Thames Tideway Tunnel
Thames Water Utilities Limited

Application for Development Consent

Application Reference Number: WWO10001

Transport Assessment

Doc Ref: **7.10.13**

Albert Embankment Foreshore

Main Report

APFP Regulations 2009: Regulation **5(2)(q)**

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Thames Tideway Tunnel

Creating a cleaner, healthier River Thames

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Thames Tideway Tunnel

Transport Assessment

Section 16: Albert Embankment Foreshore

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16.1 Introduction

16.1.1 This site specific *Transport Assessment* (*TA)* presents the findings of the assessment of the transport issues of the Thames Tideway Tunnel project at the Albert Embankment Foreshore site located within the London Borough (LB) of Lambeth.

16.1.2 The assessment takes into consideration the changes as a result of all other Thames Tideway Tunnel project sites to ensure that results indicate the significance of each individual site in combination with construction works being undertaken at other sites.

16.1.3 The purpose of this *TA* is to identify the site context, development proposals and any transport implications arising from these proposals to ensure that appropriate mitigation measures are identified, where necessary.

16.1.4 The *TA* draws on a number of project-wide or application documents which include the Transport Strategy and the *Code of Construction Practice* (*CoCP*). Further detail on these documents which form the background to the *TA* can be found in Section 1 of the *TA*.

16.1.5 The *TA* structure is as follows:

a. Section 16.2 includes a description of the proposed development, detailing construction phasing, vehicle and person trip generation and construction traffic routing and details of the operational phase

b. Section 16.3 outlines the assessment methodology used for the *TA* for the construction and operational phases

c. Section 16.4 details the baseline conditions on the transport network surrounding the site, including survey data analysis and accident analysis

d. Section 16.5 provides the assessment of the construction phase of the project, including a comparison between the construction base case and the construction development case. This section also outlines sensitivity testing for the highway network

e. Section 16.6 provides the assessment of the operational phase of the project

f. Section 16.7 summarises the *TA* findings.

16.2 Proposed development

16.2.1 The site is located on the Albert Embankment (A3036) foreshore to the north of Vauxhall Bridge (A202), within the LB of Lambeth. It is located in the reclaimed foreshore from Tintagel House to Vauxhall Bridge.

16.2.2 The majority of the site (the main site) lies to the northeast of the bridge with a smaller area located under the bridge and to the southwest as shown in Figure 16.2.1 in the Albert Embankment Foreshore *Transport Assessment* figures.

16.2.3 The River Thames lies to the north of the site. Immediately to the east are Camelford House and Vauxhall Cross (the SIS building), beyond which lies Albert Embankment (A3036). Vauxhall Bridge (A202) and Vauxhall Cross lie to the south of the Vauxhall Cross building. Albert Embankment (A3036), Vauxhall Bridge (A202) and Vauxhall Cross form part of the Transport for London Road network (TLRN).

16.2.4 The development at Albert Embankment Foreshore consists of a CSO interception structure connecting the Brixton Storm Relief and Clapham Storm Relief CSOs to the main Thames Tideway Tunnel through a CSO drop shaft.

Construction

16.2.5 The construction site would be located on the foreshore of the River Thames. In order to provide access and working areas the site would also occupy part of the riverside footway.

16.2.6 There would be four phases of construction at the Albert Embankment site: phase 1 - site set-up, phase 2 - shaft construction and tunnelling, phase 3 - construction of other structures and phase 4: demobilisation, with construction anticipated to last for three and a half years. The access plan and highway layout during construction (options A and B) plans are provided in the Albert Embankment Foreshore *Transport Assessment* figures.

16.2.7 Stage 1 Road Safety Audits have been carried out on the illustrative highway layouts proposed for this site. The *Road Safety Audit* reports for this site are contained in Appendix E.

16.2.8 During construction it is anticipated that transport elements may be affected as a result of the additional construction traffic associated with the Albert Embankment Foreshore site and other construction sites with construction routes along Albert Embankment as well as pedestrian diversions along the Thames Path.

16.2.9 The Thames Path runs along the riverside footway of Albert Embankment, between the river and Camelford House and would require closure and diversion as a result of the construction works. This would be necessary throughout the construction period. Pedestrians would be directed along the western side of Albert Embankment (A3036) between Albert Embankment Gardens and the Vauxhall Bridge (A202) / Wandsworth Road (A3036) junction. To the south, pedestrians would be able to cross at the signalised pedestrian crossing on Vauxhall Bridge Road (A202) to

connect with the existing Thames Path route on the western side of Wandsworth Road (A3036). Emergency evacuation routes from Camelford House and Peninsula Heights that currently use the Thames Path would be maintained and diverted through safe paths across the site.

16.2.10 Two construction access options are being considered for this site;

a. Option A: all vehicle access to and from the main site would take place from the nearside lane of the northbound carriageway of Albert Embankment (A3036) via a newly constructed access road adjacent to the existing Lacks Dock slipway. Access to the river foreshore via Lacks Dock would be necessary to provide occasional access to the foreshore site for plant/machinery.

b. Option B: construction vehicle access to and from the site would take place from the nearside lane of the northbound carriageway of Albert Embankment (A3036) via a newly constructed access road between Camelford House and Tintagel House. Access to the river foreshore along Lacks Dock will also be required on occasion for plant/machinery.

16.2.11 The Secretary of State will be asked to confirm which option should be provided in any decision to grant development consent for the project.

16.2.12 There are no proposals to alter the layout of the existing highway network during the construction of the site, other than the realignment of the northern kerb at the site access for construction vehicle movements for access option A or the construction of a new access across the footway of Albert Embankment for access option B.

16.2.13 The highway layout during construction vehicle swept path analysis (options A and B) plans are provided in the Albert Embankment Foreshore *Transport Assessment* figures.

16.2.14 Parking for five essential maintenance vehicles would be provided on site. No worker parking would be provided.

16.2.15 During construction cofferdam fill (import and export), shaft and other excavated material (export) would be transported by barge and all other material by road. For the assessment it has been assumed that 90% of these materials would be taken by river. This allows for periods when the river is unavailable and material unsuitable for river transport. All other material would be transported by road.

16.2.16 Construction details for the site relevant to the construction are summarised in Table 16.2.1.

Table 16.2.1 Maximum Construction traffic details

Description	Assumption
Assumed peak period of construction lorry movements	Year 1 of construction
Assumed average peak daily construction lorry vehicle movements and duration	46 movements per day (23 vehicle trips) 1 month
Assumed peak period of construction barge movements	Site Year 1 of construction
Assumed average peak daily construction barge movements	8 movements per day (4 vehicle trips)
Typical types of lorry requiring access (comprising rigid-bodied, flatbed and articulated vehicles)	Imported fill lorries Aggregate lorries Cement tankers lorries Ready Mix Mixer lorries Steel Reinforcement lorries Tunnel Precast Concrete Linings lorries Office Delivery lorries Plant and equipment lorries Temporary construction material lorries including Pipe/Track/Oils/Greases lorries Excavation lorries

Note: a movement is a construction vehicle moving either to or from the site. A Site Year is a 12 month period, one in a series of Site Years; Site Year 1 commences at the start of construction.

Construction routes

16.2.17 The Albert Embankment Foreshore site is located on the TLRN on Albert Embankment (A3036) approximately 130m north of the Vauxhall Gyratory.

16.2.18 Figure 16.2.2 in the Albert Embankment Foreshore site *Transport Assessment* figures shows the primary construction routes for Albert Embankment Foreshore and the main junctions along the construction traffic routes local to the Albert Embankment Foreshore site are:

a. Millbank (A3212) and Albert Embankment (A3036) junctions either side of Lambeth Bridge to the north of the site

b. Millbank (A3212) and Vauxhall Gyratory junctions either side of Vauxhall Bridge to the south and west of the site.

16.2.19 Vehicle access would be arranged on a left-turn in, left-turn out only basis. All vehicles arriving at the site would therefore do so from the south. Vehicles leaving the site would route north to the roundabout with Lambeth Road (A3203) at the east end of Lambeth Bridge. Vehicles would then either travel back south along Albert Embankment (A3036) to the Vauxhall Gyratory or east along Lambeth Road (A3203) towards the Elephant and Castle interchange on the A3.

16.2.20 The existing Lacks Dock access and slipway from Albert Embankment is currently used by the commercial tour company London Duck Tours which uses amphibious vehicles. The access would remain open to use by London Duck Tours during construction, regardless of the access option ultimately chosen.

16.2.21 The access option B between Camelford House and Tintagel House routes through a section of the Tintagel House car park and the ramp to the Camelford House underground car park. Access to the underground car park would be maintained during construction with a one-way system in operation.

16.2.22 Construction routes have been discussed with both Transport for London (TfL) and the Local Highway Authority.

16.2.23 The exact routing depends on the material origins and destinations which are detailed in the *Project-wide TA*.

Proposed construction flows

Construction vehicles and barges

16.2.24 The proposed working hours are set out in the *CoCP* and vehicle movements would take place during the standard day shift of ten hours on weekdays (08:00 to 18:00) and five hours on Saturdays (08:00 to 13:00) with up to one hour before and after these hours for mobilisation of staff.

16.2.25 Construction activity would occur 24 hours a day for some periods but during such periods, construction vehicle movements would only occur during the ten and five hour periods stated above.

16.2.26 A limited number of extensions to working hours may be required to cover certain construction activities at Albert Embankment Foreshore site such as major concrete pours. The site would also require continuous working hours when the tunnelling and secondary lining construction activities are taking place. These underground works would occur on a continuous 24 hour cycle seven days a week. However, construction vehicle movements would be limited to the hours stated in 16.2.24 other than in exceptional circumstances.

16.2.27 In exceptional circumstances HGV and abnormal load movements could occur up to 22:00 for large concrete pours and later at night on agreement with the LB of Lambeth.

16.2.28 A site-specific peak construction assessment year has been identified. The histograms in Plate 16.2.1 (construction lorry profile) and Plate 16.2.2 (construction barge profile) show that the peak site-specific activity at the Albert Embankment Foreshore site would occur in Year 1 of construction.

The peak activity for construction barges at this site would occur in Site Year 1 of construction.

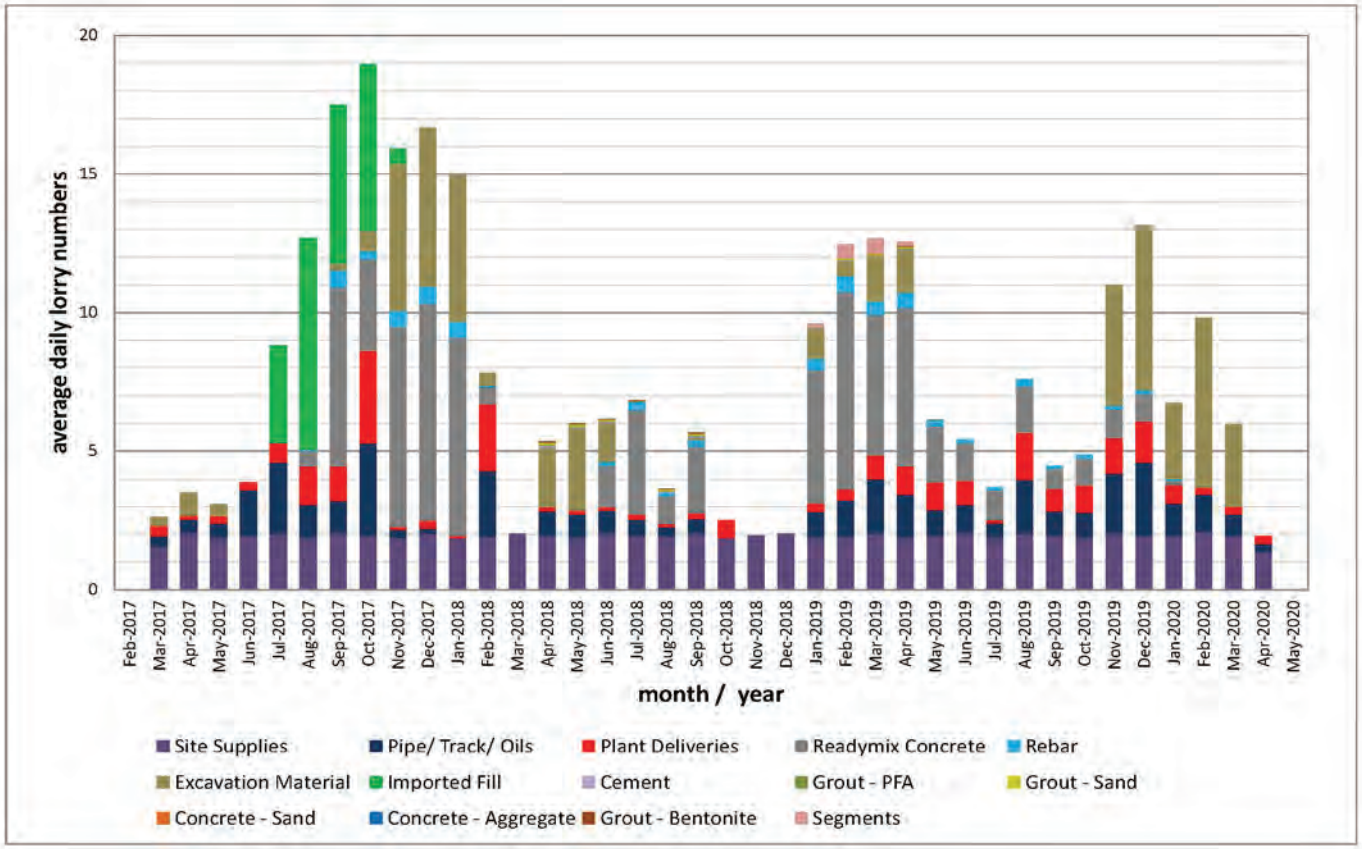
16.2.29 This site-specific peak is earlier than the overall project-wide construction peak activity year of 2019.

16.2.30 This *TA* assesses this site-specific peak construction year. As detailed in Table 16.2.1, there would be 46 average peak daily construction lorry vehicle movements (i.e. 23 vehicle trips) and an estimated 8 peak daily construction barge movements in Site Year 1 of construction.

16.2.31 The assessment is based on 10% of the daily number of lorry journeys occurring in the peak hours, which has been agreed with TfL as a reasonable approach. It is recognised that it may be desirable to reduce the number of construction lorry movements in peak hours and the mechanisms for addressing this would form part of the Traffic Management Plans which are required as part of the *CoCP*.

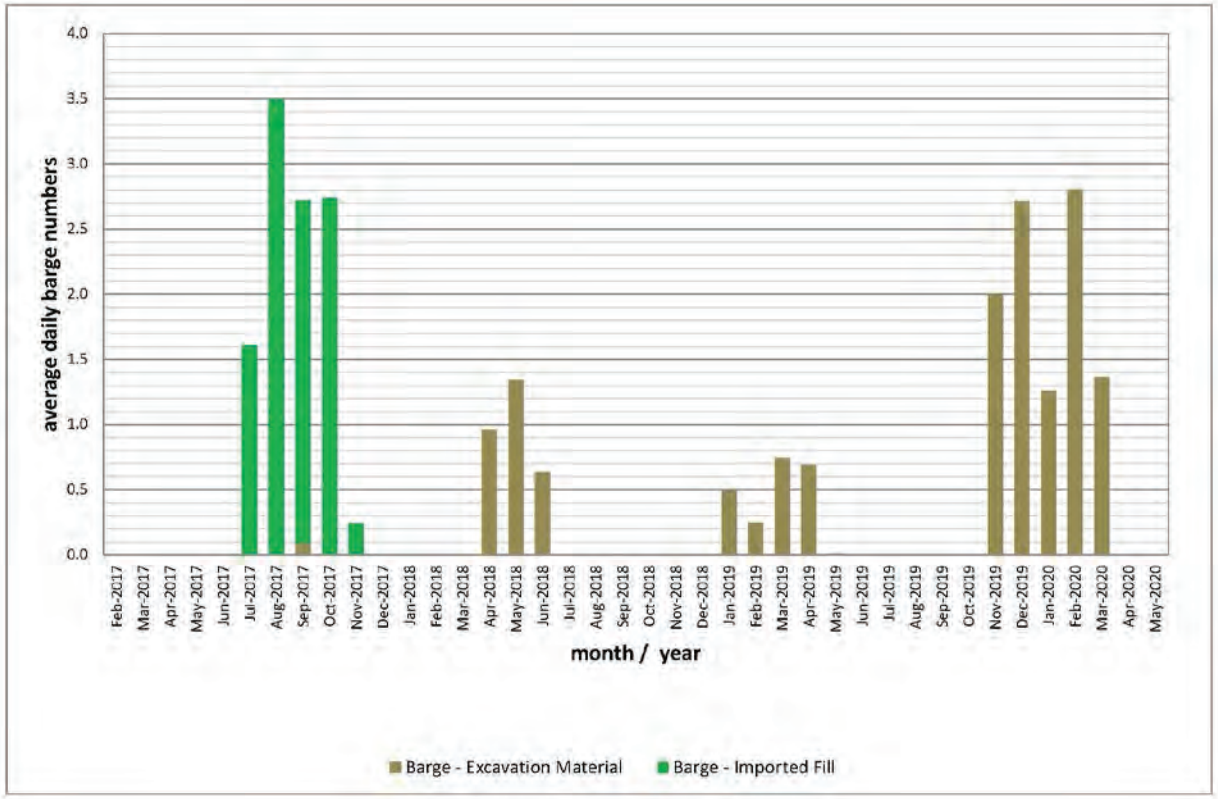
16.2.32 The number of vehicular movements will vary throughout the construction period, and Plate 16.2.1 indicates the construction vehicle profile during construction.

Plate 16.2.1 Estimated construction lorry profile



Note: Figure shows approximate volumes and number of vehicle trips based upon assumed timings for the works. It is not a programme and remains subject to change.

Plate 16.2.2 Estimated construction barge profile



Note: Figure shows approximate volumes and number of barge trips based upon assumed timings for the works. It is not a programme and remains subject to change.

16.2.33 As the *Project-wide TA* explains, the TfL Highway Assignment Models (HAMs) used for the strategic highway modelling represent peak hours of 08:00 to 09:00 and 17:00 to 18:00 and these have been taken as being the network-wide AM and PM peak hours in the project-wide and site-specific assessments.

16.2.34 The 07:00 - 09:00 and 17:00 - 19:00 periods identified from the local traffic surveys are busier on the network in the weekday than those encountered at the weekends (this is discussed in Section 16.4). Whilst the AM and PM peak hours differ slightly from these network-wide peak hours, in practice the number of vehicle movements at this site would be low in comparison to base case traffic flows on the adjacent network and is expected to be constant throughout the day.

16.2.35 Hourly construction vehicle trips during the inter-peak period are not expected to exceed the hourly trips generated between 08:00 - 09:00 and 17:00 - 18:00. The peak travel periods hours utilised for the modelling assessments in this report are therefore the weekday periods between 08:00 - 09:00 and 17:00 - 18:00.

16.2.36 Other construction vehicle movements associated with site operations and contractor activities would be cars and light goods vehicles (LGVs). The construction vehicle movements expected to be generated by the Albert Embankment Foreshore site are shown in Table 16.2.4.

16.2.37 Plate 16.2.1 shows that the number of vehicular movements varies throughout the construction period with one month of 46 movements a day, two months with 30 HGV to 34 movements a day, 10 months with between 20 to 30 HGV movements a day, 12 months with between 10 to 20 HGV movements a day and 13 months with less than 10 movements a day during the three year build programme.

16.2.38 The peak month in Year 1 of construction has been used for the assessment and 10% of the daily HGV construction movements in the peak month have been assumed to take place in the peak hours to provide a busiest case assessment. The AM and PM peak hours are assumed to be 08:00 to 09:00 and 17:00 to 18:00 respectively.

Construction workers

16.2.39 The construction site is expected to require a maximum workforce of approximately 65 workers at any one time. The number and type of workers is shown in Table 16.2.2.

Table 16.2.2 Maximum estimated construction worker numbers

Contractor				Client	
Staff*		Labour**		Staff***	
08:00-18:00	18:00-08:00	08:00-18:00	19:00-07:00	08:00-18:00	18:00-08:00
30	0	25	0	10	0

** Staff Contractor – engineering and support staff to direct and project manage the engineering work on site.*
*** Labour – those working on site doing engineering, construction and manual work.*

**** Staff Client – engineering and support staff managing the project and supervising the Contractor.*

16.2.40 The worker mode split has been derived by taking the highest number of workers during the peak month and calculating the percentage of trips based on the 2001 Census [i] to work data for the area in the vicinity of the Albert Embankment Foreshore site.

16.2.41 The Census data indicates that the predominant mode of travel for journeys to work in this area is public transport. There is no parking available on-site for workers and there would be no parking provided within the site boundary, parking on surrounding streets is also restricted, and measures to reduce car use would be incorporated into a site-specific Travel Plan which means that workers would be unlikely to drive to the site. Therefore, the Census mode shares have been adjusted to reflect increased levels of non-car use by workers at this site. In order to assess a scenario which represents the most likely mode split at a construction site within this area, the mode split outlined in Table 16.2.3 has been used to assess the impacts of worker journeys on the highway and public transport networks.

16.2.42 The method of distribution of worker trips on the transport networks, including the public transport services, has been agreed with the Local Highway Authority and TfL.

Table 16.2.3 Transport mode split

Mode	Percentage of trips to site	Equivalent number of worker trips (based on 65 worker trips)	
		AM peak (07:00-08:00)	PM peak (18:00-19:00)
Bus	13%	9	9
National Rail	42%	27	27
Tube	30%	20	20
Car driver	<1%*	0	0
Car passenger	<1%*	0	0
Cycle	4%	2	2
Walk	7%	5	5
River	0%	0	0
Other (taxi/motorcycle)	3%	3	3
Total	**100%**	**65***	**65***

** assuming to be zero for the purpose of this assessment;**Totals subject to rounding*

[i] Based on 2001 Census. This type of data had not been released from the 2011 Census at the time of the assessment.

16.2.43 Information regarding the travel arrangements of these workers would be included in the *Construction Management Plan* and *Workplace Travel Plan* documents for the site.

16.2.44 It is difficult to predict with certainty the directions to and from which workers at the site would travel. Staff could potentially be based in the local area or in the wider Greater London area and are unlikely to have the same trip attraction to primary A roads as construction lorries.

16.2.45 As indicated in Table 16.2.3, it is assumed that the predominant mode of travel for journeys to work in this area is public transport and it is assumed that the primary public transport services used would be from the nearest bus stops at Vauxhall Bus Station and rail services at Vauxhall Underground Station within the Vauxhall Gyratory.

Vehicle movements summary

16.2.46 Other construction vehicle movements associated with site operations and contractor activities would be cars and LGVs. The construction worker vehicle movements expected to be generated by the Albert Embankment Foreshore site is shown in Table 16.2.4.

16.2.47 Table 16.2.4 also shows the construction lorry movement assumptions for the local peak traffic periods. These are based on the peak months of construction activity at this site. The table also shows the construction worker vehicle movements expected to be generated by the site.

Table 16.2.4 Peak construction works vehicle movements

Vehicle type	Vehicle movements per time period				
	Total Daily	0700 to 0800	0800 to 0900	1700 to 1800	1800 to 1900
Construction lorry vehicle movements 10%*	46	0	5	5	0
Other construction vehicle movements**	36	4	4	4	4
Worker vehicle movements***	nominal	0	0	0	0
Total	**82**	**4**	**9**	**9**	**4**

** The assessment has been based on 10% of the daily construction lorry movements associated with materials taking place in each of the peak hours.*
*** Other construction vehicle movements includes cars and light goods vehicles associated with site operations and contractor activity.*
**** Worker vehicle numbers are based on less than 1% of workers driving, on the basis that there would be no worker parking on site, on-street parking in the area is restricted, and site-specific Travel Plan measures would discourage workers from driving by car. In practical terms, this would be close to zero.*

16.2.48 Assuming that 90% of cofferdam fill (import and export) is transported by barge with all other material by road, an average peak flow of 82 vehicle movements a day is expected during the months of greatest activity during

Site Year 1 of construction at the Albert Embankment Foreshore site. At other times in the construction period vehicle flows would be lower than this average peak figure.

16.2.49 The assessment has been based on a combination of the peak hour of movements for construction and worker vehicle movements between 07:00 to 09:00 and 17:00 to19:00. These have been applied to the peak hours to take into account the highest number of movements generated by the site. In reality, not all peaks for these movements would occur concurrently and the peak for worker trips would be outside of the highway network peak hour, therefore the assessment is considered to be a robust case.

16.2.50 Table 16.2.4 shows that in the AM (07:00 – 09:00) and PM (17:00 – 19:00) peak periods, the Albert Embankment Foreshore site would generate approximately 13 vehicle movements in each peak period. This has been assessed against the peak hour operation of the highway network and represents a robust figure for assessment as it combines the anticipated movements between 07:00 and 09:00 in the morning and 17:00 to 19:00 in the evening.

16.2.51 It is anticipated that along Albert Embankment (A3036) there would be an additional five two-way HGV movements during both peak hours as a result of the construction at the Albert Embankment Foreshore site, plus an average of one two-way HGV movement during the peak hour associated with other Thames Tideway Tunnel project sites passing along Albert Embankment (A3036) during Site Year 1 of construction at the Albert Embankment Foreshore site.

Code of Construction Practice

16.2.52 Measures incorporated into the *CoCP Part A* (Section 5) to reduce transport effects include:

a. Site specific *Traffic Management Plans* (*TMP*): to set out how vehicular access to the site would be managed so as to minimise impact on the local area and communicate this with the local borough and other stakeholders. This includes any works on the highway, diversion or temporary closure of the highway or public right of way

b. HGV management and control: to ensure construction vehicles use appropriate routes to the sites and the vehicle fleet and/or drivers meet current safety and environmental standards

c. Site specific *River Transport Management Plans* (*RTMP*) are to be produced for each relevant worksite. As with the *TMP*'s this would set out how river access to site would be managed so as to minimise impact on the river and communicate this with the PLA, local borough and other stakeholders

16.2.53 In addition to the general measures within the *CoCP Part A*, the *CoCP Part B* relating to the Albert Embankment Foreshore site includes the following measures:

a. access to the site would be from Vauxhall Gyratory and Albert Embankment (A3036). The new site access road is adjacent to Lacks Dock.

b. access for to Lacks Dock for Duck Tours would be maintained throughout the works unless agreed otherwise

c. Option A: the existing security kiosk at Lacks Dock would be relocated and be utilised for a tandem Thames Tideway Tunnel site access and Duck Tours access security

d. Option B: the new site access road is between Camelford House and Tintagel House, with a new crossover constructed in the pavement

e. Options A and B: vehicles would turn left in and turn left out only and exit northbound along Albert Embankment (A3036)

f. the security barrier would be positioned at the entrance to the site access road(s) to allow a standard rigid tipper vehicle to be wholly off Albert Embankment (A3036) whilst awaiting barrier operation

g. drivers of construction vehicles accessing the site would be required to obtain security clearance before arriving at the site. The method of obtaining security clearance is to be confirmed. Vehicles arriving at the site entrance without clearance to access the site would be denied entry. Vehicles denied entry would leave the site via a left turn onto Albert Embankment (A3036) under the supervision of a traffic marshal to prevent conflict with other road users on Albert Embankment (A3036) or vehicles entering Lacks Dock or Camelford House vehicle entrance. Large vehicles denied access that are unable to turn off the highway would reverse onto Albert Embankment (A3036) under the supervision of a traffic marshal

h. Option A: a traffic marshal would be stationed at the site entrance to manage potential conflicting movements (eg, with incoming/outgoing Duck Tours vehicles) and ensure no vehicles queue/wait on Albert Embankment (A3036)

i. drivers of large vehicles exiting the site would be made aware that the vehicle may encroach into the offside northbound lane

j. provision of signage for pedestrian diversions (Thames Path) would clearly identify alternative routes during the construction works at the Albert Embankment Foreshore site

k. areas of foreshore between the working areas would have suitable protection placed for vehicle transport such as concrete ‘armorloc’ or similar product.

16.2.54 Based on current travel planning guidance including TfL’s ‘*Travel Planning for new development in London* (TfL. 2011)[1’], this development lies within the threshold for producing a *Strategic Framework Travel Plan*. *A Project*

Framework Travel Plan has been prepared based on the TfL ATTrBuTE[ii] guidance. The *Project Framework Travel Plan* addresses project-wide travel planning measures including the need for a project-wide Travel Plan Manager, initial travel surveys during construction and a monitoring framework. It also contains requirements and guidelines for the development of site-specific measures. The site-specific travel planning requirements of relevance to the *Project Framework Travel Plan* are as follows:

a. information on existing transport networks and travel initiatives for the Albert Embankment Foreshore site

a. a mode split established for the Albert Embankment Foreshore site construction workers to establish and monitor travel patterns

b. site-specific targets and interim targets would be established based on the mode share which would link to objectives based on national, regional and local policy

c. a nominated person would be assigned responsibility for managing the Travel Plan monitoring and action plans specifically for this site.

Other measures during construction

16.2.55 Embedded design measures which are not outlined in the *CoCP* but are of relevance to the *TA* at the Albert Embankment Foreshore site include the following:

a. realignment of the northern kerb at the site access (for access option A only)

b. minimum of 3m width traffic lanes to be retained

c. removal of a section of the low wall (which segregates the Duck Tour access route on Lacks Dock from the Thames Path adjacent to Camelford House to accommodate the construction access road) (for access Option A only)

d. a new access from Albert Embankment (A3036) with level realignment of the Tintagel House car park to the existing carriageway and footway level (for access option B only). Also, the ramp to the Camelford House underground car park would be reduced to a single lane with traffic flow regulated by a traffic light system at the top and bottom of the ramp.

[ii] Assessment Tool for Travel plan Building Testing and Evaluation, (ATTrBuTE), is a web-based travel planning tool, which ensures that Travel Plans are in accordance with TfL's published guidance on travel planning for new development in London, http://www.attrbute.org.uk/.

Operation

16.2.56 During operation it is anticipated that there would be no significant issues for the transport infrastructure and operation within the local area, because maintenance trips to the site would be infrequent and short-term. On this basis the only elements considered are:

a. effects on pedestrians

b. effects on highway layout and operation.

16.2.57 There would be potential for some operational issues to arise as a result of the short-term changes to the physical aspects of access to the site for maintenance. These are only considered qualitatively because the physical changes required to the highway network during maintenance activity would be minor and temporary, meaning that a quantitative assessment is not required. The scope of this analysis has been discussed with the LB of Lambeth and TfL.

16.2.58 On completion of the construction phase the existing highway layout would be returned to the existing layout, with public access to the CSO shaft provided via the Thames Path.

16.2.59 For routine three or six monthly inspections vehicular access would be required for light commercial vehicles, typically a transit van. On occasions there may be a consequent need for small flatbed vehicles to access the site.

16.2.60 During operation, maintenance vehicles would enter the site from the northbound carriageway of Albert Embankment (A3036). Vehicles would route along the Lack's Dock slipway and then either route along a section of the Thames Path to the southwest of Camelford House to reach the shaft (which would be located in the new public realm area to the west of Camelford House) or along a section of the Thames Path to the west of Vauxhall Cross to reach the interception chamber.

16.2.61 Additionally there would be more significant maintenance visits approximately every ten years requiring access to enable two mobile cranes and associated support vehicles to be brought to the site, which may require temporary closure of the Thames Path in the vicinity of the site and the foreshore access via Lack's Dock. The cranes would facilitate duty/standby access for personnel.

16.2.62 During operation, maintenance vehicles would enter the site from Albert Embankment to the immediate south of the Camelford House access. The highway layout during operation plans (options A and B) are provided in the Albert Embankment *Transport Assessment* figures and indicate the operational layout at the site.

16.3 Assessment methodology

Engagement

16.3.1 An extensive scoping and technical engagement process has been undertaken. All consultee comments relevant to this site are presented in the *Environmental Statement*.

16.3.2 The *TA* examines the operational phase in order to satisfy the relevant stakeholders that technical issues have been addressed (for example, those associated with access for maintenance activities).

Consultees

16.3.3 Throughout the scoping and technical engagement process, the key stakeholders with regards to transport, primarily TfL and the relevant local borough for each site, have been consulted. For the Albert Embankment Foreshore, the LB of Lambeth has been consulted and the comments which have arisen relating directly to Albert Embankment Foreshore have been recorded and responded to accordingly.

16.3.4 The key issues arising from the stakeholder engagement are:

a. the application will need to be accompanied by a Transport Assessment that addresses impacts on Albert Embankment and Vauxhall Gyratory and on the quality of walking and cycling routes in the area.

b. the Borough states that the location of the access on Albert Embankment (A3036) at Lacks Dock is not an issue and for TfL to be consulted to confirm they are also happy.

c. the Borough has no concerns over TfL's suggestion that vehicles arriving at the site which are refused entry would reverse onto Albert Embankment (A3036) under supervision.

d. the Borough acknowledges that the Albert Embankment Foreshore site may require a vehicle holding or screening area and suggests the area adjacent to Kennington Oval and the road under the railway line at Vauxhall Gyratory as suitable potential locations for the holding area. The Borough is content that the precise location will not be identified until closer to the construction start date.

e. the Borough indicates a preference to avoid vehicles 'stacking' (queuing) at site access or convoys of vehicles entering the site.

f. the Borough is content that the security screening will help to manage lorry flow into the site to alleviate multiple HGVs and potential queuing.

g. the Borough requests that the Environmental Impact Assessment (EIA) sets out how any negative impacts on Albert Embankment Gardens, in relation to pedestrian movement, would be minimised.

h. the use of the river for construction traffic [sic] should be maximised.

i. a Service Management Plan (for construction traffic) will be required and should provide details of the management of vehicles and deliveries.

j. a Travel Strategy for construction workers should be included in draft in the transport assessment.

k. the Borough would not welcome a considerable amount of new signage for diversions.

l. assessment of the capacity of footways and pedestrian crossings in the vicinity of the site

m. ensuring the width of the road is kept to a minimum standard for safety requirements

n. information on construction traffic associated with other Thames Tideway Tunnel sites should be provided

o. additional details and analyses of type of users involved in the accidents should be shown on a plan

p. Road Safety Audits should be carried out

q. justification should be provided of why some nearby junctions were not modelled

r. clarification of the basis for defining the year of construction is required

s. clarification of working hours assumed in the *TA* for the assessment is required

t. swept path analysis for vehicle access to the construction site and final operational site should be undertaken.

16.3.5 The key technical issues raised have been addressed as far as is practicable at this stage within this *TA*, *Project-wide TA* and the *Environmental Statement*, in consultation with both TfL and the LB of Lambeth.

Construction

16.3.6 The assessment methodology for the construction phase follows that described in the *Project-wide TA* with the exception of the method of local capacity modelling. Due to the number of committed developments in the Nine Elms area the base case traffic flows in the TfL HAMs are lower than the expected flows. Background traffic flows have therefore been calculated using information available for each committed development site and manually adding these into the models as described further in this section.

16.3.7 The effect of all other Thames Tideway Tunnel project sites on the area surrounding Albert Embankment Foreshore has been taken into account within the assessment of the peak year of construction at this site.

Construction assessment area

16.3.8 The assessment area for the Albert Embankment Foreshore site includes the area taken by the site access and its direct vicinity, i.e. Lacks Dock and the Thames Path, and Albert Embankment (A3036), which is part of the TLRN, including the footways and cycleways in the vicinity of the site access.

16.3.9 The Lacks Dock junction with Albert Embankment (A3036) has been assessed for highway, cycle and pedestrian impacts. The Thames Path has also been included within the assessment due to its proximity to the development site. Additionally, effects on local bus services within 640m (see para 16.4.33) of the site and rail services within 960m (see para 16.4.33) of the site have been assessed. The Public Transport Accessibility Level (PTAL) of the site, calculated using TfL's approved PTAL methodology assumes a walking speed of 4.8km/h and considers rail stations within a 12 minute walk (960m) of the site and bus stops within an eight minute walk (640m).

16.3.10 The extent of the assessment area for the local highway network modelling has been informed by considering the volume of construction traffic at this site and the degree of impact that would be experienced at the nearest junction of the construction vehicle route with the Strategic Road Network (SRN) or TLRN. Where the assessment shows that the forecast impacts at this junction would not be significant, junctions further afield on the strategic network have not been assessed. Where impacts are forecast to be significant, a wider area of the local network has been considered in the assessment.

