Thames Tideway Tunnel
Thames Water Utilities Limited

Application for Development Consent

Application Reference Number: WWO10001

Transport Assessment

Doc Ref: **7.10.12**

Heathwall Pumping Station

Main Report

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

This page is intentionally blank

Thames Tideway Tunnel

Transport Assessment

Section 15: Heathwall Pumping Station

List of contents

Page number

List of plates

Page number

List of tables

Page number

This page is intentionally blank

15 Heathwall Pumping Station

15.1 Introduction

15.1.1 This site-specific *Transport Assessment (TA)* presents the findings of the assessment of the transport issues of the Thames Tideway Tunnel project at the Heathwall Pumping Station site located within the London Borough (LB) of Wandsworth.

15.1.2 The assessment takes into consideration the changes as a result of all other Thames Tideway Tunnel sites to ensure that results indicate the significance of each individual site in combination with construction works being undertaken at other sites. The purpose of this *TA* is to identify the Heathwall Pumping Station site context, development proposals and any transport implications arising from these proposals to ensure that appropriate mitigation measures are identified, where necessary.

15.1.3 The *TA* draws on a number of project-wide or common 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 this report.

15.1.4 The *TA* structure is as follows:

a. Section 15.2 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 15.3 outlines the assessment methodology used for the *TA* for the construction and operational phases.

c. Section 15.4 details the baseline conditions on the transport network surrounding the site, including survey data analysis and accident analysis.

d. Section 15.5 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 15.6 provides the assessment of the operational phase of the project.

f. Section 15.7 summarises the transport assessment findings.

15.2 Proposed development

15.2.1 The site comprises an area incorporating the existing Thames Water Heathwall Pumping Station site, the adjacent Middle Wharf (formerly used as a concrete batching works) and an area of foreshore in front of the pumping station and wharf. The site location is shown in Figure 15.2.1 in the Heathwall Pumping Station *Transport Assessment* figures.

15.2.2 The site is bounded to the north by the River Thames, to the south by Nine Elms Lane (A3205), to the west by the Tideway Industrial estate (now a redevelopment site, Riverlight) and to the east by open space beyond which is Elm Quay (a residential building).

15.2.3 The development at the Heathwall Pumping Station site would link the Heathwall Pumping Station CSO and the Southwest Storm Relief CSO to a drop shaft connected to the Thames Tideway Tunnel.

Construction

15.2.4 The construction site would be located on existing industrial areas south of the River Thames. Construction vehicles would route to and from the site would be from Nine Elms Lane (A3205) or Battersea Park Road.

15.2.5 Vehicle accesses to and from the site would be located on Nine Elms Lane (A3205).

15.2.6 There would be a number of phases of construction at the Heathwall Pumping Station covering; Phase 1 - site set-up, shaft construction and tunnelling, Phase 2 – construction of other structures and Phase 3 - demobilisation. The access plan and highway layout during construction (phases 1-3) plan is provided in the Heathwall Pumping Station *Transport Assessment* figures.

15.2.7 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.

15.2.8 During construction it is anticipated that the pedestrian, cycle, public transport and highway routes as well as car parking may be affected as a result of the additional construction traffic associated with Heathwall Pumping Station, other construction sites with construction routes along Nine Elms Lane (A3205), changes to pedestrian routes and cycle lanes, and additional journeys made by construction workers on public transport.

15.2.9 The site would have two site accesses and be accessed via Nine Elms Lane (A3205), which forms part of the Transport for London Road Network (TLRN). The western access would be located in the same location as the existing eastern access to the site. The eastern access would be positioned at the location of one of the existing eastern access to the site while the remaining existing accesses would be closed. Both accesses would operate on a ‘left-turn in, left-turn out’ only basis, with turning facilities provided on the site to allow vehicles to turn on site and exit in forward gear. The highway layout during construction vehicle swept path analysis plans are provided in the Heathwall Pumping Station *Transport Assessment* figures.

