

SILVERTOWN TUNNEL

SUPPORTING TECHNICAL DOCUMENTATION

PRELIMINARY DESIGN AND ACCESS STATEMENT

October 2015

This report sets out the outline scheme design. It demonstrates why it is a suitable response to the site and its setting, taking into account existing and future planned development and that it can be adequately and safely accessed. It also sets out the design principles which will inform the detailed design, providing examples of how the Scheme may develop in the future.

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 Design +
Access Statement**

October 2015

Silvertown Tunnel

Preliminary Design and Access Statement

Silvertown Tunnel

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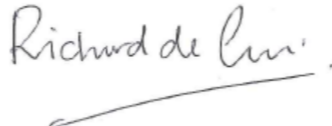
Planning Act 2008

Infrastructure Planning

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

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Glossary

Term	Explanation
Assessed Case	Scenario adopted for assessment of likely effects of the proposed scheme, with user charges set so as to balance the Scheme's traffic, environmental, socio-economic and financial objectives.
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.
Bus and Goods Vehicle Lane	A dedicated highway lane that has restricted occupancy, available for use by buses, Heavy Goods Vehicles and taxis.
Bus Gate	Bus gates are traffic signals often provided within bus priority schemes to assist buses and other permitted traffic when leaving a bus lane to enter or cross the general flow of traffic or to meter the flow of general traffic as it enters the road link downstream of the bus lane. Depending on their purpose, bus gates can be located remote from other signals or they can be positioned immediately upstream of a signal controlled junction, as a bus pre-signal.
CDM (2015)	The Construction (Design and Management) Regulations 2015 set out the roles and responsibilities of parties involved in construction projects in relation to health and safety during the project life cycle including design, construction operation and maintenance stages.
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.
Control Centre	Facility to deal with issues with over-height, illegal and unsafe vehicles going through Blackwall and Silvertown Tunnels, and help manage traffic.
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)	<p>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).</p> <p>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.</p> <p>The DBFM 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 DBFM 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.</p>

Term	Explanation
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	The design that defines precisely the works that are to be constructed to meet the specified 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.
Gasholder	A large container in which natural gas is stored near atmospheric pressure at ambient temperatures.
Greenwave	Coordinated control of a series of traffic signals to allow continuous traffic flow in a given direction.
Heavy Goods Vehicle (HGV)	European Union term for any vehicle with a gross combination mass of over 3500kg.
Illustrative Design	An example of how the proposals could be developed at the next stage of design as a result of engagement with the DBFM contractor, planning authority and other relevant stakeholders.
London Streets Tunnels Operations Centre (LSTOC)	LSTOC operates the traffic and tunnel safety systems for various road tunnels in London operated by Transport for London. LSTOC operations are fundamental to the safe and reliable operation of TfL's tunnels and performance of the corridors serviced by the London streets traffic control system.
Limits of Land to be Acquired and Used (LLAU)	The extent of land and rights over land that will be needed temporarily to construct the Scheme, and permanently to operate, maintain and safeguard the Scheme (often referred to as 'the red line boundary')
Outline Design	Defines the design principles and freezes the scope of the project

Term	Explanation
Reference Case	An assumed 'future baseline' scenario, which represents the circumstances and conditions that we would anticipate in the future year without the implementation of the Scheme, taking account of trends (for example in population and employment growth) and relevant developments (such as other committed transport schemes). The reference case is frequently used as a comparator for the 'with Scheme' case, to show the effect of the Scheme against the appropriate reference point.
Reference Design	Design proposals that the consultation and DCO application will refer to.
Secant Piles	Piles are vertical structural elements of deep foundations. Secant pile walls are formed by constructing intersecting reinforced concrete piles. The secant piles are reinforced with either steel rebar or with steel beams and are constructed by either drilling under mud or auguring. Primary piles are installed first with secondary piles constructed in between primary piles once the latter gain sufficient strength.
Service Building, Tunnel Service Building, Portal Building	The building housing all control, power supply, and other essential equipment for the operation of the tunnel. Also houses firefighting control and ventilation equipment. Serves as a maintenance base and has the facility to become a standby operations room.
Sheet Pile	Sheet piles can be a temporary or permanent earth retention solution, providing support and reducing groundwater ingress. Steel sheets are driven into the ground, interlocking with neighbouring piles in order to create a continuous wall.
Slurry Shield (SS) Tunnel Boring Machine	A type of tunnel boring machine used in soft ground with very high water pressure or where ground conditions are granular (sands and gravels) so much that a plug cannot be formed in the removal Archimedes screw. The cutter head is filled with pressurised slurry which applies hydrostatic pressure to the excavation face. The slurry also acts as a transport medium by mixing with the excavated material before being pumped out of the cutter head back to a slurry separation plant.
Spoil	The material excavated by the Tunnel Boring Machine during the construction of the tunnel.
SuDS	Sustainable Drainage Systems (SuDS) are water management solutions designed to reduce the impact of surface water runoff from new and existing developments to the natural environment. The purpose of such systems is to improve water quality and store or reuse surface runoff to reduce the discharge rate to the watercourse.
Tension Piles	Piles are vertical structural elements of deep foundations. Tension piles used to resist uplift/pull-out loads.
The O2	A large entertainment complex on the Greenwich peninsular, including an indoor arena, cinema, bars and restaurants. It is built largely within the former Millennium Dome.
The Scheme	The construction of a new bored tunnel under the River Thames between the Greenwich peninsula and Silvertown, as well as necessary alterations to the connecting road network and the introduction of user charging at both Silvertown and Blackwall Tunnels.