Construction assessment year

16.3.11 2019 has been used as the peak construction assessment year for the assessment of project-wide effects. This has been agreed with TfL and is reported in the *Environmental Statement.*

16.3.12 To assess the busiest case scenario for the Albert Embankment Foreshore locality, the peak construction traffic year has been identified. This ensures that the assessment for Albert Embankment Foreshore takes into consideration the heaviest flow of construction vehicles at this site on local roads for the local modelling assessment.

16.3.13 The site-specific peak construction traffic year at Albert Embankment Foreshore is Year 1 of construction. This site-specific peak is earlier than the overall project-wide construction peak activity year of 2019.

16.3.14 The assessment of the aggregated Thames Tideway Tunnel project construction traffic flows on the wider highway network is included within the *Project-wide TA*.

Highway network modelling

16.3.15 The assessment for each site takes account of construction vehicle movements associated with the Albert Embankment Foreshore site, together with construction traffic from other Thames Tideway Tunnel project sites that would use the highway network in the vicinity of this site in Site Year 1 of construction.

16.3.16 The *Project-wide TA* indicates that the TfL HAMs have been used as part of the assessment to take into account a level of future growth and development across London. However, it is expected that because of the scale and rate of change in the wider Nine Elms area, trips associated with the committed developments in the vicinity of the Albert Embankment Foreshore site could significantly alter the operation of the highway

network in the future. From inspection of the TfL HAM for this area, it is not clear whether the changes associated with committed development are fully represented at the detailed local level and therefore in assessing the transport effects of this site it has been agreed with TfL and LB of Lambeth that specific allowance should be made in the local highway models for trips associated with these developments in addition to the growth factors derived from the HAMs.

16.3.17 The construction base case in Year 1 takes into account the following developments that are planned to be complete at this time:

a. Market Towers
b. Spring Mews, Vauxhall[i]
c. 2-14 Tinworth Street and 108-110 Vauxhall Walk
d. Eastbury House, 30-34 Albert Embankment
e. Riverwalk House, Millbank
f. 1-9 Bondway and 4-6 South Lambeth Place
g. St George's Wharf (Vauxhall Tower)
h. Hampton House, 20 Albert Embankment
i. 30-60 South Lambeth Road
j. 10 Albert Embankment (Wah Kwong House)
k. 8 Albert Embankment and land to rear
l. 81 Black Prince Road (Parliament House)
m. Vauxhall Sky Gardens, Wandsworth Road
n. US Embassy site, Ponton Road
o. Nine Elms Sainsburys, Wandsworth Road
p. Embassy Gardens (Buildings A09, A10 and A11)
q. 10 Pascal Street
r. New Covent Garden Market (Buildings B4-B6)[i]

16.3.18 There will also be some developments that will be under construction at the same time as construction works at the Albert Embankment Foreshore site. These are:

a. Vauxhall Square Cap Gemini (plot bounded by Parry Street, Bondway, Miles Street and Wandsworth Road)
b. Island Site, Vauxhall Gyratory
c. Embassy Gardens (Buildings A01A05, and A07)
d. Nine Elms Parkside, Nine Elms Lane

e. Battersea Power Station, Nine Elms Lane[iii]

f. Northern Line Extension

g. Riverlight development[i]

h. New Covent Garden Market (Buildings B1-B3 and site entrance)[i]

16.3.19 This means that the *TA* also considers cumulative effects in relation to those developments under construction at the same time as construction works in Site Year 1 at the Albert Embankment Foreshore site.

16.3.20 Construction traffic associated with other Thames Tideway Tunnel project sites using routes in this area has been included in the Central London HAM (CLoHAM) scenario.

16.3.21 Construction lorry and operational vehicle movements associated with the Albert Embankment Foreshore site for the site-specific peak month were added to the 2021 base case flows to provide the development case flows for local modelling. .This approach provides a robust assessment case for local modelling as the baseline traffic has been growthed to 2021, which is later than the site-specific peak year of construction, and no allowance has been made for existing traffic that might divert to other routes as a consequence of the use of local roads by the project related traffic.

Sensitivity testing

16.3.22 The 'core' assessment presented in the *TA* is based on the *Transport Strategy*. It examines the month(s) in which construction vehicle activity at this site would be greatest and uses the average daily number of construction lorry movements that would occur in that month. This is considered to be reasonable because it addresses:

a. the time at which construction vehicle movements would be greatest at this site and there would be longer periods when the number of vehicle movements would be lower

b. although there may be occasions in the peak month when the number of lorry movements in one day might exceed the average daily figure, these would be limited. The number of instances would be small in the context of the overall construction period at this site and would be offset by other times when the number of construction vehicle movements would be lower than the average daily figure for the peak month

c. if lorry movements are required outside the typical hours of 08:00 to 18:00, this would be agreed in advance with TfL and the LHA.

16.3.23 The need for sensitivity testing has been discussed with TfL. Such a test could be used to address:

a. variation in construction vehicle numbers around the average daily figure for the peak month

[iii] These sites have been identified in liaison with TfL and LB of Wandsworth, which are in addition to those indicated in the site development schedule (See Vol 16 Appendix N)

b. a lower level of river transport for construction materials (leading to an increased number of lorry movements)

c. changes in programme which might lead to construction activity peaking at different times and/or a greater coincidence of peaks at adjacent sites which could lead to higher construction lorry flows on the surrounding highway network.

16.3.24 As paras 16.3.26 and 16.3.27 explain, if construction vehicle numbers were to exceed the average daily figure for the peak month, this would be an infrequent occurrence and should be seen in the context that the assessment is based on the peak month of construction activity at each site, rather than a lower 'typical' month.

16.3.25 It is expected that river transport will be used for certain construction materials and this forms part of the *Transport Strategy.* It is therefore not likely that all materials would be moved by road at all sites. However, there is the possibility that river transport might not be available at a particular site or sites for short periods of time and this might be the result of temporary navigational constraints, local issues temporarily preventing access to the river, or wider issues restricting river movements to a number of sites (such as the closure of the Thames Barrier).

16.3.26 In practice the potential for increased coincidence of construction peaks between sites is limited because of the sequential nature of the construction activities required. Whilst it is possible that individual site peaks might change slightly, it is very unlikely that all sites would experience peak activity in the same period.

16.3.27 Although these events, if they were to arise, would be limited and short-term, it has been agreed with TfL that sensitivity testing would be undertaken within the *TA* to identify the potential impacts associated with such occurrences. It has also been agreed that for consistency, the test would be based on the number of construction lorry movements that would be related to moving all construction materials by road. This has been assumed to act as a proxy for events of this nature and represents an upper bound on the level of construction traffic that could be expected.

Operation

16.3.28 The assessment methodology for the operational phase follows that described in the *Project-wide TA.* There are no site specific variations for undertaking the operational assessment of this site.

16.3.29 Given the local impact of transport activity during the operational phase only the localised transport effects around the Albert Embankment Foreshore site have been considered in this assessment. Other Thames Tideway Tunnel project sites would not affect the area around the Albert Embankment Foreshore site in the operational phase and therefore it is not necessary to consider them in this assessment.

Operational assessment area

16.3.30 The assessment area for the operational assessment remains the same as for the construction assessment as set out in paras 16.3.8 to 16.3.10.

Operational assessment year

16.3.31 The operational assessment year has been taken as Year 1 of operation which is the year in which it is assumed that the Thames Tideway Tunnel project would become operational. As transport activity associated with the operational phase is very low, there is no requirement to assess any other year beyond that date.

16.4 Baseline

16.4.1 This section sets out the baseline conditions on the local transport network in the vicinity of the Albert Embankment Foreshore site in 2012, with the exception of the traffic survey data which was collected in 2011.

Policy review

16.4.2 The site is located within the LB of Lambeth. The relevant national, regional and local policy documents have been reviewed, this review is included in Appendix A.

Existing land use

16.4.3 The site is adjacent to Albert Embankment (A3036), and north of Vauxhall Bridge (A202). It is located in the reclaimed foreshore from Tintagel House to Vauxhall Bridge.

16.4.4 The existing Lacks Dock access and slipway from Albert Embankment is currently used by the commercial tour company London Duck Tours which uses amphibious vehicles.

16.4.5 The nearest residential areas are at St George Wharf adjacent to the southeast of the site, Camelford House to the east and Tintagel House to the northeast of the site.

Existing access

16.4.6 The site is not currently accessible by vehicle. There is pedestrian and cycle access from the Thames Path along the western footway along Albert Embankment (A3036).

Pedestrian network and facilities

16.4.7 The existing pedestrian network and facilities in the vicinity of the site are shown in Figure 16.4.1 in the Albert Embankment Foreshore *Transport Assessment* figures. This includes Thames Path and Albert Embankment (A3036) which both form part of a continuous north-south link for pedestrians along the south bank of the River Thames.

16.4.8 The key pedestrian network related to the Albert Embankment Foreshore site comprises:

a. Thames Path

b. Albert Embankment (A3036) – providing connections to bus stops on Albert Embankment (A3036) to the north of the site and to Vauxhall bus station, Vauxhall London Underground station and National Rail station to the south of the site.

16.4.9 Other non-key pedestrian connections to bus stops include Vauxhall Bridge (A202) to the west of the site, Kennington Road (A3204) to the east of the site and Harleyford Road (A202) to the southeast of the site.

16.4.10 The existing pedestrian network and facilities in the vicinity of the site are described in the following paragraphs.

Thames Path

16.4.11 The Thames Path (a Public Right of Way) routes along the banks of the River Thames to the southwest of Vauxhall Bridge. The majority of the section of the Thames Path which runs along the south-eastern boundary of the Albert Embankment Foreshore site would lie within the proposed site boundary.

16.4.12 From Vauxhall Bridge the Thames Path routes eastwards between the riverside and Vauxhall Cross. The Path crosses Lacks Dock to the river frontage outside Camelford House, continuing to Albert Embankment Gardens and Albert Embankment (A3036).

16.4.13 The footpaths along the southern side of the river are greater than 2m wide, and have viewing/rest points located approximately every 15-20m.

16.4.14 Plate 16.4.1 shows a view along the Thames Path towards the proposed location of the Albert Embankment Foreshore Site adjacent to Lacks Dock.

Plate 16.4.1 Thames Path adjacent to Albert Embankment

Albert Embankment (A3036)

16.4.15 Albert Embankment forms part of a continuous north-south link for pedestrians along the south bank of the River Thames. The Albert

Embankment section starts at Lambeth Bridge, and then follows the course of the south bank, and ends at the Vauxhall Cross roundabout.

16.4.16 Signalised pedestrian crossing facilities are provided on Albert Embankment (A3036) approximately 250m northeast of the site at Albert Embankment Gardens and at the Albert Embankment (A3036) junction with Black Prince Road, a further 315m to the north; aiding east-west movements and reducing severance for pedestrians wishing to cross Albert Embankment (A3036).

16.4.17 Additional pedestrian crossings are located to the southwest of the site at Vauxhall Cross to provide access to Vauxhall Underground, rail and bus Stations.

16.4.18 Plate 16.4.2 shows a view of the signalised pedestrian crossing facility approximately 250m northeast of the Albert Embankment Foreshore site.

Plate 16.4.2 Signalised pedestrian crossing on Albert Embankment

Cycle facilities and routes

16.4.19 The existing cycle network and facilities in the vicinity of the site are described below and illustrated in Figure 16.4.1 in the Albert Embankment Foreshore *Transport Assessment* figures.

16.4.20 Cyclists are permitted to use the bus lanes on Albert Embankment (A3036) and advanced stop lines for cyclists are provided in all directions at the Albert Embankment (A3036) / Vauxhall Bridge (A202) / Kennington Road (A3204) junction (Vauxhall Gyratory).

16.4.21 Cyclists are not permitted to use the section of the Thames Path which runs adjacent to the Albert Embankment Foreshore site. However, there are a number of other cycle routes in the vicinity of the site.

16.4.22 The National Cycle Network Route 4 can be joined on Vauxhall Bridge Road approximately 750m west of the site. This route runs from Putney to Greenwich.

16.4.23 Route 37 of the London Cycle Network (LCN) routes from Vauxhall Cross to Putney on the southern side of the River Thames, along Nine Elms Lane and can be joined at Vauxhall Cross approximately 650m south of the site access.

16.4.24 LCN Route 3 also routes close to the Albert Embankment Foreshore site and can be joined at Kennington Oval approximately 700m east of the site. This route links Waterloo to Earlsfield via Stockwell and Clapham Common.

Barclays Cycle Superhighways

16.4.25 Barclays Cycle Superhighways (CS) are new cycle routes that run between central London and outer London, providing cyclists with safer, faster and more direct journeys into the city. The cycle lanes have bold road markings and signage which increase awareness among other road users. They incorporate information about journey times and links to other cycle routes along these CS routes.

16.4.26 The closest CS routes to the site are CS7 and CS8 which run from Merton to the City and Wandsworth to Westminster respectively.

16.4.27 The CS7 cycle route starts on the High Street in Colliers Wood and runs along the A24 Tooting High Street, via Balham High Road, Clapham High Street, Kennington Park Road, Southwark Bridge Road, before finishing at Southwark Bridge with an approximate 45 minute journey from Merton to the City. The nearest point of approach for the CS7 cycle route from the Albert Embankment Foreshore site is at the junction of Clapham Road and Camberwell New Road, approximately 1.1km east of the site.

16.4.28 The CS8 cycle route starts on Ram Street, continues through York Road, Battersea Park Road, Queenstown Road, Chelsea Bridge and Grosvenor Road, before finishing at Millbank with an approximate 30 minute journey from Wandsworth to Westminster. The nearest point of approach for the CS8 cycle route from the Albert Embankment Foreshore site is on the western side of Vauxhall Bridge, approximately 550m from the site access.

Barclays Cycle Hire Scheme

16.4.29 There is a Barclays Cycle Hire docking station 300m north of the site along Albert Embankment (A3036) on the western footway and also at Vauxhall Cross, within Vauxhall gyratory to the southeast of the site. These cycle docking stations accommodate 21 and 17 bicycles respectively at the time of the street audit.

16.4.30 A further docking station is located at the Kennington Lane rail bridge approximately 300m east of the Albert Embankment site which can accommodate 36 bicycles.

Cycle parking

16.4.31 The closest cycle parking provision to the Albert Embankment Foreshore site is at the Vauxhall bus and rail stations and can be accessed by route 37 of the LCN. Specifically, these are located at:

a. Vauxhall bus station – five 'Sheffield' style cycle stands within the footway approximately 160m walking distance south of the site within the internal northwest footway of the Vauxhall Gyratory

b. Vauxhall rail stations – eight 'Sheffield' style cycle stands approximately 200m walking distance south of the site within the easternmost footway adjacent and several more beneath the bridge arch.

16.4.32 Additional 'Sheffield' style cycle stands are located at:

a. three stands within the Albert Embankment (A3036) eastern footway approximately 160m to the north of the site

b. three stands within the Albert Embankment (A3036) western footway approximately 500m to the north of the site.

Public transport

Public Transport Accessibility Level

16.4.33 The Public Transport Accessibility Level (PTAL) of the site has been calculated using TfL's approved PTAL methodology (analysis is included in Appendix B). the PTAL assumes a walking speed of 4.8km/h and considers rail stations within a 12 minute walk (960m) of the site and bus stops within an eight minute walk (640m).

16.4.34 Using this methodology the site has a PTAL rating of 6b, rated as 'excellent' (with 1 being the lowest accessibility and 6b being the highest accessibility). The following sections detail the public transport services in the vicinity of the site. Figure 16.4.2 in the Albert Embankment Foreshore *Transport Assessment* figures indicates the public transport services in the vicinity of the site.

Bus services

16.4.35 A total of ten daytime and six night bus routes operate within 640m walking distance of the site. These bus services form a comprehensive network, extending outwards in all directions from the site. Table 16.4.1 provides a summary of the bus services and their frequencies during the weekday peaks.

16.4.36 These bus routes operate from the following bus stops:

a. Vauxhall Bus Station (Albert Embankment (A3036) – northbound and southbound) approximately 230m to 360m walking distance to the south of the site

b. Vauxhall Gyratory (Albert Embankment (A3036) – northbound and southbound) within approximately 50m walking distance to the south and east of the site respectively. The Vauxhall Cross southbound bus

stop is approximately 260m walking distance utilising pedestrian crossing points to the south of the site.

16.4.37 On average there are approximately 145 daytime bus services in total in the AM peak hour and 146 in the PM peak hour within 640m walking distance of the site.

16.4.38 There are approximately six night-time bus services per hour Monday – Friday between 00:00 – 06:00 and a total of nine night-time bus services per hour on Saturdays between 00:00 – 06:00 within 640m walking distance of the site.

Table 16.4.1 Existing day time local bus services and frequency*

Bus number	Weekday two-way services		Nearest bus stop to the site	Approximate walking distance from the site	Origin - destination
	AM peak (08:00-09:00)	PM peak (17:00-18:00)			
2	17	17	Vauxhall Bus Station	250	Marylebone Station – Norwood Bus Garage
36	23	23			Queens Park Station – New Cross Bus Garage
87	18	18			Wandsworth Plain - Aldwych
88	15	14			Camden Gardens - Clapham Common Old Town
185	13	13			Lewisham Station – Victoria Station
196	8	9			Elephant & Castle – Norwood Junction
436	14	18			Lewisham – Paddington
77	11	11	Albert Embankment (A3036)	50**	Waterloo Station – Tooting Station
344	15	13			Clapham Junction – Liverpool Street Station
360	11	10			Royal Albert Hall - Elephant & Castle

** Transport for London (TfL) (2011) Timetables. www.tfl.gov.uk (site last accessed March 2012)*

*** The Vauxhall Cross southbound bus stop is approximately 260m walking distance utilising pedestrian crossing points to the south of the site*

London Underground

16.4.39 As shown in Figure 16.4.2 in the Albert Embankment Foreshore *Transport Assessment* figures, the Vauxhall Underground station is the closest underground station to the site, located approximately 250m walking distance to the south of the site access. It is served by the Victoria Line.

16.4.40 Victoria Line trains serving this station travel northbound to Green Park, King's Cross, Tottenham Hale and Walthamstow Central, and southbound to Brixton.

16.4.41 In the AM and PM peaks, the frequency of services on the Victoria Line is approximately every three minutes in peak hours, providing an average of 21 services per hour in each direction.

16.4.42 Pimlico Underground station, which is also served by the Victoria Line, is located approximately 950m to the west, across the River Thames and accessed via Vauxhall Bridge.

16.4.43 Table 16.4.2 provides a summary of the London Underground services and their frequencies during the weekday and weekend peaks.

National Rail

16.4.44 As shown in Figure 16.4.2 in the Albert Embankment Foreshore *Transport Assessment* figures, the closest National Rail station to the site is Vauxhall rail station to the southeast of the site access, located approximately 200m walking distance to the south of the site.

16.4.45 Vauxhall Rail station provides access to Southwest Trains services and provides southbound services to Guildford, Woking, Clapham Junction, Chessington South, Hampton Court and Shepperton, and northbound services to London Waterloo.

16.4.46 In the AM peak hour there are approximately 90 services (62 southbound and 28 northbound) calling at Vauxhall station. In the PM peak hour there are approximately 82 services (61 southbound and 21 northbound).

16.4.47 Table 16.4.3 provides a summary of the National Rail services and their frequencies during the weekday peaks.

Table 16.4.2 Existing London Underground services and frequency*

Line	Weekday two-way frequency		Nearest London Underground station to the site	Approximate distance from the site (m)	Origin - destination
	AM peak (08:00-09:00)	PM peak (17:00-18:00)			
Victoria Line	21	21	Vauxhall	250	Seven Sisters - Brixton
	21	21	Pimlico	950	

**Transport for London (TfL) (2011) Timetables. Available at: www.tfl.gov.uk (Accessed: 20 March 2012)*

Table 16.4.3 Existing national rail services and frequency*

Line	Weekday two-way services		Nearest national rail station to the site	Approximate distance from the site	Origin - destination
	AM peak (08:00-09:00)	PM peak (17:00-18:00)			
National rail services	90	82	Vauxhall Station	200	Waterloo – Aldershot, Chessington, Dorking, Effingham Junction, Guildford, Hampton Court, Hounslow, Kingston, Shepperton, Reading, Richmond, Windsor, Woking

** Rail Planner (2012) www.nationalrail.co.uk (site last accessed: 20 March 2012).*

River passenger services

16.4.48 The Millbank Millennium Pier is approximately 950m walking distance to the northwest of the site on the northern bank of the River Thames and St George Wharf Pier is approximately 200m walking distance to the southwest of the site on the southern bank of the river. The London Eye Pier is also 1.4km walking distance to the north of the Albert Embankment Foreshore site on the southern bank of the river.

16.4.49 The Millbank Millennium Pier and St George Wharf Pier accommodate services run by Thames Clippers between St George Wharf and Bankside, which operate seven days a week. In the AM peak hour St George Wharf serves two ferries in both the eastbound and westbound direction while the Millbank Millennium Pier serves one ferry in the eastbound direction. In the weekday PM peak hour St George Wharf serves two ferries in the eastbound and westbound direction while the Millbank Millennium Pier serves two ferries in the eastbound direction and one ferry in the westbound direction. On Saturdays both piers operate services every 40 minutes in each direction from approximately 09:30 to 20:00.

16.4.50 The London Eye Pier operates services only in an eastbound direction which terminate at Royal Arsenal Woolwich. This service is also run by Thames Clippers with three services in the AM and PM peak hours. Ferries run every 20 minutes on weekends during peak times.

16.4.51 The Albert Embankment Foreshore site is adjacent to Lacks Dock, a slipway which is used by London Duck Tours' small amphibious vessels that take passengers on 75 minute tours on the River. London Duck Tours operates approximately 80 movements (in and out) per day in the summer peak operating periods and the operating company expects an increase of up to 100 daily movements by 2016. Current operating hours are from 09:15 to one hour before sunset.

16.4.52 Table 16.4.4 provides a summary of the aggregated frequency of river services per hour.

River navigation

16.4.53 An analysis has been made of the typical volume of river vessel traffic passing the Albert Embankment Foreshore site, based on published river passenger service timetables and estimates of freight traffic based on discussions with operators.

16.4.54 It is estimated that the peak hour for vessels passing the Albert Embankment Foreshore site is between 15:00 and 16:00 hours, Monday to Friday. During this hour approximately 11 vessels are estimated to pass the site. However this figure is not constant as freight vessel transit patterns are influenced by the rising and falling tide. Therefore, such a peak will only occur every ten to 12 days when the tide is at its highest.

16.4.55 Table 16.4.5 provides a summary of the aggregated frequency of passing craft per hour.

Table 16.4.4 Aggregated frequency (number of services per hour)

	Time of day																	
	0600 - 0700	0700 - 0800	0800 - 0900	0900 - 1000	1000 - 1100	1100 - 1200	1200 - 1300	1300 - 1400	1400 - 1500	1500 - 1600	1600 - 1700	1700 - 1800	1800 – 1900	1900 – 2000	2000 - 2100	2100 - 2200	2200 - 2300	2300 - 0000
Millbank Pier	1	2	1	1	3	3	3	3	3	3	3	3	3	3	1	0	0	0
St. Georges Wharf	1	4	4	0	4	2	2	4	2	4	2	4	3	3	1	0	0	0

Table 16.4.5 Aggregated frequency (passing craft per hour)

	Time of day																	
	0600 - 0700	0700 - 0800	0800 - 0900	0900 - 1000	1000 - 1100	1100 - 1200	1200 - 1300	1300 - 1400	1400 - 1500	1500 - 1600	1600 - 1700	1700 - 1800	1800 – 1900	1900 – 2000	2000 - 2100	2100 - 2200	2200 - 2300	2300 - 0000
Albert Embankment site	1	2	5	2	2	1	1	2	6	15	3	12	2	2	0	0	0	0

Taxis

16.4.56 The nearest taxi rank to the site is located on Albert Embankment (A3036) 450m east of the site at the Riverbank Park Plaza Hotel where two taxi spaces are located.

Highway network and operation

16.4.57 The site is located to the west of Albert Embankment (A3036) and to the north of Vauxhall Bridge Road (A202), both of which form part of the TLRN.

16.4.58 Construction vehicles would approach and depart from the Albert Embankment Foreshore site via Albert Embankment (A3036), as shown in Figure 16.2.2 in the Albert Embankment Foreshore *Transport Assessment* figures.

16.4.59 Albert Embankment (A3036) routes from Lambeth Road Roundabout east of Lambeth Bridge to the north of the site to Vauxhall Gyratory in the south.

16.4.60 Albert Embankment (A3036) is a four lane carriageway (northbound and southbound) with a 30mph speed limit. A bus lane is present on both sides of the road with bus stops located to the south of the site in close proximity to the junction of Albert Embankment (A3036) with New Springs Garden Walk.

16.4.61 To the south, Albert Embankment (A3036) forms an arm of the signalised seven-arm Vauxhall Gyratory, with three lanes on entry to and exit from the junction.

16.4.62 To the north, Albert Embankment (A3036) forms a junction with Lambeth Palace Road (A3036), Lambeth Road (A3203) and Lambeth Bridge Road (A3203). This is a four-arm roundabout with signalised pedestrian facilities on each arm including pedestrian refuges on all arms.

16.4.63 Vauxhall Bridge Road (A202) routes from Vauxhall Gyratory towards Victoria in the northwest. The stretch of road across Vauxhall Bridge is a single four lane carriageway in both directions, with a bus lane present on both sides of the road.

16.4.64 Local highway modelling has been agreed with the LB of Lambeth and TfL and was undertaken to determine the operation of the London Duck Tours slipway access onto Albert Embankment (A3036) in the baseline situation. These are discussed in paras 16.4.114 to 16.4.118.

16.4.65 The modelling outputs for the baseline situation for this junction are shown in Table 16.4.6

16.4.66 The results indicate that the junction operates within capacity in both weekday peak hours.

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Table 16.4.6 Baseline PICADY model outputs

Approach	Movement	Weekday							
		AM peak hour (08:00-09:00)				PM peak hour (17:00-18:00)			
		Flow (vehs)	RFC	Max Queue (vehs)	Delay (seconds /vehs)	Flow (vehs)	RFC	Max Queue (vehs)	Delay (seconds /vehs)
Lacks Dock Slipway	Left (and right) onto Albert Embankment	0	0%	0	0	1	0%	0	9
Albert Embankment (E)	Right onto London Duck Tours Slipway	2	1%	0	12	0	0%	0	0
Albert Embankment (E)	Right onto London Duck Tours Slipway	2	1%	0	12	0	0%	0	0

Notes: RFC represents Ratio of Flow to Capacity. Queue represents number of vehicles in queue. Delay represents the mean delay per vehicle.

Parking

16.4.67 Figure 16.4.3 in the Albert Embankment Foreshore *Transport Assessment* figures shows the locations of the existing car and coach parking within the vicinity of the site.

Existing on-street car parking

16.4.68 There is no on-street parking located along Albert Embankment (A3036), which is subject to TLRN restrictions. However, there is restricted parking on the adjacent road network.

16.4.69 On-street parking is provided along Goding Street. Parking at the southern end of Goding Street is for residents with permits to park in the 'KB' and 'KSB' Controlled Parking Zone (CPZ) which operates between 08:30 and 18:30, Monday to Friday. Parking on the northern end of Goding Street is subject to the same restrictions but also has pay and display parking for a maximum stay of four hours.

16.4.70 The closest blue badge parking space to the site is located on Atterbury Street on the northern side of the River Thames, adjacent to the Chelsea College of Art and Design. This is approximately 850m walking distance from the site access.

16.4.71 There is on-street motorcycle parking in place on the eastern side of Albert Embankment, directly north of Vauxhall Cross and approximately 110m from the site access. This parking can be used at any time.

Existing off-street/private car parking

16.4.72 The nearest private car park is located at 37-38 Miles Street approximately 500m southeast of the site providing approximately 35 parking spaces. In addition, approximately 850m walking distance to the south of the site access at 62 Wandsworth Road is located a Sainsbury's car park which provides a further 450 parking spaces for customers only.

16.4.73 There is a Tesco car park located at Kennington Lane approximately 1.1km to the east of the site. It is available from 08:00 to 22:00 Monday to Friday, 07.30 to 22:00 on Saturdays and 10:00 to 16:00 on Sundays. This car park is free to customers of Tesco, however has a maximum stay of two hours.

Coach parking

16.4.74 The closest coach parking to the site is provided on the western side of Albert Embankment (A3036) approximately 450m walking distance to the north of the site (to the north of Tinworth Street). These bays can accommodate up to seven coaches and are limited to a maximum stay of 20 minutes, free of charge. These bays are operational from between 00:00-07:00, 10:00-16:00 and 20:00-00:00.

Car clubs

16.4.75 Car clubs provide members with easy access to cars for short-term use. Cars are available as and when needed and allow members to access a car without purchase, storage and operational costs associated with owning a private car.

16.4.76 The closest car club parking space to the site is operated by ZipCar and is approximately 340m away on St George Wharf where three vehicles are provided.

16.4.77 There are also car club spaces at several locations to the southeast and east of the site within 640m walking distance of the site. The closest of these locations are on Parry Street and Kennington Lane which are both approximately a 550m walking distance from the site access on Albert Embankment.

Servicing and deliveries

16.4.78 There are no formal servicing and delivery areas located on the highway in the immediate vicinity of the site.

Baseline survey data

Description of data

16.4.79 Automatic Traffic Count (ATC) data for Albert Embankment (A3036) was obtained from TfL and was analysed to identify the traffic flows along this road in February 2011. The flows are discussed below in paras 16.4.108 to 16.4.113.

16.4.80 Five year accident data on the roads in the vicinity of the site was obtained from TfL. This data is discussed below in paras 16.4.123 to 16.4.131.

16.4.81 Baseline survey data were collected in three phases in February, May, and September 2011 to establish the existing transport movements in the area. Figure 16.4.4 in the Albert Embankment Foreshore *Transport Assessment* figures shows the survey locations in the vicinity of the site. Appendix A of Section 3 of the *TA* includes the *Baseline Data Report* which further details the data collection.

16.4.82 The scope of the surveys in terms of location and time periods was considered to ensure that the data required for assessment was collected. In some cases ATC data was collected on links to validate the junction count data and provide information for noise and air quality assessments. Pedestrian and cycle count data was collected at locations where flows could be affected by pedestrian and cycle diversions during construction, the generation of additional trips or where conflicts could occur with construction vehicles. Parking survey data was collected where it was possible that parking suspensions would be necessary or where additional parking demand might be generated by the proposed development.

16.4.83 As part of surveys in May and September 2011, manual traffic surveys were undertaken to establish specific traffic, pedestrian and cycle movements including turning volumes, queue lengths, saturation flows, degree of saturation and traffic signal timings.

16.4.84 Traffic surveys were carried out on a weekday and a weekend to represent a weekly profile of traffic at particular locations. Where two weekly profiles are surveyed, the busiest survey was used.

16.4.85 The surveys undertaken and their locations are summarised in Table 16.4.7

Table 16.4.7 Survey types and locations

Survey type and location	Dates
Junction survey (including pedestrian and cycle movements)	
Lambeth Palace Road / Lambeth Road / Albert Embankment, Lambeth Bridge	19th and 21st May 2011
Camelford House Access / Albert Embankment	10th and 14th Sept 2011
London Duck Tours Slipway / Albert Embankment	10th and 14th Sept 2011
Automatic Traffic Count (ATC) survey	
Albert Embankment (A3036) north of site access	1st to 28th Feb 2011
Pedestrian and cycle surveys	
Thames Path adjacent to Tintagel House	1st and 3rd Sept 2011
Pelican crossing at Albert Embankment (A3036) near Tinworth Street	1st and 3rd Sept 2011
London Duck Tours slipway footpath between Albert Embankment (A3036) and River Thames	1st and 3rd Sept 2011
Western footway on Albert Embankment (A3036) at New Spring Gardens	1st and 3rd Sept 2011
Eastern footway on Albert Embankment (A3036) at New Spring Gardens	1st and 3rd Sept 2011

16.4.86 Pedestrian and cyclist flow data from the pedestrian and cyclist surveys provided the baseline pedestrian traffic data sets which are set out in Table 16.4.7 and Table 16.4.8.

16.4.87 Vehicular traffic flow data from the junction turning movement surveys provided the baseline vehicular traffic data sets which were input into the junction assessment models described in paras 16.4.114 to 16.4.122.

16.4.88 The following ATC and junction surveys are on construction traffic routes to and from the Albert Embankment Foreshore site:

a. Lambeth Palace Road / Lambeth Road / Albert Embankment, Lambeth Bridge junction survey

b. Albert Embankment (A3036) north of site access ATC survey.

Results of the surveys

16.4.89 The surveys inform the baseline situation in the area surrounding the site and are summarised in the following paragraphs.

Pedestrians

16.4.90 Pedestrian surveys were undertaken at four locations around the site as indicated in Figure 16.4.4 in the Albert Embankment Foreshore *Transport Assessment* figures during the AM and PM peak hours.

16.4.91 Pedestrian surveys were also undertaken at the Albert Embankment / Lambeth Bridge junction pedestrian crossings as part of the junction surveys.

16.4.92 Table 16.4.8 indicates the survey locations and flow of pedestrians along the main routes surrounding the site.

Table 16.4.8 Baseline pedestrian traffic

Road/route	Direction	Weekday			Weekend
		AM peak (08:00-09:00)	Inter-peak (12:00-13:00)	PM peak (17:00-18:00)	(13:00-14:00)
Albert Embankment / Lambeth Bridge junction pedestrian crossings					
Lambeth Palace Road (north arm)	Westbound	204	169	108	82
	Eastbound	56	131	112	78
Albert Embankment (south arm)	Eastbound	75	37	62	22
	Westbound	89	135	105	13
Lambeth Road (east arm)	Northbound	70	73	57	26
	Southbound	97	22	49	33
Albert Embankment (A3036) Pelican Crossing near Tinworth Street	Westbound	85	66	83	20
	Eastbound	87	63	77	28
Thames Path adjacent to Tintagel House	Northbound	126	127	70	19
	Southbound	44	87	73	8
London Duck Tours slipway footpath between Albert Embankment (A3036) and River Thames	Eastbound	73	50	0	1
	Westbound	43	24	3	9
Albert Embankment (A3036) Westside	Northbound	283	161	129	85
	Southbound	59	78	102	47
Albert Embankment (A3036) Eastside	Northbound	495	106	71	37
	Southbound	52	139	464	64

16.4.93 At the Lambeth Roundabout, pedestrian flows across the Albert Embankment (A3036) arm amounted to approximately 164 two-way movements in the AM peak hour and approximately 167 in the PM peak.

16.4.94 Closer to the site at the pedestrian crossing near Tinworth Street, pedestrian flows across the Albert Embankment (A3036) were very similar and amounted to approximately 168 two-way movements in the AM peak hour and approximately 164 in the PM peak.

16.4.95 The pedestrian flows on the Albert Embankment (A3036) western footway next to the site access amounted to approximately 283 northbound and 59 southbound in the AM peak and approximately 129 northbound and 102 southbound in the PM peak.

16.4.96 The pedestrian flows on the Albert Embankment (A3036) eastern footway opposite the site access amounted to approximately 495 northbound and 52 southbound in the AM peak and approximately 71 northbound and 464 southbound in the PM peak.

16.4.97 The footpath alongside the London Duck Tours slipway was used by approximately 43 pedestrians travelling westbound and 73 eastbound in the AM peak. During the PM peak, very few pedestrians were observed using the footpath.

16.4.98 Pedestrians using the Thames Path amounted to approximately 126 northbound and 44 southbound in the AM peak and approximately 70 northbound and 73 southbound in the PM peak.

