

PRELIMINARY NON TECHNICAL SUMMARY

October 2015

This report provides a non technical summary of the Preliminary Environmental Information Report (PEIR). It summarises the assessment of likely environmental effects of the Scheme and describes any proposed mitigation measures. This report is appended to the PEIR.

SILVERTOWN TUNNEL SUPPORTING TECHNICAL DOCUMENTATION

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 Environmental Information Report Non Technical Summary

October 2015

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Introduction

At Transport for London (TfL) we are proposing a new road tunnel linking the areas north and south of the River Thames between the Greenwich Peninsula and Silvertown.

This Non Technical Summary (NTS) of the Preliminary Environmental Information Report (PEIR) provides a description of the proposed Silvertown Tunnel Scheme, an explanation of the consultation process and a summary of the environmental impact assessment findings and potential mitigation identified to date.

Why are we proposing the Silvertown Tunnel scheme?

The Silvertown Tunnel Scheme is proposed in response to the three transport problems which exist at the Blackwall Tunnel:

- i. congestion**
- ii. frequent closures**
- iii. a lack of resilience (owing to the lack of alternative local 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 effects will increase. Failing to address these problems could hamper the sustainable and optimal growth of London and the UK.

The Silvertown Tunnel Scheme has been designated a 'Nationally Significant Infrastructure Project'. This means that the Scheme can only be authorised by a Development Consent Order (DCO) made by the Secretary of State under the Planning Act 2008. After the consultation we will consider your comments, review the Scheme and make any final amendments. We will also finalise our environmental studies and technical assessments. We plan to submit our DCO application to the Planning Inspectorate in spring 2016.

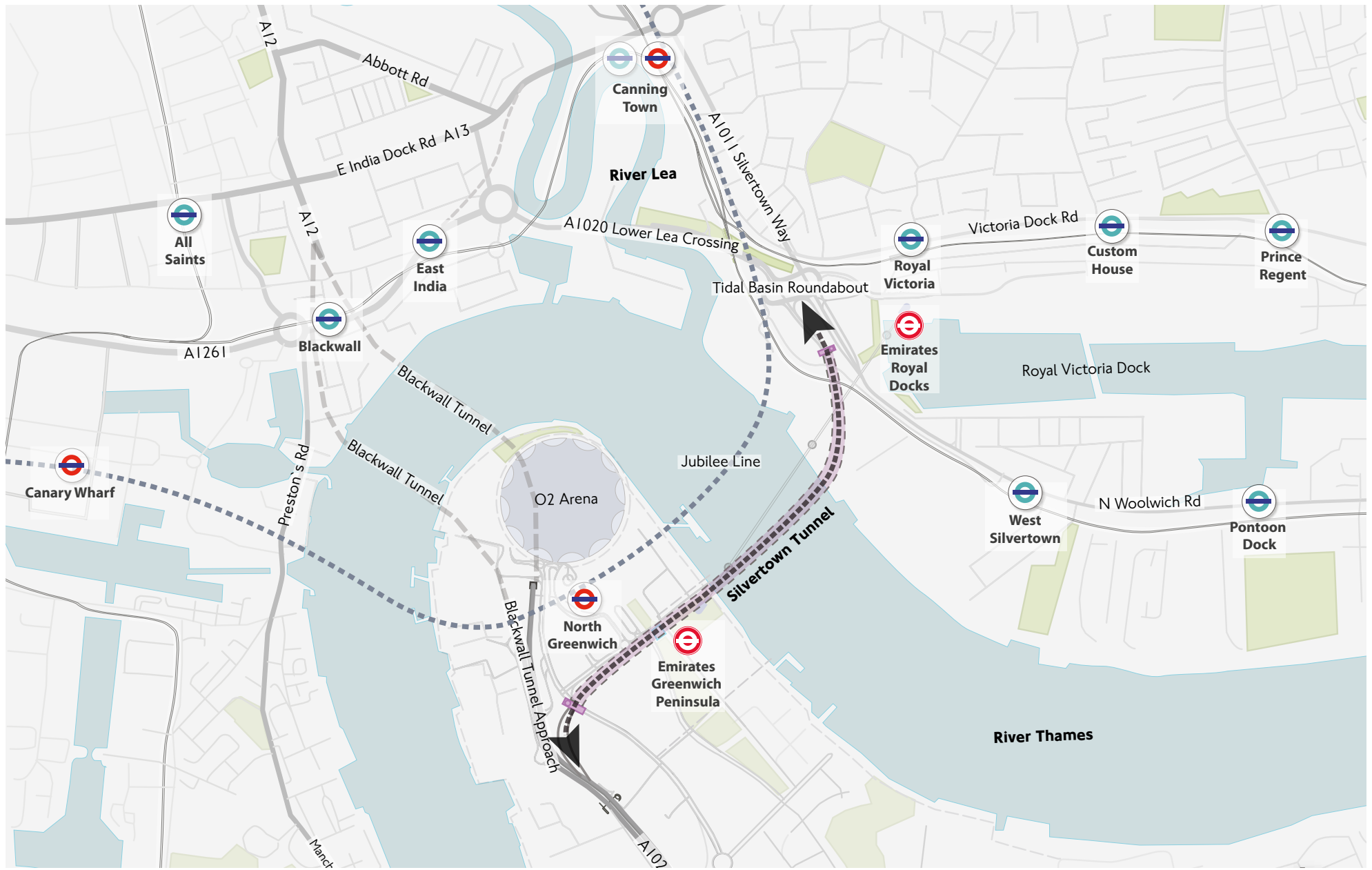


Figure 1 - Scheme Location

What are the key benefits of the Scheme?

The Scheme would provide a number of benefits:

- significantly reduce day-to-day journey times and variability during peak traffic periods.
- deliver congestion-relief during busy times on the main approach roads to the Blackwall Tunnel; including the A102, the A12 and the A13.
- Include user charging at the Blackwall and Silvertown Tunnels to manage demand and provide a source of revenue to help build and maintain the new tunnel.
- provide a nearby crossing to offer an alternative to Blackwall Tunnel when frequent closures occur due to high number of incidents.
- create new cross-river bus links in south-east and east London, notably the growing employment areas in the Royal Docks and Canary Wharf.
- new tunnel accommodates taller vehicles, which currently cause numerous temporary closures at Blackwall Tunnel, and would allow use of double-deck buses, providing operational flexibility and greater capacity to bus routes across the Thames.
- create opportunities for new jobs in the local area, help local employers access new markets and reduce the environmental impact of traffic congestion.



The Planning Process

As the Scheme has been designated as a Nationally Significant Infrastructure Project (NSIP) by the Secretary of State (SoS) for Transport we must apply for a DCO to build and operate the tunnel. Decisions on applications for development consent must have regard to the National Road and Rail Networks: National Policy Statement (NN NPS). The NN NPS sets out national planning policy in relation to nationally significant road development. Following feedback on the PEIR we will produce an Environmental Statement (ES) for the Scheme which is required to support the application for the DCO and will set out how the Scheme applied for will minimise potential impact on the environment.

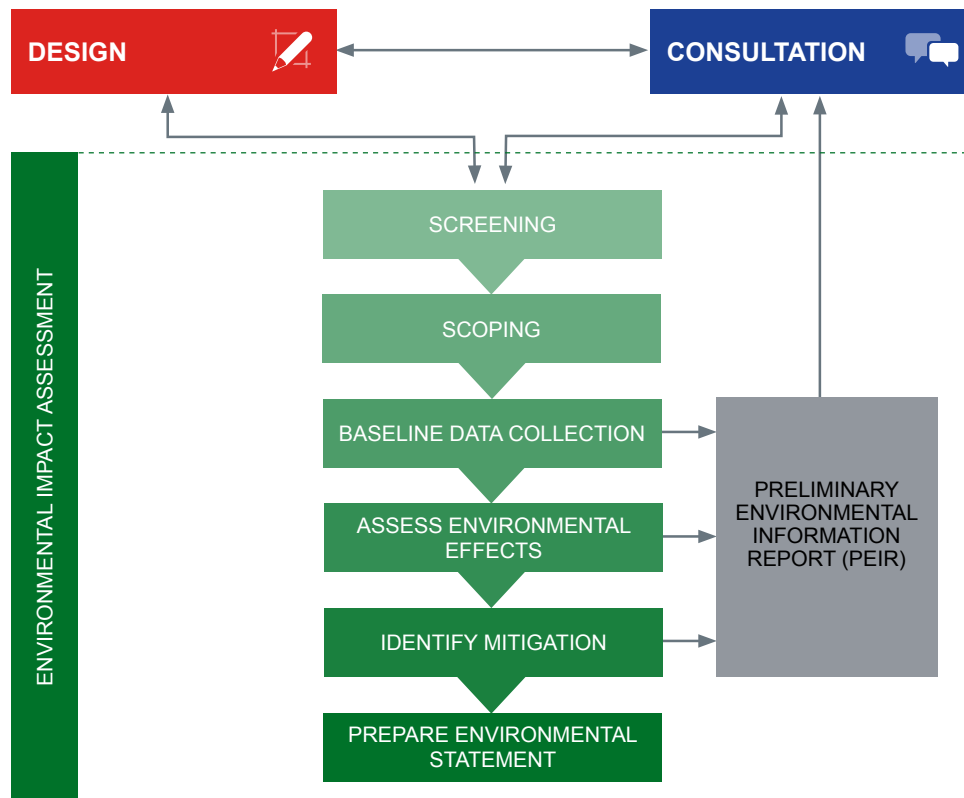


Figure 2 - Main stages of EIA

What is a Preliminary Environmental Information Report (PEIR) and how can I comment?

