Scheme's Design design team including representatives of TfL, Atkins and Arcadis.

Table C-1 Workshop attendees

Name	Organisation	Contact Details
Marisa Teuma	TfL	MarisaTeuma@tfl.gov.uk
Liz Jenks	TfL	ElizabethJenks@tfl.gov.uk
Martin Beckett	TfL	MartinBeckett@tfl.gov.uk
Jason Saldanha	TfL	Jason.Saldanha@tfl.gov.uk
Roger Bridge	Balfour Beatty	roger.bridge@balfourbeatty.com
Tim Beeson	Balfour Beatty	tim.beeson@balfourbeatty.com
Mark Marshall	Atkins	Mark.Marshall@atkinsglobal.com
Keith Linford	Atkins	Keith.Linford@atkinsglobal.com
Philip Harker	Arcadis	Philip.Harker@hyderconsulting.com
Natalia Fernandez Ferro	Arcadis	Natalia.Fernandez-Ferro@hyderconsulting.com

C.1.4 The aim of the workshop was to cover the Scheme's key sustainability aspects (social impacts, energy and carbon, material use, waste management), the DoW process and to identify sustainable opportunities that could be implemented for the Scheme.

C.1.5 The workshop started with an introductory on the key sustainability opportunities and targets presented below and the key principles underpinning the Scheme's sustainability objectives.

Table 6-1 Scheme's key sustainability opportunities and targets

Opportunity	Target
Social	Aim that suitable excavated material be transported by river instead by road
Materials	where specification allows, a portion of construction materials to include a reused and recycled content
	The need to use primary aggregates will be minimised by the selection of secondary materials, where possible.
	Where specification allows, include materials with low embodied carbon
Waste	Design for recovery of 95% of CD&E waste
Energy	Reducing energy demand
	Embedding energy efficiency and emissions reduction in the design

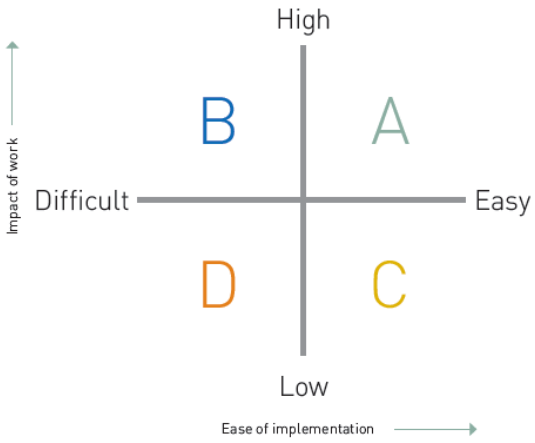
C.1.6 The sustainability workshop was based around the five key principles / questions set out in the Waste and Resources Action Programme (WRAP) guide, 'DoW' and on our previous experience on similar Schemes:

- design for reuse and recovery of materials and components;
- design for off-site construction/manufacture;
- design for materials optimisation;

- design for efficient procurement and delivery systems; and
- design for deconstruction, flexibility and adaptation.

C.1.7 The design team then focused on the Scheme and brainstorm ideas around sustainability and the key five principles to identify areas where sustainability opportunities can be implemented. The ideas raised will then be classified according to the following graph which correlates the ease/difficulty of implementation on the Scheme with the level of impact (low to high) that the idea will have on sustainability.

Figure 6-2 Classification of Scheme's impact



C.1.8 Ideas in Groups C or D may improve sustainability at a macro environmental level; however their impact on sustainability at Scheme level may be relatively low. For the purpose of the workshop (to identify feasible design solutions with a direct impact on sustainability credentials), the focus will be primarily on opportunities in quadrants A and B.

C.1.9 However the design team and TfL were advised that all opportunities need to be considered as they can bring other benefits to the Scheme, especially in the context of wider sustainability initiatives, for example CEEQUAL credits.

C.1.10 Table 6-2 lists the ideas generated during the workshop that were classified against their ranking in terms of impact on sustainability and feasibility. The opportunities marked as Y/Y under the 'A' section are the opportunities that the design team indicated that will definitely be adopted on the Scheme. The opportunities marked as 'Y/M' are the opportunities that could be implemented on the Scheme subject to some further investigation. The opportunities marked as 'Done' have already been adopted on the Scheme.

C.1.11 Atkins will check the proposed targets against the Bill of Quantities and Whole Life Costing relative to materials and recycled content assumptions made prior to their inclusion within the procurement documents.

Table 6-2 Opportunities to improve the Scheme's sustainability

Opportunities to Improve Sustainability		**Ranking**
'A' – High impact, easy to implement		
Design for reuse and recovery of materials and components	A recycled content by value target of 20% has been set for the Scheme. Recycled content % targets could also be considered for individual materials – these targets will not be included within procurement documentation but they could be included as standard, good and best practice within the Sustainability Statement.	Y/Y
	Use of Pulverised Fuel Ash (PFA) or Ground Granulated Blast furnace Slag (GGBS) as cement replacements and recycled / secondary aggregates in concrete will support the achievement of the recycled content targets.	Y/Y
	A 95% recovery of CD&E waste has been set for the Scheme.	Y/Y
	Some demolition materials will be retained / reused onsite (e.g. elements of the drainage is going to be retained and utilised within the current design). The % of materials to be retained / reused is TBC. The demolition forecast that has been included in the SWMP (April 2015, Atkins) has been based on the visual assessment of aerial photos, on previous knowledge and KPIs that Balfour Beatty has developed from previous demolition audits that they have carried out.	Y/M
	Cut and cover balancing will be optimised in order to maximise the reuse of excavated materials.	Y/Y

Opportunities to Improve Sustainability		**Ranking**
	Incorporate % of chambers within the Scheme	Y/Y
Design for off-site construction/ manufacture	Modular construction (pre-cast concrete instead of cast insitu concrete) will be utilised for the tunnel lining segments, improving quality, reducing on-site activities and installation time whilst utilising a controlled, waste optimised construction environment.	Y/Y
	All Scheme gantries will be manufactured off-site improving quality, reducing on-site activities and installation time whilst utilising a controlled, waste optimised construction environment.	Y/Y
Design for materials optimisation	A Materials Management Plan which will support the optimal reuse of site-won materials will be developed for the Scheme.	Y/M
	It is yet to be decided whether traditional steel bar reinforcement or fibre reinforcement will be utilised within the mass concrete of the Scheme – this will be decided at next phase of the design. Fibre reinforcement has benefits over steel reinforcement including a higher strength to weight ratio and better durability.	Y/M
	Space under the deck could be used to house utilities, this option is still under discussion. By utilising this space the design will be able to save space and materials.	Y/M
	The diameter of the tunnel will be optimised to minimise waste and the requirements for lining and piling.	Done