Cyclists

16.4.99 Cyclist surveys were undertaken at the same locations as the pedestrian surveys during the AM and PM peak hours.

16.4.100 Table 16.4.9 indicates the flows of cyclists along the main routes surrounding the site.

Table 16.4.9 Existing cycle traffic

Road/route	Direction	Weekday			Weekend
		AM peak (08:00-09:00)	Inter-peak (12:00-13:00)	PM peak (17:00-18:00)	(13:00-14:00)
Albert Embankment / Lambeth Bridge junction on carriageway -					
Lambeth Palace Road (north arm)	Northbound	576	42	122	54
	Southbound	75	18	230	28
Lambeth Bridge (west arm)	Westbound	541	50	117	47
	Eastbound	167	48	341	48
Albert Embankment (south arm)	Southbound	65	27	275	27
	Northbound	863	60	108	84
Lambeth Road (east arm)	Eastbound	132	39	269	39
	Westbound	209	32	104	7
Albert Embankment (A3036) Pelican Crossing near Tinworth Street	Westbound	7	1	3	4
	Eastbound	0	0	1	0
Thames Path adjacent to Tintagel House	Northbound	17	6	4	3
	Southbound	8	1	18	4
London Duck Tours slipway footpath between Albert Embankment (A3036) and River Thames	Eastbound	5	0	0	0
	Westbound	5	4	3	0
Albert Embankment (A3036) Westside	Northbound	1	0	1	11
	Southbound	3	1	4	1

Road/route	Direction	Weekday			Weekend
		AM peak (08:00-09:00)	Inter-peak (12:00-13:00)	PM peak (17:00-18:00)	(13:00-14:00)
Albert Embankment (A3036) Eastside	Northbound	4	2	0	5
	Southbound	0	0	1	0
Albert Embankment (A3036)/ Camelford House access on carriageway -					
North of site access	Northbound	757	25	92	53
	Southbound	82	25	271	27
Camelford House access	Westbound	20	3	0	0
	Eastbound	0	1	29	0

16.4.101 At the Lambeth Roundabout, cyclist flows were substantial on all approaches:

a. approximately 651 two-way flows recorded on the Lambeth Palace Road northern arm in the AM peak (approximately 576 of which were northbound) and approximately 352 in the PM peak

b. approximately 341 two-way flows recorded on the Lambeth Bridge eastern arm in the AM peak and approximately 373 in the PM peak

c. approximately 928 two-way flows recorded on the Albert Embankment southern arm in the AM peak (approximately 863 of which were northbound) and approximately 383 in the PM peak

d. approximately 708 two-way flows recorded on the Lambeth Bridge western arm (approximately 541 of which were westbound) in the AM peak and approximately 458 in the PM peak.

16.4.102 The results of the surveys at the Lambeth Roundabout show that this junction is very well patronised by cyclists in both the AM and PM peak periods.

16.4.103 The cyclist flows on the Albert Embankment (A3036) carriageway to the immediate north of the site access amounted to approximately 757 northbound and 82 southbound in the AM peak and approximately 92 northbound and 271 southbound in the PM peak. This survey validates the survey at the Lambeth Roundabout in that cyclists' flows on Albert Embankment (A3036) were substantial.

16.4.104 On the western side of Albert Embankment (A3036) a cyclist flow of four passed along this footway in the AM peak hour and five in the PM peak hour. On the eastern side of Albert Embankment (A3036) approximately four cyclists used the footway in the AM peak hour, while only one used the footway in the PM peak hour.

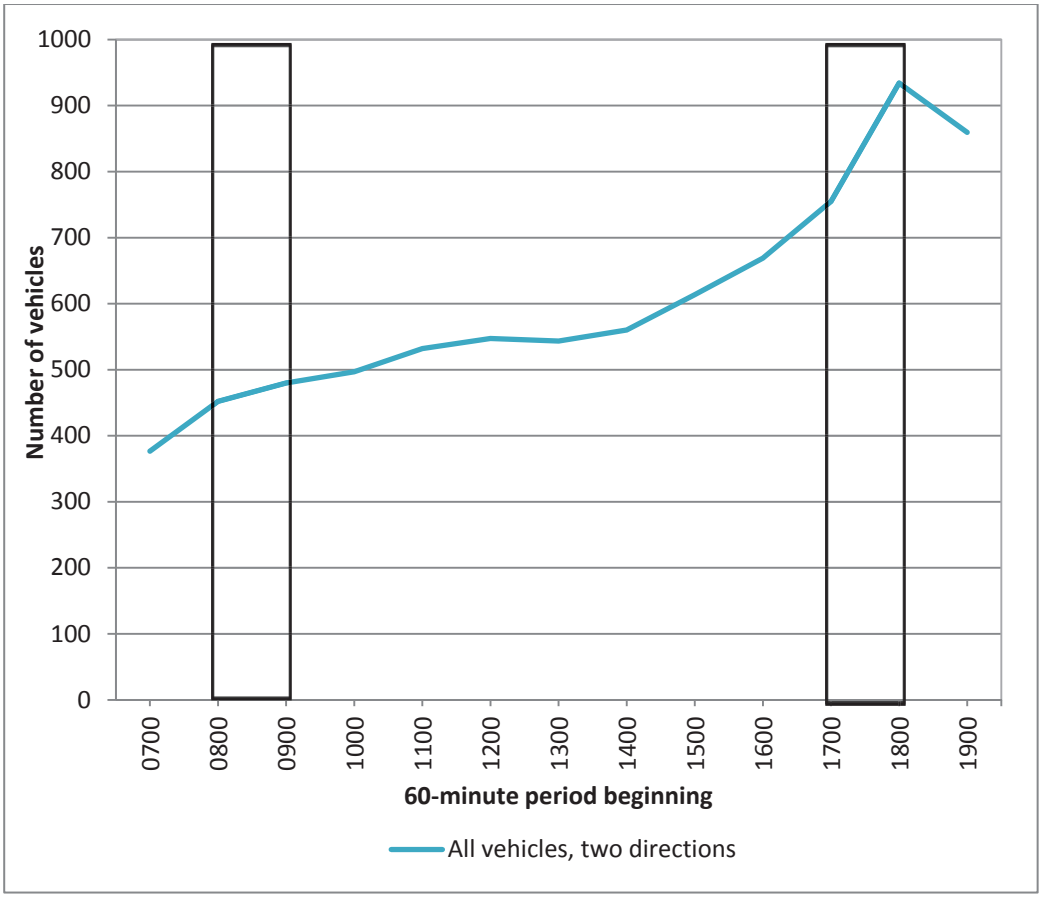
16.4.105 The survey of the footpath alongside the London Duck Tours slipway showed that very few cyclists were using the footpath.

16.4.106 Pedestrians using the Thames Path amounted to approximately 17 northbound and eight southbound in the AM peak and approximately four northbound and 18 southbound in the PM peak.

Traffic flows

16.4.107 The ATC data have been collected from TfL for Albert Embankment (A3036) and have been analysed to identify the traffic flows along this road in February 2011. The weekday vehicle flows for a 12-hour period (07:00-19:00) are shown in Plate 16.4.3.

Plate 16.4.3 Weekday two-way traffic flow

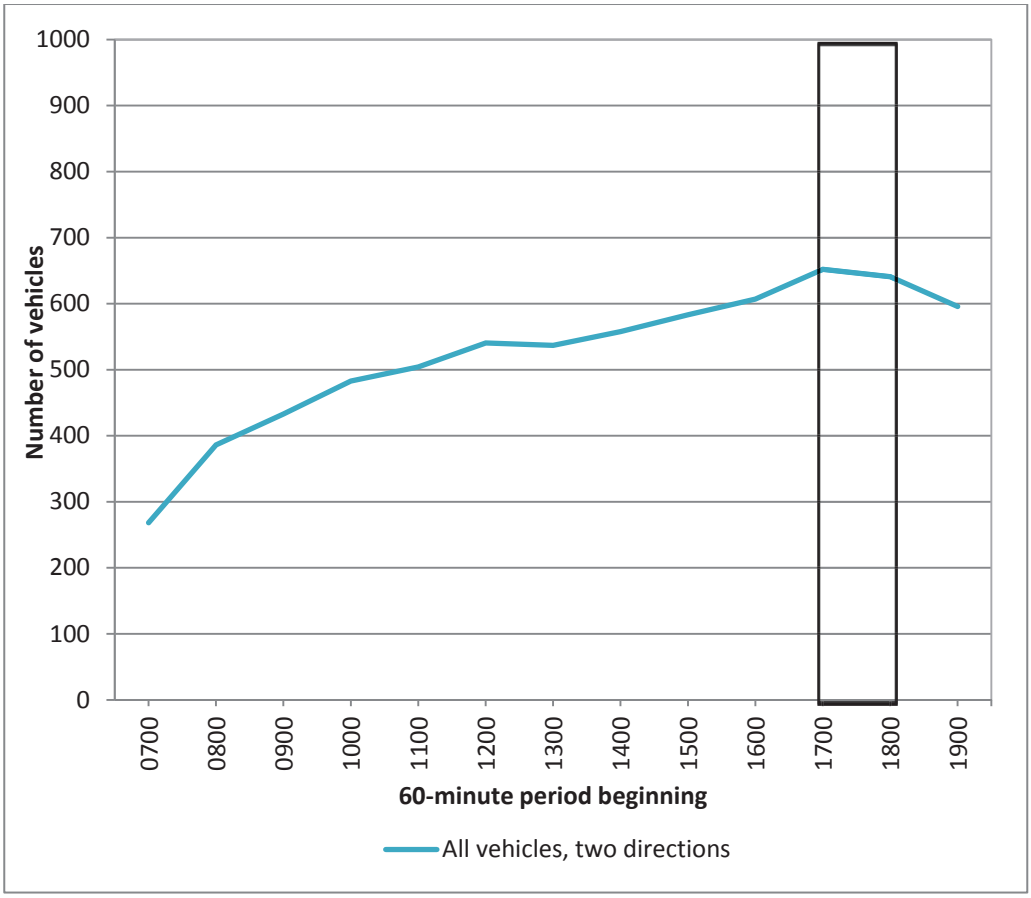


The black box represents the peak hour traffic flows used for the traffic assessment

16.4.108 The weekday hourly ATC data shows that between 08:00 – 09:00 there are approximately 452 two-way vehicle movements. For the period between 17:00 – 18:00 there are approximately 755 two-way vehicle movements. These have been calculated as the average flows from the three weeks' ATC data.

16.4.109 The turning count data has been analysed to identify the existing traffic flows along Albert Embankment. The weekday vehicle and HGV flows for a 12-hour period (07:00-19:00) are shown in Plate 16.4.4. Weekday flows are presented as this is when the greatest impacts from the project are likely to be experienced.

Plate 16.4.4 Saturday two-way traffic flow

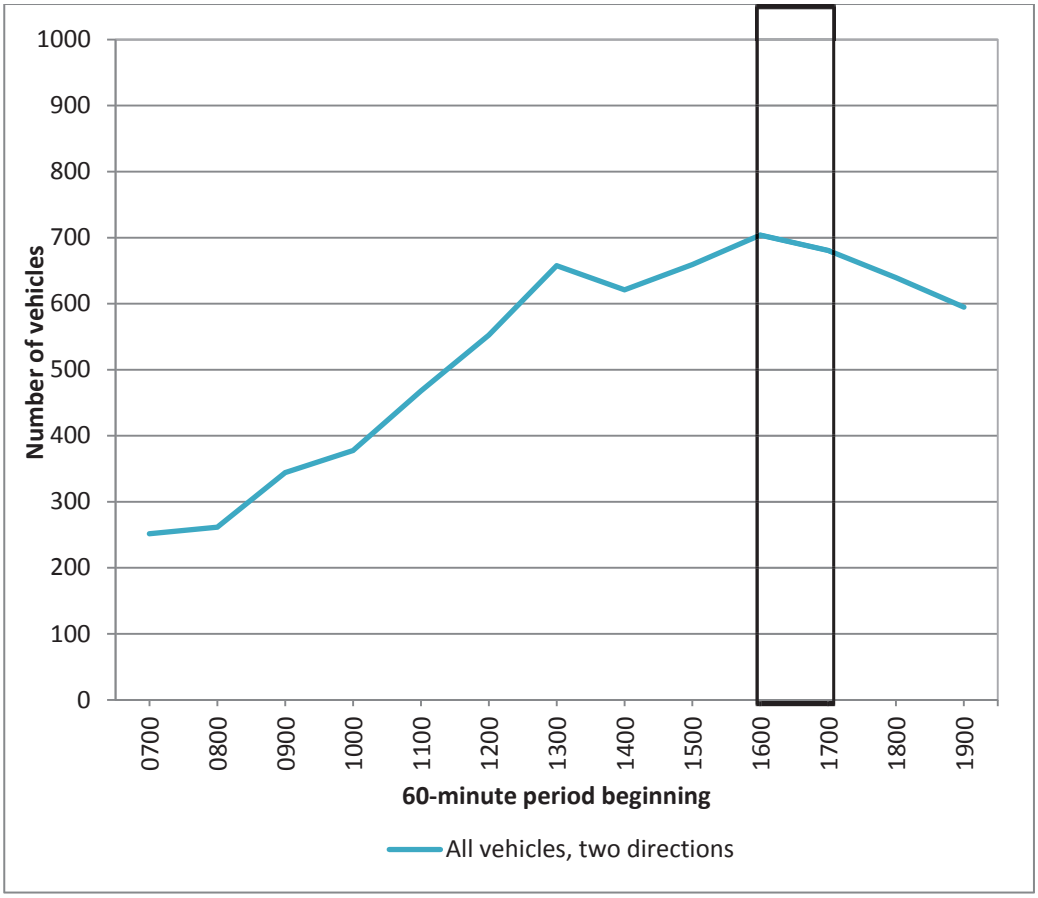


The black box represents the peak hour traffic flows used for the traffic assessment

16.4.110 Analysis of the data showed that the Saturday peak travel period occurred between 17:00 – 18:00 with 652 two-way vehicle movements recorded. These have been calculated as the average flows from the three weeks' ATC data. This is less than the PM weekday two-way traffic flows and the period falls outside of the normal weekend construction works vehicle movements period of between 08:00 – 13:00.

16.4.111 Plate 16.4.5 indicates the Sunday peak hour two-way traffic flow.

Plate 16.4.5 Sunday two-way traffic flow



The black box represents the peak hour traffic flows used for the traffic assessment

16.4.112 Analysis of the data showed that the Sunday peak travel period occurred between 16:00 – 17:00 with 704 two-way vehicle movements recorded. These have been calculated as the average flows from the three weeks' ATC data. This is less than the PM weekday two-way traffic flows and the period falls outside of the normal weekend construction works vehicle movements period of between 08:00 – 13:00.

16.4.113 Comparison of the junction survey data against the TfL junction survey data is not possible for this site.

Local highway modelling

16.4.114 To establish the existing capacity on the local highway network a scope was agreed with TfL to model the effects of the Albert Embankment Foreshore site using a PICADY model for the junction between Albert Embankment (A3036) and the Lacks Dock / Camelford House access. The baseline model incorporates the current traffic and transport conditions within the vicinity of the site and followed the methodology set out in methodology in the *Project-wide TA*.

16.4.115 Traffic models for the junction have been developed for this assessment and where possible suitable models from TfL have been used. The models have been constructed using on-site measurements of classified vehicle volumes and queue lengths.

16.4.116 The TfL modelling guidelines and Modelling Audit Process (MAP) have been used as the basis for preparing and checking models and their outputs. All required input data has been used in order to calibrate the model. Where TfL models have been used, saturation flows have been retained where no change is proposed to junctions; where changes are proposed, saturation flows have been calculated and compared with site observations to determine suitable values. Validation of the models has been based on observed data including signal timings, vehicle volumes and queue lengths to provide the key criteria for comparison with modelled queue lengths.

16.4.117 The models are considered suitable for this planning stage and are intended to demonstrate the nature of the effects of the additional vehicles generated by the Thames Tideway Tunnel project in this location. It is acknowledged that these models may require further refinement as the project moves from planning to detailed design stage; however as a period of time will elapse before construction commences at this site, it will be necessary in any case to review and revalidate the models against traffic conditions at that time, as is normal practice.

16.4.118 The baseline model therefore accounts for the current traffic and transport conditions within the vicinity of the site.

16.4.119 The weekday AM and PM baseline model flows for Albert Embankment Foreshore were compared against observed queue lengths for the peak periods (from junction surveys) to validate the PICADY model and ensure reasonable representation of existing conditions.

16.4.120 Figure 16.4.5 and 16.4.6 in the Albert Embankment Foreshore *Transport Assessment* figures indicate the traffic flows which were used for the baseline AM and PM peak hour assessments which take into account the observed flows and the TfL model output flows.

16.4.121 Table 16.4.10 shows the modelling outputs for the Albert Embankment (A3036)/ Lacks Dock/Camelford House access. Model outputs are included in Appendix C which indicates the lane structure.

Table 16.4.10 Baseline PICADY model outputs

Approach	Movement	Weekday							
		AM peak hour (08:00-09:00)				PM peak hour (17:00-18:00)			
		Flow (vehs)	RFC	Max Queue (vehs)	Delay (seconds /vehs)	Flow (vehs)	RFC	Max Queue (vehs)	Delay (seconds /vehs)
Lacks Dock Slipway	Left (and right) onto Albert Embankment	0	0%	0	0	1	0%	0	9
Albert Embankment (E)	Right onto London Duck Tours Slipway	2	1%	0	12	0	0%	0	0

Notes: RFC represents Ratio of Flow to Capacity. Queue represents number of vehicles in queue. Delay represents the mean delay per vehicle.

16.4.122 The modelling output shows that this junction is currently operating well with capacity in the weekday AM and PM peak hours. The validated model indicates the highest value of RFC is 1% occurring at the AM peak and the delay is 12 seconds per vehicle for the right-turn onto London Duck Tours slipway. There is no queuing at this junction.

Accident analysis

16.4.123 Data has been obtained for a five-year period, up until the 31st March 2011. Figure 16.4.7 in the Albert Embankment Foreshore site *Transport Assessment* figures indicates the accidents that have occurred within the vicinity of the site. The following roads and junctions have been analysed:

a. A3036 Albert Embankment;

b. Albert Embankment / Kennington Lane;

c. Albert Embankment / Vauxhall Bridge;

d. Wandsworth Road;

e. Vauxhall Cross;

f. South Lambeth Road; and

g. South Lambeth Road / Kennington Lane Junction

16.4.124 The five-year accident data was obtained from TfL and Table 16.4.11 details the accidents that occurred in the vicinity of the site. Appendix D provides a full analysis of the accidents.

Table 16.4.11 Accident severity

Location	Slight	Serious	Fatal	Total
Albert Embankment	22	3	1	26
Albert Embankment/ Kennington Lane Junction	16	4	0	20
Albert Embankment/ New Spring Gardens Walk Junction	6	2	0	8
Albert Embankment/ Glasshouse Walk Junction	3	0	0	3
Albert Embankment/ South Lambeth Place Junction	2	0	0	2
Albert Embankment/ Vauxhall Bridge Junction	3	1	1	5
Albert Embankment/ Wandsworth Road Junction	3	0	0	3
Wandsworth Road	5	1	0	6
Wandsworth Road/ Bondway	3	0	0	3

Location	Slight	Serious	Fatal	Total
Junction				
Wandsworth Road/ Vauxhall Bridge Junction	6	0	0	6
Wandsworth Road/ Kennington Lane Junction	4	0	0	4
Vauxhall Cross/ Wandsworth Road Junction	0	1	0	1
Vauxhall Cross/ Vauxhall Bridge Junction	1	0	0	1
Vauxhall Cross/ Kennington Lane Junction	1	1	0	2
Vauxhall Cross/ Lambeth Road Junction	3	0	0	3
South Lambeth Road	5	0	0	5
South Lambeth Road/ Harleyford Road Junction	6	1	0	7
South Lambeth Road/ Kennington Lane Junction	3	3	0	6
Total	**92**	**17**	**2**	**111**

16.4.125 During the five-year period assessed, a total of 111 accidents occurred within the study area analysed. Of these accidents, 92 were categorised as slight and 17 were serious and two fatal.

16.4.126 The two fatal accidents occurred on Albert Embankment (A3036). The first accident occurred north of the Albert Embankment (A3036) / Vauxhall Bridge Road (A202) junction and involved a vehicle leaving the carriageway and hitting a pedestrian. The record of the accident does not suggest a reason for the vehicle leaving the carriageway. The other fatal accident occurred at the Albert Embankment (A3036) / Vauxhall Bridge Road (A202) junction and involved a pedestrian being hit by a car when using the pedestrian crossing. In this instance the driver of the vehicle was under the influence of drugs.

16.4.127 In general, the accidents largely involved cars, motorcyclists, pedestrians and pedal cyclists. Five of the accidents involved HGVs and one medium goods vehicle (MGV). 13 of the total accidents involved pedestrians and 34 involved pedal cycles.

16.4.128 The details available within the accident records suggest that the accidents that occurred within the vicinity of the site were caused by

vehicle and pedestrian path conflicts resulting from drivers or pedestrians not looking properly or careless driving.

16.4.129 Figure 16.4.8 in the Albert Embankment Foreshore *Transport Assessment* figures shows the pedestrian and cyclist accidents by severity.

16.4.130 The records show that there were 44 accidents involving pedestrians and cyclists within the study area. All but four of the 44 accidents appear to have occurred at or close to junctions with signalised control facilities or in areas not on the construction routes (such as within the Vauxhall rail and bus stations). The two pedestrian fatalities are described above in para 16.4.126 above.

16.4.131 In the context of the temporary HGV movements associated with the Albert Embankment Foreshore site, the accident risk to these modes of travel will be managed by providing pedestrian and cyclist awareness training for commercial drivers associated with the construction works as set out in the *Construction Management Plan*. For sections of road affected by roadworks, the risk to all road-users will be managed by the contractor(s) in accordance with the provisions made under the Traffic Signs Manual Chapter 8 - Traffic Safety Measures and Signs for Road Works (DfT, 2009)[2].

16.5 Construction assessment

16.5.1 The *TA*, including both qualitative and quantitative analysis has been undertaken drawing on discussions with TfL and the Local Highway Authorities, knowledge of the transport networks and their operational characteristics in the vicinity of each site and the anticipated construction programme, duration and levels of construction activity.

16.5.2 The construction assessment compares a construction base case, which represents transport conditions in the assessment year without the Thames Tideway Tunnel project, with a construction development case, which represents conditions with the Thames Tideway Tunnel project under construction. The construction base case does not include any traffic related to the Thames Tideway Tunnel project, whether from the Albert Embankment Foreshore site or from other sites.

Construction base case

16.5.3 As described in Section 16.3, the construction assessment year for transport issues in relation to this site is Year 1 of construction.

Pedestrians and cyclists

16.5.4 There are no proposals to change the cycle or pedestrian network by Year 1 of construction and therefore the network will operate as indicated in the baseline situation.

Public transport

16.5.5 At the time of undertaking the assessment, there were no firm proposals by TfL to alter bus routes within the vicinity of Albert Embankment Foreshore. The assessment has therefore assumed that bus routes would be unchanged from the baseline.

16.5.6 In terms of the public transport network, no change is expected on London Underground Victoria line services as capacity upgrades have recently been completed and there are no specific proposals to enhance National Rail capacity. It is envisaged that London Underground and National Rail patronage will increase by Site Year 1 of construction.

16.5.7 Due to traffic growth in the construction base case compared to the baseline situation, there would be an increase in delay of a maximum of approximately four seconds on Albert Embankment (A3036) eastbound, turning right into the slipway. There would be no increases in delay on Albert Embankment (A3036) generally as a result of traffic growth. There would therefore be no impact on bus journey times in the vicinity of the Albert Embankment Foreshore site in the construction base case.

16.5.8 It is anticipated that patronage on public transport services may change between the baseline situation and Year 1 of construction. Future patronage changes on bus and rail will be driven by a range of complex factors and there are inherent uncertainties in setting a patronage level for a future year. There are further capacity improvements anticipated at the Bakerloo, Piccadilly and Central Lines, however, the best way of delivering these improvements, including the timescales, are currently being investigated by TfL. With the exception of the London Overground extension between Dalston Junction and Clapham Junction (via Surrey Quays) there are no further proposals at the time of writing for the London Overground. Services on this part of the Overground network are not expected to change. At this stage, we are unable to estimate how much of these upgrades will have been completed by the construction base case or how much will be remaining.

16.5.9 Therefore, in order to ensure that a busiest case scenario is addressed in assessing the result of additional construction worker journeys by public transport, the capacity for public transport services including London Underground and National Rail services in the construction base case has been assumed to be the same as in the baseline situation, as, given the distance to the nearest stations, no significant changes are likely to occur that will affect the of Albert Embankment Foreshore site.

River navigation

16.5.10 There are no proposals to alter any river navigation patterns from the current baseline conditions and therefore the construction base case remains similar to the baseline position.

Highway network and operation

16.5.11 Baseline traffic flows (from the junction surveys) have been used and forecasting carried out to understand the capacity on the highway network in the vicinity of the Albert Embankment Foreshore site in Year 1 of construction without the Thames Tideway Tunnel project. The scope of this analysis has been agreed with the LB of Lambeth and TfL.

16.5.12 Strategic highway network modelling has been undertaken at a project-wide level using the TfL HAMs, which include forecasts of employment and population growth in line with the London Plan. Growth factors have been derived at individual Borough level by comparing the 2008/9 base and 2021 forecast years in the HAMs, as described in the Modelling Methodology Note in the *Project-wide TA.*

16.5.13 As explained in assessment methodology of this *TA*, the traffic flows for the base and development cases have been calculated by considering the net change in traffic resulting from the committed developments in the area to ensure that the construction base case for the highway network is robust.

Committed developments

16.5.14 There are a number of committed developments that will be complete and operational by Site Year 1 of construction. The developments included in the construction base case modelling detailed in this section are:

a. US Embassy site, Ponton Road
b. Market Towers
c. Island Site, Vauxhall Gyratory
d. Spring Mews, Vauxhall
e. Nos. 2-14 Tinworth Street and 108-110 Vauxhall Walk
f. Land at St George's Wharf (Vauxhall Tower)
g. Hampton House, 20 Albert Embankment;
h. No. 10 Albert Embankment (Wah Kwong House)
i. No. 81 Black Prince Road (Parliament House)
j. Vauxhall Sky Gardens, Wandsworth Road
k. Embassy Gardens (part)
l. Development at Nine Elms Pier (Phase 1)

16.5.15 There will be some developments that that will be under construction during Site Year 1 of construction. The developments have been included in the construction base case modelling detailed in this section in paras 16.5.16 to 16.5.19 and include:

a. Vauxhall Square (plot bounded by Parry Street, Bondway, Miles Street and Wandsworth Road)
b. Embassy Gardens (part)
c. Nine Elms Sainsbury's, Wandsworth Road

d. Battersea Plant, Nine Elms Lane and Goods Yard, Cringle Street
e. Battersea Power Station, Nine Elms Lane
f. Post Office depot, Nine Elms Lane
g. Northern Line Extension
h. Riverlight development, Nine Elms Lane

Local highway modelling

16.5.16 The modelling included the committed developments detailed in the previous section for the construction base case model. Appendix C contains a summary of the trips assumed for these developments in our assessment. These assumptions have been formed in discussion with LB of Lambeth and TfL based on the information available at the time.

16.5.17 Para 16.3.8 to 16.3.10 explains the definition of the assessment area for local highway network modelling. At this site, the base case assessment examines the Lacks Dock / Albert Embankment junction.

16.5.18 The construction base case PICADY model outputs for the Lacks Dock / Albert Embankment junction are shown in Table 16.5.1.

Table 16.5.1 Construction base case PICADY model outputs

Approach	Movement	Weekday							
		AM peak hour (08:00-09:00)				PM peak hour (17:00-18:00)			
		Flow (vehs)	RFC	Max Queue (vehs)	Delay (seconds / veh)	Flow (vehs)	RFC	Max Queue (vehs)	Delay (seconds / veh)
Lacks Dock Slipway	Left (and right) onto Albert Embankment	4	0%	0	0	6 (1)	1%	0	12
Albert Embankment (E)	Right onto London Duck Tours Slipway	2	1%	0	16	0	0%	0	0

Notes: RFC represents Ratio of Flow to Capacity. Queue represents number of vehicles in queue. Delay represents the mean delay per vehicle.

16.5.19 The resulting construction base case PICADY model for the Lacks Dock/Albert Embankment junction indicates that the junction will continue to operate well within capacity. The longest delay occurs at the AM peak hour with 16 seconds delay on the turn into Lack Dock Slipway.

Construction development case

16.5.20 This section summarises the findings of the assessment undertaken for the peak year of construction at the Albert Embankment Foreshore site (Year 1 of construction).

Pedestrian routes

16.5.21 As discussed in Section 16.2 the diversion of the Thames Path and the additional construction worker trips would result in changes to the pedestrian movements around Albert Embankment Foreshore.

16.5.22 Pedestrians would be directed along the western side of Albert Embankment (A3036) between Albert Embankment Gardens and the Vauxhall Bridge (A202) / Wandsworth Road (A3036) junction. To the south, pedestrians would be able to cross at the signalised pedestrian crossing on Vauxhall Bridge Road (A202) to connect with the existing Thames Path route on the western side of Wandsworth Road (A3036).

16.5.23 To assess a busiest case scenario it has been anticipated that all worker trips would finish their journeys by foot. As a result the 65 worker trips generated by the site have been added to the construction base case pedestrian flows during the AM and PM peak hours.

16.5.24 The assessment assumes that all construction workers would travel in the peak hours, the increase in pedestrian numbers against baseline usage during the peak hours due to construction workers walking is considered to be a conservative estimate because, due to the site working start and finish times, many workers will be travelling outside of peak network hours.

16.5.25 As a result of the expected increase in worker trips, the greatest effect would be on the western footway of Albert Embankment (A3036).

16.5.26 The diversion of pedestrians from the Thames Path would add between 235 and 208 pedestrian movements to this footway in the AM and PM peak hours. This would increase pedestrian flows on the western footway to a level of around 555 people per hour in the AM peak hour, which is the busiest period. The LB of Lambeth has agreed in principle that the footway on Albert Embankment (A3036) has adequate capacity to accommodate the diversion.

16.5.27 It is anticipated that the pedestrian diversions around the Albert Embankment Foreshore site would result in a slight increase in journey time of no more than 15 seconds based on a walk speed of 4.8km per hour. The route of the Thames Path diversion along the western side of Albert Embankment (A3036) is shorter than the existing route by approximately 48m and this equates to a journey time reduction of approximately 40 seconds. However pedestrians would need to use the signalised pedestrian crossing at the Vauxhall Bridge Road (A202) / Wandsworth Road (A3036) junction which would add an average delay of

40 seconds to their journey. Additionally they would have to cross the site access which could add a maximum of 15 seconds to the journey time.

16.5.28 If access option B between Camelford House and Tintagel House were to be used as the main access for construction vehicles with the access adjacent to Lacks Dock also in use for other site vehicles the total delay could be 30 seconds as pedestrians could be delayed at both accesses.

16.5.29 In either case, overall this would result in a negligible impact on pedestrian delay, for those walking along the western side of Albert Embankment (A3036). Other pedestrian movements in the area would also experience a negligible impact.

16.5.30 With regards to pedestrian amenity the diversion of the Thames Path would result in pedestrians having to use a signalised road crossing as opposed to a pedestrian underpass when they reach Vauxhall Bridge Road (A202).

16.5.31 In addition pedestrians would also be required to cross the site access on Albert Embankment (A3036), which is directly onto the TLRN.

16.5.32 To mitigate the small increase in risk for pedestrians crossing the site access, appropriate signage would be put in place and a traffic marshals would be available.

16.5.33 During all construction work and on any section of road subject to temporary diversions or restrictions imposed by roadworks associated with the Albert Embankment Foreshore site, the risk to all road-users would be managed by the contractor(s) in accordance with the provisions made under the Traffic Signs Manual Chapter 8 - Traffic Safety Measures and Signs for Road Works. This will include compliance with the Equality Act 2010 (HM Government, 2010)[3] to ensure safe passage for mobility and vision impaired pedestrians.

Cycle routes

16.5.34 Cyclists are not permitted to use the Thames Path along the Albert Embankment riverside footway and therefore the Thames Path diversion would not result in a delay for cyclists. Cyclists using the highway would not experience an additional delay to journey time as a result of the construction works at the Albert Embankment Foreshore site.

16.5.35 Cyclists would not be required to make any additional road crossings along Albert Embankment (A3036). There would be an increase in construction traffic flow of approximately eight two-way HGV movements per hour; however, this would only result in a small increase in risk to cyclists. Cyclists would be made aware of this small increase in risk through appropriate signage.

16.5.36 Construction vehicles serving the site will comprise a range of sizes and types, including light vans, rigid bodied vehicles and longer articulated vehicles. At this site the majority of the vehicles are expected to be medium or heavy rigid bodied goods vehicles.

16.5.37 As indicated in para 16.2.51, works would include the following measures affecting cyclists:

a. traffic marshal would be stationed at the site entrance to manage potential conflicting movements

b. provision of a safe crossing point for pedestrians and cyclists at the site access, with use of a marshals as appropriate

c. provision of hoarding to segregate the site from public footpath and vehicular traffic.

16.5.38 TfL guidance (Cyclists at Roadworks – Guidance Document (TfL, 1999)[4]) indicates that 4.3m lanes in each direction would provide more than adequate width to allow HGVs to pass cyclists safely. During the construction works, it may be necessary to provide roadworks for utility diversions on the local roads; in which case a minimum 4.3m road width would be provided to allow safe passage of cyclists.

16.5.39 Measures set out in the *CoCP* described in para 16.2.51 include marshalling of traffic at the site access. During all construction work and on any section of road subject to temporary diversions or restrictions imposed by roadworks associated with the Albert Embankment Foreshore site, the risk to all road-users would be managed by the contractor(s) in accordance with the provisions made under the Traffic Signs Manual Chapter 8 - Traffic Safety Measures and Signs for Road Works. This would include compliance with TfL guidance (Cyclists at Roadworks - Guidance[5]) to ensure safe passage for cyclists.

Bus routes and patronage

16.5.40 The 77, 344 and 360 bus routes run immediately past the site. Additional construction vehicles serving the site and occasional traffic management measures at the site access if a construction vehicle were to be refused entry (see para 16.2.51) may affect these bus routes and bus journey times in the surrounding area.

16.5.41 There would be no additional delay to bus services as a result of the additional construction traffic within the local area, as detailed in the highway operation and network assessment. In the context of the local area and general journey times for bus services, this is not anticipated to cause a significant change for bus users.

16.5.42 It is expected that approximately nine additional two-way worker trips would be made by bus during the AM and PM peak hours, which would result in less than one worker trip per bus (based on a service of 145 buses within a 640m walking distance during the AM and PM peak hours). On this basis the additional worker trips made by bus in peak hours would be capable of being accommodated on the base case bus services and would typically be within the normal daily variation in bus patronage on these routes.

London Underground and National Rail patronage

16.5.43 No underground stations are directly adjacent to the site and therefore none would be directly affected by the construction site development.

However, it is anticipated that there would be approximately 20 additional person trips on London Underground services in each of the AM and PM peak hours.

16.5.44 Due to the large number of London Underground services in the vicinity of the site from the two Victoria Line stations within the vicinity of the site, this equates to less than one person per train during the AM and PM peak hours based on a frequency of 42 trains during the peaks.

16.5.45 This would result in a very small number of additional passengers on the London Underground services in the local area, which could be easily accommodated within existing capacity.

16.5.46 No rail stations are directly adjacent to the site and therefore none would be directly affected by the construction site development. However, it is anticipated that construction at Albert Embankment Foreshore would result in 27 additional person trips on National Rail services in each of the AM and PM peak hours.

16.5.47 On National Rail services from Vauxhall there would be less than one additional passenger per train based on the AM peak service of 90 trains per hour and PM peak service of 82 trains per hour and this could be easily accommodated within existing capacity.

River passenger services and patronage

16.5.48 There are river passenger services passing the Albert Embankment Foreshore site on their way to Putney, but are limited to three in the morning and three in the evening Monday to Friday. Generally their presence is not expected to be affected by the Albert Embankment Foreshore site barges.

16.5.49 It is anticipated that few, if any, construction workers and labourers would use the river services to access the construction site, based on the mode shares set out in Table 16.2.3 and therefore there would be no discernible change in river patronage as a result of the construction proposals at this site.

River navigation and access

16.5.50 During construction it is anticipated that 90% of cofferdam import and export would be transported by barge. The peak number of barge movements is within Year 1 of construction with a daily average of 8 barge movements a day.

16.5.51 It is anticipated that 350T barges would be used at this site. Barges would be hauled by tugs which may be capable of hauling two barges together. The number of transit movements required on the river may therefore be lower than the number of individual barge movements.

16.5.52 The project-wide impacts of vessels being used for the Thames Tideway Tunnel project are outlined in the *Project-wide TA* and the *Navigational Issues and Preliminary Risk Assessment*.

Parking

16.5.53 Albert Embankment (A3036) does not have any on-street car parking available due to TLRN restrictions in the area in the immediate vicinity of

the site. There would be no impact on on-street parking in the vicinity of the area during the construction phase.

16.5.54 For the access option A; although there would not be any changes to on-street parking the relocation of the security hut would require the removal of two parking bays in the Camelford House car park. These parking bays would not be replaced. There are no loading bays in the vicinity, therefore there is no impact on loading at this site.