The PEIR presents the Environmental Impact Assessment (EIA) work that has been undertaken to date and the potential environmental effects of the Scheme. A non-technical summary of all the information in the PEIR is provided in this standalone document. This is required by Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009.

As part of this statutory consultation taking place between 5 October 2015 and 29 November 2015 we are seeking feedback on the information presented in the PEIR. All consultation responses will be considered and where appropriate incorporated into the Scheme design and Environmental Statement (ES).

Copies of the consultation documents (including the PEIR) are available online and in hard-copy at a number of locations. We have also organised a series of roadshow events where TfL staff will be available to answer your questions. Details are available at tfl.gov.uk/silvertown-tunnel, or by calling us at 0343 222 1155.

The closing date for comments is 29 November 2015. To have your say about our proposals, please see our website or email us at rivercrossings@tfl.gov.uk. If you would prefer to write to us, please use our freepost address and mark your envelope 'TfL Freepost Consultations'.

What is already located in the area?

The northern part of the Scheme is situated in Silvertown to the south of Canning Town in the London Borough of Newham. Silvertown is predominantly an industrial area consisting of waste sites and concrete batching facilities along Thames Wharf. To the north of Silvertown Way the area predominantly consists of mixed residential and recreational land uses around the perimeter of the Royal Victoria Docks. Transport infrastructure is a dominant feature of the area with the elevated A1020 Silvertown Way/Lower Lea Crossing and the elevated Docklands Light Railway (DLR) Woolwich extension running north-west to south-east and the Jubilee Line and Emirates Air Line (EAL) cable car running north-east to south-west across the River Thames.

The southern part of the Scheme is located on the Greenwich Peninsula in the Royal Borough of Greenwich. There is a redundant gas holder, former lorry park, nightclub and office/commercial uses between Millennium Way and the A102 immediately south of the proposed southern tunnel portal. This area is bisected west to east by Boord Street which provides access to a footbridge crossing of the A102 and links to Tunnel Avenue on the west side. The majority of the area to the north and east of the A102 is undergoing re-development as part of the consented Greenwich Peninsula Masterplan, a major high-density residential-led (ca. 12,000 homes), mixed-use development. Currently the masterplan is part implemented with offices, hotel and college buildings to the north set around the established O2 and new residential blocks to the south. The central portion is predominantly laid out as surface car parks and access roads associated with The O2 and the station. The main transport infrastructure on the peninsula are: the A102 Blackwall Tunnel Approach leading to the north and southbound tunnels; Millennium Way providing access

to the North Greenwich London Underground (LU) and bus station; Jubilee Line linking to Canning Town and Canary Wharf; and EAL south station.

In addition to the EAL, Jubilee Line and Blackwall Tunnel infrastructure there is a pier serving the Thames Clipper river bus on the east side of the Greenwich Peninsula. South of this there are moorings for leisure craft and on the north side there are moorings for barges, tugs and marine engineering vessels adjacent to Thames Wharf. The main navigation channel serves a variety of traffic from large sea-going vessels and to small leisure craft. The River Lea (known as Bow Creek) joins the main river at the northern end of Thames Wharf.



Figure 3 - Existing site infrastructure and development

Summary of the Proposals

The Scheme – known as the Silvertown Tunnel would comprise a new dual two-lane connection between the A102 Blackwall Tunnel Approach on Greenwich Peninsula (Royal Borough of Greenwich) and the Tidal Basin roundabout junction on the A1020 Lower Lea Crossing/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 (Figure 1 - Scheme Location).

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 Silvertown Way, Dock Road and the 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 new pedestrian and cycle bridge. Portal buildings would be located close to each portal to house the plant and equipment necessary to operate the tunnel, including ventilation equipment. The tunnel has been designed to accommodate taller HGVs and double-deck buses and would include a dedicated bus/coach and Heavy Goods Vehicle (HGV) lane, which would provide opportunities for us to provide additional cross-river bus routes.

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.



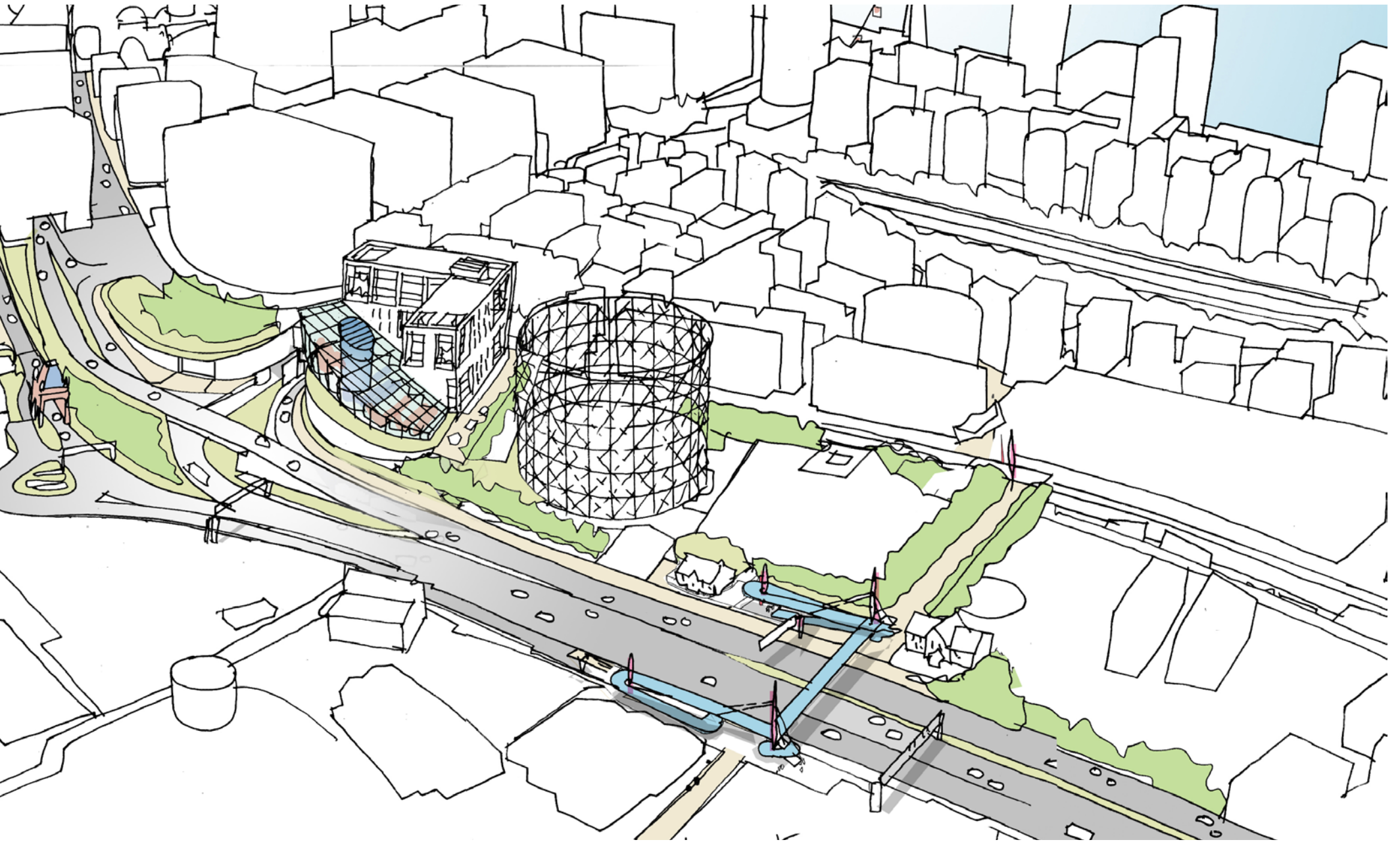


Figure 4 - Indicative artist impression of the proposed southern portal at Greenwich

How would the Scheme be constructed?