Term	Explanation
Toucan Crossing	A signal controlled crossing that allows pedestrians and cyclists to cross a road safely.
Transport for London (TfL)	<p>A local government body responsible for most aspects of the transport system in Greater London. Its role is to implement transport strategy and to manage transport services across London.</p> <p>These services include: buses, the Underground network, Docklands Light Railway, Overground and Trams. TfL also runs Santander Cycles, London River Services, Victoria Coach Station and the Emirates Air Line.</p> <p>As well as controlling a 580km network of main roads and the city's 6,000 traffic lights, TfL regulates London's private hire vehicles and the Congestion Charge scheme.</p>
The Tunnel, Silvertown Tunnel	A new bored tunnel under the River Thames between the Greenwich peninsula and Silvertown.
Tunnel Boring Machine (TBM)	A machine used to excavate tunnels with a circular cross section. There are two main types of closed face TBMs: Earth Pressure Balance (EPB) and Slurry Shield (SS). Please see those terms for further explanation.
Ventilation Building	Surface level structure housing ventilation equipment, fans and an exhaust shaft, used to move fresh air underground by drawing air from the tunnel and venting it to the atmosphere. Located adjacent to and integral with the Tunnel Services Buildings.

Executive Summary

This Design and Access Statement (DAS) is one of the supporting documents submitted as part of the application for development consent for the Silvertown Tunnel Project.

The Silvertown Tunnel would constitute a new dual two-lane connection between the A102 Blackwall Tunnel Approach on Greenwich Peninsula (Royal Borough of Greenwich) and the Tidal Basin roundabout junction on the A1020 Lower Lea Crossing/Silvertown Way (London Borough of Newham). This would be by means of twin tunnel bores under the River Thames and associated approach roads. The Silvertown Tunnel would be approximately 1.4km long.

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

The following Scheme objectives have been adopted:

- PO1: to improve the resilience of the river crossings in the highway network in east and southeast London to cope with planned and unplanned events and incidents;
- PO2: to improve the road network performance of the Blackwall Tunnel and its approach roads;
- PO3: to support economic and population growth, in particular in east and southeast London by providing improved cross-river transport links;
- PO4: to integrate with local and strategic land use policies;
- PO5: to minimise adverse impacts of any proposals on communities, health, safety and the environment;
- PO6: to ensure, where possible, that any proposals are acceptable in principle to key stakeholders, including affected boroughs;
- PO7: to achieve value for money and, through road user charging, to manage congestion.

NB: Appendix A of the 'Case for the Scheme' document contains an appraisal of all Scheme options against the above project objectives.

The scheme proposals incorporate both above and below ground works and include the following key elements:

Above Ground

- Tunnel portals at Silvertown and Greenwich;
- Tunnel services buildings at Silvertown and Greenwich;
- Tunnel ventilation buildings at Silvertown and Greenwich;
- Surface highways / junction changes and associated landscape;
- A new pedestrian / cycle footbridge at Boord Street on the Greenwich Peninsula.

Below Ground

- A new twin-bore tunnel between North Greenwich and Silvertown.

The proposals are the result of an iterative design process which has been informed by an understanding of the existing and changing context of Silvertown and Greenwich Peninsula.

This along with public and stakeholder consultation and pre-application meetings with dialogue with the local Boroughs, the GLA, landowners and other key stakeholders have informed the design.