Opportunities to Improve Sustainability		**Ranking**
	Wherever possible, standardisation of materials and building elements will be incorporated into the Scheme design in order to minimise required material resources and the production of waste.	Y/Y
Design for efficient procurement and delivery systems	All of the agreed upon DoW options to be integrated by the Scheme will be embedded in Scheme briefings and procurement.	Y/Y
	The key Scheme sustainability targets will be embedded within all relevant procurement documentation, along with the methodology for monitoring and reporting	Y/Y
	Procure tunnel segments from existing UK market - the tunnel is not of a considerable length, as such the number of tunnel segments can easily be provided by the existing market capacity.	Y/Y
	It is currently estimated that 70% of waste will be transported by river barge, 30% by road due to programme of cut cover and tunnel start prior to breakthrough of TBM. Transportation by barge will be restrained by the moisture content of the excavated material and moisture content will therefore need to be appropriately monitored.	Y/M
	The delivery of a Scheme specific EMS should be investigated. It has been recommended the production of a skeleton EMS with all requirements detailed should be included within the procurement documents.	Y/M
	The TBM will operation 24/7 reducing construction time and associated financial and environmental impacts.	Y/Y

Opportunities to Improve Sustainability		**Ranking**
	Prepare a construction traffic report which will detail the processes in place to ensure optimal ingress and egress to the site for all material resource and waste related road movements.	Done
Design for deconstruction, flexibility and adaptation	Ensure that no materials are incorporated into the Scheme that will be difficult to recycle in the future and record assessment of each material used and a determination of its recyclability in the Scheme Health and Safety File.	Y/M
	The vent stacks may be designed so they can be decommissioned given that when car emissions improve they will no longer be needed. They will be located in the North site where they are not needed for the current development but they will be needed if the residential development proposed for the area is going ahead. If they are not constructed a planning condition will be included for the new development restricting the use of the two lower floors of the buildings.	Y/M
	Elements within the scheme have been considered to enhance visual aspect of the tunnel in case affected new development within the vicinity goes ahead. Also the Scheme has been designed to take the weight of future developments above the tunnel	Done
	Materials utilised should be able to perform during the design life of the tunnel (120 years). Consideration to the durability of the materials to be utilised by the Scheme will be provided at a later stage of design.	Y/M
‘B’ – High impact, more difficult to implement		

Opportunities to Improve Sustainability		**Ranking**
Design for reuse and recovery of materials and components	Set a recycled content by value target of 30%. Recycled content % targets could also be considered for individual materials – these targets will not be included within the procurement documents but they could be included as standard, good and best practice within the Sustainability Statement. The use of Pulverised Fuel ash Ground Granulated Blast furnace Slag as cement replacements and recycled / secondary aggregates in concrete will support the achievement of the recycled content targets.	Y/M
Design for efficient procurement and delivery systems	Minimising air quality and noise impacts - xx% of all plant equipment and machines fitted with emissions controls, diesel particulate filters or Euro stage 3b engines. Air quality targets have been set against major / large plant kit (recognising that smaller contractor / utility providers will be operating existing plant / kit). If purchasing/using equipment from Europe will operate under 25 ppm instead under the 5ppm or 3ppm (stretch target) required in UK.	Y/M
Design for deconstruction, flexibility and adaptation	Opportunity to use local energy generation (onsite or local area e.g. UL backup supply) as opposed to totally obtaining from grid reinforcements will be investigated	Y/M

C.2 Next steps

C.2.1 The design team then identified the opportunities that will require immediate further investigation in order to be implemented on the Scheme. The table below summarises the key actions required for the implementation of these ideas at the next Scheme stage.

Table 6-3 Opportunities that will require further investigation

Opportunity	Responsibility	Quantification requirement	Inclusion in the documents	Procurement implementation	Action
Use materials with high recycled content	Atkins	Yes	SWMP and Sustainability Statement	Drawings and Specifications	Check proposed targets against Bill of Quantities relative to assumptions made re materials and recycled content. Gather information throughout the Scheme for a 'lessons learned case study' using the NetWaste Tool
Materials retained / reused onsite	Atkins	Yes	SWMP and Sustainability Statement	Drawings and Specifications	MB to confirm the % of materials/elements to be retained / reused/retained onsite from demolition and construction works (e.g. drainage, chamber, etc.)
Materials Management Plan	TFL	No	Sustainability Statement		Investigate the possibility of the production of a Materials Management Plan which will support the optimal reuse of site-won materials and ensure that no materials are incorporated into the Scheme that will be difficult to recycle in the future. Also, materials utilised should

					be able to perform during the design life of the tunnel
Use of fibre reinforcement instead traditional steel bar reinforcement	Atkins	No	Sustainability Statement	Drawings and Specifications	Clarify whether traditional steel bar reinforcement or fibre reinforcement will be utilised within the mass concrete of the Scheme
Space under the deck to house utilities	TFL	No	Sustainability Statement and Energy Strategy	Drawings and Specifications	Clarify whether the space under the deck is used to house utilities
Transport of waste by river	Atkins	Yes	Sustainability Statement and Transport Statement		Investigate the possibility of improving the 70% of waste transported by river
Environmental Management System	TFL / Hyder	No	Procurement documents		Investigate the delivery of a Scheme specific EMS. It has been recommended the production of a skeleton EMS with all requirements detailed should be included within the procurement documents. Hyder to provide a brief
Decommissioning of vent stacks	Atkins	Yes	SWMP and Sustainability Statement	Drawings and Specifications	Clarify whether the vent stacks will be included within the design
Minimising air quality and noise impacts	Atkins	Yes	Sustainability Statement	Specifications	The target presented of 80% was considered unrealistic due to the nature of the Scheme. MM to check what has been done in Crossrail.