Main construction works would likely commence in 2018 (subject to receiving consent) and would last approximately four 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 within the Silvertown and Greenwich Peninsulas. The main site construction compound would be located at Silvertown to utilise Thames Wharf to facilitate the removal of excavated material and delivery of materials by river. The Scheme includes the potential for construction of a temporary jetty, respecting the requirement to maintain the navigable channel.

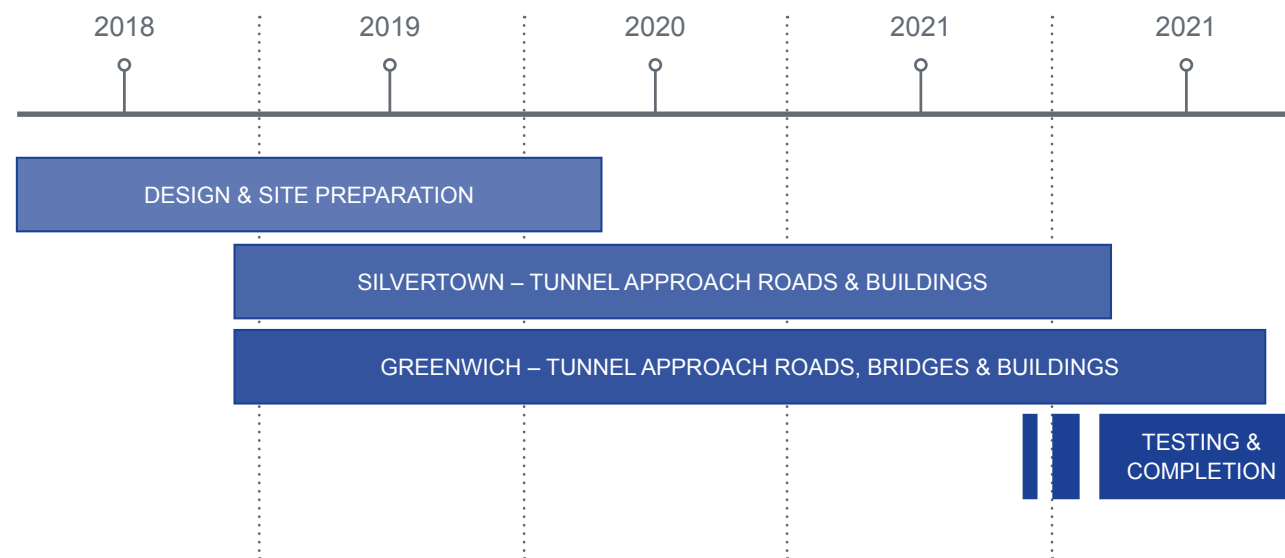
A secondary site compound would be located adjacent to the alignment of the proposed cut and cover tunnel on the Greenwich Peninsula.

We intend to transport as much material to and from our compounds as possible using the River Thames although there may still be the need to use some lorries. Carriageway connections and junctions would progress in parallel with tunnelling activities and would be phased suitably to enable construction activities to be undertaken whilst minimising the impact on surrounding areas.

We would plan the construction of the Silvertown Tunnel to cause the least disruption possible. A draft Code of Construction Practice (CoCP) is included in the PEIR. The CoCP sets out standards and procedures for managing the environmental impacts of constructing the Scheme. This will be submitted with our application for a Development Consent Order for approval and must be followed during construction



Figure 5 - Example of tunnel construction works



Indicative Construction timeline

Development of the scheme

Scheme History

The need to provide an additional river crossing in south east London has been identified through a three-stage process which commenced in 2009. In Stage 1 and 2 of the development, the issues were identified and a wide range of potential river crossing locations and options assessed. This resulted in the inclusion of a fixed link at Silvertown in the Mayor's Transport Strategy (MTS) published in 2010 and the identification of a road tunnel in the London Plan, published in 2011.

Following the inclusion of the Silvertown Tunnel Scheme in the London Plan, further tunnel engineering and strategy studies were undertaken. In 2013 we identified eight tunnel options and assessed them against environmental, land-use and cost criteria. A bored tunnel design was selected instead of an immersed tube option based on its comparatively lower environmental risks, reduced land take and excavation requirements.

Consultation

Our first non-statutory consultation was undertaken on the Silvertown Tunnel from 15 October to 19 December 2014. We published a Responses to Issues Raised report (available at <https://tfl.gov.uk/corporate/publications-and-reports/silvertown-tunnel>) which committed to addressing issues and where appropriate changes have been incorporated into the Scheme. At this initial phase of consultation 83% of respondents to the questionnaire agreed that a new river crossing was needed at this location, just over half (55%) opposed the user charge and 37% supported it.

The current consultation exercise is a statutory consultation conducted in accordance with the Planning Act 2008. A Statement of Community Consultation (SoCC) has been published ahead of this phase of consultation setting out our approach to consulting the local community and confirming the dates and location of roadshow events which are taking place as part of this consultation.



Figure 6 - Cover page of the proposal for a new tunnel under the Thames at Silvertown consultation document 2014

Proposed Timeline

TfL aims to submit the DCO application to the Planning Inspectorate (PINS) in spring 2016. Subject to approval the earliest construction would be able to start is 2018.



Figure 7 – Scheme Timeline

Environmental Impact Assessment

In line with the planning process and the EIA regulations we are carrying out a comprehensive Environmental Impact Assessment (EIA) for the Scheme. The PEIR contains the results of the EIA process to date. We have more work to undertake but have already compiled a substantial amount of information to help us identify and manage the potential environmental effects of the Scheme.

Scope of the EIA

Scoping is the process of determining the content and extent of the matters which should be covered in the EIA. An EIA Scoping Report for the Scheme was submitted to the Planning Inspectorate (PINS) in June 2014. The PINS reviewed and consulted on the Scoping Report and issued a Scoping Opinion in July 2014. The scoping process concluded that the environmental topics covered below are relevant to the EIA process for the Scheme, and these have informed the structure and scope of the PEIR. We will be undertaking further assessments and analysis to inform the EIA. The full results of the EIA process will be presented in the ES to be submitted with the DCO application in spring 2016.

Mitigation Measures

Throughout the design process, mitigation measures to reduce the environmental effects were identified including:

- noise barriers and low noise road surfacing
- works will be timed to avoid sensitive periods for people and protected species
- replacement of ecologically valuable habitat
- landscape design to integrate the proposals with the current Scheme location and contribute positively to the development of the area
- archaeological excavation and watching briefs prior to and/or during construction
- pollution control in drainage systems; good practice storage of hazardous substances and surface water runoff management within the Scheme boundary to prevent or minimise adverse effects on the water environment
- spillage containment facilities to mitigate for fuel spillage in the tunnel during operation
- the use of cut-off and directional lighting

A Preliminary Code of Construction Practice (CoCP) has been prepared which sets out how the contractor will manage the construction-related impacts, including measures to:

- protect sensitive environmental sites and prevent accidental pollution;
- control construction traffic
- minimise noise and vibration disturbance
- control dust emissions

Environmental Impacts

The following section provides a summary of the environmental topics addressed, the issues raised, the mitigation provided to reduce any impacts and a description of the significance of the effects of the Scheme is also provided in Table 1 (Page 24).

Air Quality

This topic considers the potential effects of the proposed Scheme on air quality. The construction assessment has not been covered in the PEIR but will be addressed in the ES submitted with the DCO application. It is however anticipated that dust impacts would not be significant as the Code of Construction Practice (CoCP) includes measures to mitigate such as wheel washes, covering materials during storage and transport and keeping a tidy site. A travel plan would also be implemented to minimise traffic movements and maximise use of the River Thames for transport, where possible.

The operational effect on local air quality has been assessed by undertaking modelling in the assessed year of 2021 with and without the Scheme. The year 2021 is considered to be the worse case in terms of air quality impacts (both background concentrations and emissions from vehicles are expected to improve over time as newer, low emission vehicles are introduced to the fleet) as well as the earliest possible date the Scheme could open..