16.5.55 In the case of the access option B; the new access between Camelford House and Tintagel House would require the removal of six parking bays in the Tintagel House car park. These parking bays would not be replaced, however Tintagel House is currently unoccupied and therefore the parking spaces associated with this building are not in use. The new access road would also require the reduction from two lanes to one lane on the ramp to the Camelford House underground car park. A traffic light system would operate at the top and bottom of the ramp to prevent vehicle conflicts.

16.5.56 Although there would be no changes to on-street parking, the private car parks of Camelford House and/or Tintagel House would experience a reduction in parking availability during construction. As Tintagel House is currently unoccupied the parking associated with it is not currently required so its removal would have a negligible impact. Although the two Camelford House parking spaces that would be removed would not be replaced, it is expected that sufficient capacity is available in the remainder of the car park to accommodate this loss of capacity.

Highway assessment

Highway layout

16.5.57 The access plan and highway layout during construction plans are provided in the Albert Embankment Foreshore *Transport Assessment* figures. The site is on the western side of Albert Embankment (A3036) and would be accessed from the northbound lane. There would be a gated access for the left-turn in, left turn out movement for construction traffic.

16.5.58 For the access option A, the entrance to Lack's Dock from Albert Embankment (A3036) would be shared with the London Duck Tours vehicles. London Duck Tours would use the southern section of the Lacks Dock slipway to reach the foreshore, as existing, and construction vehicles would use the northern section, which is currently a footway. The southern and northern sections of Lack's Dock would be segregated by a site hoarding. The arrival of construction vehicles at the site would be managed to minimise conflict with London Duck Tours vehicles as described in the *CoCP Part B*.

16.5.59 In the event of a departing construction vehicle meeting an arriving London Duck Tours vehicle, the London Duck Tours vehicle would take priority in order to minimise delays to general traffic on Albert Embankment (A3036).

16.5.60 In the access option B, construction HGVs would access the site via a new road constructed between Camelford House and Tintagel House forming a new junction with Albert Embankment (A3036) at this location. This would remove the conflict between large construction vehicles and the London Duck Tours vehicles except for occasional plant/machinery routing along Lacks Dock to the foreshore. The same traffic management and priority operation for London Duck Tours vehicles would be implemented for this alternative option as described for the single-access option.

16.5.61 The highway layout during construction vehicle swept path analysis (options A and B) plans are provided the Albert Embankment Foreshore *Transport Assessment* figures and show that the construction vehicles would be able to safely enter and leave the site.

Highway network

16.5.62 Table 16.2.4 in Section 16.2 shows the construction lorry movement assumptions for the local peak traffic periods based on the peak months of construction activity at this site. The table also shows the construction worker vehicle movements expected to be generated by the site.

16.5.63 Table 16.2.4 shows an average peak flow of 46 vehicle movements a day is expected during the months of greatest activity during Year 1 of construction at the Albert Embankment Foreshore site. At other times in the construction period, vehicle flows would be lower than this average peak figure.

16.5.64 The busiest peak in the AM and PM period for each type of movement (construction lorries, other construction vehicles and worker vehicles) has been combined in the development case and assessed against the peak hour operation of the highway network. In reality not all peaks for these movements will occur concurrently and the peak for worker trips will be outside of the highway network peak hour, therefore the assessment is considered to be robust.

16.5.65 The *Project-wide TA* explains the method used to assign construction traffic to the HAMs, from which the likely changes in turning movements at local junctions have been identified and added to the construction base case flows.

16.5.66 The assignment of construction lorry trips has been undertaken using OmniTrans[iv] software, which enables a fixed assignment to be created for these trips in order to ensure that they are assigned only to the proposed construction routes. The OmniTrans outputs also identify lorry traffic which would be associated with the Albert Embankment Foreshore site, or with other Thames Tideway Tunnel project sites, that would use routes in the vicinity of the Albert Embankment Foreshore site. Figure 16.5.1 in the Albert Embankment Foreshore *Transport Assessment* figures shows the

[iv] OmniTrans is a software package used for multi-modal transport network modelling and in this case has been used to produce assignments of construction traffic across the proposed network of routes to be used for the project.

OmniTrans plot for the local road network around the Albert Embankment Foreshore site.

16.5.67 Construction lorry movements would be limited to the day shift only (08:00 to 18:00). In exceptional circumstances HGV and abnormal load movements could occur up to 22:00 for large concrete pours and later at night on agreement with the LB of Lambeth.

16.5.68 Construction vehicle arrivals at the site would be managed and it is anticipated that the occurrence of construction vehicles being refused entry into the site and needing to reverse onto Albert Embankment (for access option A) would be infrequent and would only cause a minor delay to northbound traffic on Albert Embankment when it does occur. It is expected that if this requirement does occur it would happen on an infrequent basis.

16.5.69 The presence of a traffic marshal to guide vehicles out of the site access if they have been refused entry would also serve to reduce the risk of accidents.

16.5.70 An additional security check would be required for construction vehicles entering this site (for access option A) due to the close proximity of the Vauxhall Cross building. This would require that each vehicle would be inspected at a remote vehicle holding area located no more than ten minutes from the site. The holding and inspection location has not yet been defined but is expected to be within the Nine Elms area. Vehicles would be inspected and given clearance to proceed to the site and on arrival at the site access would need to provide evidence of their security clearance.

16.5.71 The vehicle holding area required for access option A would reduce the length of time that construction vehicles would need to be held at the site gate and could be used to control the arrival times of vehicles to the construction site.

16.5.72 The additional construction traffic generated by the project may lead to local changes in traffic flow and capacity. Local modelling has been undertaken to assess the effect on the highway operation resulting from the construction traffic flows.

16.5.73 The local PICADY model has been used to apply the construction traffic demands to the construction base case to determine the changes in the highway network operation due to the project (i.e. comparison of base and development cases). Both access options have been assessed.

16.5.74 Summaries of the construction assessment results for access option A at the Lacks Dock slipway / Albert Embankment (A3036) junction are presented in Table 16.5.2 and Table 16.5.3.

Table 16.5.2 Construction development case PICADY model outputs, AM peak (access option A)

Approach	Arm	Flow (vehs)	Weekday								
			AM peak hour (08:00-09:00)								
			RFC			Max Queue (vehs)			Delay (seconds/vehs)		
			Base case	Devt case	Change	Base case	Devt case	Change	Base case	Devt case	Change
Lacks Dock Slipway	Left (and right) onto Albert Embankment	4	0%	2%	+2%	0	0	0	0	21	+21
Albert Embankment (E)	Right onto London Duck Tours Slipway	2	1%	1%	0%	0	0	0	16	16	0

Notes: RFC represents Ratio of Flow to Capacity. Queue represents number of vehicles in queue. Delay represents the mean delay per vehicle.

Table 16.5.3 Construction development case PICADY model outputs, PM peak (access option A)

Approach	Arm	Flow (vehs)	Weekday								
			PM peak hour (17:00-18:00)								
			RFC			Max Queue (vehs)			Delay (seconds/vehs)		
			Base case	Devt case	Change	Base case	Devt case	Change	Base case	Devt case	Change
Lacks Dock Slipway	Left (and right) onto Albert Embankment	6	1%	2%	+1%	0	0	0	12	11	-1
Albert Embankment (E)	Right onto London Duck Tours Slipway	0	0%	0%	0%	0	0	0	0	0	0

Notes: RFC represents Ratio of Flow to Capacity. Queue represents number of vehicles in queue. Delay represents the mean delay per vehicle.

16.5.75 The results indicate that the construction development case would result in a negligible impact on capacity at the Lacks Dock slipway / Albert Embankment (A3036) junction.

16.5.76 The assessment indicates that the road network delay during the AM and PM peak hours in the construction case would be a maximum of 16 seconds per vehicle in the AM peak hour on Albert Embankment eastbound. This delay is caused by vehicles turning right into Camelford House and is not caused by construction vehicles. This indicates that should this movement be restricted or discouraged, the impact on the junction would be reduced.

16.5.77 If option B were to be adopted, the geometry of the site access junction would be very similar to that for option A. The traffic flows through the junction would also be very similar with the exception that total flows would be lower in option B as the option A modelling includes London Duck Tours and Camelford House traffic. The outcomes of the option A modelling therefore provide a reasonable representation of what could be expected from the option B solution.

16.5.78 The results indicate that the construction development case would result in a negligible impact on capacity at both the Lacks Dock slipway / Albert Embankment (A3036) junction and the new access between Camelford House and Tintagel House.

Construction mitigation

16.5.79 The project has been designed to limit the issues arising on transport networks as far as possible and many measures have been embedded directly in the design of the project. These are summarised in Table 16.5.4. No additional measures are proposed for transport and therefore there is no mitigation identified for the construction phase.

Table 16.5.4 Albert Embankment Foreshore site design measures

Phase	Issues	Design measures
Construction	Creating access point	• Creation of a left-in/ left-out site access for construction traffic
	Safe passage for pedestrians and cyclists	• Traffic marshal would be stationed at the site entrance to manage potential conflicting movements • Provision of a safe crossing point for pedestrians and cyclists at the site access • Provision of hoarding to segregate the site from public footpath and vehicular traffic.

Phase	Issues	Design measures
	Movement of construction traffic flows on the local highway network	• Providing traffic marshals at the site access to minimise conflicts with construction traffic.
Operation	Permanent access point	• New public realm area in the foreshore to the west of Camelford House

16.5.80 These embedded measures, discussed in Section 16.2, have been taken into account in the assessment. The outcomes indicate that with these measures in place the changes to be expected in the transport networks are not significant and therefore no additional measures are required for the construction phase.

Sensitivity testing

16.5.81 The assessment outcomes reported earlier in Section 16.3 are based on the *Transport Strategy*. In that scenario, the number of construction vehicles generated by the Albert Embankment site is nine vehicles in the AM and PM peak hours respectively which would use the Lacks Dock / Albert Embankment junction.

16.5.82 A sensitivity test has been undertaken to examine the implications of variation in the number of construction vehicles in the peak month of activity at this site, including the possibility that river transport were not available for short periods of time which could temporarily increase vehicle numbers. In this sensitivity test, the number of construction vehicles would be a maximum of 20 per hour in the AM and PM peak hour.

16.5.83 A summary of the construction assessment results from the PICADY model for the Lacks Dock / Albert Embankment junction in the weekday AM and PM peak hours using the sensitivity test figures are presented in Table 16.5.5 and Table 16.5.6 for access option A.

Table 16.5.5 Construction development case PICADY model outputs, AM peak, for the sensitivity test (access option A)

Approach	Arm	Flow (vehs)	Weekday								
			AM peak hour (08:00-09:00)								
			RFC			Max Queue (vehs)			Delay (seconds/veh)		
			Base case	Devt case	Sensitivity test	Base case	Devt case	Sensitivity test	Base case	Devt case	Sensitivity test
Lacks Dock Slipway	Left (and right) onto Albert Embankment	18	0%	2%	13%	0	0	0	0	21	30
Albert Embankment (E)	Right onto London Duck Tours Slipway	2	1%	1%	1%	0	0	0	16	16	16

Notes: RFC represents Ratio of Flow to Capacity. Queue represents number of vehicles in queue. Delay represents the mean delay per vehicle.

Table 16.5.6 Construction development case PICADY model outputs, PM peak, for the sensitivity test (access option A)

Approach	Arm	Flow (vehs)	Weekday								
			PM peak hour (17:00-18:00)								
			RFC			Max Queue (vehs)			Delay (seconds/veh)		
			Base case	Devt case	Sensitivity test	Base case	Devt case	Sensitivity test	Base case	Devt case	Sensitivity test
Lacks Dock Slipway	Left (and right) onto Albert Embankment	20 (1)	1%	2%	7%	0	0	0	12	11	14
Albert Embankment (E)	Right onto London Duck Tours Slipway	0	0%	0%	0%	0	0	0	0	0	0

Notes: RFC represents Ratio of Flow to Capacity. Queue represents number of vehicles in queue. Delay represents the mean delay per vehicle.

16.5.84 The results suggest that under this scenario, the Lacks Dock / Albert Embankment junction would operate with an additional delay of nine seconds and three seconds in the AM and PM peaks respectively. The largest change is an 11% increase in RFC from 2% to 13% on the left turn movement onto Albert Embankment from Lacks Dock in the AM peak. This is not significant.

16.5.85 The results of this sensitivity test indicate that even assuming all materials arrive and depart the site by road, the impact on the operation of the Lacks Dock / Albert Embankment junction would not be significant.

16.5.86 As mentioned previously, If option B were to be adopted, the geometry of the site access junction would be very similar to that for option A. The traffic flows through the junction would also be very similar with the exception that total flows would be lower in option B as the option A modelling includes London Duck Tours and Camelford House traffic. The outcomes of the option A modelling therefore provide a reasonable representation of what could be expected from the option B solution.

16.6 Operational assessment

16.6.1 This section summarises the findings of the assessment undertaken for Year 1 of operation at the Albert Embankment Foreshore site.

16.6.2 The assessment of the operational phase is limited to the physical issues associated with accessing the site from the highway network as outlined in Section 16.2. This has been discussed with the LB of Lambeth and TfL.

Operational base case

16.6.3 The operational assessment year for transport is Year 1 of operation.

16.6.4 As stated in para. 16.2.56, the elements of the transport network that would be affected during operation are pedestrian movements, highway layout and operation and parking. For the purposes of the operational base case, it is anticipated that the highway layout will be as indicated in the construction base case.

Operational development case

16.6.5 The operational assessment has taken into consideration those elements that would be affected, which primarily comprise the short-term impacts on highway layout and operation when maintenance visits are made to the Albert Embankment Foreshore site.

16.6.6 The assessment of the operational phase is therefore limited to the physical issues associated with accessing the Albert Embankment Foreshore site from the highway network, i.e. highway layout and operation, as outlined in the following section. This has been discussed with the LB of Lambeth and TfL.

16.6.7 The transport demands created by the development in the operational phase would be extremely low and limited to occasional maintenance visits every three to six months, and mobile cranes required for access to the shaft and tunnel every ten years.

16.6.8 The permanent highway layout (options A and B) plans are provided in the Albert Embankment *Transport Assessment* figures and indicates the operational phase permanent works.

Parking

16.6.9 No change is expected to car parking in the vicinity of the site, compared to the base case, as a result of the operational phase of the proposed development at the Albert Embankment Foreshore site.

Pedestrians

16.6.10 Once the construction works have been completed, new areas would be created in the foreshore to the west of Camelford House and also to the west of Vauxhall Cross. The area to the west of Camelford House would be public realm, effectively widening the Thames Path at this location. This area would include seating with views over the River Thames.

16.6.11 Vehicles would be required to access both sections of the operational site, to the west of Camelford House and Vauxhall Cross, for maintenance purposes on an occasional basis. Vehicles would use a section of the Thames Path to the southwest of Camelford House and the new public realm area to the west of Camelford House in order to gain access to the shaft, and a section of the Thames Path to the west of Vauxhall Cross in order to gain access to the interception chamber. As a result, pedestrians would not be able to use these sections of the Thames Path when maintenance is taking place. This temporary closure of the Thames Path would occur every three to six months and the closure would last one day. When larger vehicles are required to access the site every ten years, the Thames Path would be closed for approximately two weeks.

16.6.12 Taking into consideration the infrequent and temporary nature of the arrival of vehicles at the Albert Embankment Foreshore site which would require closure of a section of the Thames Path and the presence of an alternative route via the western footway of Albert Embankment (A3036), it is anticipated that there would be no significant overall change to pedestrian movements in the area.

Highway layout and operation

16.6.13 For routine three or six monthly inspections vehicular access would be required for light commercial vehicles, typically a transit van. On occasion there may be a consequent need for small flatbed vehicles to access the site.

16.6.14 During ten-yearly inspections, space to locate two mobile cranes with associated support vehicles within the site would be required. The cranes would facilitate duty/standby access for personnel.

16.6.15 To assess the effect of the operational traffic movements on the highway layout, swept paths have been undertaken for the largest vehicles including an 11.36m mobile crane, 10m rigid vehicle and a 10.7m articulated vehicle. The permanent highway layout vehicle swept path analysis (options A and B) plans are provided in the Albert Embankment

Transport Assessment figures and show safe access/ egress at the site for the operational phase.

16.6.16 When larger vehicles are required to service the site, there may be some temporary, short-term delay to other road users while manoeuvres are made. However it is anticipated that the arrival of large vehicles would normally be scheduled to take place outside of the peak hours to minimise the effect on the local highway network.

16.6.17 There may also be some temporary, short-term delay to London Duck Tours vehicles accessing and egressing the foreshore via Lack's Dock as this is the route that maintenance vehicles would use to reach the operational site.

16.6.18 Due to the infrequent nature of maintenance trips there is anticipated to be no significant change to the operation of the surrounding highway network during the operational phase at Albert Embankment Foreshore.

Operational mitigation

16.6.19 Due to there being no significant changes to transport during the operational phase, no mitigation is required.

16.7 Summary of site-specific Transport Assessment

16.7.1 The outcomes of this *TA* demonstrate the key findings indicated in Table 16.7.1.

Table 16.7.1 Albert Embankment Foreshore Transport Assessment results

Phase	Mode of transport	Key Findings
Construction	Pedestrians	Approximate 15 second delay to pedestrian journeys due to the diversion of the Thames Path along Albert Embankment.
	Cyclists	No delay experienced by cyclists using Albert Embankment as a result of the highway network delay.
	Bus patronage and operators	Approximately nine worker trips would be made by bus in the AM and PM peak hours which could be accommodated on base case services. No delay to bus services would be anticipated due to highway network delay.
	London Underground and National Rail patronage	Approximately 27 worker trips would be made by National Rail and 20 worker trips would be made by London Underground. These could be accommodated on base case services.
	River passenger services and patronage	River services would not be impacted during construction. The London Duck Tours service would be affected (although disruption would be kept to a minimum)
	River navigation	An assumed average peak of approximately 14 barge movements a day during Year 1 of construction which is not anticipated to change existing river navigation patterns. Note that navigation for Duck Tour vessels at Lacks Dock may be affected due to presence of cofferdam.
	Parking	On-street parking would not be impacted during construction In option A; two parking spaces in the Camelford House car park would be suspended and not re-provided during construction In option A; two parking spaces in the Camelford House car park and six spaces in the Tintagal House car park would be suspended and not re-provided during construction
	Highway network and operation	Approximately 82 additional daily movements would be produced by the construction works at Albert Embankment Foreshore. A delay of 16 seconds to the highway network would be anticipated, not as a result additional construction traffic generated by the project.

Phase	Mode of transport	Key Findings
Operation	Pedestrians	Temporary closure of the Thames Path, due to infrequent maintenance visits.
	Highway layout and operation	Some network delay may be experienced by other road users when large vehicles are accessing the site, however this will be infrequent and temporary.

References

[1] Transport for London, Travel *Planning for new development in London*, Transport for London (2011)

[2] Department for Transport (DfT), *Traffic Signs Manual Chapter 8 - Traffic Safety Measures and Signs for Road Works and Temporary Situations*, 2009.

[3] HM Government, Equality Act 2010 – Guidance, 2010.

[4] Traffic Advisory Leaflet 15/99 (December 1999) *Cyclists at Roadworks* – Guidance was produced by TfL and provides recommended lane widths at roadworks.

Thames Tideway Tunnel
Thames Water Utilities Limited

Application for Development Consent

Application Reference Number: WWO10001

Transport Assessment

Doc Ref: **7.10.13**

Albert Embankment Foreshore

Appendices

APFP Regulations 2009: Regulation **5(2)(q)**

Hard copy available in

Box **51** Folder **B**
January 2013

Thames Tideway Tunnel

Creating a cleaner, healthier River Thames

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Thames Tideway Tunnel

Transport Assessment

Volume 14 Appendices: Albert Embankment Foreshore

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Appendix A – Policy review

A.1 Introduction

A.1.1 There are a number of documents containing planning policies that are relevant to transport matters for the proposed development at Albert Embankment. This includes national, regional and local policies relevant to the site.

A.1.2 This section reviews current documents relevant to the proposed development which is situated within the Borough of Lambeth.

A.2 National Policy

National Planning Policy Framework (March 2012)

A.2.1 The Department for Communities and Local Government published the National Planning Policy Framework (NPPF) in March 2012. The NPPF replaces a variety of existing planning guidance, most notable the following document, Planning Policy Guidance 13: Transport (November 2010).

A.2.2 The key objective of the NPPF is to create a policy context to support economic growth. The principle of the guidance is to place an emphasis on sustainable development, where environmental conditions should be considered alongside economical and social matters.

A.2.3 It outlines the importance of local development plans and notes that where development accords with an up to date development plan then the proposals should be approved. Moreover, it suggests that local authorities should follow the approach of the presumption in favour of sustainable development.

A.2.4 With particular reference to transport matters the documents states:

"*In preparing local plans, local planning authorities should therefore support a pattern of development which, where reasonable to do so, and facilitates the use of sustainable modes of transport."*

A.2.5 The guidance goes on to advise at paragraph 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."

A.2.6 The document also states that:

"Plans should protect and exploit opportunities for the use of sustainable transport modes for the movement of goods or people". Therefore:

"A key tool to facilitate this would be a Travel Pan. All developments which generate significant amounts of movement should be required to provide a Travel Plan".

National Policy Statement for Waste Water (March 2012)

A.2.7 The National Policy Statement for Waste Water (NPS) was published by the Department of Environment, Food and Rural Affairs in March 2012. This National Policy Statement (NPS) sets out Government policy for the provision of major waste water infrastructures. The NPS does not recognise the Thames Tideway Tunnel project within the original thresholds which is contained within the Planning Act. However the document indicates that *"the Government has already stated its intention that the project should be considered at a national level"*.

A.2.8 The Secretary of State announced that development consent for the Thames Tideway Tunnel project should also be dealt with under the regime for nationally significant infrastructure projects under the Planning Act 2008.

A.2.9 The NPS seeks a sustainable long term solution to address the untreated sewage discharged into the river Thames and Thames Tideway Tunnel has been considered as the preferred solution.

A.2.10 With particular reference to transport matters the document states:

"The ES should include a transport assessment, using the NATA/WebTAG methodology stipulated in Department for Transport (DfT), or any successor to such methodology. Applicants should consult the Highways Agency and/or the relevant highway authority, as appropriate, on the assessment and on mitigation measures. The assessment should distinguish between the construction, operation and decommissioning project stages as appropriate".

A.2.11 The document states that the impacts on the surrounding transport infrastructure should be mitigated and where the mitigation measures are not sufficient the requirements to mitigate adverse impacts on transport networks should be considered.

A.2.12 Therefore it is advised to prepare a travel plan which includes demand management measures to mitigate transport impacts, and *"to provide details of proposed measures to improve access by public transport, walking and cycling, to reduce the need for parking associated with the proposal and to mitigate transport impacts".*

A.2.13 The NPS prefers water-borne or rail transport over road transport and where there is likely to be substantial HGV traffic, the following measures should be looked:

- *"control numbers of HGV movements to and from the site in a specified period during its construction and possibly on the routing of such movements;*
- *make sufficient provision for HGV parking, either on the site or at dedicated facilities elsewhere, to avoid 'overspill' parking on public roads, prolonged queuing on approach roads and uncontrolled on-street HGV parking in normal operating conditions; and*
- *ensure satisfactory arrangements for reasonably foreseeable abnormal disruption, in consultation with network providers and the responsible police force".*

A.2.14 The proposed development is located at a relatively moderate accessible transport hub and the proposed location has a Public Transport Accessibility Level (PTAL) rating of 3, rated as 'moderate'. It is assumed that construction workers would not travel by car to and from the site on the basis that there would be no worker parking on site; on-street parking in the area is restricted; and site-specific Travel Plan measures will discourage workers from travelling by car. Information regarding the travel arrangements of the workers associated with the site will be included in the *Project Framework Travel Plan* and site-specific Travel Plan documents.

A.3 Regional policy

The London Plan (July 2011)

A.3.1 The London Plan 2011 is produced by the Greater London Authority (GLA) and sets out the strategic planning guidance for London planning authorities. The Mayor of London is responsible for strategic planning and the production of a Spatial Development Strategy called The London Plan. The London plan sets out the integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years. The Plan takes the year 2031 as its formal end date and its over-arching vision is supported by six detailed objectives for London:

- 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.

A.3.2 The last objective of the plan relates specifically to transport. Policies within the London Plan of relevance to the proposed development are outlined as follows:

A.3.3 **Policy 6.1 – Strategic Approach** advises that the mayor will work with all relevant partners to encourage the closer integration of transport and development by:

- Encouraging patterns and nodes of development that reduce the need to travel, especially by car;
- Seeking to improve the capacity and accessibility of public transport, walking and cycling, particularly in areas of greater demand;
- Supporting development that generates high levels of trips at locations with high public transport accessibility and/or capacity, either currently or via committed, funded improvement;
- Seeking to increase the use of the Blue Ribbon Network, especially the Thames, for passenger and freight use;
- Facilitating the efficient distribution of freight whilst minimising its impacts on the transport network;
- Supporting measures that encourage shifts to mode sustainable modes and appropriate demand management; and
- Promoting greater use of low carbon technology so that carbon dioxide and other contributors to global warming are reduced.

A.3.4 **Policy 6.2 – Providing public transport capacity and safeguarding land for transport** which notes that development proposals that do not provide adequate safeguarding for the schemes should be refused.

A.3.5 **Policy 6.3 – Assessing effects of development on transport capacity** outlines that 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. Where existing transport capacity is insufficient for the travel generated by proposed developments, and no firm plans exist for an increase in capacity, boroughs should ensure that the development proposals are phased until it is known that these requirements can be met. The policy notes that the use of Travel Plans and addressing freight issues can help reduce the impact of development on the transport network.

A.3.6 **Policy 6.7 – Better streets and surface transport** notes that high levels of priority should be provided to bus routes and there should be direct, secure, accessible and pleasant walking routes to stops. The development would include provision of transport to and from public transport nodes where sites are at a distance from public transport services.

A.3.7 **Policy 6.9 – Cycling** presents measures to increase cycling mode share in London to 5 percent by 2026. Measures include completing the Cycle Super Highways and expanding the London cycle hire scheme. To support this, developments should provide cycle parking to at least the minimum standards, provide showers and changing facilities and facilitate the major cycling schemes in London (Super Highways / Cycle Hire).

A.3.8 **Policy 6.10 – Walking** recommends the use of shared space principles with simplified streetscape, de-cluttering and access for all. Developments should therefore ensure high quality pedestrian environments and emphasise the quality of pedestrian and street space. It points to the 'Legible London' pedestrian wayfinding system as a successful measure to support walking journeys.

A.3.9 **Policy 6.13 – Parking** outlines the need to seek an appropriate balance between promoting new development and preventing excessive car parking provision that can undermine cycling, walking and public transport use. As such, car parking should reduce as public transport accessibility (measured by PTAL) increases. The policy advises that Transport assessments and travel plans for major developments should give details of proposed measures to improve non-car based access, reduce parking and mitigate adverse transport impacts.

A.3.10 **Policy 6.14 – Freight** notes that freight distribution should be improved and movement of freight by rail and waterway should be promoted. To support this, developments that generate high number of freight movements should be located close to major transport routes. In addition, the Freight Operators Recognition Scheme, construction logistics plans and delivery and servicing plans should be promoted. The policy also advises the increase in the use of the Blue Ribbon Network for freight transport.

The Mayors Transport Strategy (GLA, 2010)

A.3.11 In addition to the London Plan, the Mayor has prepared a number of strategies that are essentially an extension of the London Plan. Published by the GLA in 2010, the Mayor's Transport Strategy (MTS) (Greater London Authority, May 2010) envisages *"London's Transport system excelling among that of global cities, providing access to opportunities for all people and enterprises while achieving the highest environmental standards and leading the world in its move towards tackling the urban transport challenges of the 21st century"*.

A.3.12 The MTS sets out a number of policy commitments or requirements which have implications for TfL and a range of other delivery partners including the GLA and the London boroughs. The policies that are relevant to the proposed development are:

- **Policy 4** indicating that the Mayor will seek *"to improve people's access to jobs, business' access to employment markets, business to business access, and freight access by seeking to ensure appropriate transport capacity and connectivity is provided on radial corridors into central London";*
- **Policy 5** seeks *"to ensure efficient and effective access for people and goods within central London";*
- **Policy 8** supports *"a range of transport improvements within metropolitan town centres for people and freight that help improve connectivity and promote the vitality and viability of town centres, and that provide enhanced travel facilities for pedestrians and cyclists";*

- **Policy 9** states that the Mayor *"will use the local and strategic development control processes";*
- **Policy 11** specifies that the Mayor will *"encourage the use of more sustainable, less congesting modes of transport, set appropriate parking standards, and aim to increase public transport, walking and cycling mode share";*
- **Policy 12** states that the Mayor *"will seek to improve the distribution of freight through the provision of better access to/from Strategic Industrial Locations, delivery and servicing plans, and other efficiency measures across London"; and*
- **Policy 15** and **Policy 16** indicate that the Mayor will seek to reduce emissions of air pollutants and noise impacts from transport respectively.

A.3.13 The *London Freight Plan, Sustainable Freight Distribution: a Plan for London* (TfL, June 2008) sets out the steps that have to be taken over the next five to ten years to identify and begin to address the challenge of delivering freight sustainably in the capital. Principles set in that document are expected to be relevant to the consideration of the construction logistics strategy for the proposed development.

A.4 Local policy

A.4.1 The London Borough of Lambeth has a number of policies relevant to transport within the Local Development Framework (LDF), the Unitary Development Plan (UDP) and the Supplementary Planning Guidance (SPG): Safer Built Environments.

Local Development Framework - Core Strategy (LB Lambeth, January 2011)

A.4.2 The emerging LDF aims to guide and manage development and regeneration in the borough up until 2026. The Core Strategy of the LDF - adopted in January 2011- now forms part of the statutory planning guidance for the borough, together with the saved policies of the borough's Unitary Development Plan (UDP).

A.4.3 Transport policies within the Core Strategy focus on ensuring improvements are made to transport, open space and sustainable waste management. These policies are outlined below.

A.4.4 **Strategic Policy S4 – Transport** outlines how the borough will enhance the transport network by:

A.4.5 Reducing the need to travel and the reliance on the private car;

A.4.6 Improving public transport connectivity, quality and capacity;

A.4.7 Encouraging walking and cycling;

A.4.8 Complying with maximum car parking standards contained within the London Plan; and

A.4.9 Supporting the use of the River Thames as a strategic route for transporting passengers and freight.

A.4.10 **Strategic Policy S5 – Open space** aims to enhance and increase the quantity of open space within the borough. This is expected to be achieved through existing initiatives associated with the Greenway and the Thames Path National Walking Trail. Additionally, the policy states that "where appropriate in major developments, financial contributions will be sought towards improvements in the quality of, and access to, open space in the borough."

A.4.11 **Strategic Policy S8 – Sustainable waste management** sets out how the borough plans to manage waste sustainably through the efficient use of resources and materials, safeguarding existing waste transfer and management sites, implementing a Lambeth Sustainable Waste Management Strategy and by supporting additional sites and land for waste management and waste collection.

Unitary Development Plan (LB of Lambeth, August 2007)

A.4.12 The UDP was adopted by the London Borough of Lambeth in August 2007. Due to the emerging LDF and the adoption of the Core Strategy, a number of policies have been deleted from the UDP. The relevant UDP policies which have been saved since August 2010 are outlined below.

A.4.13 **Policy 9 – Transport impact** requires a Transport Assessment to be submitted for all developments which are likely to have a significant impact on the transport network. The cumulative impacts on highway safety, the environment and the road network and on all transport modes (including public transport, walking and cycling) should be considered.

A.4.14 **Policy 12 – Strategic transport hubs and transport development areas** outlines the borough's support to develop seven key transport hubs within the area. The Vauxhall Cross interchange has been identified as a key transport hub.

A.4.15 **Policy MDO 1 – Camelford House/Tintagel House 89 Albert Embankment** supports the redevelopment of this area. It states that redevelopment should include widening and improving the riverside walk.

A.4.16 **Policy MDO 2 – Texaco Garage and Albert** Embankment states that development should be designed to "terminate rather than continue the wall-like effect and act as a gateway to Albert Embankment from the South." Also within this policy the Council further state the importance of the area; it "should enhance and not dominate the setting of Spring Garden"' and the "residential amenity of Peninsula heights is to be protected."

A.4.17 **Policy MDO 88 – Glasshouse Walk, Tinworth Street, Vauxhall Walk** promotes development and regeneration in this area. Aims to improve pedestrian links are included. The policy also states that areas such Spring Gardens and Vauxhall Gardens Conservation Area should be improved and enhanced.

Supplementary Planning Guidance (SPGs)

A.4.18 Supplementary Planning Guidance documents provide additional guidance and detail to support the LDF and the UDP. The most relevant SPG document to transport is the 'Safer Built Environments' document which was adopted in April, 2008.

Safer Built Environments (LB of Lambeth, April 2008)

A.4.19 Within this document the Council make reference to 'streets and spaces should be linked together' and that pedestrian route's 'should be extended and integrated into new development'. Also they emphasise that 'movement routes should be first designed around pedestrians and cyclists and then vehicles'.