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Appendix D TfL's Sustainability Toolkit

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TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
Economic progress	Tackling congestion and smoothing traffic flow	Will freight be transferred via rail or other sustainable modes?	A sustainable design review workshop was held with TfL on 18 June 2015 for the Scheme. As agreed at the sustainable design review workshop, and in accordance with the London Plan, TfL aims to transport suitable excavated material by river instead of road. The CLP would manage all types of freight vehicle movement to and from the Scheme. Adoption of river transport for the construction materials and excavated materials would significantly reduce the HGV movements required on the local road network. It is estimated that spoil removal by barge could remove over 178,000 two-way lorry movements from the road network over the four year construction period. It is likely that the non-contaminated excavated materials will require disposal by river and the hazardous and less standard materials by road rather than by river. In addition, TfL is exploring the use of river vessels to transport construction materials and waste. While the exact configuration of the mooring has not been determined, a jetty has been proposed to enable the operation of HAV ships at Thames Wharf (provided and named after HAV shipping, a Norwegian limited holding company focused on short sea shipping). A Preliminary SWMP has been developed for the Scheme and would be refined and updated as the design and the Scheme progresses.

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
			The SWMP would consider how the waste hierarchy can be applied and details how all spoil is to be managed. The SWMP would also provide a framework for checking compliance with waste legislation and the Duty of Care.
		Will reliability be affected for all users (station and approach users)?	Reliability is expected to be one of the most significant benefits of the Scheme and is of particular importance to business users including freight. The design of the Silvertown Tunnel would allow for full clearance by higher vehicles, including HGVs and double-decker buses. It therefore would reduce the propensity for certain types of incidents to occur, including those relating to congestion and those involving over-height vehicles attempting to use the northbound Blackwall Tunnel bore and would offer freight operators more route choices. Much lower congestion would also reduce congestion-related incidents such as vehicle shunt accidents. When there are closures at the Blackwall Tunnel, the journey times and congestion impacts on the wider road network and on adjacent river crossings would be lessened because there is an alternative crossing available. This includes relatively short closures as well as potential longer-term closures associated with major incidents.
		Will public transport	The Scheme would create opportunities for significant improvements in cross-river bus services, which are vital to the ability of residents in the regeneration areas to access employment opportunities.

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
		capacity be improved?	There is only one existing cross-river bus service in this area (the service 108 through the Blackwall Tunnel, linking Greenwich to Stratford along the A102/A12) – the geometry of the tunnel and the major congestion and reliability issues restrict the ability to improve cross-river bus services here. Fundamental to the Scheme is the creation of a new strategic bus corridor with the capacity to carry up to 9,000 people in each direction during the peak period. This would significantly improve connectivity between south-east and east London. The Scheme would create excellent connections between Greenwich, Eltham. Charlton and the Grove Park areas and the Royal Docks area and other parts of LB Newham and LB Tower Hamlets. There would also be a secondary effect that route extensions to/from cross-river links would also help connect other parts of RB Greenwich and LB Newham to opportunity areas on either side of the river. In effect the Scheme opens up the area to many new potential bus connections to 'stitch together' the regeneration areas on either side of the river.
		Will the Scheme affect journey times?	The scheme would be expected to lead to a reduction in the length of the morning and afternoon peak periods, principally as a result of the reduced congestion and additional capacity that the scheme would provide. Effectively, the scheme would enable more motorists to travel at the times they wish, rather than earlier or later to avoid the worst of

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
			the traffic. With reduced congestion, the scheme would also result in an overall reduction in travel times across the network. Journey times through the Blackwall Tunnel in peak periods and peak directions would be reduced by up to 20 minutes taking into account reliability benefits. In particular, the Silvertown Tunnel would relieve congestion at the A102/A13 East India Dock Road junction, improving northbound journeys during the AM peak hour by some 13-23 minutes.
		Will the Scheme encourage people to use private transport less?	The Scheme would increase the access to the labour market by public transport, particularly in the London Boroughs of Greenwich and Newham. The Scheme would also offer an extra travel option for people travelling to and from the area. These factors may potentially encourage to travel less using private transport.
	Improving productivity and competitiveness	Will the Scheme affect growth in key sectors?	The Scheme will create opportunities for new cross-river bus services to improve public transport links between south-east 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 in the bus routes that could be extended across the River Thames, as well as greater capacity.

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
			The Preliminary Distributional Impact Assessment shows that more than half of households within the impact area do not have access to a car. Improved public transport links will increase the access to employment opportunities for people living in the impact area and it follows that this will particularly benefit people living in households without a car. Public transport accessibility to employment has been explored in detail in the PTA and Preliminary OBC.
		Will the Scheme impact local/ regional businesses?	In relation to the tunnel works at the Silvertown and Greenwich sites, there will be some localised impacts affecting access to businesses in the immediate area, for which a range of mitigation measures have been identified in the PTA. During Scheme operation, a wider range of potential impacts have been identified relating both to effects arising from changes in road traffic through to effects of user-charging on personal affordability and businesses. Key findings from this preliminary assessment include that: ▪ there would be connectivity improvements across a wider area as a result of the Scheme, benefiting groups both within and outside of the immediate study area; and ▪ potential differential impacts experienced by businesses with a high utilisation of LGVs, for which Asian businesses may be more highly represented within the local area, should be considerably offset by wider benefits to business brought about by the Scheme such as

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
			improved access to cross-river markets and improvements in business journey times and reliability. In addition, Chapter 4 of the Preliminary EqIA identified that LGVs play an important part in all sectors of London's economy, with a 'significantly higher proportion of London's Asian community represented as business owners in the wholesale and retail business.' Whilst the higher representation of Asian populations within the local study area of LB Newham, LB Tower Hamlets and RB Greenwich means that the potential could exist for a disproportionate impact on this group, this is likely to be offset by the wider benefits to business from improved access to cross-river markets and improvements in journey times and reliability.
		Will the Scheme affect operating costs? E.g. minimise whole life cost	The Scheme comprises not only the planning and construction of the Silvertown Tunnel but also the introduction of a road user charge for both the new Silvertown Tunnel and the existing Blackwall Tunnel. It is anticipated that the charge will be collected from drivers using a similar method employed for collecting the central London Congestion Charge. Operating costs for the collection of the road user charge have been provided by TfL. These costs include elements such as transactional charge costs, and monthly maintenance costs for the Automatic Number Plate Recognition (ANPR) cameras. The Silvertown Tunnel charge collection operating costs are based on the traffic flows. Traffic flows for intermediate years between 2021, 2031 and 2041 have been

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
			interpolated on a straight-line basis, between the values for the three model forecast years (2021, 2031and 2041). Charge collection costs beyond 2041 to 2080 have been assumed at the 2041 value. The transactional collection costs have been estimated assuming a 5% evasion rate to allow for the higher costs associated with PCN issue and assurance. Transactional costs are the process charges for the registration, charging and enforcement backend services including contact centre costs. Operating costs have also been provided by TfL. These costs were converted to 2010 prices, adjusted for indirect taxation and discounted over 60 years. The total discounted cost associated with user charge collection is £414m (2010 prices).
		Will the Scheme deliver value for money through responsible procurement practices?	Responsible procurement practices will be promoted thorough the procurement stages of the Scheme. TfL has strong Green Procurement Policy framework, which will be implemented to the Scheme.