The study area incorporated approximately 50km of the road network in east London, covering sections of the A13, A12, A2, A1, A102, A1203, A1020, and A282. Base year monitored and modelled concentrations indicated that the study area was subject to poor air quality particularly for NO₂.

Traffic data has been used to generate the emission rates which have been modelled in the Atmospheric Dispersion Modelling System (ADMS)-Roads model. The output has been verified using existing monitoring data.

Worst-case sensitive receptors including residences, schools and hospitals have been identified at locations where air pollutant concentrations are expected to be highest such as those closest to roads and junctions or in areas currently experiencing poor air quality.

A definitive judgement has not been made in terms of the overall significance of the Scheme in the operational phase as further modelling will be required in the ES to consider all receptors rather than just those classified as worst-case and also consider modelled traffic speeds. However the implementation of the Scheme is predicted to result in both improvements and deterioration in air quality at worst-case sensitive receptors. The main changes are expected to be associated with less traffic, and therefore improved air quality, at the Blackwall tunnel approaches; and increased traffic, and therefore reduced air quality, at the Silvertown Tunnel approaches.

In general there will be a net positive impact i.e. more receptors where concentrations of NO₂, PM₁₀ and PM_{2.5} are predicted to decrease than receptors where concentrations are predicted to increase.

Additionally the ES will incorporate ecological receptors, the construction phase impacts and the impact on regional air quality.

Mitigation measures to reduce the operational impact of the Scheme on air quality are embedded in the Scheme design. The tunnel charge modelled seeks to manage traffic levels and air quality impacts. Additionally, the charging regime includes a discount for low emission vehicles thereby promoting the use of cleanest vehicles. A tunnel vent has been included in the design to minimise portal emissions, if it is deemed to be necessary, the full effect of this will be modelled in the ES.

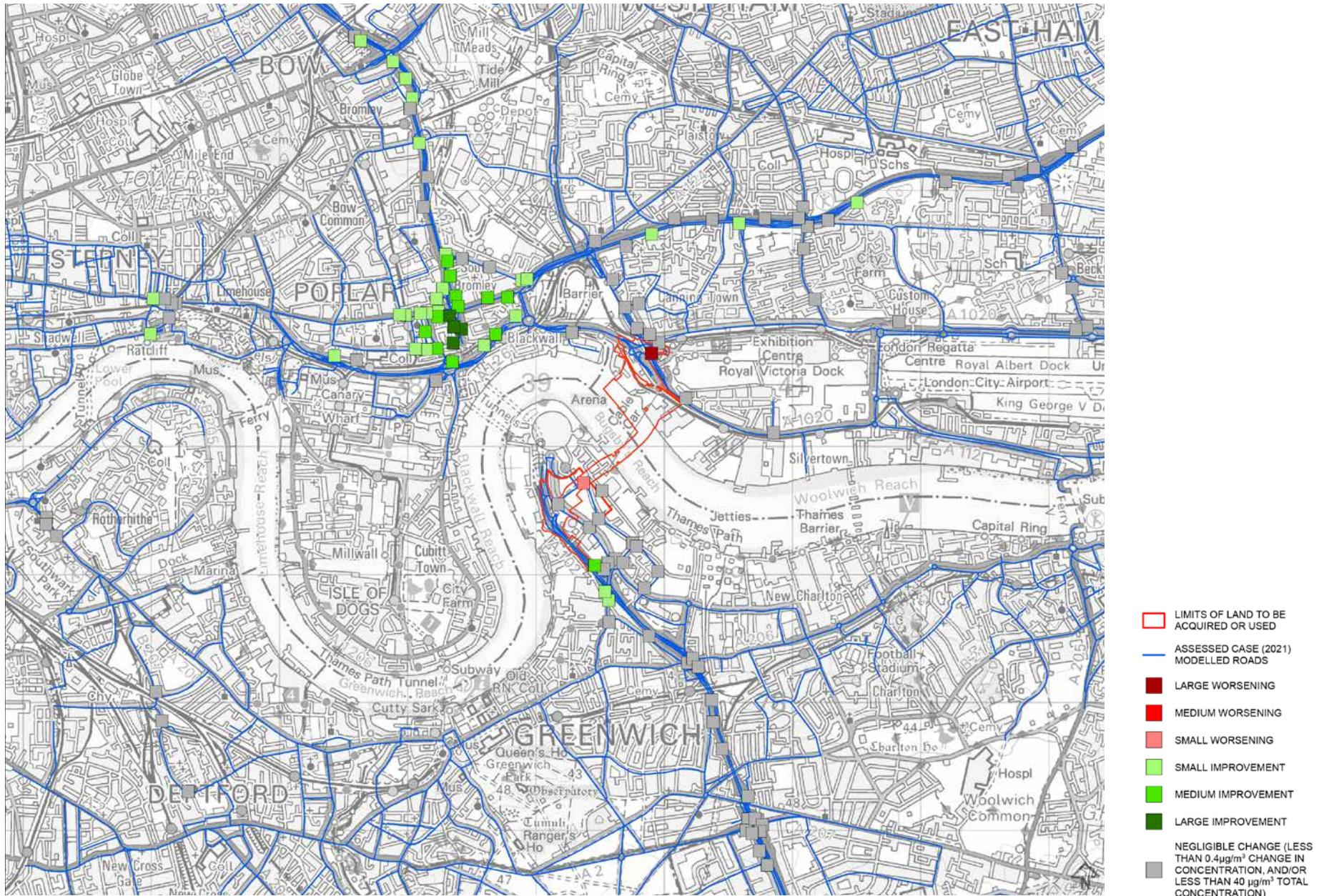


Figure 8 – Air Quality modelling output map

Community and Private Assets

This topic looks at how the Scheme would affect commercial and residential developments as well as providing an overview of the local economy and socio-economic effects. Social and community facilities have been identified in the local area, including areas of public open space, education and healthcare facilities, community centres, leisure and entertainment facilities and places of worship.

Without the Silvertown Tunnel the road crossings between east and southeast London will continue to operate at, or close to, their practical capacity at peak times. There will be limited capacity for growth in road vehicle trips in the future, with average journey times and delays expected to increase significantly, resulting in knock-on negative effects for network resilience and connectivity to labour markets and jobs.

During construction of the Scheme no residential properties would be affected in terms of demolition or land-take. Adverse effects would be predominantly confined within the construction site and are restricted to a limited number of business premises. Adverse effects will also include temporary changes in air quality, visual amenity, noise and vibration disturbance for a number of receptors. Approximately 650 O2 car park spaces would be affected during construction and these will be relocated by TfL.

The construction of the Scheme will involve more barge movements on the River Thames. This would only have a minor adverse effect on other river users following the implementation of mitigation, such as local marine traffic control measures. Indicative routes for lorries have been identified and will be agreed with the local authorities, taking into account the presence and access of key community facilities such as schools and healthcare facilities. There would be communication with local businesses

and residents during construction. The CoCP would ensure disruption would be kept to a minimum and any adverse effects are mitigated. The principal socio-economic benefits during construction will be in relation to job creation and associated expenditure. Employment during the construction period has been estimated at peak of approximately 1,000 people, with works phased over a total period of four to five years.

There are significant time user benefits predicted for all modes of transport. Buses, coaches and business car users would have high levels of benefit due to congestion relief experienced during evening and morning peak traffic periods. The Scheme is expected to deliver a step change in cross-river bus connectivity, opening up the area to many new potential bus connections and thereby 'stitching together' the regeneration areas on either side of the River Thames. Overall there would be significant benefits for residents and employers in areas around the Scheme in terms of improved bus access to jobs and employees. More people would be able to reach their nearest town centre more quickly and there would be improved access to the nearest university campus for 16-25 year olds.

Business opinion has identified potential benefits in terms of attracting more business to the area, making journey times more reliable, increasing their customer base and facilitating recruitment.