Appendix B – PTAL analysis

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PTAI Study Report File Summary

PTAI Run Parameters

PTAI Run	20120410134507
Description	20120410134507
Run by user	PTAL web application
Date	04/10/2012

Walk File Parameters

Walk File	PLSQLTest
Day of Week	M-F
Time Period	AM Peak
Walk Speed	4.8 kph
BUS Walk Access Time (mins)	8
BUS Reliability Factor	2.0
LU LRT Walk Access Time (mins)	12
LU LRT Reliability Factor	0.75
NATIONAL_RAIL Walk Access Time (mins)	12
NATIONAL_RAIL Reliability Factor	0.75
Coordinates:	530385, 178182

Mode	Stop	Route	Distance (metres)	Frequency (vph)	Weight	Walk time (mins)	SWT (mins)	TAT (mins)	EDF	AI
BUS	VAUXHALL STATION BONDWAY	88	354.79	9	0.5	4.43	5.33	9.77	3.07	1.54
BUS	VAUXHALL X ALBERT EMBKMT	360	37.55	5	0.5	0.47	8	8.47	3.54	1.77
BUS	VAUXHALL X BRIDGEFOOT	87	224.42	10	0.5	2.81	5	7.81	3.84	1.92
BUS	VAUXHALL STATION BONDWAY	2	354.79	9	0.5	4.43	5.33	9.77	3.07	1.54
BUS	VAUXHALL STATION BONDWAY	36	354.79	10	0.5	4.43	5	9.43	3.18	1.59
BUS	VAUXHALL STATION BONDWAY	185	354.79	6	0.5	4.43	7	11.43	2.62	1.31
BUS	VAUXHALL STATION BONDWAY	436	354.79	10	0.5	4.43	5	9.43	3.18	1.59
BUS	VAUXHALL X ALBERT EMBKMT	77	37.55	6	0.5	0.47	7	7.47	4.02	2.01
BUS	VAUXHALL X ALBERT	344	37.55	10	1	0.47	5	5.47	5.49	5.49

Mode	Stop	Route	Distance (metres)	Frequency (vph)	Weight	Walk time (mins)	SWT (mins)	TAT (mins)	EDF	AI
	EMBKMT									
BUS	VAUXHALL STATION N/B	196	333.96	5	0.5	4.17	8	12.17	2.46	1.23
BUS	VAUXHALL STATION BONDWAY	156	354.79	7.5	0.5	4.43	6	10.43	2.87	1.44
LU LRT	Vauxhall	Victoria Line Seven Sisters to Brixton	229.57	11.7	0.5	2.87	3.31	6.18	4.85	2.43
LU LRT	Vauxhall	Victoria Line Brixton to Walthamstow Central	229.57	15.7	1	2.87	2.66	5.53	5.42	5.42
NATIONAL_RAIL	VAUXHALL BR	LONDON WATERLOO BR to LONDON WATERLOO BR	229.57	2	1	2.87	15.75	18.62	1.61	1.61
NATIONAL_RAIL	VAUXHALL BR	DORKING BR to LONDON WATERLOO BR	229.57	1	0.5	2.87	30.75	33.62	0.89	0.45
NATIONAL_RAIL	VAUXHALL BR	READING to LONDON WATERLOO BR	229.57	0.33	0.5	2.87	91.66	94.53	0.32	0.16
NATIONAL_RAIL	VAUXHALL BR	LONDON WATERLOO BR to SHEPPERTON	229.57	2	0.5	2.87	15.75	18.62	1.61	0.81
NATIONAL_RAIL	VAUXHALL	LONDON	229.57	1.67	0.5	2.87	18.71	21.58	1.39	0.69

Mode	Stop	Route	Distance (metres)	Frequency (vph)	Weight	Walk time (mins)	SWT (mins)	TAT (mins)	EDF	AI
	BR	WATERLOO BR to GUILDFORD BR								
NATIONAL_RAIL	VAUXHALL BR	LONDON WATERLOO BR to GUILDFORD BR	229.57	2	0.5	2.87	15.75	18.62	1.61	0.81
NATIONAL_RAIL	VAUXHALL BR	LONDON WATERLOO BR to DORKING BR	229.57	2	0.5	2.87	15.75	18.62	1.61	0.81
NATIONAL_RAIL	VAUXHALL BR	KINGSTON to LONDON WATERLOO BR	229.57	0.33	0.5	2.87	91.66	94.53	0.32	0.16
NATIONAL_RAIL	VAUXHALL BR	GUILDFORD BR to LONDON WATERLOO BR	229.57	0.67	0.5	2.87	45.53	48.4	0.62	0.31
NATIONAL_RAIL	VAUXHALL BR	LONDON WATERLOO BR to HAMPTON COURT	229.57	2	0.5	2.87	15.75	18.62	1.61	0.81
NATIONAL_RAIL	VAUXHALL BR	WEYBRIDGE to LONDON WATERLOO BR	229.57	1.67	0.5	2.87	18.71	21.58	1.39	0.69
NATIONAL_RAIL	VAUXHALL BR	TWICKENHAM BR to LONDON WATERLOO BR	229.57	0.67	0.5	2.87	45.53	48.4	0.62	0.31
NATIONAL_RAIL	VAUXHALL BR	LONDON WATERLOO BR	229.57	1.67	0.5	2.87	18.71	21.58	1.39	0.69

Mode	Stop	Route	Distance (metres)	Frequency (vph)	Weight	Walk time (mins)	SWT (mins)	TAT (mins)	EDF	AI
		to WOKING								
NATIONAL_RAIL	VAUXHALL BR	WINDSOR AND ETON RIVERSIDE to LONDON WATERLOO BR	229.57	2	0.5	2.87	15.75	18.62	1.61	0.81
NATIONAL_RAIL	VAUXHALL BR	EFFINGHAM JUNCTION to LONDON WATERLOO BR	229.57	0.67	0.5	2.87	45.53	48.4	0.62	0.31
NATIONAL_RAIL	VAUXHALL BR	LONDON WATERLOO BR to LONDON WATERLOO BR	229.57	2	0.5	2.87	15.75	18.62	1.61	0.81
NATIONAL_RAIL	VAUXHALL BR	TEDDINGTON to LONDON WATERLOO BR	229.57	0.33	0.5	2.87	91.66	94.53	0.32	0.16
NATIONAL_RAIL	VAUXHALL BR	LONDON WATERLOO BR to CHESSINGTON SOUTH BR	229.57	2	0.5	2.87	15.75	18.62	1.61	0.81
NATIONAL_RAIL	VAUXHALL BR	SHEPPERTON to LONDON WATERLOO BR	229.57	1	0.5	2.87	30.75	33.62	0.89	0.45
NATIONAL_RAIL	VAUXHALL BR	EPSOM to LONDON	229.57	1	0.5	2.87	30.75	33.62	0.89	0.45

Mode	Stop	Route	Distance (metres)	Frequency (vph)	Weight	Walk time (mins)	SWT (mins)	TAT (mins)	EDF	AI
		WATERLOO BR								
NATIONAL_RAIL	VAUXHALL BR	LONDON WATERLOO BR to HOUNSLOW	229.57	0.33	0.5	2.87	91.66	94.53	0.32	0.16
NATIONAL_RAIL	VAUXHALL BR	LONDON WATERLOO BR to WEYBRIDGE	229.57	2	0.5	2.87	15.75	18.62	1.61	0.81
NATIONAL_RAIL	VAUXHALL BR	ALDERSHOT to LONDON WATERLOO BR	229.57	0.67	0.5	2.87	45.53	48.4	0.62	0.31
NATIONAL_RAIL	VAUXHALL BR	STAINES to LONDON WATERLOO BR	229.57	0.33	0.5	2.87	91.66	94.53	0.32	0.16
NATIONAL_RAIL	VAUXHALL BR	TWICKENHAM BR to LONDON WATERLOO BR	229.57	0.33	0.5	2.87	91.66	94.53	0.32	0.16

Total AI for this POI is 42.99.

PTAL Rating is 6b.

Appendix C – Local modelling outputs

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C.1 Baseline results, AM peak hour

Albert Embankment/Lacks Dock Slipway junction priority layout

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Baseline, AM	Baseline	AM		DIRECT	08:00	09:00	60	15		

Junction Network

Junctions

Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
untitled	T-Junction	Two-way	A,B,C	12.49	B

Junction Network Options

Driving Side	Lighting	Road Surface
Left	Normal/unknown	(Mini-roundabouts only)

Arms

Arms

Arm	Name	Description	Arm Type
A	Albert Embankment (W)		Major
B	Lacks Dock		Minor
C	Albert Embankment (E)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	13.50		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.70										30	20

Pedestrian Crossings

Arm	Crossing Type
A	None
B	None
C	None

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	531.978	0.065	0.165	0.104	0.236
1	B-C	681.136	0.070	0.178	-	-
1	C-B	602.919	0.157	0.157	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	DIRECT	✓	N/A	100.000
B	DIRECT	✓	N/A	100.000
C	DIRECT	✓	N/A	100.000

Turning Proportions

Turning Counts or Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	7.000	1965.000
	B	0.000	0.000	0.000
	C	539.000	2.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.00	1.00
	B	0.33	0.33	0.33
	C	1.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.007
	B	1.000	1.000	1.000
	C	1.015	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	0.000	0.710
	B	0.000	0.000	0.000

	C	1.480	0.000	0.000

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.00	0.00	0.00	A
C-A	-	-	-	-
C-B	0.01	12.49	0.01	B
A-B	-	-	-	-
A-C	-	-	-	-

C.2 Baseline results, PM peak hour

Albert Embankment/Lacks Dock Slipway junction priority layout

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Baseline, PM	Baseline	PM		DIRECT	17:00	18:00	60	15		

Junction Network

Junctions

Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
untitled	T-Junction	Two-way	A,B,C	8.64	A

Junction Network Options

Driving Side	Lighting	Road Surface
Left	Normal/unknown	(Mini-roundabouts only)

Arms

Arms

Arm	Name	Description	Arm Type
A	Albert Embankment (W)		Major
B	Lacks Dock		Minor
C	Albert Embankment (E)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	13.50		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.70										30	20

Pedestrian Crossings

Arm	Crossing Type
A	None
B	None
C	None

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	531.978	0.065	0.165	0.104	0.236
1	B-C	681.136	0.070	0.178	-	-
1	C-B	602.919	0.157	0.157	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	DIRECT	✓	N/A	100.000
B	DIRECT	✓	N/A	100.000
C	DIRECT	✓	N/A	100.000

Turning Proportions

Turning Counts or Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	5.000	550.000
	B	1.000	0.000	1.000
	C	1098.000	0.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.01	0.99
	B	0.50	0.00	0.50
	C	1.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.002
	B	1.000	1.000	1.000
	C	1.004	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	0.000	0.180
	B	0.000	0.000	0.000

	C	0.360	0.000	0.000

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.00	8.64	0.00	A
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A
A-B	-	-	-	-
A-C	-	-	-	-

C.3 Construction base case results, AM peak hour

Albert Embankment/Lacks Dock Slipway junction priority layout

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base Case, AM	Base Case	AM		DIRECT	08:00	09:00	60	15		

Junction Network

Junctions

Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
untitled	T-Junction	Two-way	A,B,C	15.79	C

Junction Network Options

Driving Side	Lighting	Road Surface
Left	Normal/unknown	(Mini-roundabouts only)

Arms

Arms

Arm	Name	Description	Arm Type
A	Albert Embankment (W)		Major
B	Lacks Dock		Minor
C	Albert Embankment (E)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	13.50		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.70										30	20

Pedestrian Crossings

Arm	Crossing Type
A	None
B	None
C	None

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	531.978	0.065	0.165	0.104	0.236
1	B-C	681.136	0.070	0.178	-	-
1	C-B	602.919	0.157	0.157	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	DIRECT	✓	N/A	100.000
B	DIRECT	✓	N/A	100.000
C	DIRECT	✓	N/A	100.000

Turning Proportions

Turning Counts or Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	7.000	2272.000
	B	0.000	0.000	0.000
	C	763.000	2.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.00	1.00
	B	0.33	0.33	0.33
	C	1.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.040
	B	1.000	1.000	1.512
	C	1.145	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	0.000	3.980
	B	0.000	0.000	51.220

	C	14.480	0.000	0.000

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.00	0.00	0.00	A
C-A	-	-	-	-
C-B	0.01	15.79	0.01	C
A-B	-	-	-	-
A-C	-	-	-	-

C.4 Construction base case results, PM peak hour

Albert Embankment/Lacks Dock Slipway junction priority layout

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base Case, PM	Base Case	PM		DIRECT	17:00	18:00	60	15		

Junction Network

Junctions

Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
untitled	T-Junction	Two-way	A,B,C	11.88	B

Junction Network Options

Driving Side	Lighting	Road Surface
Left	Normal/unknown	(Mini-roundabouts only)

Arms

Arms

Arm	Name	Description	Arm Type
A	Albert Embankment (W)		Major
B	Lacks Dock		Minor
C	Albert Embankment (E)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	13.50		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.70										30	20

Pedestrian Crossings

Arm	Crossing Type
A	None
B	None
C	None

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	531.978	0.065	0.165	0.104	0.236
1	B-C	681.136	0.070	0.178	-	-
1	C-B	602.919	0.157	0.157	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	DIRECT	✓	N/A	100.000
B	DIRECT	✓	N/A	100.000
C	DIRECT	✓	N/A	100.000

Turning Proportions

Turning Counts or Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	5.000	856.000
	B	1.000	0.000	1.000
	C	1445.000	0.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.01	0.99
	B	0.50	0.00	0.50
	C	1.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.087
	B	1.000	1.000	1.000
	C	1.077	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	0.000	8.680
	B	0.000	0.000	0.000

	C	7.650	0.000	0.000

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.01	11.88	0.01	B
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A
A-B	-	-	-	-
A-C	-	-	-	-

C.5 Construction development case results, AM peak hour

Albert Embankment/Lacks Dock Slipway junction priority layout

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Construction EIA, AM	Construction EIA	AM		DIRECT	08:00	09:00	60	15		

Junction Network

Junctions

Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
untitled	T-Junction	Two-way	A,B,C	20.07	C

Junction Network Options

Driving Side	Lighting	Road Surface
Left	Normal/unknown	(Mini-roundabouts only)

Arms

Arms

Arm	Name	Description	Arm Type
A	Albert Embankment (W)		Major
B	Lacks Dock		Minor
C	Albert Embankment (E)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	13.50		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.70										30	20

Pedestrian Crossings

Arm	Crossing Type
A	None
B	None
C	None

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	531.978	0.065	0.165	0.104	0.236
1	B-C	681.136	0.070	0.178	-	-
1	C-B	602.919	0.157	0.157	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV	2.00				✓	✓

				Percentages						

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	DIRECT	✓	N/A	100.000
B	DIRECT	✓	N/A	100.000
C	DIRECT	✓	N/A	100.000

Turning Proportions

Turning Counts or Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	13.000	2273.000
	B	0.000	0.000	4.000
	C	766.000	2.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.01	0.99
	B	0.00	0.00	1.00
	C	1.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.168	1.040
	B	1.000	1.000	1.512
	C	1.147	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	16.780	3.980
	B	0.000	0.000	51.220

	C	14.730	0.000	0.000

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.02	21.45	0.02	C
C-A	-	-	-	-
C-B	0.01	15.89	0.01	C
A-B	-	-	-	-
A-C	-	-	-	-

C.6 Construction development case results, PM peak hour

Albert Embankment/Lacks Dock Slipway junction priority layout

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Construction EIA, PM	Construction EIA	PM		DIRECT	17:00	18:00	60	15		

Junction Network

Junctions

Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
untitled	T-Junction	Two-way	A,B,C	10.63	B

Junction Network Options

Driving Side	Lighting	Road Surface
Left	Normal/unknown	(Mini-roundabouts only)

Arms

Arms

Arm	Name	Description	Arm Type
A	Albert Embankment (W)		Major
B	Lacks Dock		Minor
C	Albert Embankment (E)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	13.50		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.70										30	20

Pedestrian Crossings

Arm	Crossing Type
A	None
B	None
C	None

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	531.978	0.065	0.165	0.104	0.236
1	B-C	681.136	0.070	0.178	-	-
1	C-B	602.919	0.157	0.157	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	DIRECT	✓	N/A	100.000
B	DIRECT	✓	N/A	100.000
C	DIRECT	✓	N/A	100.000

Turning Proportions

Turning Counts or Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	9.000	856.000
	B	1.000	0.000	6.000
	C	1447.000	0.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.01	0.99
	B	0.14	0.00	0.86
	C	1.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.222	1.087
	B	1.000	1.000	1.340
	C	1.078	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	22.160	8.690
	B	0.000	0.000	34.010

	C	7.790	0.000	0.000

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.02	10.63	0.02	B
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A
A-B	-	-	-	-
A-C	-	-	-	-

C.7 Construction development case results, AM peak hour, 'all by road' sensitivity test

Albert Embankment/Lacks Dock Slipway junction priority layout

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Construction ABR, AM	Construction ABR	AM		DIRECT	08:00	09:00	60	15		

Junction Network

Junctions

Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
untitled	T-Junction	Two-way	A,B,C	29.58	D

Junction Network Options

Driving Side	Lighting	Road Surface
Left	Normal/unknown	(Mini-roundabouts only)

Arms

Arms

Arm	Name	Description	Arm Type
A	Albert Embankment (W)		Major
B	Lacks Dock		Minor
C	Albert Embankment (E)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	13.50		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.70										30	20

Pedestrian Crossings

Arm	Crossing Type
A	None
B	None
C	None

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	531.978	0.065	0.165	0.104	0.236
1	B-C	681.136	0.070	0.178	-	-
1	C-B	602.919	0.157	0.157	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV	2.00				✓	✓

				Percentages						

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	DIRECT	✓	N/A	100.000
B	DIRECT	✓	N/A	100.000
C	DIRECT	✓	N/A	100.000

Turning Proportions

Turning Counts or Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	26.000	2273.000
	B	0.000	0.000	18.000
	C	780.000	2.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.00	0.01	0.99
	B	0.00	0.00	1.00
	C	1.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	**B**	**C**
From	**A**	1.000	1.607	1.040
	B	1.000	1.000	1.889
	C	1.163	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	60.700	3.980
	B	0.000	0.000	88.940

	C	16.260	0.000	0.000

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.13	30.37	0.15	D
C-A	-	-	-	-
C-B	0.01	16.19	0.01	C
A-B	-	-	-	-
A-C	-	-	-	-

C.8 Construction development case results, PM peak hour, 'all by road' sensitivity test

Albert Embankment/Lacks Dock Slipway junction priority layout

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Construction ABR, PM	Construction ABR	PM		DIRECT	17:00	18:00	60	15		

Junction Network

Junctions

Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
untitled	T-Junction	Two-way	A,B,C	13.86	B

Junction Network Options

Driving Side	Lighting	Road Surface
Left	Normal/unknown	(Mini-roundabouts only)

Arms

Arms

Arm	Name	Description	Arm Type
A	Albert Embankment (W)		Major
B	Lacks Dock		Minor
C	Albert Embankment (E)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	13.50		0.00		2.20	50.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	3.70										30	20

Pedestrian Crossings

Arm	Crossing Type
A	None
B	None
C	None

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	531.978	0.065	0.165	0.104	0.236
1	B-C	681.136	0.070	0.178	-	-
1	C-B	602.919	0.157	0.157	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	DIRECT	✓	N/A	100.000
B	DIRECT	✓	N/A	100.000
C	DIRECT	✓	N/A	100.000

Turning Proportions

Turning Counts or Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	**B**	**C**
From	**A**	0.000	23.000	856.000
	B	1.000	0.000	20.000
	C	1461.000	0.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.03	0.97
	B	0.05	0.00	0.95
	C	1.00	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.686	1.087
	B	1.000	1.000	1.798
	C	1.087	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	68.560	8.690
	B	0.000	0.000	79.790
	C	8.680	0.000	0.000

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.07	13.86	0.08	B
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A
A-B	-	-	-	-
A-C	-	-	-	-

Appendix D – Accident Analysis

D.1 Existing highway safety analysis

D.1.1 Details of road traffic accidents within the vicinity of the site have been obtained from Transport for London (TfL) and have been reviewed to determine whether there are particular issues or trends on the local highway network.

D.1.2 Data on accidents for 5 years until the end of March 2011 has been analysed for the following junctions and surrounding roads:

- A3036 Albert Embankment;
- Albert Embankment/ Kennington Lane;
- Albert Embankment/ Vauxhall Bridge;
- Wandsworth Road;
- Vauxhall Cross;
- South Lambeth Road; and

South Lambeth Road/ Kennington Lane Junction

D.1.3 Based on the DfT Design Manual for Roads and Bridges, Volume 13 Economic Assessment of Road Schemes, accidents have been analysed according to the method outlined in this guidance which states that accidents that have occurred within 20m of each junction are associated with that specific junction, and the remaining accidents are grouped to the relevant links.

D.1.4 The area of interest together with the locations of the recorded road traffic accidents are indicated in Table D.1 below.

Vol 4 Table D.1 Accident severity 2006 to 2011

Location	Slight	Serious	Fatal	Total
Albert Embankment	22	3	1	26
Albert Embankment/ Kennington Lane Junction	16	4	0	20
Albert Embankment/ New Spring Gardens Walk Junction	6	2	0	8
Albert Embankment/ Glasshouse Walk Junction	3	0	0	3
Albert Embankment/ South Lambeth Place Junction	2	0	0	2
Albert Embankment/ Vauxhall Bridge Junction	3	1	1	5
Albert Embankment/ Wandsworth Road Junction	3	0	0	3

Wandsworth Road	5	1	0	6
Wandsworth Road/ Bondway Junction	3	0	0	3
Wandsworth Road/ Vauxhall Bridge Junction	6	0	0	6
Wandsworth Road/ Kennington Lane Junction	4	0	0	4
Vauxhall Cross/ Wandsworth Road Junction	0	1	0	1
Vauxhall Cross/ Vauxhall Bridge Junction	1	0	0	1
Vauxhall Cross/ Kennington Lane Junction	1	1	0	2
Vauxhall Cross/ Lambeth Road Junction	3	0	0	3
South Lambeth Road	5	0	0	5
South Lambeth Road/ Harleyford Road Junction	6	1	0	7
South Lambeth Road/ Kennington Lane Junction	3	3	0	6
Total	92	17	2	111

A3036 Albert Embankment

D.1.5 The A3036 Albert Embankment section runs parallel both to the River Thames to the west and the A3 in the east in a southern direction passing the eastern boundary of the site area. For the stretch of the A3036 within the study area, the highway is a two lane dual carriageway inclusive of a bus lane on either side heading in the north-south direction. The Albert Embankment road is also part of the TfL Red Route highway network and extends north as far as the A302 Westminister Bridge Road and south as far as the A3 Huguenot Place. The junctions involved within this analysis are as follows:

- Albert Embankment/ Kennington Lane Junction;
- Albert Embankment/ New Spring Gardens Walk Junction;
- Albert Embankment/ Glasshouse Walk Junction;
- Albert Embankment/ South Lambeth Place Junction;
- Albert Embankment/ Vauxhall Bridge Junction;
- Albert Embankment/ Wandsworth Road Junction;

D.1.6 In total 67 accidents have occurred along A3036 Albert Embankment and the junction associated with this stretch of highway. In relation to the severity of these accidents, 55 were slight accidents, predominantly resulting from failure to look properly. The slight accidents were predominantly the result of failing to look properly, and failing to judge the other person's path or speed. In particular, accidents involving pedal cycles also had a contributing factor to travelling too fast for the conditions and following too closely.

D.1.7 Of the total accidents, 10 were classified as serious. Most of the accidents involved a collision of cars with motorcycles, pedal cycles and pedestrians. There is a cluster of four serious accidents at the junction between Albert Embankment and Kennington Lane where the major contributory factor to the serious accidents was failure to look properly, failure to judge other person's path or speed and travelling too fast for the conditions. One of the serious accidents involved a car turning into the path of a motorcycle at the junction between Albert Embankment and New Spring Gardens Walk. Another serious accident accrued 20m north of Albert Embankment with its junction with Kennington Lane where a pedestrian disobeyed an ATS red light while there was a green light for traffic and a motorcycle struck the pedestrian.

D.1.8 The 2 fatal accidents that occurred along the A3036 Albert Embankment in the 5 year period analysed, with one occurring 50m north of the Albert Embankment/ Vauxhall Bridge Road junction and the other at the same junction. The accident 50m from the junction involved a car leaving the carriageway and hitting a pedestrian and the other involved a pedestrian using a pedestrian crossing a road and being struck by the car. The accident was caused by the driver of the car being impaired by drugs (illicit or medicinal) and by illness or disability (mental or physical).

D.1.9 Nearly all of the slight accidents that occurred along Albert Embankment involved cars and motorcyclists and the cause was often attributed to failing to look properly, failure to judge other person's path or speed and undertaking a poor turn or manoeuvre.

D.1.10 Of the total accidents, three accidents included HGVs and none for MGVs/LGVs. All three of the HGV accidents were rated as slight in severity. Also, within these total accidents three involved pedestrians and 17 involved pedal cycles.

Wandsworth Road

D.1.11 Wandsworth Road forms another section of the A3036 that runs in a south-west direction with the A3205 to the west, the A3 in the east and the site to the north. For the stretch of the A3036 within the study area, the highway is a six lane one-way carriageway inclusive of a bus lane heading in the north and eastern directions. The Albert Embankment road is also part of the TfL Red Route highway network and extends north as far as the A302 Westminister Bridge Road and south as far as the A3 Huguenot Place. The junctions involved within this analysis are as follows:

- Wandsworth Road/ Bondway Junction;
- Wandsworth Road/ Vauxhall Bridge Junction; and
- Wandsworth Road/ Kennington Lane Junction.

D.1.12 In total 19 accidents have occurred along the A3036 Wandsworth Road and the junction associated with this stretch of highway. In relation to the severity of these accidents, 18 were slight accidents, predominantly resulting from careless driving and failure to look properly.

D.1.13 Of the total accidents, one was classified as serious which occurred on Wandsworth Road/ Vauxhall Bridge junction. The accident involved a car

and a pedestrian and the key causes were recorded as a failure to look properly and careless/ reckless driving.

D.1.14 Nearly all of the slight accidents that occurred along Wandsworth Road involved cars and another car, taxi, pedestrian and motorcycle and the cause was often attributed to poor manoeuvring, illegal turning and not looking properly.

D.1.15 None of the total accidents included HGVs or MGVs/LGVs but two involved pedestrians and eight pedal cycle.

Vauxhall Cross Gyratory

D.1.16 Vauxhall Cross forms part of the Vauxhall Gyratory that has the junctions outlined below forming the approaching/ exiting lanes. the stretch of the highways within the gyratory area, the highway is a combination of a five and six lane one-way carriageway inclusive of a bus lane circulating the gyratory. The gyratory is also part of the TfL Red Route highway network and extends north as far as the A3036 Albert Embankment, the A203 South Lambeth Road/ A3036 Wandsworth Road to the south and the A202 Harleyford Road/ A202 Vauxhall Bridge Road to the east/west. The junctions involved within this analysis are as follows:

- Vauxhall Cross/ Wandsworth Road Junction;
- Vauxhall Cross/ Vauxhall Bridge Junction;
- Vauxhall Cross/ Kennington Lane Junction; and
- Vauxhall Cross/ Lambeth Road Junction

D.1.17 In total 7 accidents have occurred along the Vauxhall Cross Gyratory and the junction associated with this stretch of highway. In relation to the severity of these accidents, 4 were slight accidents, predominantly resulting from careless driving, failure to look properly and crossing the road while masked by stationery or parked vehicle.

D.1.18 Of the total accidents, 2 were classified as serious. Both accidents involved a car and a pedestrian and the major contributory factor to the serious accidents was a failure to look properly and careless driving. One of the accidents occurred on the Vauxhall Cross/ Wandsworth Road junction while the other serious accident occurred approximately 46m along Vauxhall Cross with the junction of Kennington Lane.

D.1.19 None of the total accidents included HGVs or MGVs/LGVs but three involved pedestrians and one pedal cycle.

D.1.20 No fatal accident occurred along Wandsworth Road in the 5 year period analysed.

A203 South Lambeth Road

D.1.21 The A203 South Lambeth Road section of the gyratory runs in a southern direction running parallel to the A3036 Wandsworth Road to the West and the A3 Clapham Road. For the stretch of the A203 within the study area, the highway is a five lane dual carriageway inclusive of a bus lane heading in the north direction. The A203 South Lambeth Road is also part of the TfL Red Route highway network and extends north as far as the Vauxhall

Cross Gyratory and south as far as the A23 Brixton Road. The junctions involved within this analysis are as follows:

- South Lambeth Road/ Kennington Lane Junction;
- South Lambeth Road/ Bondway; and
- South Lambeth Road/ Harleyford Road Junction.

D.1.22 In total 18 accidents have occurred along the A203 South Lambeth Road and the junction associated with this stretch of highway. In relation to the severity of these accidents, 14 were slight accidents, predominantly resulting from careless driving and failure to look properly.

D.1.23 Of the total accidents, 4 were classified as serious. Three of the serious accidents occurred on the South Lambeth Road/ Kennington Lane junction while the other serious accident occurred South Lambeth Road/ Harleyford Road junction. The major contributory factor to the three serious accidents was failure to look properly, careless driving and poor turning/ manoeuvring. Two of these three accidents involved pedal cycles where generally the contributing factors were carelessness and passing too close to a pedestrian or cyclist. The remaining accident involved a pedestrian and a motorcycle, where the contributing factor was identified as failing to look properly and failing to judge the other person's path or speed.

D.1.24 Of the total accidents, two accidents included HGVs and one for MGVs. Both HGV accidents were rated as slight in severity and the one MGV was also rated as slight in severity. Five accidents involved pedestrians and eight pedal cycles.

D.1.25 No fatal accident occurred along South Lambeth Road in the 5 year period analysed.

D.2 Summary and conclusion

D.2.1 During the 5 year period, a total of 111 accidents occurred within the study area analysed. Of these accidents, 92 were categorised as slight and 17 were serious and two fatal with the majority of accidents occurring on the junctions of Albert Embankment/ Kennington Lane, Albert Embankment/ New Spring Gardens Walk, Wandsworth Road/ Vauxhall Bridge and South Lambeth Road/ Harleyford Road.

D.2.2 In general, the accidents largely involved cars, motorcyclists, pedestrians and pedal cyclists. Five of the accidents involved HGVs and one MGV. 13 of the total accidents involved pedestrians and 34 involved pedal cycles.

D.2.3 The two fatal accidents that occurred along the A3036 Albert Embankment in the 5 year period analysed, with one occurring 50m north of the Albert Embankment/ Vauxhall Bridge Road junction and the other at the same junction. The accident 50m from the junction involved a car leaving the carriageway and hitting a pedestrian and the other involved a pedestrian using a pedestrian crossing and being struck by the car. The accident was caused by the driver of the car being impaired by drugs (illicit or medicinal) and by illness or disability (mental or physical).

D.2.4 Of the serious accidents, three occurred each on the Albert Embankment/Kennington Lane and South Lambeth Road/Kennington Lane junctions, while there were a number of single serious accidents at other roads within the study area. The cause of these accidents were attributed to factors such as failure to look properly, failure to judge other person's path or speed and travelling too fast for the conditions. Thus, suggesting that these accidents have occurred as a result of human error rather than as a result of the highway geometry.

D.2.5 Furthermore, the majority of the slight accidents were also caused by factors associated with human error.

D.2.6 In summary, it is considered that the accidents within the vicinity of the site have been a result of human error rather than due to the geometry and / or infrastructure of the highway network. For this reason, accident mitigation is not considered necessary at this site location. In total 111 accidents have occurred within the study area analysed. In relation to the severity of these accidents, 92 were slight accidents, predominantly resulting from failure to look properly, failure to judge other person's path or speed and travelling too fast for the conditions

Appendix E – Road Safety Audit

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Your ref -
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For the attention of Dermot Scanlon

15 February 2013

Dear Sirs

Thames Tideway Tunnel
Albert Embankment Foreshore – Stage 1 Road Safety Audit

I have the pleasure of enclosing our Albert Embankment Foreshore – Stage 1 Road Safety Audit report.

If you have any further queries regarding the enclosed report, please do not hesitate to contact me.

Yours faithfully

Chris van Lottum
Senior Engineer
Road Safety Audit Team Leader

Enc

cc Phil Longman, Peter Brett Associates,
Gavin Wicks, Arup

Thames Tideway Tunnel

Thames Tideway Tunnel – Albert Embankment Foreshore

Stage 1 Road Safety Audit

RSA1.1a

Rev A | 15 February 2013

Job number 211146-03

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Document Verification

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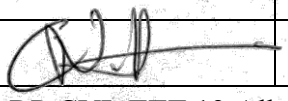
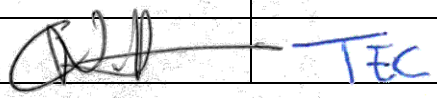
Issue	11 Jan 2013	**Description**	Issue Document		
			Prepared by	Checked by	Approved by
		Name	Chris van Lottum	Steve Wells	Steve Wells
		Signature			
Rev A	15 Feb 2013	**Filename**	RP CVL TTT 13 Albert Embankment RSA1.1 130215 Rev A.docx		
		Description	Revised information received		
			Prepared by	Checked by	Approved by
		Name	Chris van Lottum	Tom Corke	Steve Wells
		Signature			
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				Issue Document Verification with Document	✓

Contents

Figures

Appendices

1 Introduction

Arup was appointed by Thames Tideway Tunnel to conduct a Stage 1 Road Safety Audit on proposals to create a construction access and egress for works associated with the Thames Tideway Tunnel at Albert Embankment Foreshore in the London Borough of Lambeth.

The agreed Audit Team consisted of:

- Mr C van Lottum MEng (Hons), MCIHT, MSoRSA
- Mr T Corke BEng (Hons), MSc, CEng, MICE, MCIHT, MSoRSA

The Audit Team visited the site together on Wednesday 5th December 2012; weather conditions at the time of the site visit were overcast with showers and the road surface was wet.

A list of information provided to the Audit Team has been included as Appendix A to this Report.

The following information was **not** made available to the Audit Team and as such any specific influence of these details on road user safety has not been considered by this audit:

- Departures from Standard
- Road profiles
- Cross sections
- Drainage
- Landscape
- Public utilities
- Traffic signals
- Traffic signs
- Street lighting
- Road markings
- Road restraint systems

It is understood that no previous road safety audits have been conducted on this scheme.

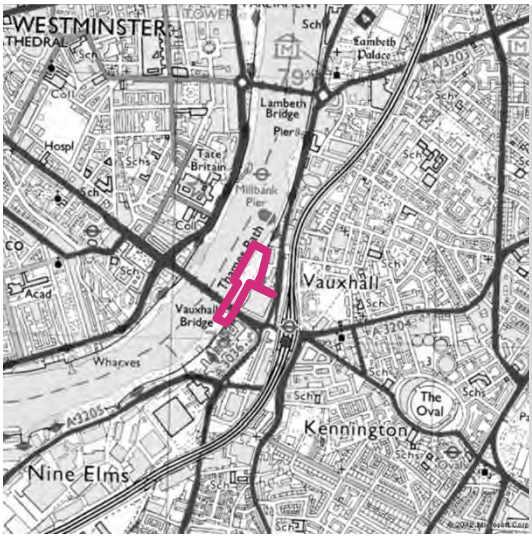
This audit has been undertaken in accordance with the Terms of Reference set out in TfL Procedure 'Road Safety Audit SQA-0170 – Issue 4'; and the Audit Team members meet the training and experience requirements set out therein. The Audit Team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the design to any other criteria. However, to clearly explain a problem or recommendation, the Audit Team may occasionally refer to design standards without engaging in technical audit.

All problems and recommendations identified by this audit are referenced to the design drawings and the locations have been indicated on the attached plan.

Other issues, including safety issues identified during the Audit, but excluded from this report by the Terms of Reference, which the Audit Team wishes to draw to the attention of the Audit Project Sponsor are set out in separate correspondence.

Road Safety Audit is based upon a qualitative risk assessment process and there is no measure of the success achieved by any recommendations given herein. Road Safety Audit cannot guarantee the safe operation of the scheme under consideration in this report as accidents are rare and random events and are largely caused by factors outside the Audit Team's influence, such as driving behaviour and, to a lesser extent, vehicle condition.

1.1 Site Description



Scheme Location

The Albert Embankment Foreshore, site is located on the south bank of the Thames adjacent to Vauxhall Bridge. The site is accessed directly from the A3036 Albert Embankment close to Vauxhall Cross.

1.2 Scheme Description

The construction site would be located on the foreshore of the River Thames and part of the riverside footway. Two construction access options are being considered for this site:

Option A - all vehicle access to and from the site would take place from the nearside lane of the northbound carriageway of Albert Embankment via a newly constructed access road adjacent to the existing Lacks Dock slipway; and

Option B - construction vehicle access to and from the site would take place from the nearside lane of the northbound carriageway of Albert Embankment (A3036) via a newly constructed access road between Camelford House and Tintagel House. A newly constructed access road adjacent to the existing Lacks Dock slipway would still be necessary for access to the foreshore.

2 Stage 1 Road Safety Audit

The Recommendations below are numbered as follows:

STAGE . AUDIT NUMBER . RECOMMENDATION NUMBER

	Location:	Albert Embankment
	Summary:	Existing accident record for delivery route could be exacerbated by construction traffic.
	Description:	There is an existing accident risk relating to vehicles turning on and off Albert Embankment in the vicinity of the site and colliding with vulnerable road users. The construction necessitates large numbers of HGV turning movements at this location which may exacerbate the existing problems.
S1.1.1	**Recommendation:**	Traffic management layouts during construction should highlight the likelihood of HGV and plant movements at this location. Delivery drivers and site staff should be made aware of the likely increased risk of turning conflicts, particularly with vulnerable road users through inclusion in the site induction process and construction method statements.

2.1 Construction Layout - Option A

	Location:	Albert Embankment
	Summary:	Proposed tactile paving surface is out of keeping with surroundings leading to pedestrian injuries.
	Description:	A tactile paving surface is proposed at the revised kerb line on the north side of the proposed Option A site access. However, there is no tactile paving surface on the south side of this access.

Tactile paving surfaces are used by the visually impaired to assist them in crossing roads. Providing a single surface will confuse a visually impaired pedestrian and could lead to a conflict with a vehicle at the access.

S1.1.2 **Recommendation:** Either omit the tactile paving surface from the north side of the access, or provide additional tactile paving on the south side of the access.

2.2 Construction Layout - Option B

Location: Albert Embankment

Summary: Gulley at the temporary site access likely to be damaged by repeated over running leading to loss of control collisions.

Description: It is proposed to open a site access (Option B) on the northern side of Albert Embankment during the construction phase. There is a drainage gulley located in the channel at the kerb, concurrent with the access

IMG_8625.jpg

Repeated over-running of the gulley could result in damage which in turn could damage a tyre or wheel resulting in rapid deflation and loss of control.

S1.1.3 **Recommendation:** Relocate the gulley away from the access

	Location:	Albert Embankment
	Summary:	Construction access may result in vehicle conflict with lamp column.
	Description:	It is proposed to open a site access (Option B) on the northern side of Albert Embankment during the construction phase. There is a lighting column located in the footway concurrent with the access.

IMG_8625.jpg

Street furniture with insufficient clearance to passing vehicles could be struck by a passing vehicle resulting in vehicle damage, or damage to the street furniture which could injure a passer-by.

S1.1.4	**Recommendation:**	Relocate the lighting column without detriment to lighting levels on the surrounding carriageway.

2.3 Permanent Layout

No items have been raised with respect to the Permanent Layout as a result of this audit

End of list of problems identified and recommendations offered in this Stage 1 Road Safety Audit.

3 Road Safety Audit Statement

I certify that this audit has been carried out in accordance with HD19/03.