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
		Will the Scheme have long term effect on costs through knowledge sharing and bringing firms closer together	It is currently not anticipated that the scheme will have long term effects on costs through knowledge sharing and bringing firms closer together.
	Improving employment and earnings	Will employers' access to labour markets be affected?	At present the labour market in east London is not operating optimally, with the vast majority of people that work east of the Blackwall Tunnel highly likely to also live on the same side of the river. This restricts firms' access to specialist skills, with lower levels of competition for jobs. With the Silvertown Tunnel, employers north of the River Thames would see more than a 10% increase in the size of their labour market catchments living within a 45 minute drive time due to the faster journey times for those living south of the river wishing to access job opportunities to the north. Improvements in access to the labour market would be particularly important to the Royal Docks, where tens of thousands of new jobs are

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
			planned, but where access to the labour market south of the river is currently poor. Furthermore, Canary Wharf, which has capacity to accommodate 100,000 new jobs, could see benefits from a greater potential labour force, as improved commuter coach services bring in more people from Kent and east London.
		Will it affect employment levels in the local area?	The Scheme will have an overall positive economic effect on Greater London as a whole, through direct and indirect employment generation, improving access to employment opportunities for residents and improving connectivity between employment areas. Chapter 4: Scheme Description of the PEIR Volume I identifies that the estimated peak number of personnel working on the Scheme will be approximately 1,010 people.
		Will it impact the essential skills levels in the workforce?	The Scheme provides an opportunity to develop good practice in terms of the use of a proportion of the workforce from local communities, development of skills and training programmes, and apprenticeship schemes.
		Will the London Living Wage be paid to all employees in	It is currently assumed that the London Living Wage will be paid to all employees in the supply chain.

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
		the supply chain?	
		Will it impact the accessibility to employment and training opportunities, particularly for disadvantaged sections of the community?	The Scheme will enable the provision of new cross-river bus services offering improved public transport links in south east London. It will improve journey time reliability for all road users, by reducing congestion and by reducing the number of incidents that currently occur at the Blackwall Tunnel that cause delays and unpredictability in the operation of the road network. Services and facilities considered here include those that may have direct relationships with specific equalities groups, including education (young people), healthcare (older people, disabled people), religious institutions (faith groups) and social care (older people). Part of the services/facilities offered may include trips using private hire vehicles (for example school trips, day trips, provision of a collection/drop-off service for individual users). Relevant facilities identified as part of the PEIR Chapter 7: Communities and Private Assets
Climate Change	Tackling CO_2 emissions	Will the scheme impact CO2 emission levels from private	Although the potential for modal shifting in behaviour from car to bus is reflected in the Scheme's PTA forecasts, it appears unlikely to happen to any significant extent. There is also potential for some switching from car use to public transport as the Scheme would present a significant opportunity for introducing fast and reliable cross-river bus services to a range of

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
		transport (i.e. Cars)?	destinations both south and north of the River Thames, and could also make coach trips more attractive.
		Will the scheme use or change the level of use of cleaner technologies, renewable energy, regenerative energy or energy conservation techniques?	It should be noted however that the Scheme is not well suited to the employment of many passive measures typically applied to buildings. Nonetheless, the design of the Scheme will be fully integrated with the PES in order to identify and bring about savings in CO2 emissions as the Scheme progresses. TfL are working closely with Arup via the GLA's "Decentralised Energy for London" programme to ensure the Scheme maximises synergies and potentials from the local plans. Discussions will continue around making passive provision for the heat network to use the tunnel to connect across the river as well as reviewing potential for the Scheme to contribute waste heat to the network. However, given the negligible heating demands of the Scheme, the potential for carbon savings through connection to a heat network would be minimal. The cost and embodied energy associated with the infrastructure required to allow this connection would therefore likely exceed the benefits of the connection.
		Will the scheme use or change the level of use of	A sustainable design review workshop was held with TfL on 18 June 2015 for the Scheme. As agreed at the sustainable design review workshop, and in accordance with the London Plan, where

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
		low carbon materials and resources?	specification allows, the Scheme will include material resources with low embodied carbon.
		Will it impact public transport emissions?	Due to the use of the charging Scheme, the operation of the Silvertown Tunnel is not expected to result in an increase in road traffic in this part of London. As a result the Scheme will redistribute current levels of road transport air pollution. Changes in air quality are partly as a result of improved traffic flows (i.e. less stationary traffic) and partly due to the diversion of road traffic through the Silvertown Tunnel. The main changes are expected to be associated with less traffic, and therefore improved air quality, at the Blackwall tunnel approaches; and more traffic, and therefore reduced air quality, at the Silvertown Tunnel approaches. However, improvements to bus routes due to the Scheme may also increase public transport use, reducing private car related emissions and increasing public transport related emission.
	Adapting to a climate change	Does the scheme consider retrofitting to climate change? For	A number of measures have been looked at to reduce energy consumption and greenhouse gas emissions during the construction phase. The principal options include the Scheme's design optimisation to also optimise energy performance and CO_2 emissions during the operational phase (e.g. through the optimisation of daylighting, orientation, site layout and energy efficient lighting).