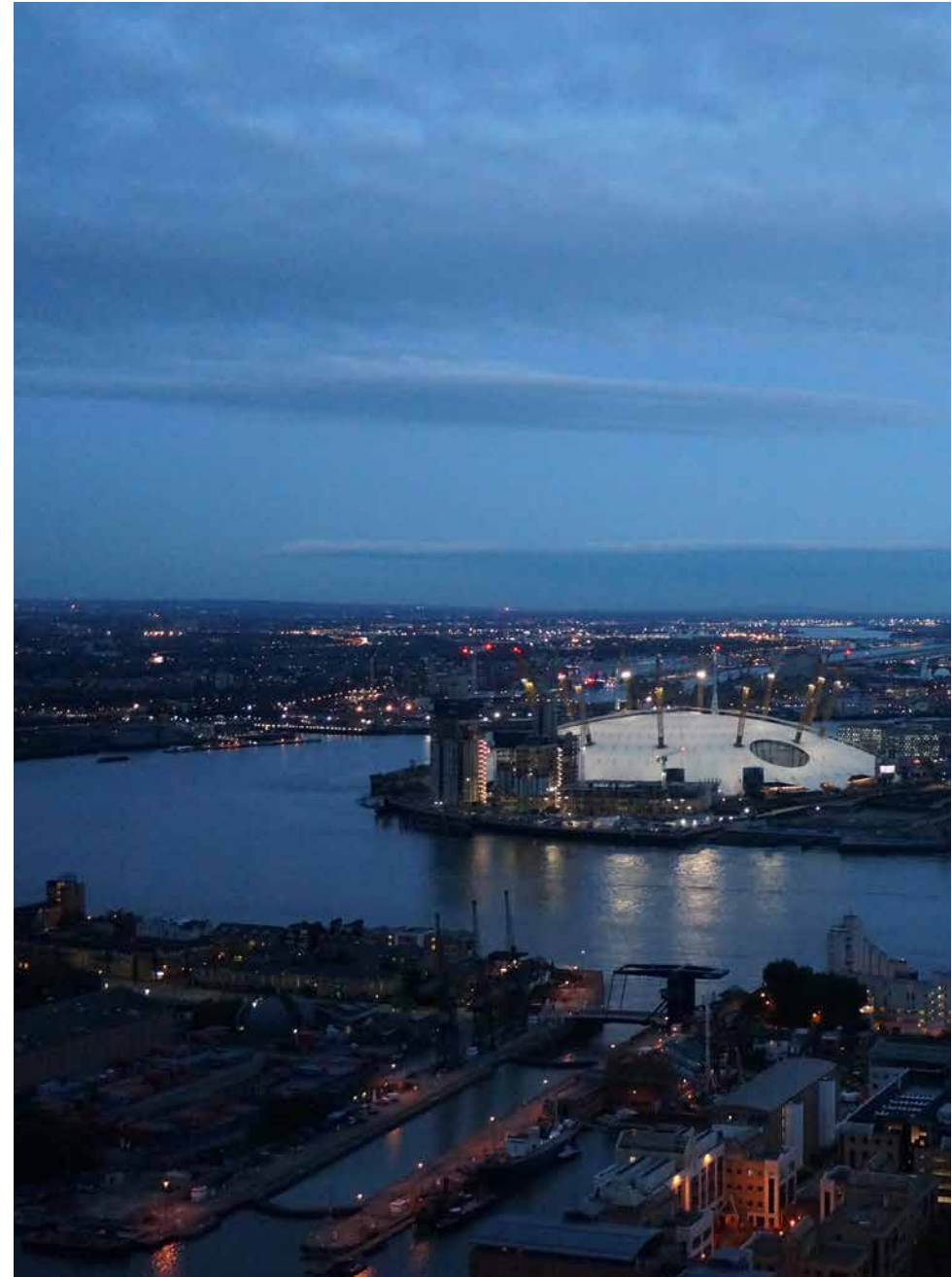
Cultural Heritage

This topic looks at the potential effects of the Scheme on heritage assets such as listed buildings, conservation areas and archaeological remains. A geo-archaeological deposit model has identified the potential for the presence of buried archaeological remains at the locations of the tunnel portals and cut and cover sections of the tunnel.

The deposit model has identified that excavation during the construction of the Scheme could impact potential buried archaeological remains. Particularly land surfaces and peat deposits dating from the Mesolithic (middle part of the Stone Age) to Bronze age periods such as artefacts, timber fish traps and walk-ways or the remains of river craft. There is also a possibility of relatively shallow post-medieval remains relating to industrial development.

Whilst there are a number of listed buildings within 1km of the Scheme, no adverse effects to their settings are predicted during construction or operation due to the limited visibility of the Scheme.

The assessment has predicted that if any archaeological remains are found during excavation, the Scheme could have a potentially adverse effect. However a mitigation approach to be taken will be agreed through ongoing consultation during the EIA process and secured in the DCO. This could include further archaeological investigations and recording. There will be no adverse effects on buried archaeology during operation.



Terrestrial Ecology

This topic assesses the effects of the Scheme on ecology and nature conservation. A habitat survey was undertaken in November 2013 and March 2014 to establish what plant and animal species are present on the site. Surveys specific to invertebrates, reptiles, black redstart birds and bats were undertaken in spring/summer 2014.

The area is industrial in nature and is predominantly comprised of hard standing and buildings, with habitats that are common to urban and wasteland areas present. Habitats and species found include woodland (which has been planted), dense scrub, species-poor grassland, one area of standing water (a reedbed) and some notable terrestrial invertebrates. The surveys showed that the habitat could support breeding and foraging black redstart which is a rare breeding species in the UK (less than 100 pairs) which has a strong hold in London but is difficult to find when surveying. A total of 16 ecological habitats and species were assigned levels of value/importance at a geographical scale. Most were evaluated as being of site-level importance (value) which means that habitats may not be the best examples of semi-natural habitat in the borough but that they have value within the site. The Black redstart bird species was assigned as being of county level importance as it is rare in the UK.

Potential slight adverse construction effects were identified due to temporary habitat loss and potential disturbance of black redstarts. One beneficial effect was also identified, as non-native invasive species such as Japanese knotweed would be removed from the site.

Construction mitigation measures will include pre-construction surveys prior to development, the clearance of vegetation suitable for breeding birds outside of the breeding season and Black redstart monitoring. Therefore no adverse residual effects are predicted with regards to the potential disturbance of black redstart.

It is not clear in the long term what the development proposals are for the areas cleared solely for construction purposes. However, it is likely that the habitats lost temporarily would be returned to their previous condition post-construction. Therefore, there will be no adverse residual effects due to temporary habitat loss.

Operational (long-term) slight adverse effects were identified due to permanent direct habitat loss, with one slight beneficial effect due to non-native species removal.

There are two areas of the Scheme and roofs of buildings (brown roofs) that would provide replacement habitat. The design of these habitats and will be developed further for the DCO submission. This will leave a shortfall of habitat to be replaced of at least 6000m² which will be addressed via off site mitigation if land is not available within the Scheme. This would include, as a minimum, like for like replacement in terms of area and quality outside of the Scheme. Liaison is ongoing with the Local Authorities and key stakeholders to identify the best opportunities for mitigation and enhancement.

An arboricultural (tree) survey, bat activity survey and updated habitat surveys will be undertaken over the next few months to confirm any likely effects the Scheme could have on trees, other natural habitats and bats.

Marine Ecology

This topic area assesses the Scheme's impact on marine ecology. This is confined to the construction period where a jetty is proposed to enable materials to be delivered to and from the site by river. This will require piling, dredging and disposal of the dredge material.

The full details of the marine elements of the Scheme are still being developed and assessed. Therefore the study has so far determine what species may be present in this part of the River Thames and provided an indication of the likely scale of the effects.

Environmental effects could occur through a number of key pathways, including: changes in water quality; changes in habitat extent and quality; the introduction of non-native marine species (from construction material and vessels); direct loss and/or damage to river bed habitats and species; noise disturbance to fish, shellfish and marine mammals and fish and shellfish entrainment i.e the potential for fish, fish eggs and shellfish to be directly taken up during dredging.

The assessment of these potential effects is ongoing, and further work is to be undertaken to inform the assessment prior to the submission of the DCO. This will include an intertidal ecology survey, subtidal ecology survey, and collection and analysis of sediment contaminant samples.

Potential mitigation measures to be considered will include the application of established industry guidance and protocols which will be documented in a CoCP. A review of site specific data (including contamination data) will inform a detailed waste disposal strategy for dredge material. The construction techniques (including the dredging, piling and tunnelling methods) that are deployed along with the timing of the works will also be reviewed in the context of the sensitivity of marine ecology features. A non-native species risk assessment and management plan will be developed. In addition, there could be a requirement for monitoring during the marine works.

Effects on all Travellers

The topic assesses the potential effects of the Silvertown Tunnel on all travellers using the highway network including vehicle travellers, cyclists and pedestrians. This chapter draws on the findings of the Preliminary Transport Assessment prepared for the Scheme.