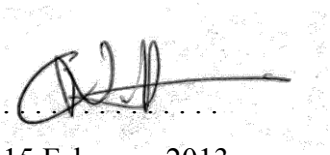
Audit Team Leader

Mr C van Lottum MEng (Hons), MCIHT, MSoRSA

Senior Engineer

Arup

Central Square, Forth Street,
Newcastle upon Tyne, NE1 3PL



15 February 2013

Audit Team Member

Mr T Corke BEng (Hons), MSc, CEng, MICE, MCIHT, MSoRSA

Senior Engineer

Arup

The Arup Campus, Blythe Gate, Blythe Valley Park,
Solihull, B90 8AE

Figures

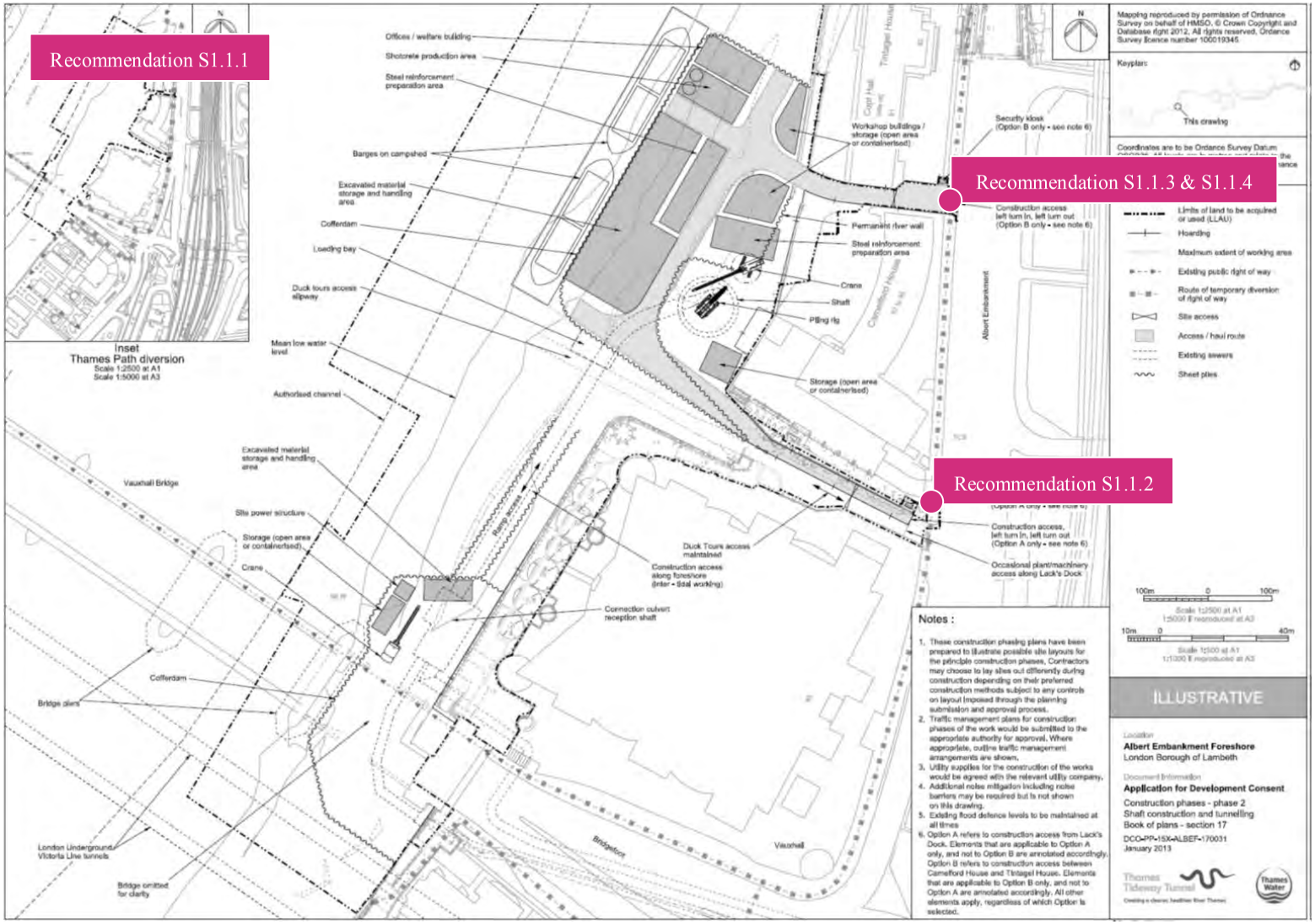


Figure 1 Location of Recommendations

Appendix A

Documents and Drawings

A1 Documents and Drawings

The following documents and drawings were supplied to the Audit Team by the Designer and have been examined in the course of conducting this audit.

A1.1 Documents

Title	Reference	Revision
Road Safety Audit Brief	-	16/12/2012
Road Accident Data	-	-

A1.2 Drawings

Title	Reference	Revision
Transport - site location plan	1PL03-TT-50706	Jan 2013
Transport - construction traffic routes	1PL03-TT-50698	Jan 2013
Transport - accident locations	1PL03-TT-50762	Jan 2013
Construction phases - phase 2 - Shaft construction and tunnelling	DCO-PP-15X-ALBEF-170031	Jan 2013
Existing highway layout - Option A	DCO-PP-15X-ALBEF-170037	Jan 2013
Highway layout during construction – Option A	DCO-PP-15X-ALBEF-170038	Jan 2013
Highway layout during construction - Option B	DCO-PP-15X-ALBEF-170039	Jan 2013
Permanent highway layout – Option A	DCO-PP-15X-ALBEF-170040	Jan 2013
Permanent highway layout - Option B	DCO-PP-15X-ALBEF-170041	Jan 2013
Highway layout during construction – Vehicle swept path analysis – Option A	DCO-PP-15X-ALBEF-170042	Jan 2013
Highway layout during construction – Vehicle swept path analysis – Option B	DCO-PP-15X-ALBEF-170043	Jan 2013
Permanent highway layout – Vehicle swept path analysis	DCO-PP-15X-ALBEF-170044	Jan 2013

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TECHNICAL NOTE

Peter Brett Associates LLP
16 Brewhouse Yard, Clerkenwell,
London, EC1V 4LJ
T: +44 (0)20 7025 7100
E: london@peterbrett.com

Job Name	**Thames Tideway Tunnel – Albert Embankment**	
Job No.	22104	
Note No.	001	
Date	15th February 2013	
Subject	Stage 1 Road Safety Audit – Designer's Response	
Prepared by	L Harney	**Reviewed:** B Kemp

1 Introduction

1.1 Arup was appointed by Thames Water to conduct a Stage 1 Road Safety Audit on proposals to create a construction access and egress for works associated with the Thames Tideway Tunnel at Albert Embankment in the London Borough of Lambeth.

1.2 This technical note provides the Designer's Response to the Stage 1 Audit for this site.

2 Stage 1 Road Safety Audit

2.1 Location: Albert Embankment

Summary: Existing accident record for delivery route could be exacerbated by construction traffic.

Description: There is an existing accident risk relating to vehicles turning on and off Albert Embankment in the vicinity of the site and colliding with vulnerable road users.

The construction necessitates large numbers of HGV turning movements at this location which may exacerbate the existing problems.

S1.1.1 Recommendation: Traffic management layouts during construction should highlight the likelihood of HGV and plant movements at this location. Delivery drivers and site staff should be made aware of the likely increased risk of turning conflicts, particularly with vulnerable road users through inclusion in the site induction process and construction method statements.

Recommendation Accepted – The traffic management layouts for this site will highlight the likelihood of HGV and plant movements as recommended. Delivery drivers and site staff will be made aware of the likely increase in turning conflicts as part of the site induction. This will be included in the Code of Construction Practice at Stage 2 (Detailed Design).

Construction Layout – Option A

2.2 Location: Albert Embankment

Summary: Proposed tactile paving surface is out of keeping with surroundings leading to pedestrian injuries.

Description: A tactile paving surface is proposed at the revised kerb line on the north side of the proposed Option A site access. However, there are no tactile paving surfaces present at this access.

Tactile paving surfaces are used by the visually impaired to assist them in crossing roads. Providing a single surface will confuse a visually impaired pedestrian and could lead to a conflict with a vehicle at the access.

S1.1.2 Recommendation: Either omit the tactile paving surface from the north side of the access, or provide additional tactile paving on the south side of the access.

Recommendation Accepted – The tactile paving on the northern side of the access will be omitted. This will be reflected in the drawings at Stage 2 (Detailed Design).

Construction Layout – Option B

2.3 Location: Albert Embankment

Summary: Gulley at the temporary site access likely to be damaged by repeated over running leading to a loss of control collisions.

Description: It is proposed to open a site access (Option B) on the northern side of Albert Embankment during the construction phase. There is a drainage gulley located in the channel at the kerb, concurrent with the access.

Repeated over running of the gulley could result in damage which in turn could damage a tyre of wheel resulting in rapid deflation and loss of control.

S1.1.3 Recommendation: Relocate the gulley away from the access.

Recommendation Accepted – Relocating the gulley will be detailed at Stage 2 (Detailed Design).

2.4 Location: Albert Embankment

Summary: Construction access may result in vehicle conflict with lamp column.

Description: It is proposed to open a site access (Option B) on the northern side of Albert Embankment during the construction phase. There is a lighting column located in the footway concurrent with the access.

Street furniture with insufficient clearance to passing vehicles could be struck by a passing vehicle resulting in vehicle damage, or damage to the street furniture which could injure a passer-by.

S1.1.4 Recommendation: Relocate the lighting column without detriment to lighting levels on the surrounding carriageway.

Recommendation Accepted – The lighting column will be relocated in order to accommodate the Option B site access. This will be detailed at Stage 2 (Detailed Design).

3 Response to Comments provided in addition to the Stage 1 Road Safety Audit

3.1 Additional Comments

There were no additional comments provided as part of the Stage 1 Road Safety Audit for this site.

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Thames Tideway Tunnel
Thames Water Utilities Limited

Application for Development Consent

Application Reference Number: WWO10001

Transport Assessment

Doc Ref: **7.10.13**

Albert Embankment Foreshore

Figures

APFP Regulations 2009: Regulation **5(2)(q)**

Hard copy available in

Box **51** Folder **B**
January 2013

Thames Tideway Tunnel

Creating a cleaner, healthier River Thames

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Thames Tideway Tunnel

Transport Assessment

Section 16: Albert Embankment Foreshore figures

List of contents

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Plans

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Albert Embankment Foreshore

THAMES TIDEWAY TUNNEL - SCHEDULE OF ASSOCIATED HIGHWAY WORKS

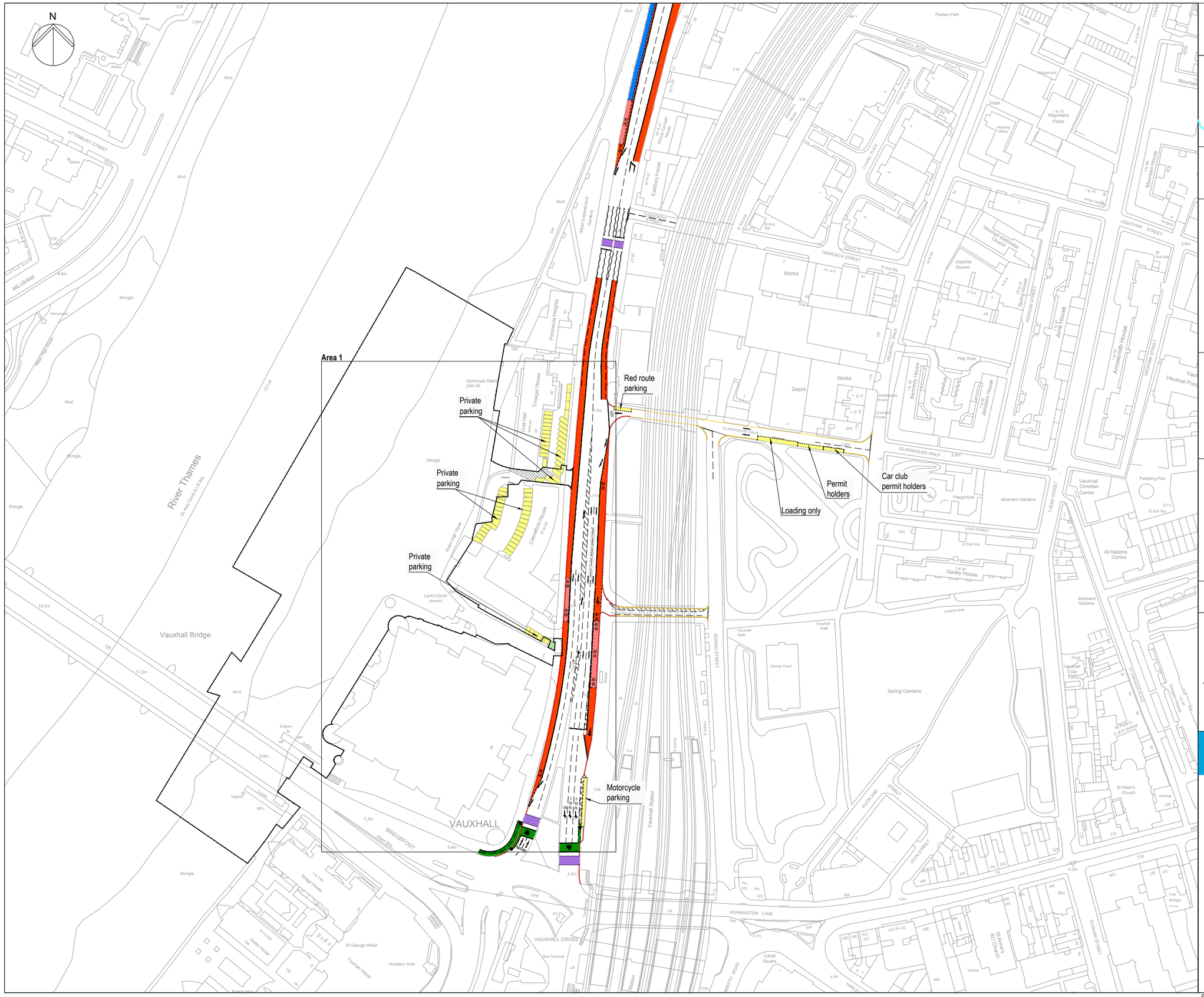
Drawing Number	Works Reference	Location	Item of Work	Access Option	Date of Implementation
DCO-PP-15X-ALBEF-170038	PLH1X_C01	Site access on Albert Embankment	Realignment of kerb on the north side of the site access crossover in order to accommodate the turning movements of HGVs. Relocation of tactile paving to tie in with new kerb line.	Option A only	TBC
	PLH1X_C02	Lacks Dock Access Road	Removal of low-rise wall and level difference between Duck Tours access road and new construction site access road to the south-east of the new construction site gate.	Option A only	TBC
	PLH1X_C03	Lacks Dock Access Road	Relocation of the existing Duck Tours barrier in order to accommodate the left turning movement of egressing construction vehicles. Extension of barrier to full width of Lacks Dock Access Road and construction site access road to control access/egress of HGVs	Option A only	TBC
	PLH1X_C04	Lacks Dock Access Road	Removal of pedestrian walkway on the northern side of the Lack's Dock access road and provision of a site access road. This will also require the diversion of the Thames Path to along Albert Embankment.	Option A only	TBC
	PLH1X_C05	Lacks Dock Access Road	Relocation of security hut to west of the ventilation shaft located at the site access / Albert Embankment crossover. Suspension of two on-site parking bays in Camelford House forecourt	Option A only	TBC
DCO-PP-15X-ALBEF-170039	PLH2X_C01	Albert Embankment	Removal of footway, kerb and retaining wall on Albert Embankment for new site access into Tintagel House car park	Option B only	TBC
	PLH2X_C02	Tintagel House and Camelford House car parks	Suspension of 6 parking bays in Tintagel House car park Provision of site access road and site access gate One-way operation of vehicles at the top of the Camelford House basement car park Removal of pedestrian walkway at the riverside under the site access road. This will also require the diversion of the Thames Path to along Albert Embankment.	Option B only	TBC
DCO-PP-15X-170040	PLH1X_P01	Site access on Albert Embankment	Reinstatement of the kerb on the northern side of the site access cover which was realigned to accommodate the turning movements of the HGVs during the construction phase.	Option A only	TBC
	PLH1X_P02	Lacks Dock Access Road	Reinstatement of the low-rise wall that separated the carriageway from the footway on Lacks Dock.	Option A only	TBC
	PLH1X_P03	Lacks Dock Access Road	Reinstatement of the Duck Tours barrier at the eastern end of the Lacks Dock access road.	Option A only	TBC
	PLH1X_P04	Lacks Dock Access Road	Reinstatement of the security hut in the footway on the northern side of the Lacks Dock access road.	Option A only	TBC
	PLH1X_P05	Lacks Dock Access Road	Provision of access ramp and removable bollards which will allow maintenance vehicles to access the operational site using the Duck Tours access road and turning right crossing over on to the footway at the western end of the access.	Option A or B	TBC
	PLH1X_P06	Lacks Dock Access Road	Reinstatement of the footway on the northern side of the Lacks Dock access road.	Option A only	TBC
	PLH1X_P07	Lacks Dock Access Road	Provision of new open space for pedestrians	Option A or B	TBC
DCO-PP-15X-ALBEF-170041	PLH2X_C01	Albert Embankment	Reinstatement of footway, kerb and retaining wall on Albert Embankment for new site access into Tintagel House car park	Option B only	TBC
	PLH2X_C02	Tintagel House and Camelford House car parks	Reinstatement of 6 parking bays in Tintagel House car park Removal of site access road and site access gate Reinstatement of two-way operation of vehicles at the top of the Camelford House basement car park Reinstatement of pedestrian walkway at the riverside under the site access road.	Option B only	TBC

Date of issue: January 2013

Albert Embankment Foreshore

THAMES TIDEWAY TUNNEL - SCHEDULE OF ASSOCIATED HIGHWAY WORKS

Drawing Number	Works Reference	Location	Item of Work	Access Option	Date of Implementation
	PLH2X_P03	Lacks Dock Access Road	Provision of new open space for pedestrians	Option A or B	TBC
	PLH2X_P04	Lacks Dock Access Road	Provision of access ramp and removable bollards which will allow maintenance vehicles to access the operational site using the Duck Tours access road and turning right crossing over on to the footway at the western end of the access.	Option A or B	TBC



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Keyplan:

Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key

Existing

- Red route parking restrictions
- Parking restrictions
- On street parking
- Bus stop / stand
- Bus lane
- Cycle lane/ cycle track
- Pedestrian crossing
- Coach parking
- Ventilation shaft

Revised

- Limit of land to be acquired or used (LLAU)

On Street Parking

Red route parking - Mon - Sat 7:00am - 7:00pm max stay 1 hour no return within 2 hours
Private parking - Private parking for Camelford House and Tintagel House
Permit holders - Zone K permit holders only Mon - Fri 8:30am - 6:30pm
Car club permit holders - Car club permit holders only
Loading only

Standards

- Design Manual for Roads and Bridges, Dft, 1992
- Traffic Signs Regulations & General Directions, Tso, 2002
- Traffic Signs Manual, Dft, 2006
- Manual for Streets, Dft, 2007
- Manual for Streets 2, CIHT, 2010
- Designing for Deliveries, Fta, 1998
- Cycle Infrastructure Design Ltn 2/08, Dft, 2008
- Design of Pedestrian Crossings Ltn 2/95, Dft, 1995
- Guidance on the use of Tactile Paving Surfaces, Dft, 1998
- Accessible Bus Stop Design Guidance, TfL, 2006

Stage

Existing & construction base case

10m 0 100m

Scale 1:1000 at A1
1:2000 if reproduced at A3

FOR INFORMATION

Location

Albert Embankment Foreshore
London Borough of Lambeth

Document Information

Application for Development Consent

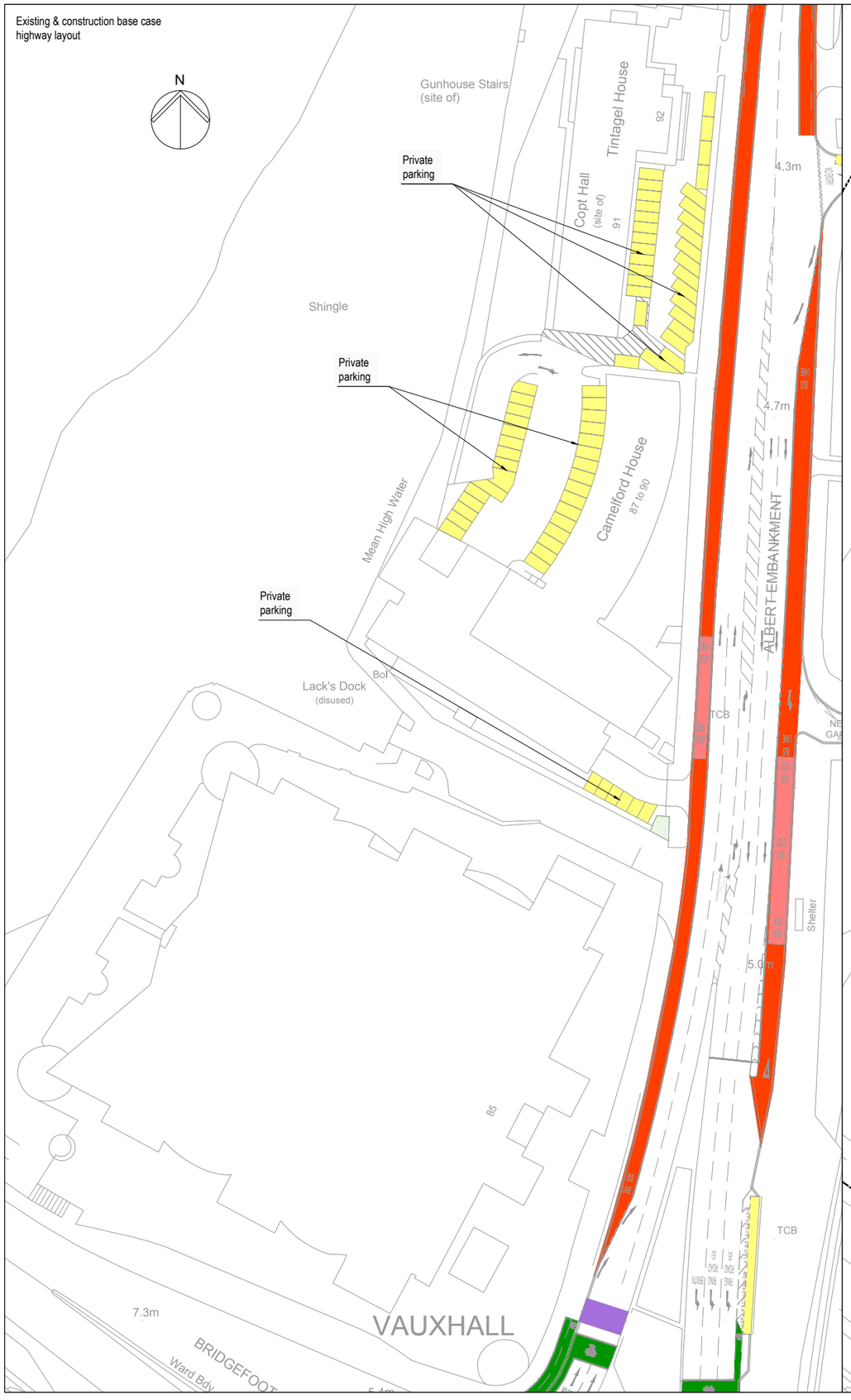
Existing highway layout - Option A

DCO-PP-15X-ALBEF-170037
January 2013

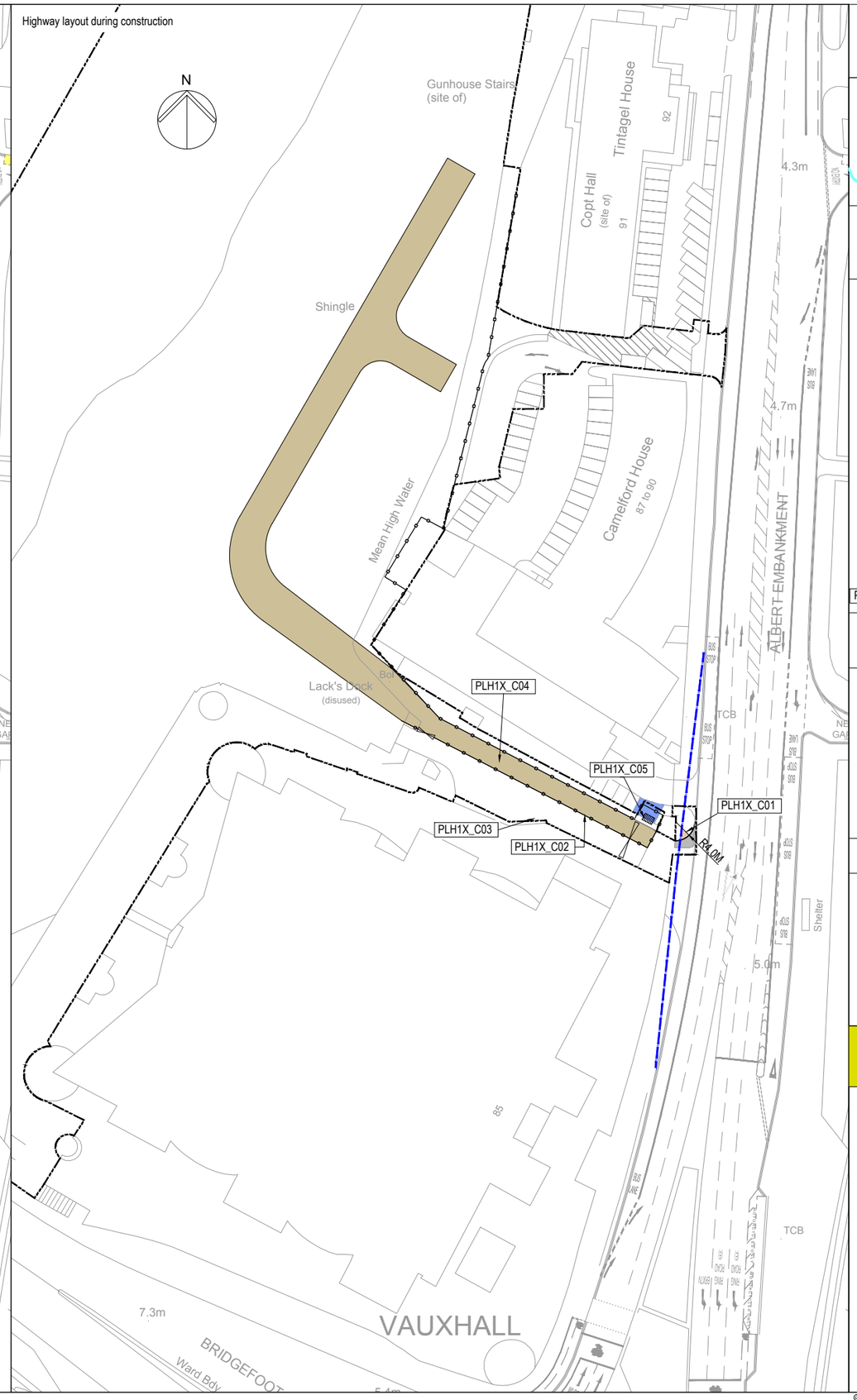
Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Existing & construction base case highway layout



Highway layout during construction



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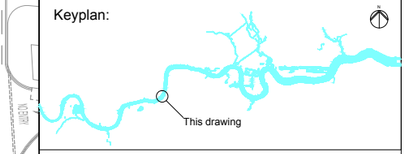


Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key

Existing
- Parking restrictions
- Private parking
- Bus stop / stand
- Bus lane
- Pedestrian crossing
- Cycle lane / cycle track
- Ventilation shaft

Revised
- Removal of footway
- Suspended private parking
- Illustrative on-site manoeuvring zone
- Relocated tactile paving
- Relocated site hut
- Visibility splay - 2.4m x 43m (ssd adjust for bonnet length)
- Site hoarding
- Access gate
- Limit of land to be acquired or used (LLAU)
- PLH1X_C00 See schedule of works

On Street Parking

Private parking - Private parking for Camelford House and Tintagel House

Standards
- Design Manual for Roads and Bridges, Dft, 1992
- Traffic Signs Regulations & General Directions, Tso, 2002
- Traffic Signs Manual, Dft, 2006
- Manual for Streets, Dft, 2007
- Manual for Streets 2, CIHT, 2010
- Designing for Deliveries, Fta, 1998
- Cycle Infrastructure Design Ltn 2/08, Dft, 2008
- Design of Pedestrian Crossings Ltn 2/95, Dft, 1995
- Guidance on the use of Tactile Paving Surfaces, Dft, 1998
- Accessible Bus Stop Design Guidance, TfL, 2006

Stage
Phase 2

10m 0 40m

Scale 1:500 at A1
1:1000 if reproduced at A3

ILLUSTRATIVE

Location
Albert Embankment Foreshore
London Borough of Lambeth

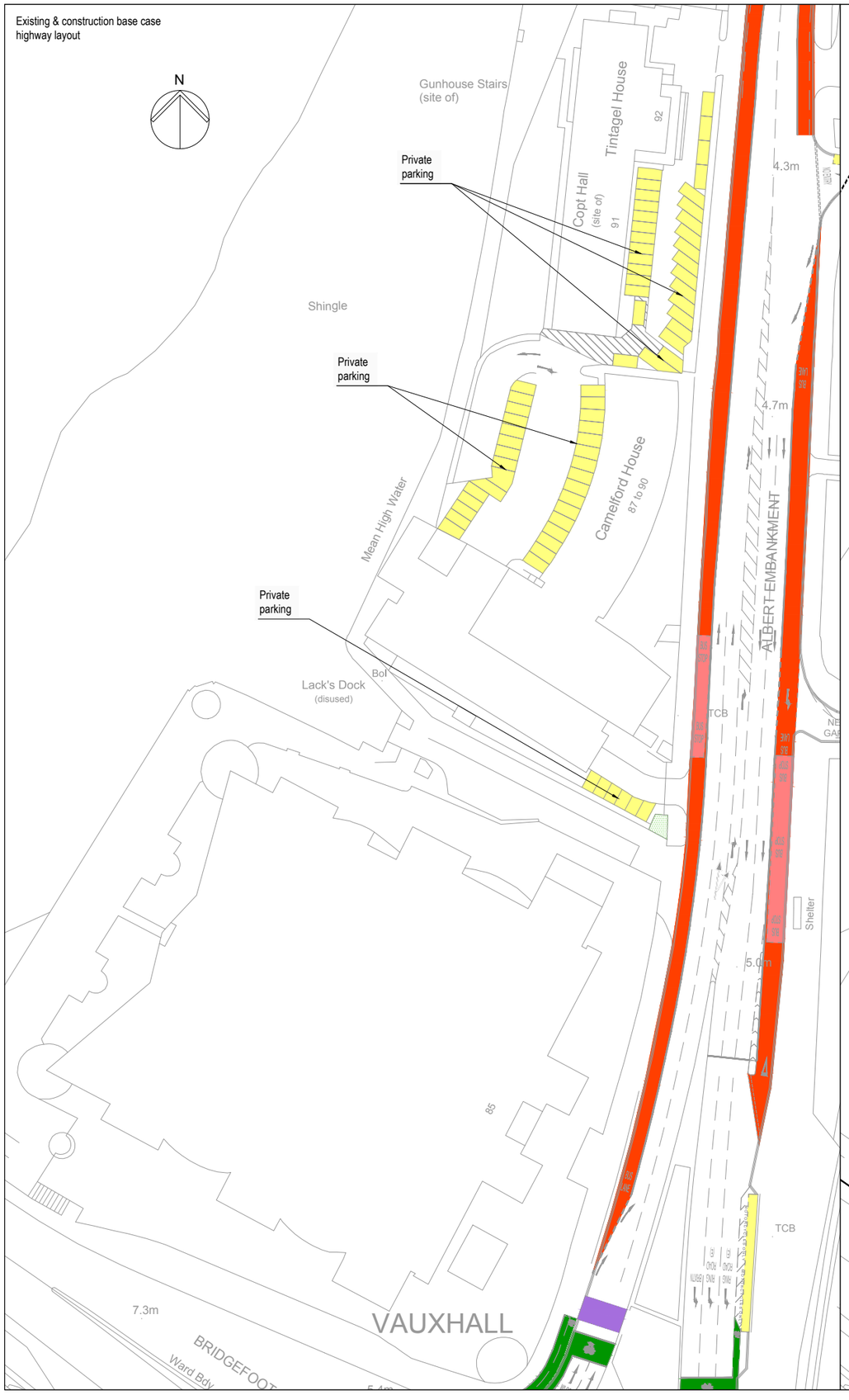
Document Information
Application for Development Consent
Highway layout during construction - Option A

DCO-PP-15X-ALBEF-170038
January 2013

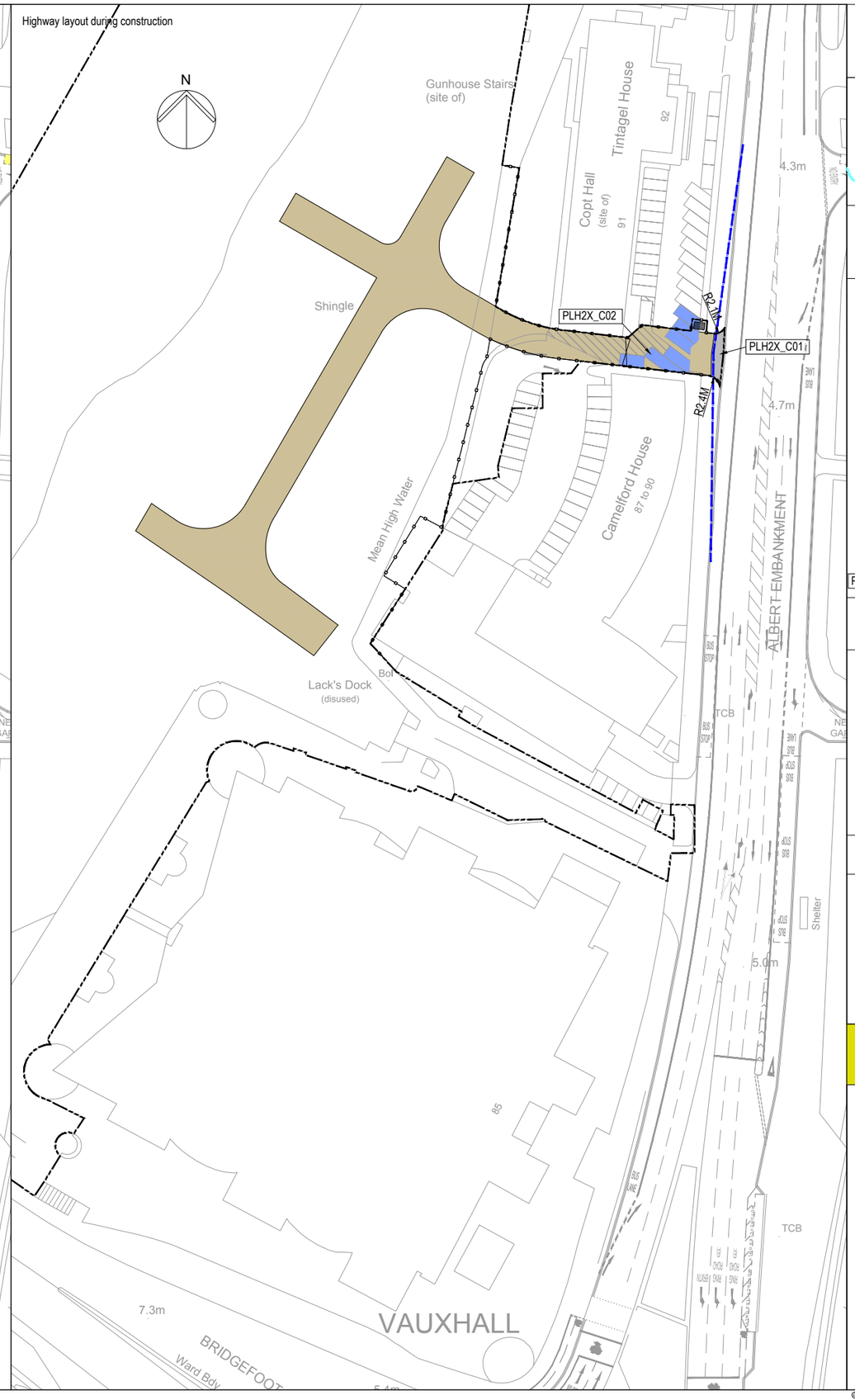
Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Existing & construction base case highway layout