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
		example alter insulation, building fabric to increase energy efficiency	
		Is this project at a risk of flooding?	The northern and southern portals of the Scheme are located within defended Flood Zone 3, subject to a high residual risk of flooding from the River Thames. The Scheme's design is such that there would be no construction phase impact on the integrity of existing flood defences, for example, any clash with river wall foundations would be avoided and settlement from tunnel boring would be minimised and monitored. Therefore during the construction phase of the Scheme, as detailed in the FRA, baseline standards of fluvial/tidal flood protection would be maintained. According to the FRA, the majority of the Scheme is located in an area of 'very low' surface water flood risk. There are some small isolated areas where the Scheme is at low, medium and high risk of surface water flooding, for example, the road which forms the southern portal of the tunnel is classed as at low risk of surface water flooding.
		Will this project be	Adaptation, along with mitigation, is an essential part of addressing the challenges associated with climate change. While adaptation

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
		able to adapt to a changing climate?	addresses the impacts resulting from a changing climate, mitigation refers to efforts to limit the anthropogenic effects of climate change. Climate change adaptation has been considered within the Materials Chapter (Chapter 16 of PEIR Volume I) and a PES which have been produced as part of the pre-application consultation documents. The Materials Chapter reports on the estimated carbon emissions that would be produced by the Scheme during construction and the PES throughout operation. Potential adaptation mitigation measures to reduce these estimated emissions are included within this PSS (see 5.3.36) and presented within the Materials Chapter (Chapter 16 of PEIR Volume I) and the PES.
	Improving resource efficiency	Will the project impact material efficiency in all aspects of the design (i.e., not overdesign)?	Responsible sourcing would encourage contractors to apply good practice standards to source material resources from suppliers with responsible sourcing certification as far as practicable. To this end, the DBFM contractor would adopt the BES 6001 Responsible Sourcing of construction products standard. The extraction of primary aggregates (e.g. sands and gravels) and lime from quarries will deplete finite material resources. The need to use primary aggregates will be minimised by the selection of secondary material resource, where possible. The maximum amount of secondary material resources will be specified for the concrete subject to not compromising its performance.

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
			Where practicable, the specification of concrete replacements such as Ground Granulated Blast furnace Slag (GGBS) and Pulverised Fly Ash (PFA) will be considered to reduce embodied carbon. Consideration of the durability of the material resources to be used by the Scheme (considering the 120 year design life of the tunnel) will be provided at a later stage of the design. Modular construction (e.g. precast concrete instead of cast in situ concrete) will be utilised for the tunnel lining segments; improving quality, reducing onsite activities and installation time whilst utilising a controlled, spoil optimised construction environment. In addition, the Silvertown Tunnel segments would be procured from the existing UK market when possible.In addition, a Materials Management Plan (MMP) would be prepared by the DBFM contractor to ensure that materials are handled and used in a way that prevents harm to human health and pollution of the environment.
		Will it promote efficient water is use?	Water supply for demolition and construction phases may result in a short term increase in supply volumes to the site. Water saving measures would be advocated by the CEMP and adopted where possible thereby reducing the impact on the water supply network. Means of reducing water consumption that would be adopted include: ▪ selection and specification of equipment to reduce the amount of water required;

TfL's Toolkit Theme	TfL's Toolkit Indicator	Guiding question	Scheme's response
			▪ implementation of water reduction initiatives such as turning off taps, plant and equipment when not in use both onsite and within site offices, canteens and laboratories; ▪ use of stored water collected by the drainage systems for dust suppression and if required, pumps would be provided at each storage lagoon for use in filling water bowsers; and ▪ use of water from Thames Water mains piped potable supplies for site offices, canteens and laboratories consumption and implementation of measures to encourage water use efficiency. Once the construction stage is complete the demand on water resources will be reduced from that associated with the construction stage, with water use associated with periodic tunnel cleaning and supply of water required for firefighting.
		Will it impact the proportion of waste that is reused, recycled or converted to energy?	The Scheme has adopted principles of DoW during the construction to minimise material resources' use and construction spoil arisings. The Scheme will also adopt a stringent spoil control strategy, with the intention of achieving a minimum quantity of spoil being taken off site to a licensed tip. Spoil management compounds would be set up to handle incoming spoil from construction activities. The project has set a 95% for recycling and reuse of the materials arising from the construction of the Scheme and operational infrastructure. 'Green procurement' objectives would be defined and

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			integrated into the procurement and specification process to use reused or recycled products and construction materials.
		Will the scheme use ethically sourced materials?	Responsible sourcing would encourage contractors to apply good practice standards to source material resources from suppliers with responsible sourcing certification as far as practicable. To this end, the DBFM contractor would adopt the BES 6001 Responsible Sourcing of construction products standard.
		Will the project influence the construction supply chain with regard to resource efficiency and quantity of all forms of waste?	The project has set a 95% for recycling and reuse of the materials arising from the construction of the Scheme and operational infrastructure. 'Green procurement' objectives would be defined and integrated into the procurement and specification process to use reused or recycled products and construction materials. The need to use primary aggregates will be minimised by the selection of secondary material resource, where possible. The maximum amount of secondary material resources will be specified for the concrete subject to not compromising its performance. In addition, where practicable, the specification of concrete replacements such as Ground Granulated Blast furnace Slag (GGBS) and Pulverised Fly Ash (PFA) will be considered to reduce embodied carbon. Modular construction (e.g. precast concrete instead of cast in situ concrete) will be utilised for the tunnel lining segments; improving

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			quality, reducing onsite activities and installation time whilst utilising a controlled, spoil optimised construction environment. The Scheme's gantries would be manufactured off-site (whenever possible) improving quality, reducing onsite activities and installation time whilst utilising a controlled, spoil optimised construction environment. The Silvertown Tunnel segments would be procured from the existing UK market when possible.
		Will it impact the levels of energy efficiency?	Although there are physical limitations associated with a tunnel, there remains ample opportunity to incorporate sustainability and energy efficiency measures as part of the Scheme. The PES evaluates the opportunities for reducing minimising the CO_2 emissions generated by the use of the tunnel and following these evaluations outlines the energy strategy for the Scheme. The DBFM contractor would address working methods that reduce energy consumption through the Preliminary CoCP and would aim to continually improve energy efficiency on the work sites. The DBFM contractor would also seek to minimise both power consumption and the peak power required on all the works associated with the Scheme. This strategy will incorporate two methods – first, phasing of the works and demands to minimise the overall peak energy demand, and secondly a requirement to investigate and adopt

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			methodology, equipment and operational practices throughout the site, including site offices and other facilities, that will minimise power consumption and make the whole construction process more energy efficient.
Safety and security	Improving security and resilience	Will it impact the security of the transport network?	The PTA indicates that all public transport waiting areas (PTWAS), especially isolated or secluded bus stops such as BS16, BS13, BS6 and BS9, would benefit from more provision of dedicated and advertised closed circuit television (CCTV), which would reinforce perceptions of safety and add to security measures.
		Will the scheme reduce the perception of crime on the public transport network?	The Scheme's design will seek to design out crime and to help people feel safe. 'Secured by Design' principles will be observed. The Scheme is not expected to have any material impact on security issues in the area. Some elements of the highway works to link the tunnel to the existing road network may affect the level of natural surveillance affecting the personal security of pedestrians in the area. However, development adjacent to the crossing is likely to have a greater impact on security than the tunnel itself. The design of the tunnel will incorporate a range of security measures through the layout, lighting, alarm, CCTV coverage and signage used to reduce the potential and perception of crime.