It can be seen that without the Scheme by 2021 there would be increases in flows on certain parts of the Strategic Road Network (SRN) as well at morning and evening peak traffic flows. At the A102 Blackwall Tunnel Approach flows are forecast to increase between 5% and 14% and by 2036 and there would be further increased traffic flows across the SRN of up to 11% this would mean increased congestion without the Scheme

During construction the assessment indicates that there would be a negligible to minor adverse effect on traveller journey lengths, amenity, severance, views from the road and driver stress. It is not anticipated that increases in HGV flows during construction would be large enough to cause significant changes in journey lengths and patterns for pedestrians, cyclists or vehicle travellers/drivers.

As set out in the Preliminary Transport Assessment and the CoCP, a construction traffic management plan would be prepared for each of the construction work sites. This would set out the methods for managing construction impacts on all forms of transportation, including: construction worker flows, vehicle, pedestrian and cycle diversion routes.

During operation of the Scheme there would be a beneficial effect on journey lengths and amenity and a negligible effect on severance. Adverse effects are likely in relation to the changing views from the road as a result of the new highway infrastructure. Driver stress will be assessed fully in the ES, however ultimately the Scheme will reduce congestion and incidents at the Blackwall Tunnel and on the surrounding highway network, which should reduce stress.

The following mitigation measures have also been designed into the Scheme:

- immediate replacement of the Boord Street footbridge
- appropriate provision for pedestrian and cyclist crossings
- limiting lorry movements and deliveries during peak hours
- minimising footpath and cycle route diversions
- clear signage as part of the Scheme
- improved bus facilities on the highway (such as bus only links) and journey times during the operational phase.

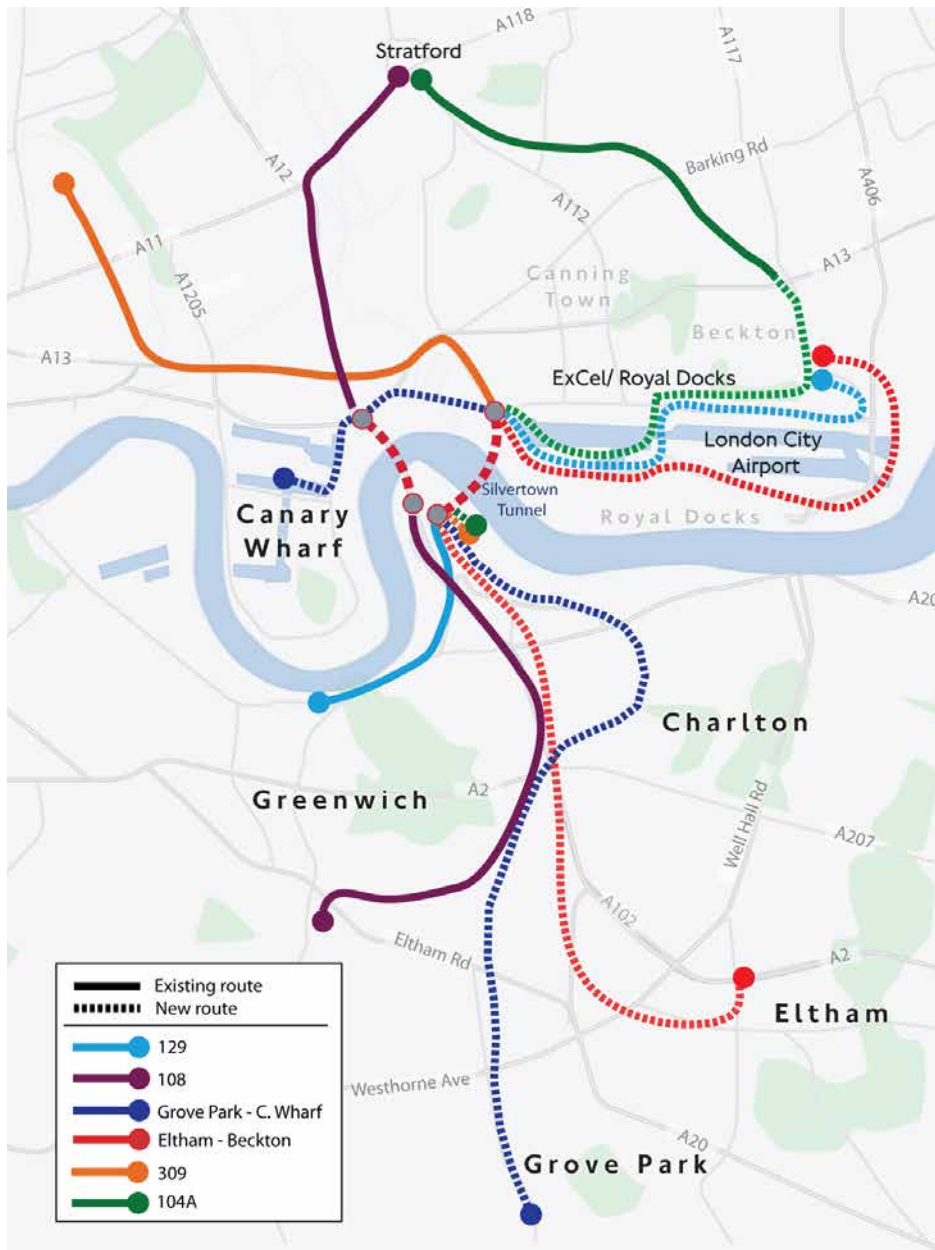


Figure 9 - Potential Bus Corridors

Geology and Soils

This topic covers the potential effects of contamination (existing or created) on human health and sensitive environmental receptors such as geology, soils and groundwater.

Ground conditions have been established using previous ground investigation studies and contamination assessments from recent nearby developments. A site walkover survey was conducted in May 2013. A ground investigation study involving boreholes was undertaken earlier this year to further inform the assessment.

Potential effects during construction of the tunnel include:

- disturbance of existing contaminated soils;
- risks to people and site workers from contaminated soils,
- potential contamination of rivers, estuaries, coastal waters and groundwaters from removal of topsoil and transfer of wastes; and
- risk from underlying unidentified unexploded ordnance (UXO).

Geo-environmental design measures have been incorporated into the Scheme to prevent or minimise adverse effects. Any contaminated land excavated during construction would be remediated/disposed of to a suitable remediation site. As the Scheme is located within an area of London which is known to have been heavily bombed during the Second World War. A detailed UXO mitigation strategy will be developed for the Scheme prior to construction.

Effects will be controlled through the implementation of good site management plan, the CoCP and Environment Agency Guidelines. As a result, construction of the Scheme will have a neutral effect on geology and soils.

As a result of tunnel construction, ground movement can occur during construction or shortly afterwards. Most structures are good at tolerating small ground movements of the magnitude produced by modern tunnelling. Post construction monitoring is likely to form part of the design mitigation. No further effects on geology and soils are expected during operation.

Materials

This chapter addresses potential effects resulting from the use of material resources associated when constructing the tunnel and waste management. It also assesses potential embodied carbon effects associated with material resources to be used and the management of waste.

During construction the Scheme will maximise the reuse of materials currently on site and procure materials, where specification allows, with recycled content.

Waste generated by the Scheme will be segregated and sent for beneficial reuse, recycling or for further segregation and sorting at a materials recovery facility. It is anticipated that, where possible, excavated material will be sent for beneficial reuse to a scheme such as Wallasea Island (an RSPB wetland creation scheme). Discussion between TfL and RSPB are ongoing. It is anticipated that the Scheme will produce 93,655 tonnes of waste to be sent to landfill, equal to just 2.3% of the current landfill capacity. The impact on landfill capacity is considered to be minor.

It is proposed that, where reasonably practicable, materials and waste associated with the Scheme would be transported to and from the Silvertown site by river. However, the volumes of materials and waste that could be transported by river would be highly dependent on ground conditions and detailed construction methodologies. Therefore, for the purposes of the EIA, the worst case has been assumed, where all construction traffic including removal of excavated material would be undertaken by road. The existing highway network and river have a high capacity to accommodate the increases in lorry and barge/ship movements associated with the transport of materials and waste. Therefore the effect of waste transportation on the highway network is assessed to be minor adverse.

Further assessment regarding the operation and maintenance activities required for the Scheme will be undertaken as further information becomes available.



Figure 10 - Example of a barge being used to transport materials

Noise and Vibration

This topic considers the potential noise and vibration effects as a result of the Scheme during construction and the road traffic noise associated with the Scheme during operation.