Highway layout during construction



Keyplan:

Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key

Existing
- Parking restrictions
- Private parking
- Bus stop / stand
- Bus lane
- Pedestrian crossing
- Cycle lane / cycle track
- Ventilation shaft

Revised
- Removal of footway
- Suspended private parking
- Illustrative on-site manoeuvring zone
- Relocated site hut
- Visibility splay - 2.4m x 43m (ssd adjust for bonnet length)
- Site hoarding
- Access gate
- Limit of land to be acquired or used (LLAU)
- PLH2X_C00 See schedule of works

On Street Parking
Private parking - Private parking for Camelford House and Tintagel House

Standards

- Design Manual for Roads and Bridges, Dft, 1992
- Traffic Signs Regulations & General Directions, Tso, 2002
- Traffic Signs Manual, Dft, 2006
- Manual for Streets, Dft, 2007
- Manual for Streets 2, CIHT, 2010
- Designing for Deliveries, Fta, 1998
- Cycle Infrastructure Design Ltn 2/08, Dft, 2008
- Design of Pedestrian Crossings Ltn 2/95, Dft, 1995
- Guidance on the use of Tactile Paving Surfaces, Dft, 1998
- Accessible Bus Stop Design Guidance, TfL, 2006

Stage
Phase 2

10m 0 40m

Scale 1:500 at A1
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ILLUSTRATIVE

Location
Albert Embankment Foreshore
London Borough of Lambeth

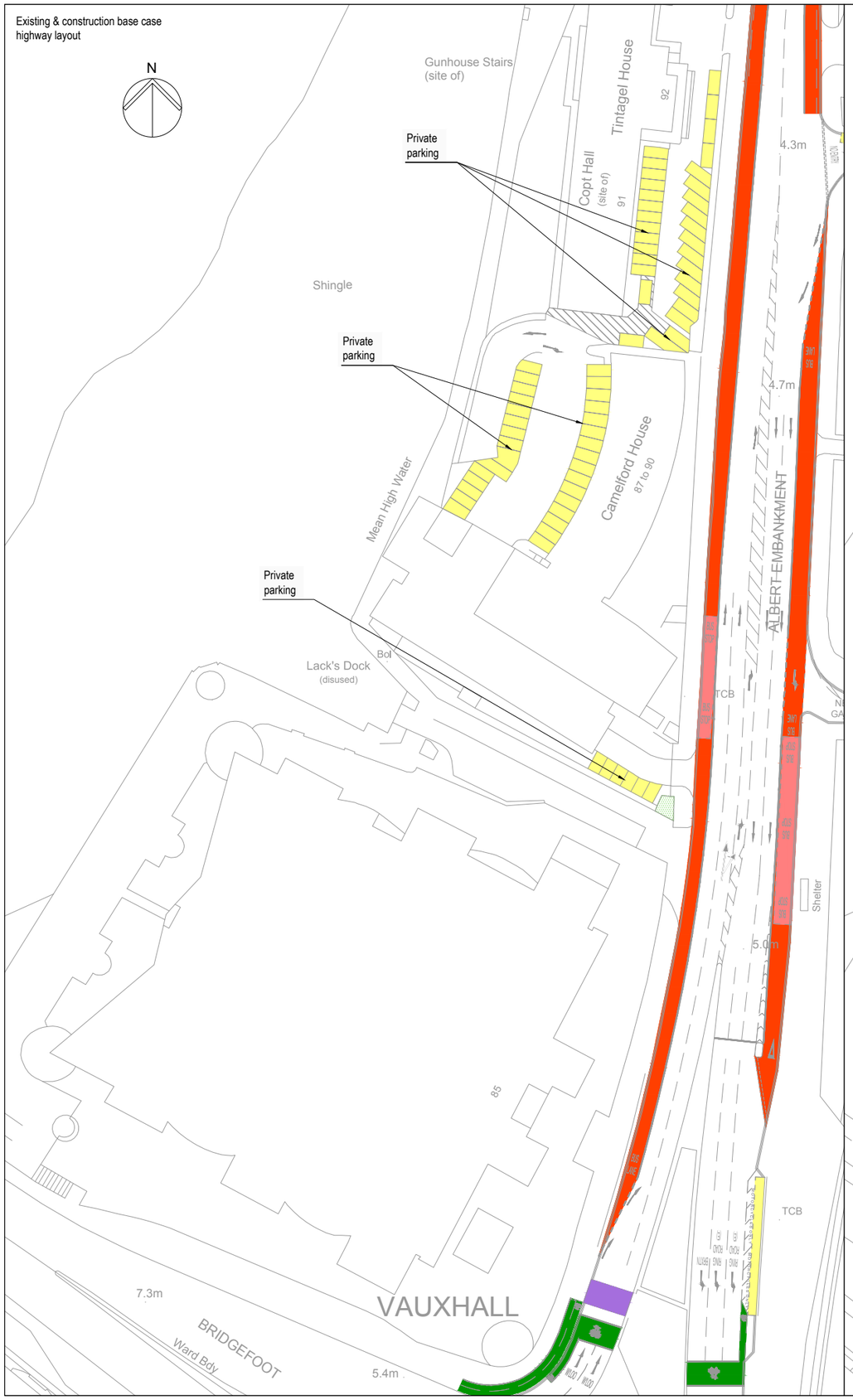
Document Information
Application for Development Consent
Highway layout during construction - Option B

DCO-PP-15X-ALBEF-170039
January 2013

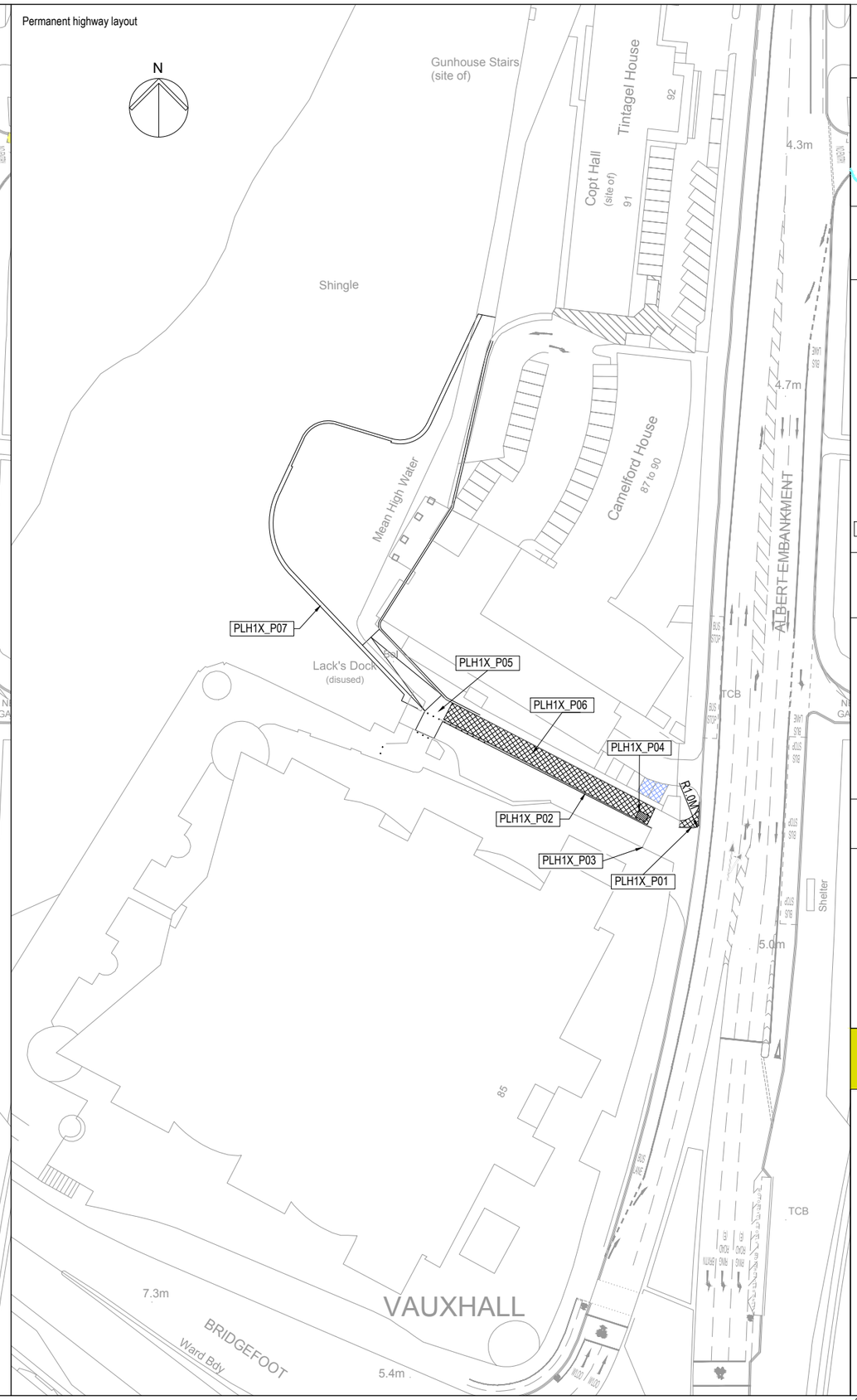
Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

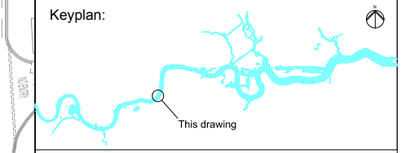
Existing & construction base case highway layout



Permanent highway layout



Keyplan:



Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key

Existing

- Parking restrictions
- Private parking
- Bus stop / stand
- Bus lane
- Pedestrian crossing
- Cycle lane / cycle track
- Ventilation shaft

Revised

- Reinstated footway
- Reinstated parking
- Replacement site hut
- New shoreline wall
- Drop down bollard
- PLH1X_P00 See schedule of works

On Street Parking

Private parking - Private parking for Camelford House and Tintagel House

Standards

- Design Manual for Roads and Bridges, Dft, 1992
- Traffic Signs Regulations & General Directions, Tso, 2002
- Traffic Signs Manual, Dft, 2006
- Manual for Streets, Dft, 2007
- Manual for Streets 2, CIHT, 2010
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- Cycle Infrastructure Design Ltn 2/08, Dft, 2008
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- Guidance on the use of Tactile Paving Surfaces, Dft, 1998
- Accessible Bus Stop Design Guidance, TfL, 2006

Stage

Permanent phase

10m 0 40m

Scale 1:500 at A1
1:1000 if reproduced at A3

ILLUSTRATIVE

Location

Albert Embankment Foreshore
London Borough of Lambeth

Document Information

Application for Development Consent

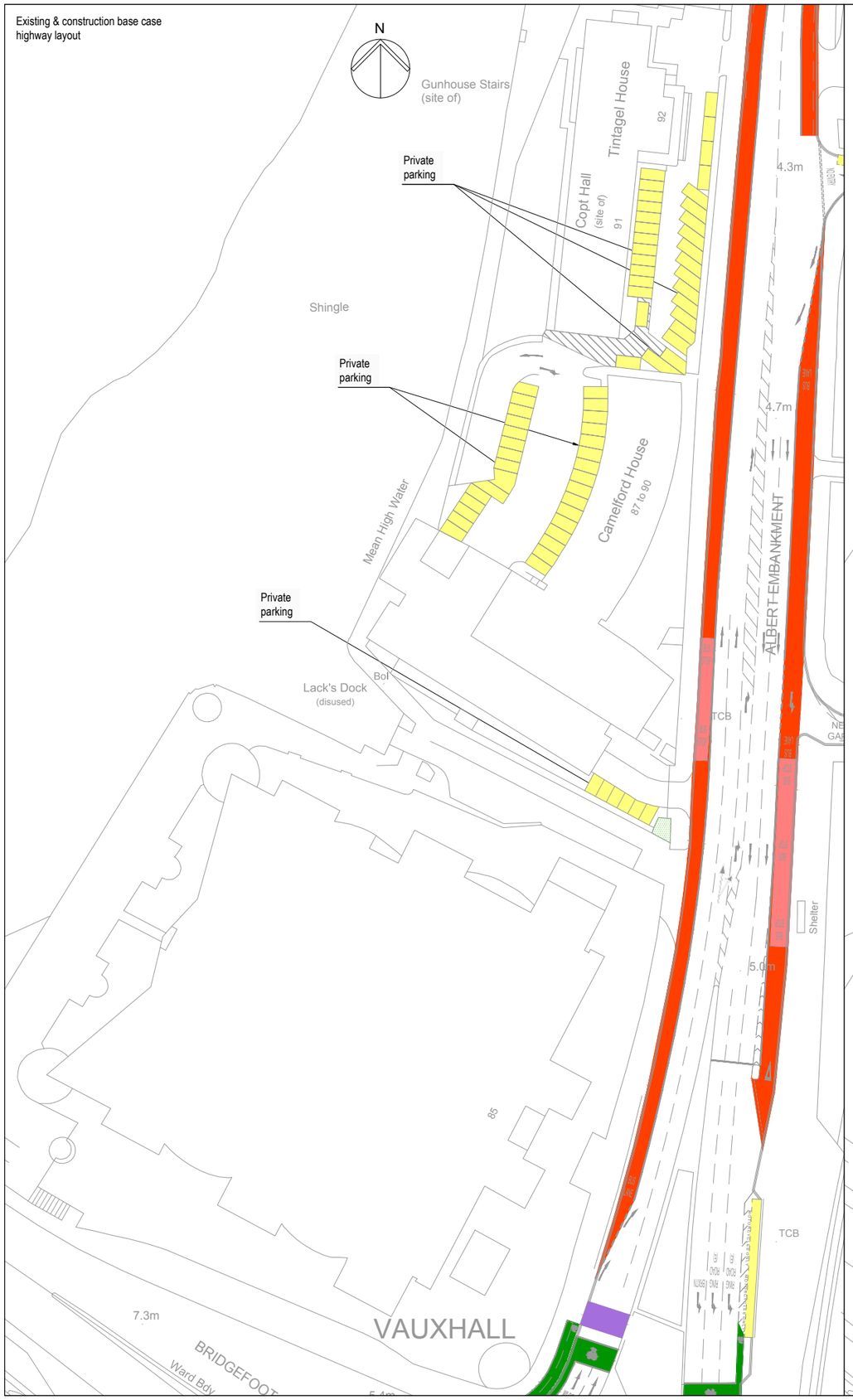
Permanent highway layout - Option A

DCO-PP-15X-ALBEF-170040
January 2013

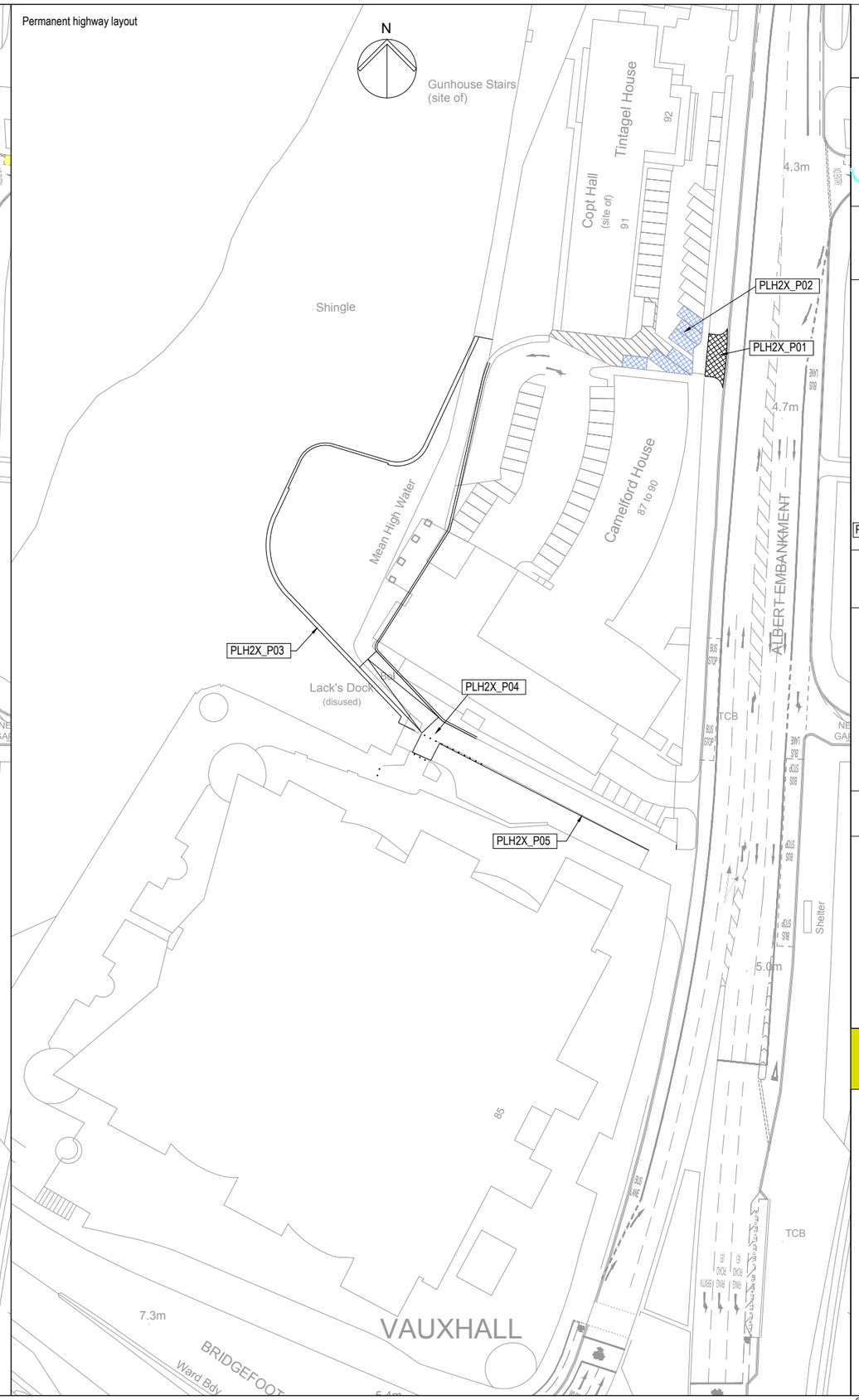
Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

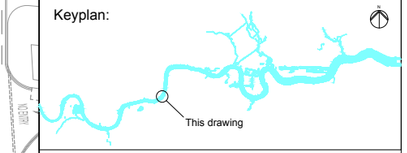
Existing & construction base case highway layout



Permanent highway layout



Keyplan:



Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key

Existing
- Parking restrictions
- Private parking
- Bus stop / stand
- Bus lane
- Pedestrian crossing
- Cycle lane / cycle track
- Ventilation shaft

Revised
- Reinstated footway
- Reinstated parking
- Replacement site hut
- New shoreline wall
- Drop down bollard
- PLH2X_P00 See schedule of works

On Street Parking

Private parking - Private parking for Camelford House and Tintagel House

Standards
- Design Manual for Roads and Bridges, Dft, 1992
- Traffic Signs Regulations & General Directions, Tso, 2002
- Traffic Signs Manual, Dft, 2006
- Manual for Streets, Dft, 2007
- Manual for Streets 2, CIHT, 2010
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- Design of Pedestrian Crossings Ltn 2/95, Dft, 1995
- Guidance on the use of Tactile Paving Surfaces, Dft, 1998
- Accessible Bus Stop Design Guidance, TfL, 2006

Stage

Permanent phase

10m 0 40m

Scale 1:500 at A1
1:1000 if reproduced at A3

ILLUSTRATIVE

Location

Albert Embankment Foreshore
London Borough of Lambeth

Document Information

Application for Development Consent

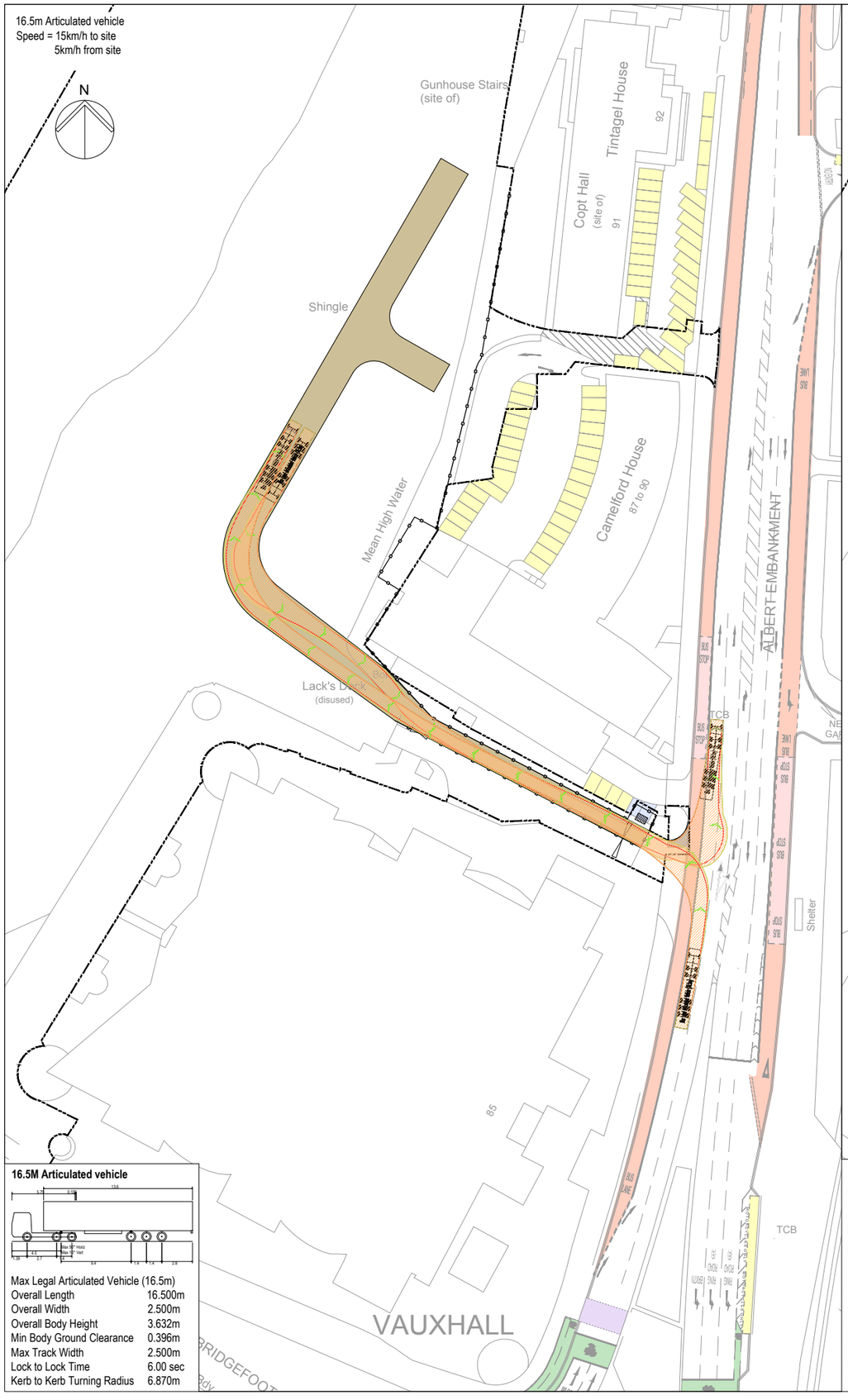
Permanent highway layout - Option B

DCO-PP-15X-ALBEF-170041
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

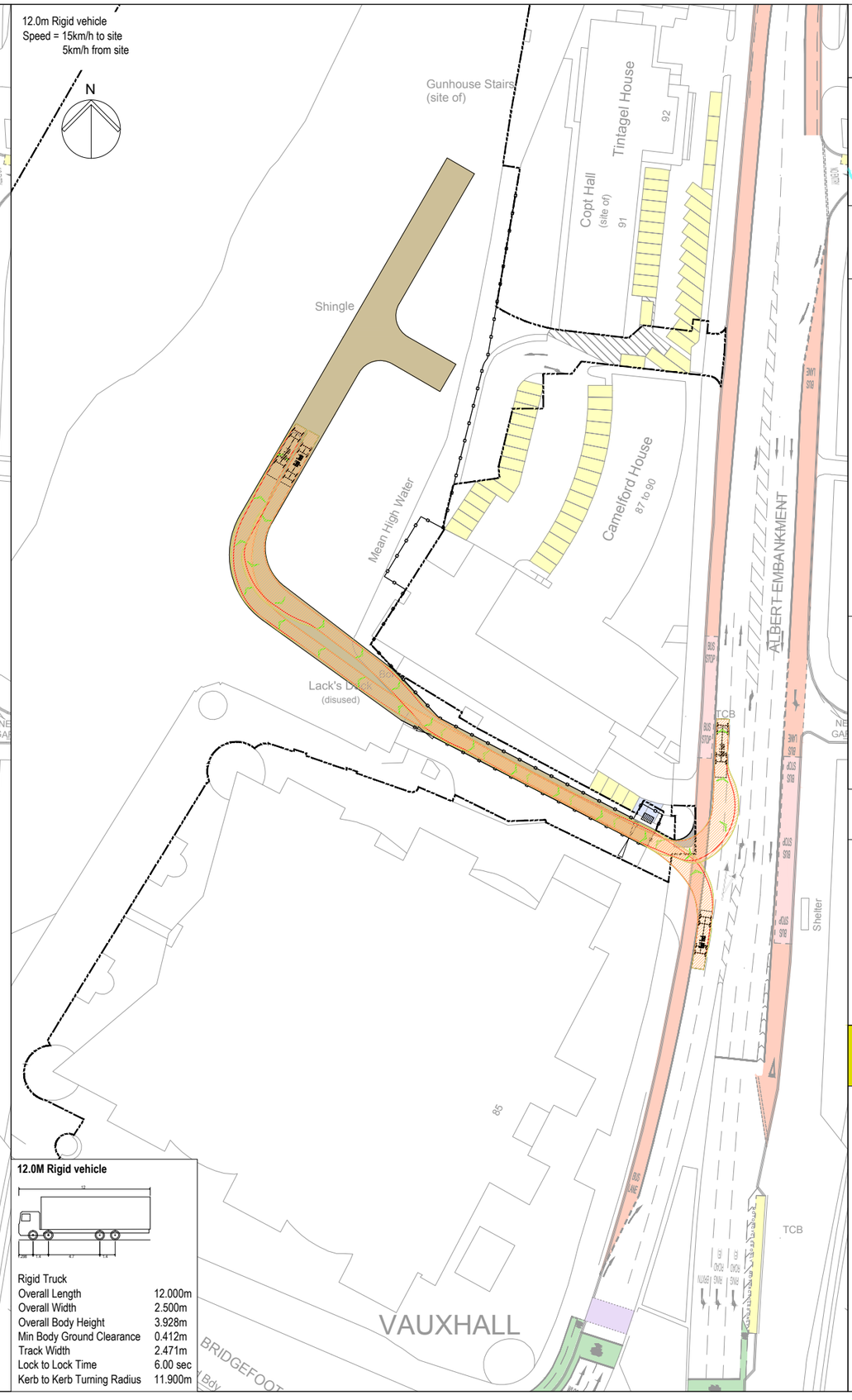
16.5m Articulated vehicle
Speed = 15km/h to site
5km/h from site



16.5M Articulated vehicle

Max Legal Articulated Vehicle (16.5m)	
Overall Length	16.500m
Overall Width	2.500m
Overall Body Height	3.632m
Min Body Ground Clearance	0.396m
Max Track Width	2.500m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	6.870m

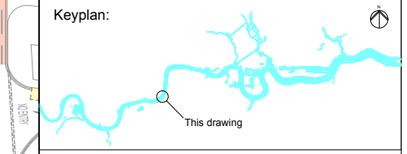
12.0m Rigid vehicle
Speed = 15km/h to site
5km/h from site



12.0M Rigid vehicle

Rigid Truck	
Overall Length	12.000m
Overall Width	2.500m
Overall Body Height	3.928m
Min Body Ground Clearance	0.412m
Track Width	2.471m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	11.900m

Keyplan:



Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key

Existing
- Parking restrictions
- Private parking
- Bus stop / stand
- Bus lane
- Pedestrian crossing
- Cycle lane / advance stop line

Revised
- Removal of footway
- Suspended private parking
- Illustrative on -site manoeuvring zone
- Site hut
- Site hoarding
- Access gate
- Limit of land to be acquired or used (LLAU)

Vehicle swept path analysis
- Vehicle body outlines
- Vehicle chassis outline
- Vehicle swept path

Standards
- Design Manual for Roads and Bridges, Dft, 1992
- Traffic Signs Regulations & General Directions, Tso, 2002
- Traffic Signs Manual, Dft, 2006
- Manual for Streets, Dft, 2007
- Manual for Streets 2, CIHT, 2010
- Designing for Deliveries, Fta, 1998
- Cycle Infrastructure Design Ltn 2/08, Dft, 2008
- Design of Pedestrian Crossings Ltn 2/95, Dft, 1995
- Guidance on the use of Tactile Paving Surfaces, Dft, 1998
- Accessible Bus Stop Design Guidance, TfL, 2006

Stage
Phase 2

10m 0 40m

Scale 1:500 at A1
1:1000 if reproduced at A3

ILLUSTRATIVE

Location
Albert Embankment Foreshore
London Borough of Lambeth

Document Information
Application for Development Consent

Highway layout during construction
Vehicle swept path analysis - Option A

DCO-PP-15X-ALBEF-170042
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

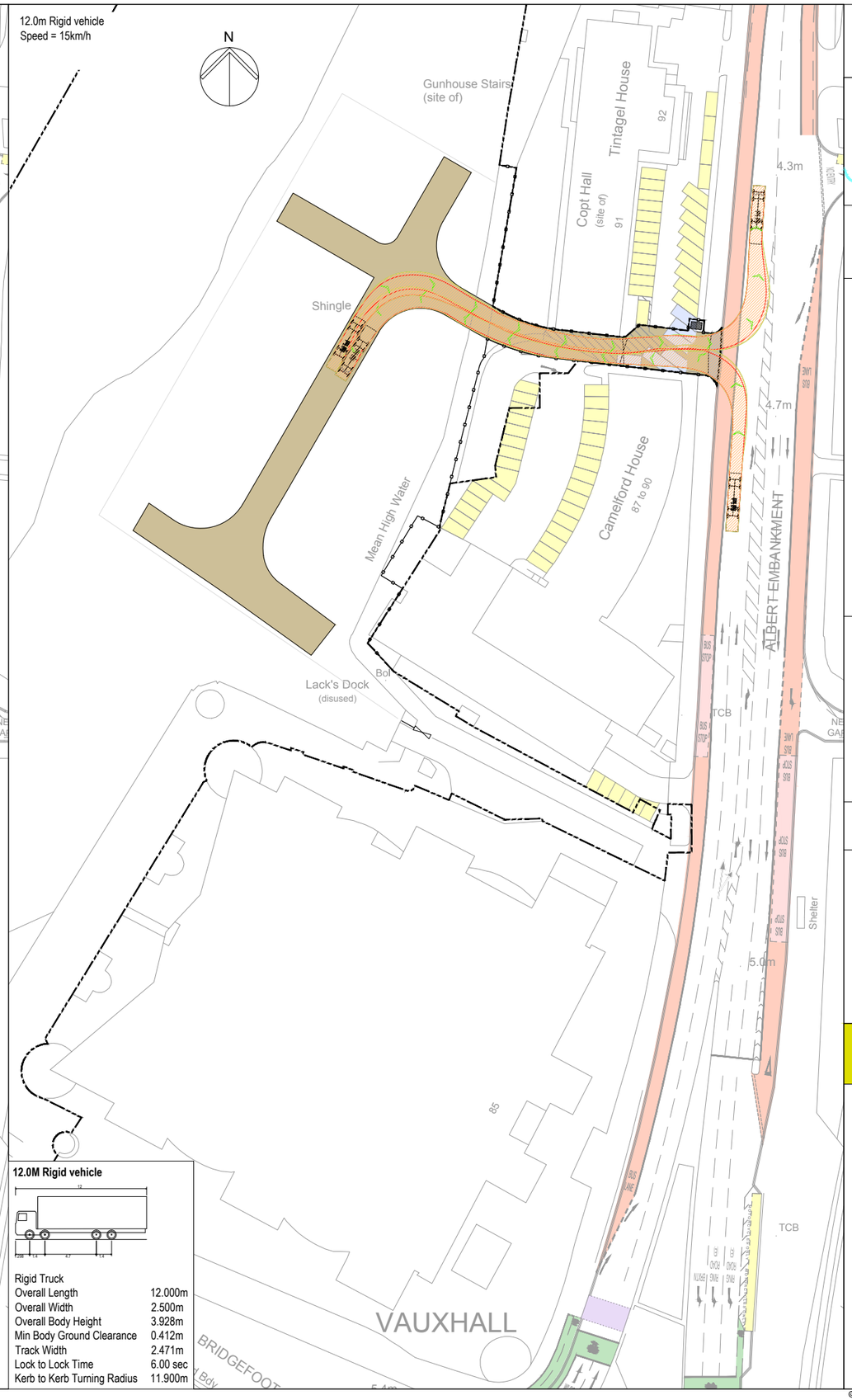
Thames Water

16.5m Articulated vehicle
Speed = 15km/h

16.5M Articulated vehicle

Max Legal Articulated Vehicle (16.5m)	
Overall Length	16.500m
Overall Width	2.500m
Overall Body Height	3.632m
Min Body Ground Clearance	0.396m
Max Track Width	2.500m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	6.870m

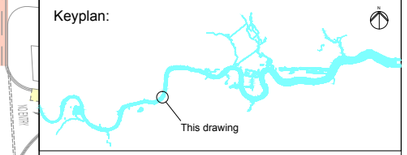
12.0m Rigid vehicle
Speed = 15km/h



12.0M Rigid vehicle

Rigid Truck	
Overall Length	12.000m
Overall Width	2.500m
Overall Body Height	3.928m
Min Body Ground Clearance	0.412m
Track Width	2.471m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	11.900m

Keyplan:



Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key

Existing
- Parking restrictions
- Private parking
- Bus stop / stand
- Bus lane
- Pedestrian crossing
- Cycle lane / cycle track

Revised
- Removal of footway
- Illustrative on-site manoeuvring zone
- Suspended private parking
- Relocated site hut
- Site hoarding
- Access gate
- Limit of land to be acquired or used (LLAU)

Vehicle swept path analysis
- Vehicle body outlines
- Vehicle chassis outline
- Vehicle swept path

Standards
- Design Manual for Roads and Bridges, Dft, 1992
- Traffic Signs Regulations & General Directions, Tso, 2002
- Traffic Signs Manual, Dft, 2006
- Manual for Streets, Dft, 2007
- Manual for Streets 2, CIHT, 2010
- Designing for Deliveries, Fta, 1998
- Cycle Infrastructure Design Ltn 2/08, Dft, 2008
- Design of Pedestrian Crossings Ltn 2/95, Dft, 1995
- Guidance on the use of Tactile Paving Surfaces, Dft, 1998
- Accessible Bus Stop Design Guidance, TfL, 2006