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		Will the resilience and reliability of the transport network be affected?	The PTA describes how the reliability and resilience of the current cross-river highway network in east London is adversely impacted by a lack of alternative crossings, the ability of existing crossings to meet demand and their susceptibility to incidents and closures. These factors combined result in a sub-optimal network which leads to unreliable journey times for users and poor levels of service when incidents and closures occur. The Scheme would provide a new high-capacity highway crossing with full dimensional clearance within close proximity to the Blackwall Tunnel, and as part of the scheme user charges will be implemented at both Silvertown and Blackwall Tunnels to manage levels of demand. The Scheme will help to improve the current reliability and resilience of the highway network, primarily by facilitating: ▪ reduced congestion; ▪ fewer incidents; and ▪ the ability to divert vehicles when incidents and closures occur. In addition to the day-to-day benefits listed above, the Scheme will also enable improved asset management of the Blackwall Tunnel and considerably enhance network resilience in the event of a long-term closure of the Blackwall Tunnel.
		Will it affect the number of	The operational impacts to road safety, accessibility and active travel are complex. The Scheme will be designed to current standards and it

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	Improving transport safety	people killed or seriously injured on London's roads?	takes road safety into account. It is estimated to reduce the number of traffic collisions (a reduction of 683 accidents over a 60 year period, or a reduction of 0.3% compared to the Reference Case).
		Will it impact the safety of users and all people involved in the project?	No, the Scheme will be designed to high safety standards, which will have positive impact on the safety of users and all people involved in the project. In addition, to further improve the safety of vulnerable road users on London's roads, TfL has mandated in all new and existing contracts that the suppliers and their sub-contractors who deliver to, collect from or service a TfL project, premise or site must comply with certain safety requirements known as 'Work Related Road Risk' (WRRR). These requirements include: ▪ accreditation to the Fleet Operator Recognition Scheme (FORS); ▪ enhanced vehicle safety equipment; ▪ Safe Urban Driving training and regular Driver and Vehicle Licensing Agency (DVLA) licence checking; and ▪ collision and incident reporting.
	Tackling crime and disorder	Will it affect the level of crime on the public	No, 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.

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		transport system?	In addition, there are significant numbers of other users at all times of the day and indeed the level of congestion precludes obvious escape routes.
		Will it affect the perception of crime?	The design of the tunnel will incorporate a range of security measures through the layout, lighting, alarm, closed-circuit television (CCTV) coverage and signage used to reduce the potential and perception of crime.
Quality of life	Improving built structures and streetscapes	Will it promote high quality design and sustainable construction methods?	Yes, high quality design and sustainable construction methods will be employed as far as feasible. Whilst there are a number of listed buildings within 1km of the Scheme, it is not considered that there will be any discernible direct impacts to the settings of heritage assets during the construction and operational phases of the Scheme. Direct physical impacts to sub-surface archaeological remains may occur during the construction phase of the Scheme However, it would be possible to mitigate any impacts to sub-surface archaeological remains caused during the construction phase of the Scheme through archaeological recording.
		Will it affect noise levels?	The schemes design will seek out to reduce noise and vibration impacts to a minimum. Noise and vibration impacts will be minimised through the implementation of a CEMP as well as employing best

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			available techniques. The scheme is located in an area of existing high noise levels. The Scheme will reduce operational noise impacts through the use of noise barriers and low noise surfacing where possible. Impacts from the tunnel ventilation system will be reduced through design and commercially available stack silencers.
		Will it affect the condition of the built environment (including litter and graffiti?	TfL devised a series of six design principles that establish guidelines for the design of the permanent elements and spaces created by the project. These overarching design principles are: ▪ celebrate functional components through articulation of portals and associated structures and create potentially iconic landmark structures; ▪ embedding public art into built fabric to be experienced by all; ▪ integrate landscape to tie the scheme into it's surrounding context and provide new surface linkages; ▪ connect communities that are isolated or severed by the existing road infrastructure through appropriate mitigation; ▪ sensitive lighting that not only fulfils a functional requirement, but also brings interest and enhances townscape at night specifically in respect of improved pedestrian and cycle lanes; ▪ use quality materials that will be robust and through innovative application and use can become instantly recognisable; and ▪ acknowledge that this is in an area of change and the scheme needs to be future proofed to an evolving urban context.

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		Will it affect the physical quality of the built environment?	Yes, the Scheme will provide high quality build environment.
	Improving greenspaces	Will it affect the number and/or quality of open/public spaces?	The Scheme landscape design will contribute positively to the development of the area in terms of visual amenity. The design includes a varied and visually interesting combination of trees and herbaceous plants, including wildflower meadow planting. At the northern portal, where at-grade pedestrian and cycle links are incorporated, the design includes areas of green space and brings together areas of hard surfacing with clusters of tree planting and under-storey vegetation. This will enhance the urban realm and improve the quality of life of the local residents. In addition, the Scheme would employ best practice, during the construction phase, to minimise visual disruption (e.g. protection of existing vegetation to be retained and targeted use of hoarding to screen construction sites, as set out in the Preliminary CoCP).
		Will it enhance the quality of the public realm?	The proposed infrastructure (including ventilation stack, if required) would sit within a surrounding context formed by existing highway and railway structures, and industrial areas.

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		Will it conserve or enhance natural or semi-natural habitats?	The Site was found to be industrial in nature and predominantly comprised hard standing and buildings, with scattered semi-natural habitats that have value within this highly urbanised environment. Following mitigation currently confirmed there will be a net permanent deficit of 16,230m^2 of semi-natural habitat across both sites. Proposals for how this deficit can be mitigated are made in Chapter 9: Terrestrial Ecology of the PEIR Volume I. For mitigating the slight adverse effects of permanent habitat loss the natural or semi-natural habitats will be replaced with trees, shrubs, brownfield habitat, species rich grasslands and at least two waterbodies. The mitigation will also include suitable foraging and sheltering habitat for terrestrial invertebrates and foraging and nesting habitat for black redstart. Parameters for delivering operational mitigation for breeding birds and invertebrates will also be developed and clearly presented within the ES. Therefore there will be no adverse residual effects due to permanent habitat loss for any receptor.
		Will this project affect road or public transport customer satisfaction?	Yes, as a result of reduced journey time. The reduction in journey time will increase capacity and contribute to alleviate traffic congestion.