Daytime construction noise levels are not considered to be significant, however, they may be of a slightly different character to the local area and as such would result in a slight adverse effect on residential receptors. The vibration levels from piling for the tunnel construction would be below human perception, but it is possible that the piling technique used for the temporary jetty could be just perceivable by humans. This effect is not considered to be significant due to the short term duration of the piling works in the River Thames. In relation to the tunnelling works, undertaken using a tunnel boring machine (TBM), the study has shown that the level of surface noise is unlikely to increase even if there were sensitive receptors directly above the tunnel and vibration levels would be below the threshold level of human perception.

The assessment of the Scheme indicates that when the tunnel opens there would be negligible or minor changes in road traffic noise at the majority of receptors with a net gain of 1,302 residential dwellings experiencing a perceptible decrease in noise level. The assessment of the long term operation of the Scheme in 2036 also indicates that there would be negligible, or no-change, in road traffic noise at the majority of receptors in the day time.

Residential dwellings located within the east tower of the Hoola development in the vicinity of Tidal Basin Road are predicted to experience a moderate increase in noise due to a higher number of lorry movements when the Scheme opens and in the future year (2036). However, these effects have been mitigated to a minimum through the use of low noise surfacing around Tidal Basin Road.

Mitigation to eliminate or reduce any potential noise effects during construction will be included in the CoCP. Measures include the installation of solid, continuous fence around the sites and effective communication to keep local residents informed of the type and timing of works involved, paying particular attention to potential evening and night time works and activities which may occur in close proximity to properties. A set of pre-construction noise monitoring surveys would be undertaken and agreed with the relevant local authority to establish a pre-construction baseline for monitoring compliance with construction noise limits.

During operation a visual/acoustic barrier would be constructed around both the new northern and southern tunnel portals, low noise surface will also be laid where possible within redline boundary.

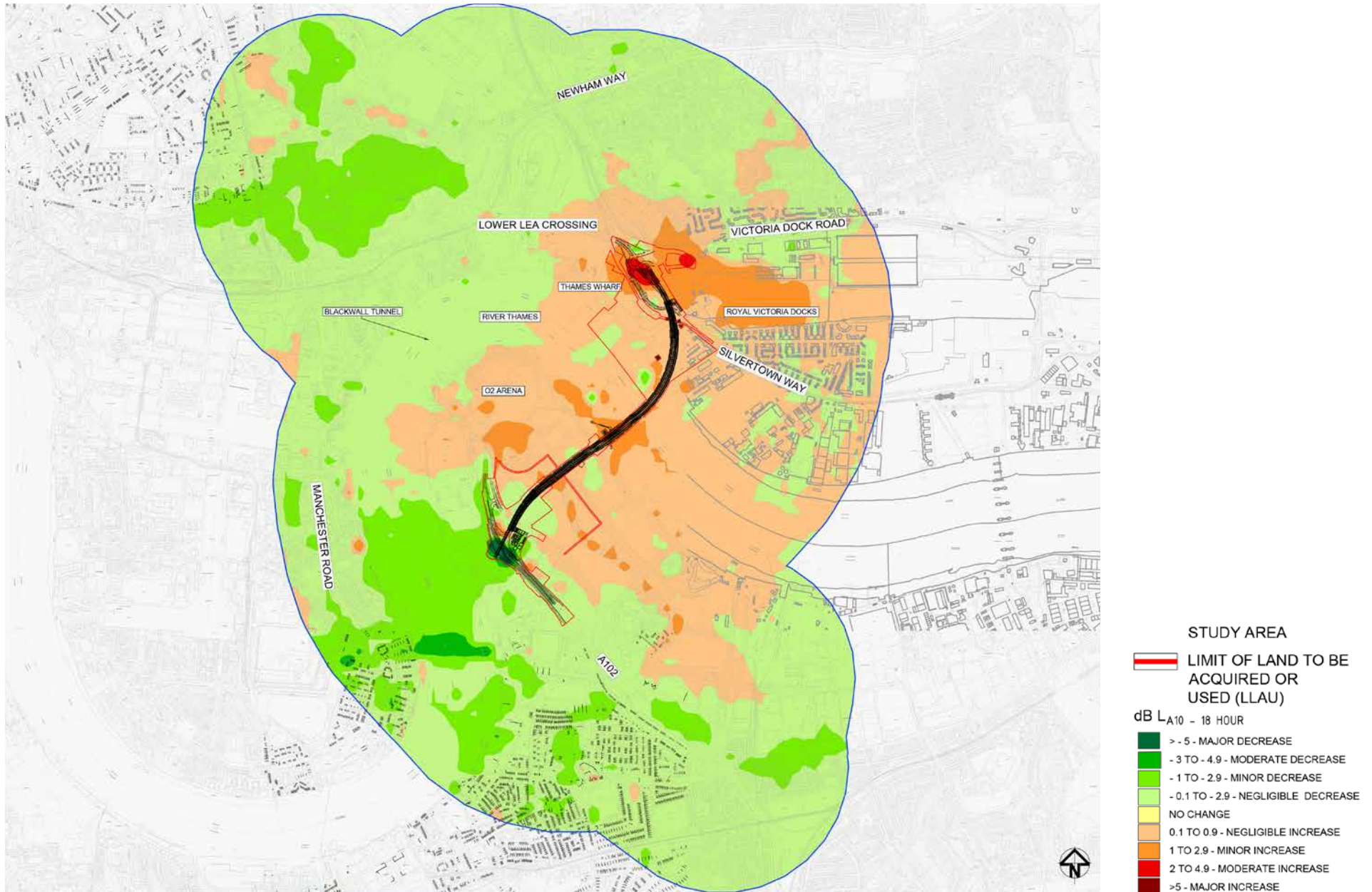


Figure 11 - Short term operational noise impacts with the Scheme

Townscape and Visual

This topic considers the character of the area ‘townscape’ and visual implications of the Scheme.

The character of the local townscape in the immediate vicinity of the proposed tunnel portals and road junction alterations are currently largely defined by highway corridors, industrial and commercial areas and derelict land. Visual receptors comprise low sensitivity light industrial/commercial places of work and road/railway users, moderately sensitive tourist routes e.g. National Cycle Route 13 and the Emirates Air Line (EAL). There are also some high sensitivity residential properties (apartments at Royal Victoria Docks) and the Thames Path. In terms of night time characteristics, the Scheme falls within a high district brightness area where there are high levels of night-time activity.

During construction of the tunnel, activities such as stockpiling of excavated material/spoil and heavy vehicle movements could cause temporary disruption to townscape and views however construction best practice such as the use of hoarding around the site would be used to limit disruption to townscape and visual amenity.

In terms of permanent effects, whilst the Scheme introduces new infrastructure, it is not at odds with that already present within the local townscape and views. The Scheme includes building design and landscape proposals which would integrate the proposals with the current location and enhance the local townscape and views. Night-time visual effects would be prevented by the use of cut-off, directional lighting.



Figure 12 - Indicative artist impression of the Scheme (Silvertown)



Figure 13 - Illustrative landscape proposals at Silvertown

Water

This topic identifies and assesses effects on the local water environment, including: hydrology (underground water), hydrological (surface water) receptors, flood risk and surface water drainage. Data has been obtained through a number of published documents from the Local Authorities and the Environment Agency (EA), a site walkover was undertaken in May 2014.

Construction work may cause heavily silted or contaminated runoff to nearby water bodies (eg. the River Thames). A temporary drainage network would be installed during the construction period. Any drainage discharge would be treated prior to entry into the water environment. We would adhere to the Environment Agency's Pollution Prevention Guidelines and the CoCP. Once appropriate design and mitigation measures are in place to treat runoff, the potential for water quality effects is restricted to the potential for localised contained spills, silt releases, or mobilisation of ground contamination. The working practices that would be adhered to in the CoCP would allow rapid containment and clean up. These would include good practice site management such as pollution control in drainage systems; correct storage of hazardous substances and surface water runoff management within the Scheme boundary.

Both the Silvertown and Greenwich sites are classed as being in an 'Area Benefitting from Defences', which reduces flood risk to the Scheme. Existing standards of flood protection will remain unchanged during construction and operation. Hydrodynamic modelling which looks at the change in suspended sediments and water quality as a result of the proposed jetty at Silvertown has been undertaken and has shown no significant effects on the existing flow or sediment transport regimes of the River Thames.

The Scheme is generally at low risk of surface water flooding and the existing drainage system would be improved resulting in a minor beneficial change to the water quality. Effects on recreational users of the water environment would be neutral and construction and operation of the Scheme is considered to have no potential to affect the integrity of existing water abstractions or discharges.