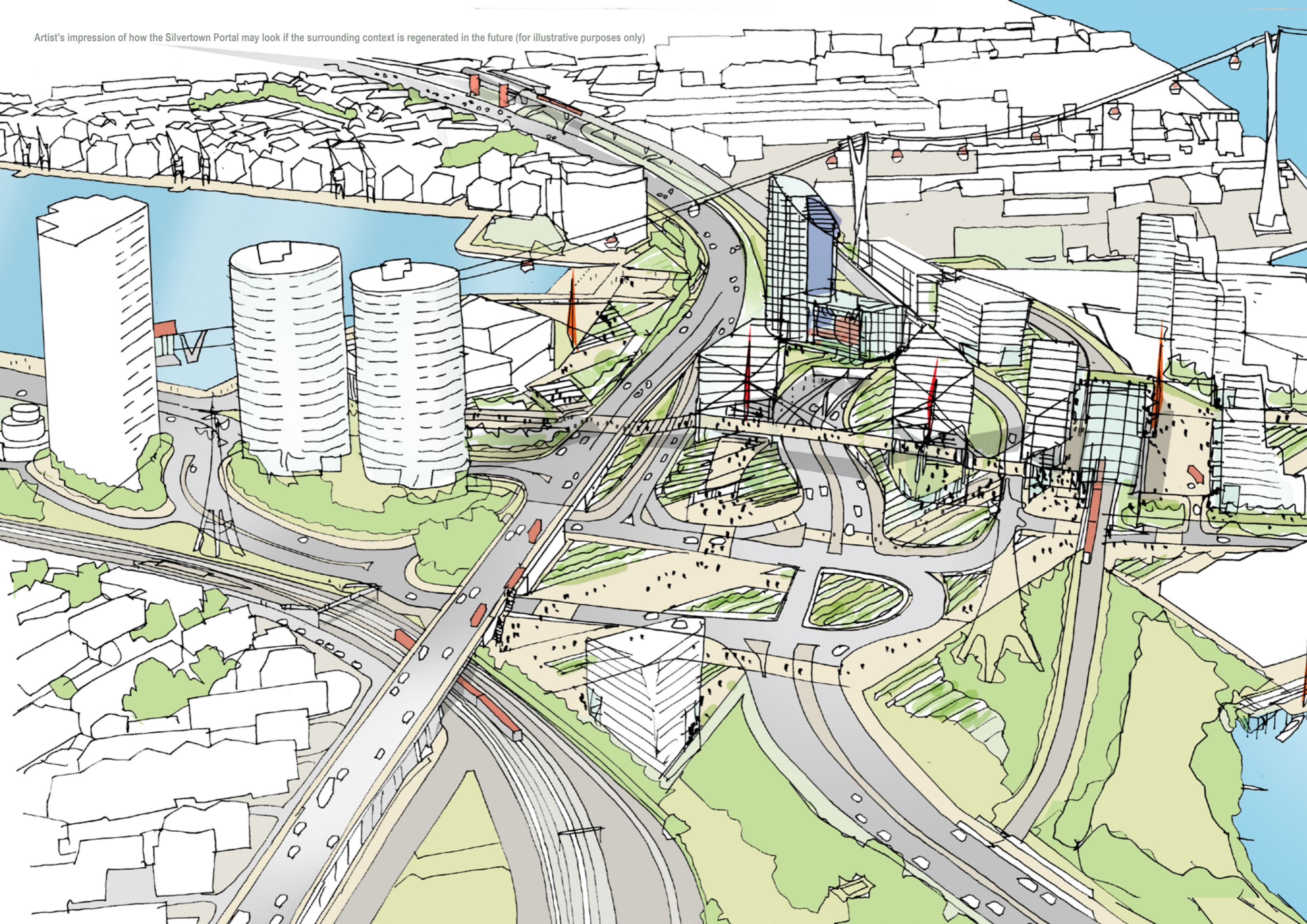
Alongside the benefits for motorists using the tunnel, the proposals would generate substantial benefits for public transport and non-motorised users. The area around each tunnel portal would be enhanced through new landscape and public realm, and enhanced routes for cycling and walking would be delivered.

Overall, the Scheme benefits would include:

- Increased river crossing capacity;
- Improved pedestrian and cycle links around the Royal Docks, and to the Emirates Air Line;
- Potential for the future regeneration of land required for construction, unlocked through the removal of the existent safeguarding, once the tunnel is completed;
- A replacement pedestrian / cycle bridge across the A102 Blackwall Tunnel Southern Approach at Boord Street;
- Enhanced landscape and public realm in the vicinity of the Silvertown Portal.

This statement presents the Scheme along with illustrative designs in design and access terms, to demonstrate how the Scheme design would meet the technical requirements of the project objectives to provide a world-class new road tunnel and enhancements to the local area that would improve connectivity for all.