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		Will the project affect healthy lifestyle choices (including promoting walking and cycling)?	While the proposed scheme would make significant improvements to local pedestrian and cycling connectivity, no provision was made to allow pedestrians and cyclists through the tunnel. This was because such cross river connectivity at this point was provided by the Emirates Air Line cable car. However, further design work has been undertaken to explore the feasibility of providing facilities within the proposed Silvertown Tunnel for pedestrians and cyclists. The Preliminary TA notes that it is a requirement of the Scheme to ensure that all walking and cycling routes in the vicinity of the tunnel portals are re-instated or are replaced with direct, safe and comfortable alternative routes. However, since there is no walking and cycling provision through the Tunnel included in the Scheme, a substantial change in healthy lifestyle choices is not expected.
	Enhancing physical wellbeing	Will this project impact London's air quality including levels of air pollutants	An air quality assessment has been included in Chapter 6: Air Quality of the PEIR Volume I. It was prepared for the Scheme to identify potential impacts on local air quality and specify appropriate mitigation measures. The implementation of the Scheme is predicted to result in both improvements and deterioration in air quality at worst case receptors. In general there are more receptors where concentrations of NO_2, PM10 and PM2.5 are predicted to decrease than receptors where

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		such as nitrogen oxides and particulates?	concentrations are predicted increase. A definitive judgement was not made in terms of the overall significance of the Scheme in the operational phase as all receptors will need to be modelled that exceed AQS objectives in line with the current guidance (particularly in relation to incorporating IAN 185/15 into the modelling methodology). A definitive judgement will be made in the ES when the air quality modelling has been updated speed banding of the traffic data has been completed and all receptors (rather than worst case receptors only).
		Will the project impact stress levels of users?	Total user net benefits (time and operating cost benefits less any charges paid) are positive in total and for each user group (commuters, business and other travellers). The improved certainty of journey time is likely to reduce driver stress. The reduction in incidents currently occurring in the Blackwall Tunnel will also have a strong positive impact on drivers' perception of safety. The Blackwall Tunnel northbound bore is currently a very stressful environment for drivers due to its geometry, height restrictions and the need to pay attention to large vehicles on the tight corners. The availability of a tunnel with more comfortable driving conditions and the transfer of larger vehicles from Blackwall to the safer Silvertown Tunnel will reduce this stress. The additional bus provision will provide more certainty and reduce delays and stress for bus passengers.

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		Will it impact the health of the local residence?	It is anticipated that the Scheme will have marginal indirect positive effects resulting from regeneration, stress reduction and employment opportunities.
Transport for all	Improving access to the transport system	Does it impact physical or attitudinal barriers to using the transport network?	The Social Impact Appraisal presents a summary assessment of accessibility in the context of the availability and physical accessibility of transport: The Scheme includes improvements to four existing bus routes and additional cross-river bus links, which will be of particular benefit to older or mobility impaired persons who may find interchange at North Greenwich difficult. In addition, a Public Transport Access Level (PTAL) assessment was also undertaken to measure the impact on accessibility of potential enhancements to the bus network as a result of the Scheme. PTAL shows that new cross-river bus links would lead to wider travel horizons for residents of some nearby regeneration areas, providing low-cost travel options to access employment and education opportunities on the opposite side of the River Thames.
		Will it affect access to high quality public services?	The Silvertown works site will not impact on the operation of DLR services or the EAL, and there are currently no scheduled bus services on the Tidal Basin Roundabout. For the duration of the works, key public transport access routes would remain open. This includes the stairwell between the Tidal Basin

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			Roundabout and the Charrington Steps bus stop on Silvertown Way situated above the roundabout. The pedestrian access route between the West Silvertown DLR station and the employment sites around Dock Road would also remain open. The diversion route for Dock Road (which would be closed for the duration of the works) is described later in this chapter. The Greenwich works will not impact on the operation of North Greenwich bus station, the Jubilee Line station, or the EAL. However, there will be some diversions to existing bus routes during the works. In addition to the impact on buses, the closure of bus stop MV on Tunnel Avenue in phase 3 would also impact on some northbound commuter coaches from Kent that currently use the stop. To mitigate such impacts, TfL would seek alternative arrangements in partnership with coach operators wishing to continue stopping in the vicinity during the Silvertown Tunnel construction phases. After completion of construction works, the tunnel portals would not have a material impact on the pedestrian access routes to nearby stations. The access routes to a potential new DLR station at Thames Wharf would remain unobstructed. Two key objectives of the Silvertown Tunnel project are to improve resilience and road network performance in and around the Blackwall Tunnel, which would benefit local bus services. The existing route 108,

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			which is the only cross-river London bus service east of Tower Bridge, would benefit from improved performance in terms of reliability and journey times arising from reduced congestion at the Blackwall Tunnel.
		Will it cause modal shift to or from more sustainable forms of travel?	Modal shift covers users who switch between modes (e.g. public transport) following implementation of the Scheme. Users may switch to car from public transport, and vice versa, due to the combination of the new Silvertown Tunnel, the user charge, and improved cross-river bus connections. Although the potential for modal shifting in behaviour from car to bus is reflected in the Scheme's PTA forecasts, it appears unlikely to happen to any significant extent. There is also potential for some switching from car use to public transport as the Scheme would present a significant opportunity for introducing fast and reliable cross-river bus services to a range of destinations both south and north of the River Thames, and could also make coach trips more attractive.
		Will it impact public transport connectivity?	Fundamental to the Scheme is the creation of a new strategic bus corridor with the capacity to carry up to 9,000 people in each direction during the peak period. This would significantly improve connectivity between south-east and east London, particularly to parts of the Royal Docks, where there are plans to accommodate tens of thousands of new jobs. This would facilitate an increase in access to 9,000 jobs for

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			residents of regeneration areas in RB Greenwich and 6,000 jobs for residents of regeneration areas in LB Newham;
		Will the affordability of travel be affected?	The introduction of user charging on both the Blackwall and Silvertown Tunnels will have a direct impact on the affordability of travel by car and public transport for some users. Personal affordability is a key distributional impact that may affect different groups of people positively or negatively to different extents. For example, lower income groups experience the impacts of travel affordability more strongly than higher income groups. The Economic Assessment Report identifies that users will have significant time saving benefits, the monetary value of which are greater than the cost of user charges. 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. People with disabilities may also suffer significant disbenefits when faced with higher costs, due to limited transport choices, whilst unemployed adults also have difficulties in accessing services (including training), again due to low incomes. Enhancements to bus services included with the Scheme will impact on the affordability of travel by public transport for those who will be able to take cross-river trips by bus instead of by more expensive modes such as the Emirates Airline or the Underground.