Cumulative Effects

Cumulative effects that arise from the Scheme with other proposed projects in the area have been considered in the PEIR. An assessment of effects of the Scheme (for example, changes in air quality, noise levels and visual impact) on individual receptors will be provided in the final Environmental Statement (ES).

Construction of the Scheme over a four year period will overlap with other development Schemes including the Thames Tideway Tunnel. There may therefore be an impact on the availability of specialist labour, however this will be reduced given the Schemes location in central London and with specialist training centres nearby (such as the Tunnelling and Underground Construction Academy).

It is assumed that waste arisings from other consented schemes will be segregated and sent for composting, recycling or for further segregation and sorting at a materials recovery facility. As such the waste sent to landfill is considered to be a minor potential cumulative effect.

In relation to all other elements of the assessment the application of suitable mitigation identified in the Scheme results in no significant cumulative impact during construction.

The traffic data used in the operational road traffic noise, air quality and effects on all travellers assessments has taken into account other transportation Schemes as well as future predicted traffic growth as a result of new, major development. Therefore the cumulative effects of other developments, transportation Schemes and population growth are an inherent part these assessments.

Summary of Environmental impacts

Topic	Environmental issue	Mitigation to reduce the impact	Significance of Effect
AIR QUALITY	Construction: dust from construction works	Good practice measures in CoCP to minimise effects on air quality including: wheel washes, covering materials during storage and transport and keeping a tidy site. A travel plan would be implemented to minimise traffic movements.	To be provided in the ES.
	Operation: Changes in local air quality and levels of NO ₂ , PM ₁₀ and PM _{2.5}	Implementation of the user charge. Discount charge for low emissions vehicles and electric cars. Tunnel ventilation to minimise portal emissions.	To be provided in the ES.
COMMUNITY AND PRIVATE ASSETS	Construction: Direct land take, construction impact on assets (buildings and structures), river navigation and wharfage, infrastructure e.g. utilities and pipework, severance to business and non-motorised users, amenity and socioeconomics.	Good practice measures in CoCP to minimise effects on the amenity of local residents. Alternative parking capacity for the O2. Localised temporary diversions to maintain access. Safeguarding of existing infrastructure assets.	Negligible to Moderate Beneficial (Moderate Adverse for certain commercial properties relating to land take)
	Operation: Improved accessibility to jobs and services, Employment, Wider economic, Community severance effects and development land.	No mitigation required.	Minor to Moderate Beneficial
CULTURAL HERITAGE	Construction: Potential disturbance of archaeological and palaeoenvironmental deposits.	Archaeological recording and appropriate programme of assessment, analysis and reporting during construction.	Moderate Adverse
	Operation: None	No mitigation required.	Neutral
TERRESTRIAL ECOLOGY	Construction: Temporary disturbance/ mortality of species and degradation of habitat.	Good practice measures in CEMP to protect ecological receptors Pre-construction surveys. Black redstart monitoring.	Negligible
	Operation: Permanent disturbance/ mortality of species and permanent loss of habitat. Removal of invasive plant species.	Habitat replacement as part of landscape plans.	Local/site Adverse (Site Beneficial for the removal and treatment of Japanese knotweed).
MARINE ECOLOGY	Construction: Changes in water quality; extent and quality of habitat; the introduction of non-native marine species (from construction material and vessels); direct loss and/or damage to river bed habitats and species; noise disturbance to fish, shellfish and marine mammals and fish and shellfish entrainment due to the construction of a temporary jetty	Established industry guidance and protocols documented in a preliminary CoCP. Review of site specific data (including contamination data) to inform a detailed waste disposal strategy Construction techniques (including the dredging, piling and tunnelling methods) reviewed in the context of the sensitivity of marine ecology features. Non-native species risk assessment and management plan	To be provided in the ES.
	Operation: None	N/A	N/A
EFFECTS ON ALL TRAVELLERS	Construction: Change in journey lengths, amenity, severance, views from the road and driver stress.	Implementation of a construction traffic management plan.	Negligible to Minor Adverse (Moderate Adverse for certain journey length changes)
	Operation: Change in journey lengths, amenity, severance, views from the road and driver stress.	Appropriate provision for pedestrian crossings. Minimising footpath and cycle route diversions. Clear signage and limiting lorry movements. Meeting public transport needs.	Minor Beneficial to Negligible (Minor Adverse for certain views from the road)

Topic	Environmental issue	Mitigation to reduce the impact	Significance of Effect
GEOLOGY AND SOILS	Construction: Contamination of soil and ground water due to excavation and transportation of materials and risk of encountering of Unexploded Ordnance (UXO).	Good practice measures in CEMP to protect geology and soils. UXO survey. Completion of a Remediation Strategy (if required).	Neutral
	Operation: Post construction settlement and associated damage to built structures as a result of ground movement.	Post construction monitoring is likely to form part of the design mitigation.	Neutral
MATERIALS	Construction: Material resource use, waste production, impact on landfill capacity and transportation of material resources.	Good practice measures in CEMP relevant to materials and waste. Site Waste Management Plan (SWMP). Materials Management Plan (MMP). Construction Logistics Plan. Sustainable construction materials sourcing	Slight Adverse (and slight to moderate adverse when considering the cumulative impact of neighbouring schemes)
	Operation: The operational and maintenance activities required for the Scheme have not been fully identified at this stage. The assessment will be updated in the ES.	No mitigation currently required.	N/A
NOISE AND VIBRATION	Construction: Increased noise levels at receptors during construction from use of equipment, processes and vehicle movements. Construction vibration effects from piling.	Good practice measures in CoCP relevant to noise and vibration will be adopted. Pre-construction noise monitoring surveys. Noise and vibration limits agreed with the local authority. Monitoring	Negligible to Slight Adverse
	Operation: Increased road traffic noise for short term and long term operation particularly around the Hoola Towers development in the vicinity of Tidal Basin Road.	Visual/acoustic barrier around both northern and southern tunnel portals; and Low noise surface to be laid where appropriate within redline boundary.	Slight to Moderate Adverse for short term and long term noise impacts.
TOWNSCAPE AND VISUAL AMENITY	Construction: Impact of the temporary movement of plant and vehicles, creation of compounds and material stockpiles on the townscape and existing views.	Measures in CoCP to minimise townscape and visual disruption including good site practice to keep the site tidy and the erecting of site hoardings to obstruct views of the construction works.	Minor to Slight Adverse
	Operation: Impact of the constructed and operational Scheme on the townscape and existing views.	The Scheme includes built form and landscape proposals designed to integrate and improve the current area.	Minor to Slight Beneficial
WATER ENVIRONMENT	Construction: Potential pollution of the water environment, impact on flood defences, drainage, recreation and water resource demand associated with river transportation during construction of the Scheme.	Good practice measures in CoCP relevant to excavation, dewatering, storage of fuels and chemicals. Including: pollution control in drainage systems; correct storage of hazardous substances and surface water runoff management within the Scheme boundary. A temporary jetty would be constructed to permit the operation of the proposed marine spoil disposal system.	Neutral
	Operation: Potential pollution of the water environment, impact on flood defences, drainage, recreation and water resource demand associated with operation of the Scheme.	Surface water discharge runoff into the existing Thames Water sewer network. A Flood Emergency Plan.	Neutral



What happens next?

Following the end of the consultation, we will take account of all of the comments received in order to finalise the Environmental Statement (ES) which will form part of the application for the Development Consent Order (DCO). The application will also include a Consultation Report which will document the outcome of the consultation and how this has informed the final proposal. We will continue to keep our website tfl.gov.uk/silvertown-tunnel up to date with key information about the project.

If the application is accepted for examination, we will carry out further publicity, in relation to the application. Interested parties will then be able to register their interest with the Planning Inspectorate, who will examine the application on behalf of the Secretary of State. Registering will enable interested parties to participate in the Examination and to be kept informed of opportunities to present their views.

During the Examination, interested parties will be able to submit written comments on the proposals and participate in the public hearings. The Examination must be completed within six months.

The Planning Inspectorate will examine the application on behalf of the Secretary of State. Interested parties will be able to submit written comments on the proposals and participate in the public examination hearings.

The examination must be completed within 6 months of application. Following the examination, the Planning Inspectorate will make a recommendation to the Secretary of State for Transport who will then have three months to decide whether or not to grant the DCO.

Further advice on how to get involved in the planning process is available on the PINS website at <http://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/>