Artist's impression of how the Silvertown Portal may look if the surrounding context is regenerated in the future (for illustrative purposes only)



Part A

Scheme Context

01

Introduction

- 1.1 Purpose of the Document
 - 1.2 The Development Consent Order (DCO)
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01

Introduction

1.1 Purpose of the Document

1.1.1 This preliminary Design and Access Statement (DAS) is one of the documents provided as part of the statutory consultation on TfL's proposed application for development consent for the Silvertown Tunnel Scheme. A development consent order (DCO) is a means of obtaining permission for developments categorised as Nationally Significant Infrastructure Schemes (NSIP). DCOs are required in place of consents such as planning permission, listed building consent and compulsory purchase orders.

1.1.2 The DAS sets out preliminary illustrative designs for the permanent spaces, above ground structures and access arrangements for both the north and south ends of the tunnel (portals, junctions and tunnel services buildings) plus the replacement Boord Street pedestrian and cycle bridge across the A102 Blackwall Tunnel Approach road on the Greenwich Peninsula. It sets out the site context and explains how this was taken into account in developing the Reference Design.

1.1.3 The DAS also describes the main alternatives to the designs that were considered, how the designs have evolved in response to public and stakeholder consultation so far, and the reasons for selecting the proposed designs.

This DAS is submitted as a consultation document. It provides information that will help consultees to understand the Scheme design, and how the context of the proposed tunnel has informed the design. It sets out the design principles and includes an illustrative presentation of how the Scheme may be built.

Certain elements of the illustrative design are still being developed. Any further design changes made following this consultation will be captured in the final version of the DAS ahead of its submission as one of the supporting documents for the DCO application.

1.2 The Development Consent Order (DCO)

1.2.1 This document primarily focuses on the illustrative design of the Scheme, which is an example of what the Scheme may look like as the detailed design is developed by the DBFM contractor. The DBFM contractor will develop the detailed design to meet the outputs specified by TfL and to comply with any Requirements set within the DCO by the Planning Inspectorate.

1.2.2 In June 2012 the Secretary of State for Transport gave a direction under section 35 of the Planning Act 2008 that the proposed Silvertown Tunnel be treated as a Nationally Significant Infrastructure Project (NSIP). The NSIP designation means that the project may only be authorised by means of a Development Consent Order (DCO) made by the Secretary of State under the Planning Act 2008.

1.2.3 TfL propose to submit a DCO application for the Silvertown Tunnel in early 2016. The application will include information about the design of the tunnel and highway junctions. It will assess the impacts of the Scheme and explain how these will be mitigated. In the case of the landscaping, architecture (e.g. tunnel portals and control buildings) and urban design elements of the Scheme, it is currently envisaged that

the DCO application will include an illustrative design only for these aspects, providing an example of what the Scheme could look like in the future. This is because there are emerging developments at each end of the tunnel that will change the townscape between now and the tunnel opening. It would result in a better outcome if the detailed design was developed when more about the surrounding developments is known. The detailed design would however, reflect the same principles and parameters as the illustrative design. These principles are set out later in this Design and Access Statement.

1.2.4 When a DCO application is approved by the Secretary of State it would normally include a series of Requirements (ie planning conditions) that must be met. For this Scheme, it is envisaged that one such Requirement could be that the landscaping, architecture and urban realm elements of the design are submitted to the local planning authorities for approval. The local planning authorities for the Scheme are the London Borough of Newham and the Royal Borough of Greenwich.

1.2.5 This document primarily focuses on an illustrative design and sets out the design principles that would be adopted throughout the detailed design.

1.3 Design and Access Statement (DAS) Requirements

1.3.1 There is no specific statutory requirement for a DAS for applications for Development Consent Order under the Planning Act 2008 (as amended by the Localism Act 2011). However, it is seen as a document that can be useful to support such applications. In this case the DAS demonstrates how TfL have taken account of the need for good design, and how TfL propose to make the Scheme as attractive, durable and adaptable as possible, and to optimise local, regional and national benefits.

1.3.2 The structure and content of this DAS reflects the special characteristics of the Scheme, which was designated a Nationally Significant Infrastructure Scheme (NSIP) in 2012.

1.3.3 While the tunnel sections would be constructed underground, the portals, highways works and associated buildings would affect the surface, and therefore it is appropriate to place the design of these elements in their existing and future context.

1.3.4 The scale and definition of the Scheme has been determined by the functional and operational requirements as detailed in the Preliminary Engineering Report which is being provided as part of the statutory consultation.