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	Supporting regeneration and spatial development	Will it impact the provision of appropriate services and facilities for new residents?	The severance impacts of the Scheme, included within the Preliminary DIA, indicate the extent to which the Scheme impedes residents' access to local community facilities and services. 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 will be reduced. The severance impact areas identified within the Preliminary DIA (Blackwall and South Bromley by Bow and Greenwich Peninsula) contain several amenities that could attract trips from users in the wider area as well as local residents. Across the impact area there are slight positive impacts for children and no-car households.
		Will the eligibility of new office, retail or commercial developments be affected?	The area is expected to attract new businesses development opportunities. Compared to a rail-based public transport scheme, the improvements in connectivity expected with the Silvertown Tunnel would be dispersed over a much wider area. Tangible impacts in the efficiency of the local economy, improved access to jobs and services, as well as

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		Will it affect the attraction of the area to new people and businesses?	improvements in the perception of the area, could mean that future levels of development may be higher as a result of the Scheme. The EAR identifies that there is a strong and positive relationship between new investment in transport and the growth of a local economy and development. East London is a highly deprived area that has considerable potential to accommodate the housing and commercial development needed to support London's economy, yet the River Thames remains a major barrier to cross-river traffic.
	Enhancing diversity	Does this project meet the diverse needs of all users now and in the future?	The Scheme brings improvements in future access across the river to facilities and amenities (education, leisure, social networks, food choice, etc.). However for some people, particularly those on low income who are dependent on car travel, the Scheme will have an impact on the affordability of accessing current cross-river facilities and amenities due to the introduction of the charging scheme at the Blackwall Tunnel. People on low incomes reliant on cross river amenities, particularly their place of work or education, would be particularly vulnerable in this regard. While the proposed scheme would make significant improvements to local pedestrian and cycling connectivity, no provision was made to allow pedestrians and cyclists through the tunnel. This was because such cross river connectivity at this point was provided by the Emirates Air Line cable car.

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		Does this project meet the diverse needs of all people involved in the project?	The Preliminary DIA includes an appraisal of accessibility that focuses on public transport as a means of accessing employment, services and social networks. Findings from the Preliminary DIA conclude that there would be a: • slight beneficial impact for older and disabled people and those without a car being able to reach their nearest town centre (increasing the number of residents able to reach their nearest town centre in a shorter time period); • large beneficial impact on the number of 16-25 year olds able to access the nearest university campus. There will also be a beneficial impact for people from outside the area that travel into the area to use local amenities; and • moderate beneficial impact on public transport accessibility to the nearest general hospital for households with no car. The Preliminary SIA for the Scheme also identifies that there is likely to be a positive impact on low-income public transport users as a result of the new cross-river bus links, which will reduce the need to use either the London Underground or EAL services, both of which are more expensive.

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		Does this project promote personal well-being, social cohesion and inclusion?	No provision for active modes is included in the Scheme reference tunnel design. A small mode shift from car to public transport will lead to a small increase in physical activity The affordability of accessing new cross-river facilities and amenities and their living in an increasingly desirable area may also disproportionately affect current and future residents on low incomes. The sensitivity of the current and future populations to changes in social cohesion and lifetime neighbourhoods is considered to be 'high'. Based on the sensitivity of the affected population, the magnitude of the potential impact and existing mitigation proposed with the Scheme (notably the use of the community fund), the HIA identifies the potential for a 'negligible' health impact arising from any adverse effect of the Scheme on social cohesion and lifetime neighbourhoods.
		Does this project create equal opportunity for all people involved in the project	A PEqIA has been developed for the Scheme to ensure that the project will meet the diverse needs of all people involved. Impacts identified during the construction stage of the Scheme relate to impacts on health and quality of life arising from changes to air quality (dust, plant and vehicle emissions), construction noise and vibration, and from likely diversions to public transport and pedestrian routes. Impacts have been assessed in relation to those equalities groups with the potential to be most affected and have principally been both minor and short-term in nature.

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		Does this project create equal opportunity for all users / passengers?	Proposed improvements in public transport accessibility as part of the Scheme will provide a considerable benefit for equalities groups that typically use public transport more frequently, with improvements not only to journey routes but also to journey times and reliability as a result of bus-only lanes through the tunnel.
	Equality and participation	Will the project promote stakeholder relationships at all stages?	Stakeholder engagement through public consultation and key stakeholder involvement in a steering group would be undertaken throughout the project and would guide the design. In 2012 TfL ran a four week consultation with members of the public and stakeholders on proposals to enhance highway river crossings in east and south-east London, which included a new tunnel at Silvertown to ease congestion and provide additional resilience at Blackwall Tunnel. Information about the proposals was made available online, including an online questionnaire; the consultation was promoted in a range of local and pan-London press titles, via social media and via emails direct to stakeholders and members of the public who had registered to receive email updates. The outcome of the consultation demonstrated that there was widespread support for TfL to continue to develop the Silvertown Tunnel proposals, which were then taken forward.

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			A further round of formal consultation took place between October 2012 and February 2013 which sought the views of the public and stakeholders on a number of issues relating to river crossings, including the introduction of a new tunnel at Silvertown. The consultation included the issue of nearly 200,000 information letters to local addresses, two separate emails to approximately 350,000 customers in TfL's customer services database, and advertising in London-wide and local press titles and on the DLR network. Twelve consultation roadshow events were held at locations around the affected areas. The consultation was publicised to a large number of stakeholders, including relevant local authorities, political representatives and transport campaign groups. Public and stakeholder consultation was also undertaken from September to October 2014. This consultation included the Introductory Environmental Report, which provided initial detail about the Scheme and the potential effects arising from it. During this consultation, roadshow events took place at local venues. Consultation responses have been taken into account and are reflected in the current scheme proposals, for example measures will be implemented to improve public transport provision in the vicinity of the Scheme. Further details of the consultation are documented in the Silvertown Tunnel Public Consultation Analysis Report (2015).

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