Stage
Phase 2

10m 0 40m

Scale 1:500 at A1
1:1000 if reproduced at A3

ILLUSTRATIVE

Location
Albert Embankment Foreshore
London Borough of Lambeth

Document Information
Application for Development Consent

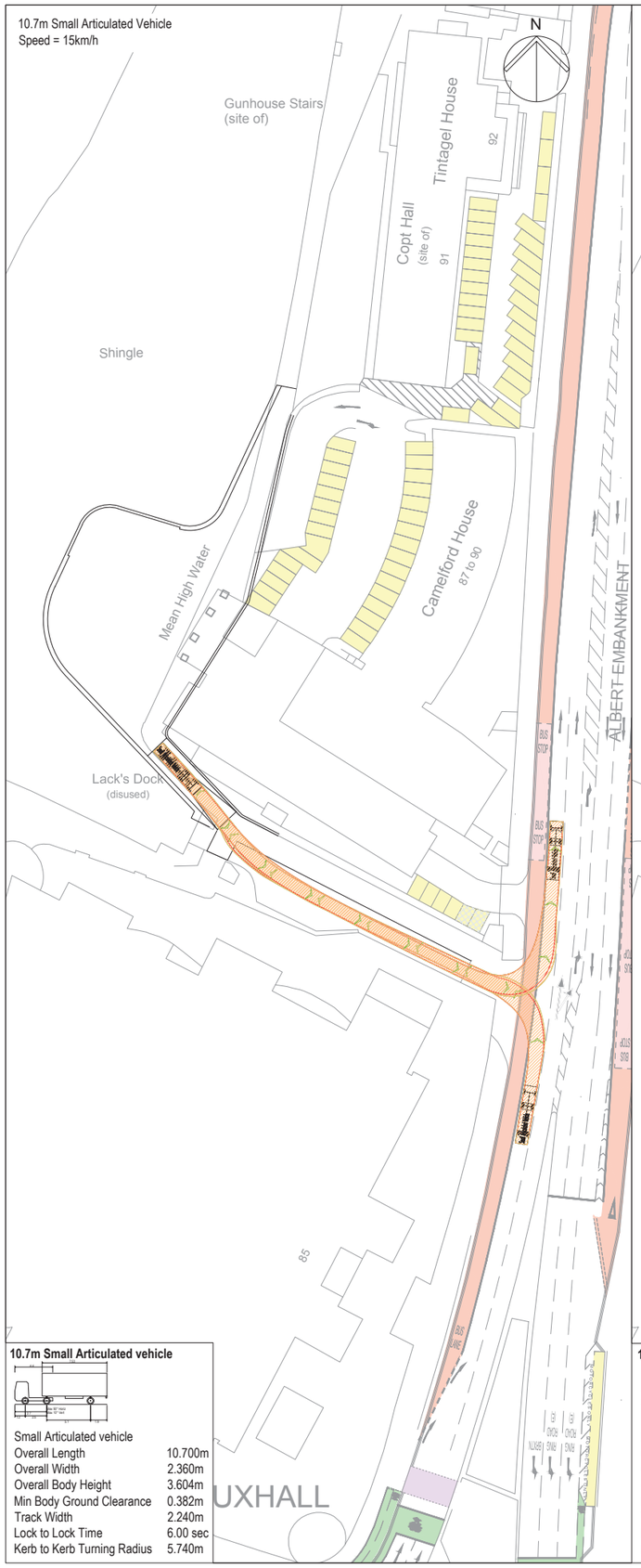
Highway layout during construction
Vehicle swept path analysis - Option B

DCO-PP-15X-ALBEF-170043
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

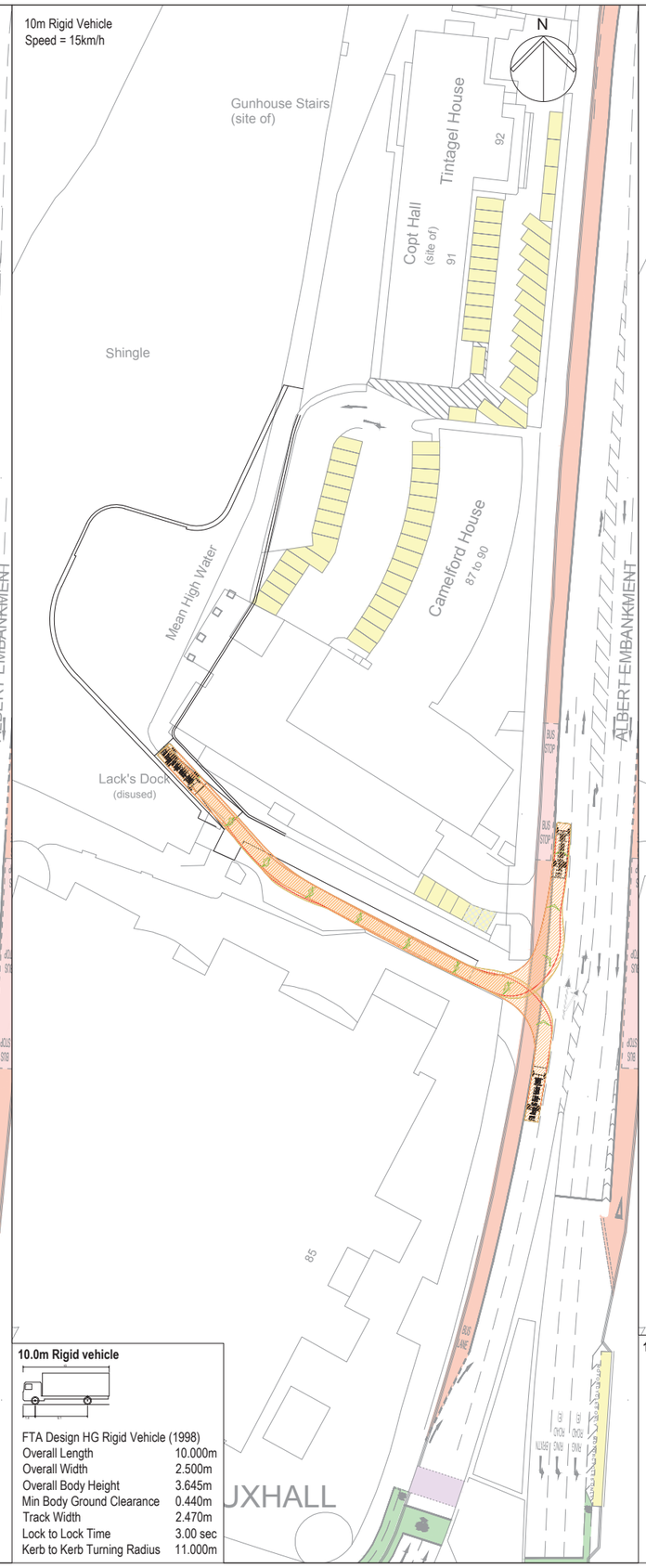
10.7m Small Articulated Vehicle
Speed = 15km/h



10.7m Small Articulated vehicle

Small Articulated vehicle	
Overall Length	10.700m
Overall Width	2.360m
Overall Body Height	3.604m
Min Body Ground Clearance	0.382m
Track Width	2.240m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	5.740m

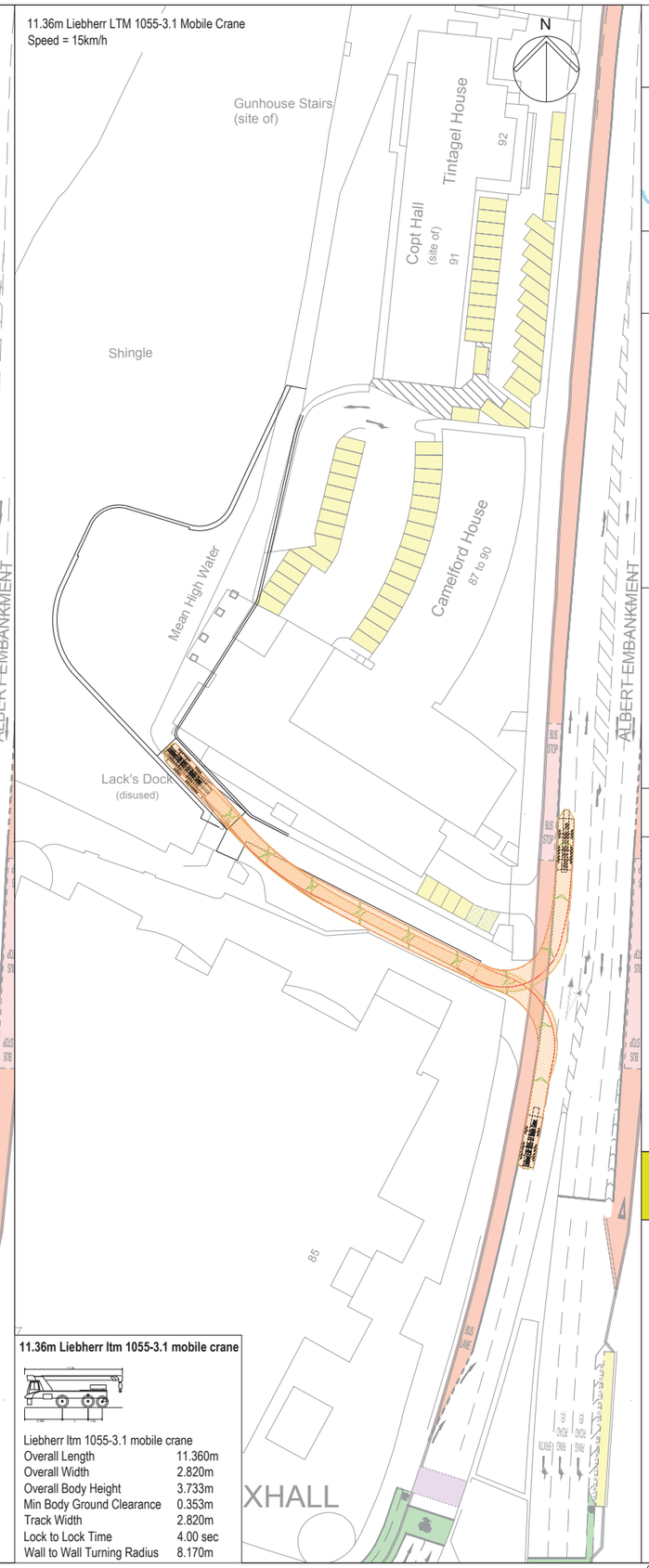
10m Rigid Vehicle
Speed = 15km/h



10.0m Rigid vehicle

FTA Design HG Rigid Vehicle (1998)	
Overall Length	10.000m
Overall Width	2.500m
Overall Body Height	3.645m
Min Body Ground Clearance	0.440m
Track Width	2.470m
Lock to Lock Time	3.00 sec
Kerb to Kerb Turning Radius	11.000m

11.36m Liebherr LTM 1055-3.1 Mobile Crane
Speed = 15km/h



11.36m Liebherr ltm 1055-3.1 mobile crane

Liebherr ltm 1055-3.1 mobile crane	
Overall Length	11.360m
Overall Width	2.820m
Overall Body Height	3.733m
Min Body Ground Clearance	0.353m
Track Width	2.820m
Lock to Lock Time	4.00 sec
Wall to Wall Turning Radius	8.170m

Keyplan:

Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key

Existing
- Parking restrictions
- Private parking
- Bus stop / stand
- Bus lane
- Pedestrian crossing
- Cycle lane / advance stop line

Revised
- New shoreline wall

Vehicle swept path analysis
- Vehicle body outlines
- Vehicle chassis outline
- Vehicle swept path

Standards
- Design Manual for Roads and Bridges, Dft, 1992
- Traffic Signs Regulations & General Directions, Tso, 2002
- Traffic Signs Manual, Dft, 2006
- Manual for Streets, Dft, 2007
- Manual for Streets 2, CIHT, 2010
- Designing for Deliveries, Fta, 1998
- Cycle Infrastructure Design Ltn 2/08, Dft, 2008
- Design of Pedestrian Crossings Ltn 2/95, Dft, 1995
- Guidance on the use of Tactile Paving Surfaces, Dft, 1998
- Accessible Bus Stop Design Guidance, TfL, 2006

Stage
Permanent phase

10m 0 40m

Scale 1:500 at A1
1:1000 if reproduced at A3

ILLUSTRATIVE

Location
Albert Embankment Foreshore
London Borough of Lambeth

Document Information
Application for Development Consent
Permanent highway layout
Vehicle swept path analysis

DCO-PP-15X-ALBEF-170044
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Transport assessment figures

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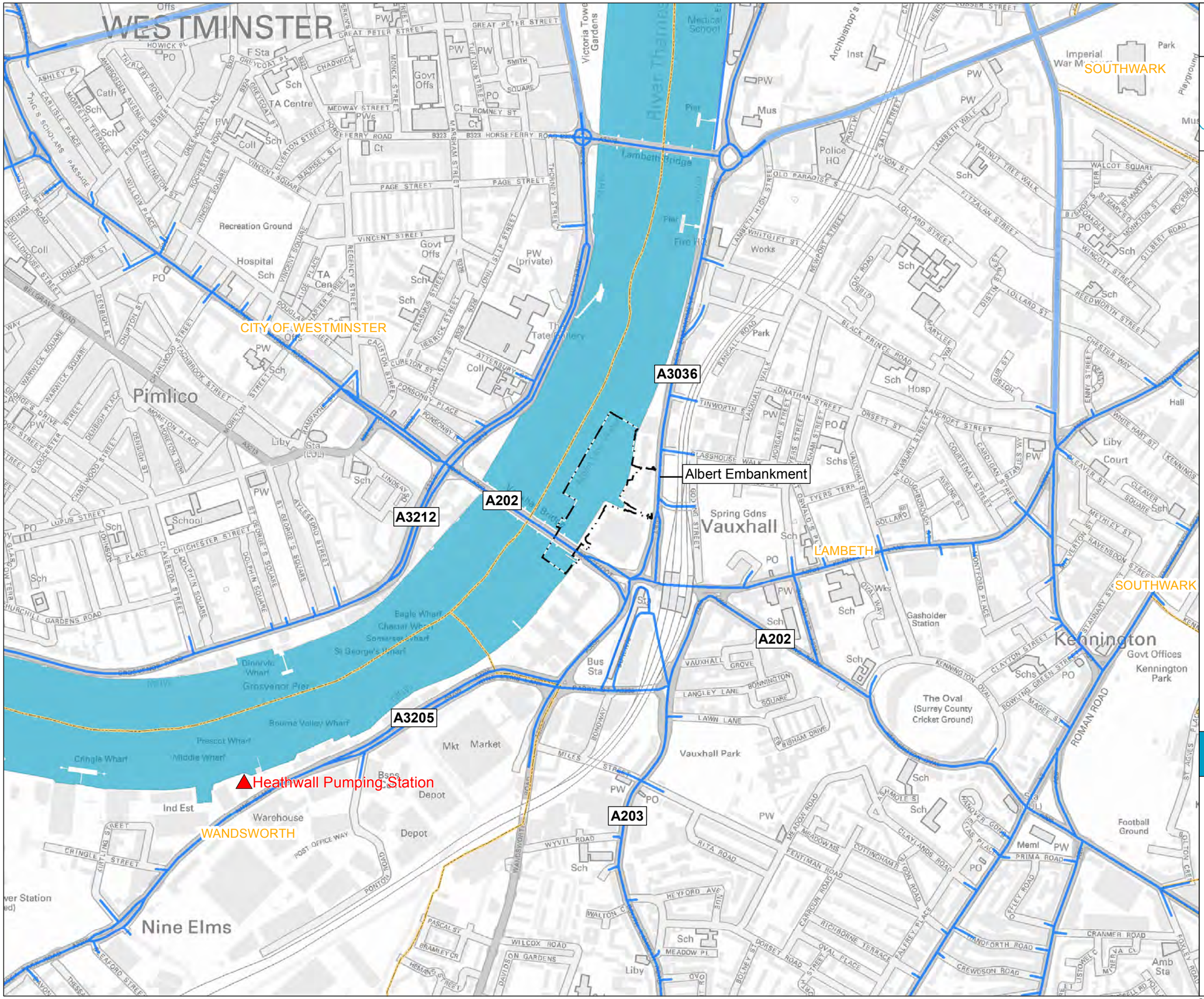


FOR INFORMATION

Location
Albert Embankment Foreshore
London Borough of Lambeth

Document Information
Transport Assessment
Transport - site location plan

Figure 16.2.1
1PL03-TT-50706
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Keyplan:

Key

- Site access
- Alternative site access
- TFL road network
- Strategic road network
- Primary construction route
- Limits of Land to be Acquired or Used
- Local authority boundary

110 55 0 110 m

Scale 1 : 7,500 at A3

FOR INFORMATION

Location

Albert Embankment Foreshore
London Borough of Lambeth

Document Information

Transport Assessment

Transport - construction traffic routes

Figure 16.2.2

1PL03-TT-50698
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Keyplan:

Key

- Barclays cycle hire docking stations
- National rail stations with cycle parking
- Underground stations with cycle parking
- Cycle superhighway (open)
- Cycle superhighway (open 2013)
- London strategic walk network
- London cycle routes

National cycle network

Route Type

- Open Traffic Free
- Open on-road
- Limits of Land to be Acquired or Used
- Local authority boundary

110 55 0 110 m

Scale 1 : 7,500 at A3

FOR INFORMATION

Location

Albert Embankment Foreshore
London Borough of Lambeth

Document Information

Transport Assessment

Transport - pedestrian and cycle network

Figure 16.4.1

1PL03-TT-50714
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Keyplan:

Key

- TFL bus stops
- National rail stations
- London underground stations
- Pier locations
- TfL bus routes
- Limits of Land to be Acquired or Used
- Local authority boundary

110 55 0 110 m

Scale 1 : 7,500 at A3

FOR INFORMATION

Location

Albert Embankment Foreshore
London Borough of Lambeth

Document Information

Transport Assessment

Transport - public transport

Figure 16.4.2

1PL03-TT-50722
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Keyplan:

Key

- Private car parking
- Coach parking
- City Car
- Green Wheels
- Hertz on Demand
- Zip Car
- Controlled Parking Zones and Hours of Operation
- Limits of Land to be Acquired or Used
- Local authority boundary

110 55 0 110 m

Scale 1 : 7,500 at A3

FOR INFORMATION

Location

Albert Embankment Foreshore
London Borough of Lambeth

Document Information

Transport Assessment

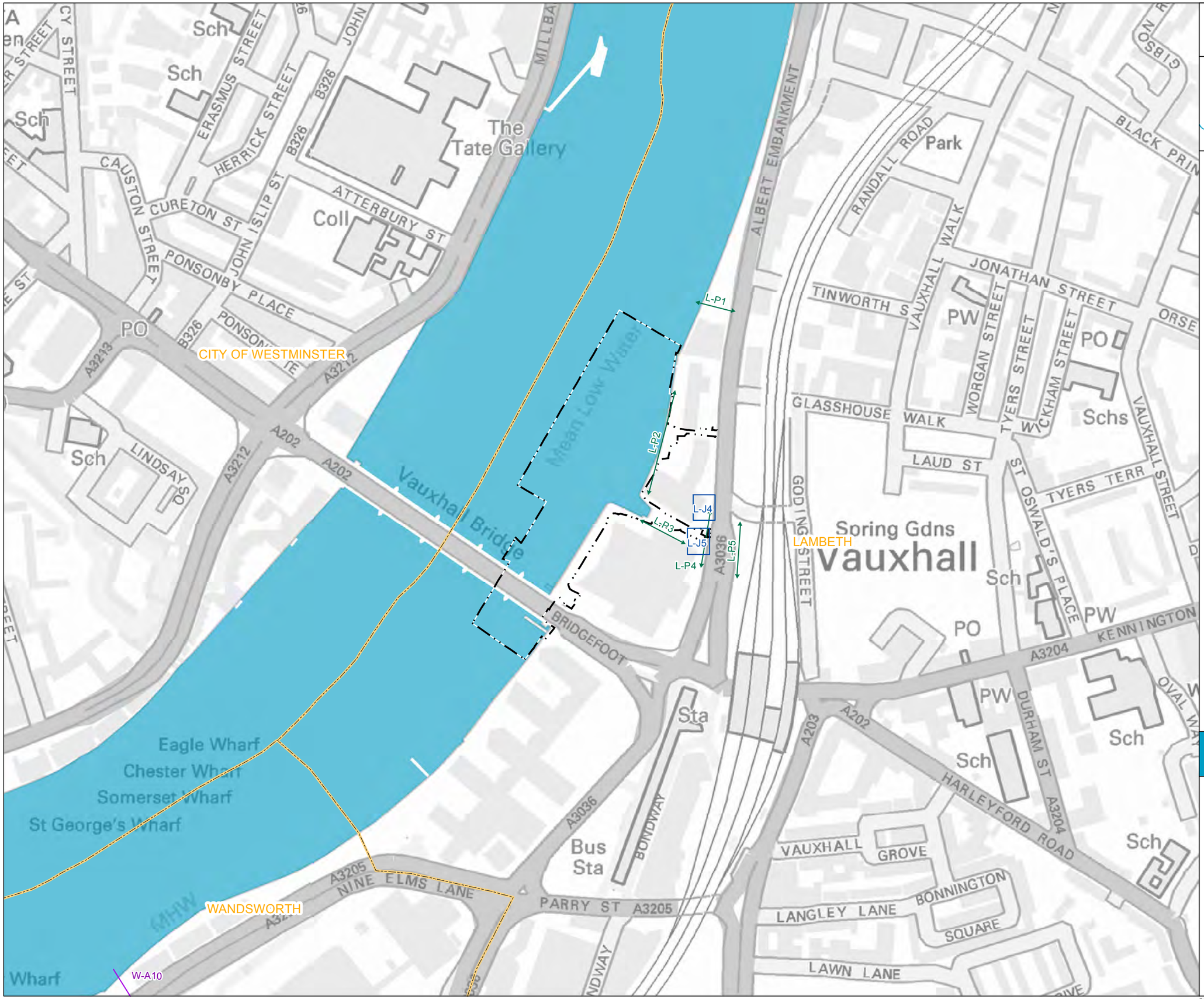
Transport - parking

Figure 16.4.3

1PL03-TT-50730
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water



Keyplan:

Key

- Automatic traffic count surveys
- Pedestrian annd cycle surveys
- Junction surveys
- Limits of Land to be Acquired or Used
- Local authority boundary

50 25 0 50 m

Scale 1 : 3,500 at A3

FOR INFORMATION

Location

Albert Embankment Foreshore
London Borough of Lambeth

Document Information

Transport Assessment

Transport - survey locations

Figure 16.4.4

1PL03-TT-50738
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

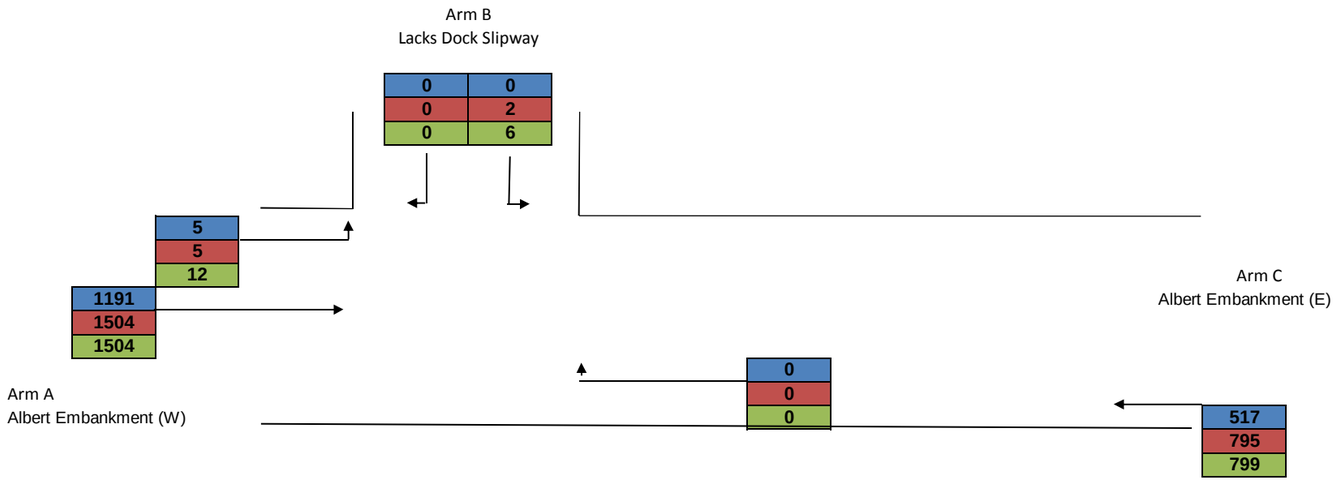
Site: Albert Embankment
Borough: Lambeth
Junction: Albert Embankment/Duck Tours/ Camelford House Access
Junction no.: PBA 32

Data: Traffic Flow in PCUs - PM Peak Hour
from Traffic Survey

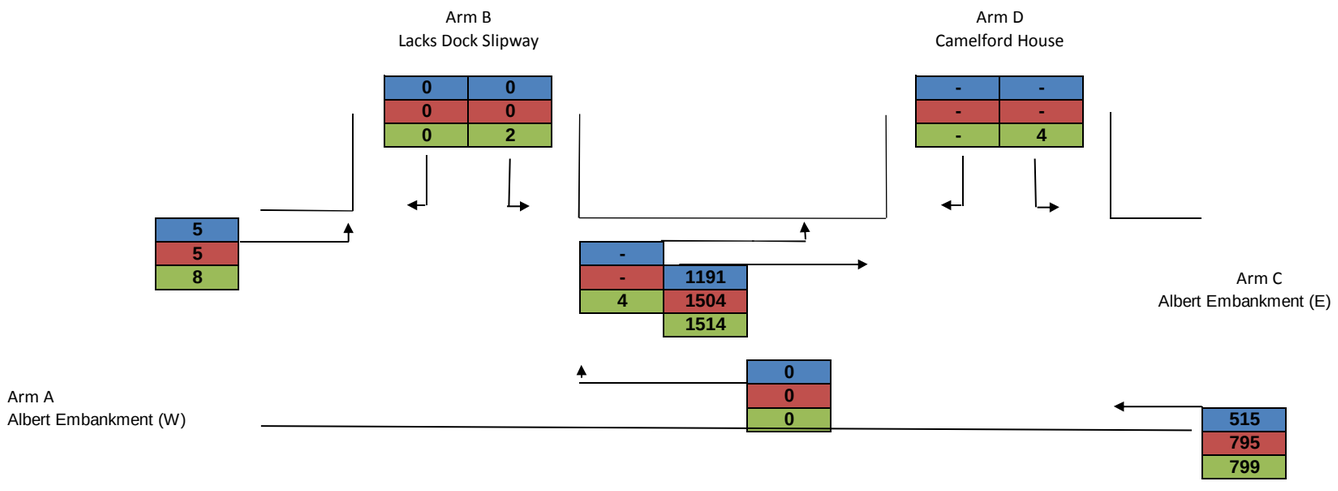
Key

	Baseline
	Construction Base
	Development Case

Option A



Option B



FOR INFORMATION

Location
Albert Embankment Foreshore
London Borough of Lambeth

Document Information
Transport Assessment

Baseline, Construction and Development case traffic flow (AM peak hour)

Figure 16.4.5
1PL03-TT-50917
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames
Thames Water

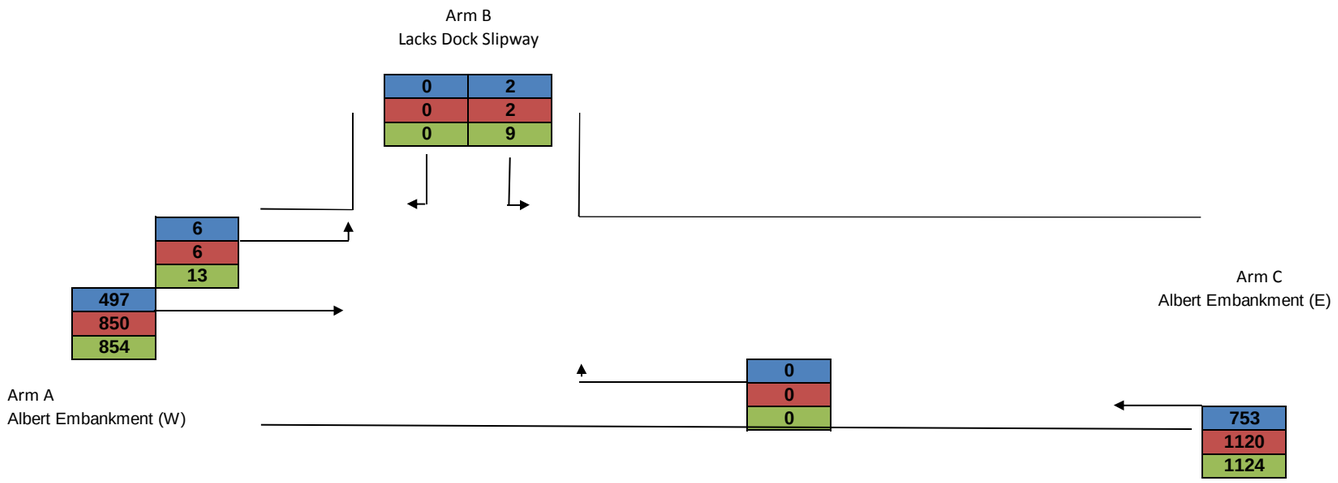
Site: Albert Embankment
Borough: Lambeth
Junction: Albert Embankment/Duck Tours/ Camelford House Access
Junction no.: PBA 32

Data: Traffic Flow in PCUs - PM Peak Hour
from Traffic Survey

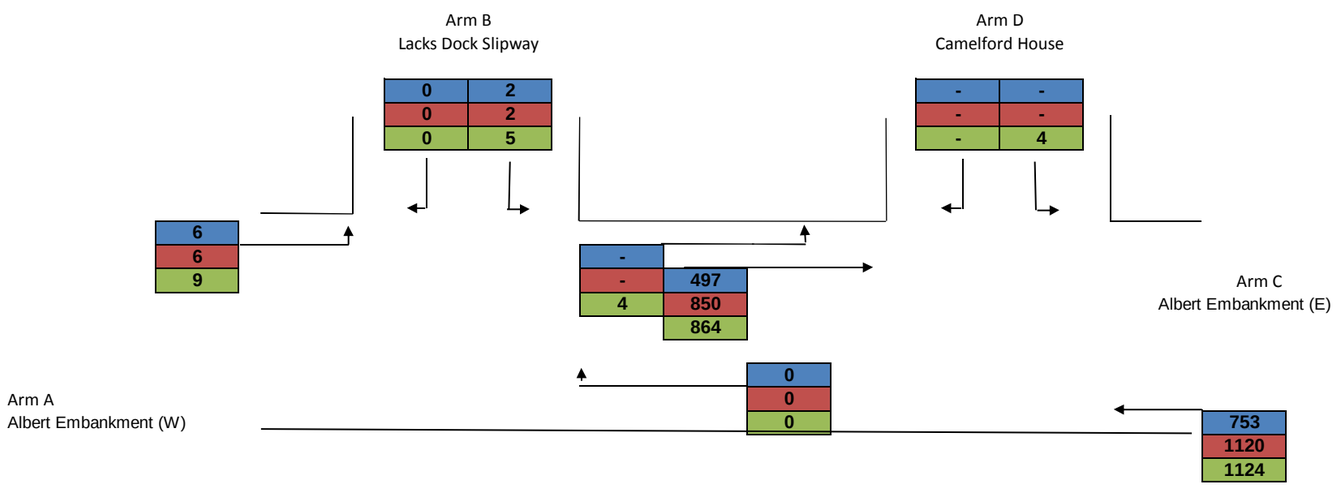
Key

	Baseline
	Construction Base
	Development Case

Option A



Option B



FOR INFORMATION

Location
Albert Embankment Foreshore
London Borough of Lambeth

Document Information
Transport Assessment

Baseline, Construction and Development case traffic flow (PM peak hour)

Figure 16.4.6
1PL03-TT-50941
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Keyplan:

Key

- Slight
- Serious
- Fatal
- Limits of Land to be Acquired or Used
- Local authority boundary

110 55 0 110 m

Scale 1 : 7,500 at A3

FOR INFORMATION

Location

Albert Embankment Foreshore
London Borough of Lambeth

Document Information

Transport Assessment

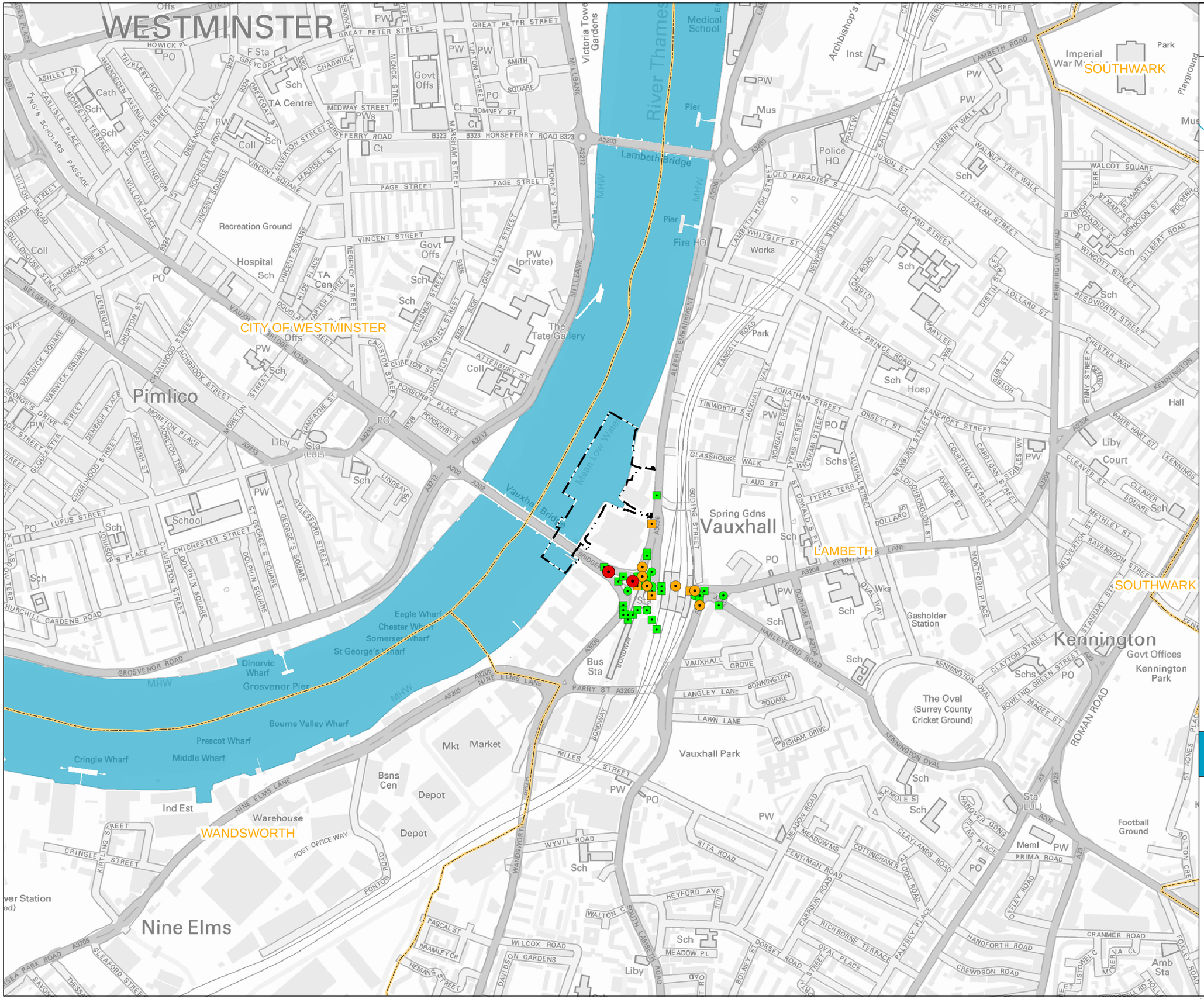
Transport - accident locations

Figure 16.4.7

1PL03-TT-50762
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water



Keyplan:

Key

Accidents

(Severity, Mode of travel)

- Slight, Pedestrian
- Slight, Pedal Cycle
- Serious, Pedestrian
- Serious, Pedal Cycle
- Fatal, Pedestrian
- Limits of Land to be Acquired or Used
- Local authority boundary

110 55 0 110 m

Scale 1 : 7,500 at A3

FOR INFORMATION

Location

Albert Embankment Foreshore
London Borough of Lambeth

Document Information

Transport Assessment

Transport - pedestrian and cyclist accidents by severity
Figure 16.4.8

1PL03-TT-50845
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Lambeth Road

Lambeth Bridge

Albert Embankment

Albert Embankment Foreshore

Harleyford Road

Nine Elms Lane

Chelsea Embankment Foreshore

Kirtling Street

Heathwall Pumping Station

Queenstown Road

Battersea Park Road

Camberwell New Road

Tarmac & Concrete London Battersea

Hourly construction lorries arrivals and departures

- Arrivals
- Departures

Hourly construction lorries movements

- 0 - 5
- 5 - 10
- 10 - 15
- 15 - 20
- 20 - 25
- 25 - 30
- 30 - 35
- 35 - 40
- 40 - 45
- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65
- 65 - 70
- 70 - 75
- > 75

Note: Construction vehicle flows include all Thames Tideway Tunnel sites on this network during this period.

FOR INFORMATION

Location

Albert Embankment Foreshore
London Borough of Lambeth

Document Information

Transport Assessment
Hourly Construction Lorry Movements - Site Year 1 of Construction

Figure 16.5.1

1PL03-TT-50895

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

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Thames Water Utilities Limited
Clearwater Court, Vastern Road, Reading RG1 8DB

DCO-DT-000-ZZZZZ-071013