1.3.5 The Preliminary Engineering Report describes the design and construction elements of the Scheme based on appropriate technical standards and best practice guidance for design, construction, operation and maintenance.

1.3.6 The layout and arrangement of the development has been informed by a detailed local analysis and stakeholder engagement.

1.3.7 In preparing this DAS TfL had regard to the best practice guidance contained in "Design and Access Statements: How to write, read and use them" published by CABE (Now Design Council CABE) in 2006.

1.4 Structure of the DAS

1.4.1 This document is structured in two parts. Part A establishes the Scheme background and physical context, and Part B sets out the proposed works and how the design has been influenced by that context.

1.4.2 A glossary of terms is included at the front of this document.

1.4.3 The document contents are as follows:

PART A

Chapter 1

Introduction: States the background to the Scheme, and the purpose of the DAS.

Chapter 2

Context: Sets out the context of the Scheme in terms of planning policy, local regeneration, public transport improvements, land use and urban analysis.

Chapter 3

Consultation, Engagement and Design

Development: Sets out the various rounds of consultation and stakeholder engagement that have been undertaken to-date, and how these have informed the evolution of the design.

PART B

Chapter 4

Vision & Approach: Sets out the overall vision for the Scheme, and the design principles derived from this vision that have then underpinned the design, and how these will deliver benefits for London.

Chapter 5

Landscape & Public Realm Design: Sets out the illustrative design and access features of the surface elements - the junctions, landscape and public realm - and how this responds to the Scheme vision and design principles.

Chapter 6

Portal & Building Design: Sets out the illustrative design and access features of the portals and buildings which are required for the operation of the tunnel - and how their design responds to the Scheme vision and design principles.

Chapter 7

Scheme Integration: Looks at the works that may be provided alongside the main tunnel, or just outside of the Scheme red line boundary that complement its aims & objectives, and help to integrate the Scheme into its context. This includes the replacement pedestrian / cycle bridge at Boord Street.

Chapter 8

Sustainability & Environment: This chapter sets out how the Scheme has been designed to be sustainable in terms of its economic, environmental and social aspects. It provides a more detailed look at the specific biodiversity measures that are embedded into the design to help improve environmental performance, and to offset any loss of habitat. It also considers how features such as green walls could be utilised within the Scheme.

Chapter 9

Scheme-Wide Strategies: The final chapter sets out details of some strategies that are being applied across the whole Scheme, such as the lighting, or the approach to integration of public art.

1.5 Background to Scheme

1.5.1 TfL is developing proposals for a new road tunnel under the River Thames linking the Greenwich Peninsula and Silvertown. The Scheme is known as the Silvertown Tunnel.

1.5.2 The key aims of the Scheme are to:

- reduce congestion at the Blackwall Tunnel
- facilitate forecast growth in population and employment in east London
- improve the reliability and resilience of the wider road network

1.5.3 The twin bore tunnel would connect to the A1020 Silvertown Way/Lower Lea Crossing on the north side and to the A102 Blackwall Tunnel Approach on the south side. The tunnel generally follows the alignment of the Emirates Air Line cable car which provides cross river pedestrian and cycle connectivity.

1.5.4 The Scheme would:

- reduce the impact of unplanned incidents at the Blackwall Tunnel by providing a nearby alternative route;
- reduce congestion at the Blackwall Tunnel
- manage demand with user charging at the Blackwall and Silvertown Tunnels and to provide a source of revenue to help build the new tunnel;

Fig 1.1 Queueing traffic on the A102 Blackwall Tunnel Southern Approach



Fig 1.2 Existing industrial landscape at the proposed location of the Silvertown Portal looking north



- provide an opportunity to create new cross-river bus links in east London;
- improve road connections to and from Docklands and east London from south London; and
- improve journey times and make road travel, including access to employment, deliveries and servicing more reliable.

1.5.5 The tunnel would also create opportunities for new jobs and regeneration in the local area through the release of safeguarded land, help local employers access new markets and reduce the environmental impact of traffic congestion.

1.6 Next Steps

1.6.1 This DAS is part of a suite of documents which have been made available for the statutory consultation on the Silvertown Tunnel scheme which runs from 5 October to 29 November 2015. Following this consultation, TfL will carefully consider comments made by the public and stakeholders in order to improve and refine the scheme proposals. TfL aim to submit a DCO application to the Planning Inspectorate in Spring 2016. This application will seek the consent of the Secretary of State for Transport to build and operate the proposed tunnel and all associated measures.

Fig 1.3 Route of the Silvertown tunnel



Fig 1.4 The Silvertown tunnel Safeguarding Area