15.2.10 To enable HGV access to the eastern access it would be necessary to remove a section of footpath (approximately 5m) along Nine Elms Lane immediately adjacent to this access. Short term pedestrian diversions may be required while the crossovers are being modified, but otherwise no pedestrian diversions would be required.

15.2.11 The highway layout during construction plan is provided in the Heathwall Pumping Station *Transport Assessment* figures.

15.2.12 Parking for five essential maintenance/operational vehicles would be provided on the Kirtling Street site. No on-site worker parking would be provided.

15.2.13 Campsheds would be provided adjacent to the cofferdam at the Heathwall Pumping Station site to facilitate the use of river transport at the site.

15.2.14 During construction 90% of the cofferdam fill (both import and export) and 90% of the excavated material from the shaft would be transported by barge and all other material by road .Construction details for the site relevant to the construction assessment are summarised in Table 15.2.1.

Table 15.2.1 Construction traffic details

Description	Assumption
Assumed peak period of construction lorry movements	Site Year 1 of construction
Assumed average peak daily construction lorry vehicle movements	36 movements per day (18 vehicle trips) 1 month
Assumed average peak period of construction barge movements	Site Year 1 of construction
Assumed average peak daily construction barge movements	4 movements per day (2 barge trips)
Types of lorry requiring access	Excavation lorries Temporary construction material lorries Concrete lorries Plant and equipment lorries Rebar lorries Imported fill lorries Cement tanker lorries Aggregate lorries Office lorries Pipe/track/oils lorries Tunnel Precast Concrete Linings 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. A tug may hauls up to two barges at a time however for the purposes of this assessment it is assumed that one tug hauls one barge.

Construction routes

15.2.15 The Heathwall Pumping Station site is located on Nine Elms Lane (A3205) which forms part of the Transport for London Road Network (TLRN).

15.2.16 Figure 15.2.2 in the Heathwall Pumping Station *Transport Assessment* figures shows the construction traffic routes for the Heathwall Pumping Station site. These have been discussed with both Transport for London (TfL) and the Local Highway Authority.

15.2.17 The main junctions in the vicinity of the site, along the construction traffic routes are:

a. Nine Elms Lane (A3205) / Queenstown Road (A3216) junction

b. Nine Elms Lane (A3205) / Wandsworth Bridge Road (A3036) junction

c. Wandsworth Bridge Road (A3036) / (A203) junction

d. Vauxhall gyratory.

15.2.18 The construction routing for all phases at Heathwall Pumping Station would use the TLRN to access the site (Nine Elms Lane (A3205)). Vehicles would access the site on a left-turn in, left-turn out basis. All of the vehicles would arrive at the site from the direction of the Battersea Road (A3205) / Queenstown Road (A3216) junction. Vehicles leaving the site would travel east towards the Vauxhall gyratory. Vehicles would then route along South Lambeth Road (A203) and Wandsworth Road (A3036) to the south, Kennington Lane (A3204) and Harleyford Road (A202) to the east, Albert Embankment (A3036) to the north or Vauxhall Bridge Road (A202) to the northwest.

15.2.19 Two existing accesses would be used to gain access into the Heathwall Pumping Station site from Nine Elms Lane (A3205). The area available for vehicles within the site would be limited and therefore each access point would only be able to accommodate one construction vehicle at a time.

Proposed construction flows

Construction vehicles and barges

15.2.20 During construction 90% of the cofferdam fill (both import and export) and 90% of the excavated material from the shaft (export) would be transported by barge and all other material by road.

15.2.21 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).

15.2.22 Construction at this site may involve continuous 24 hour working seven days a week and extended working hours (between 18:00 and 22:00 on weekdays and between 13:00 and 17:00 on Saturdays) for approximately one month. However, construction vehicle movements would typically be limited to the hours stated in para. 15.2.21.

15.2.23 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 local authority.

15.2.24 The histograms in Plate 15.2.1 (construction lorry profile) and Plate 15.2.2 (construction barge profile) show that the peak site-specific activity at the Heathwall Pumping Station site would occur in Year 1 of construction. This site-specific peak is earlier than the overall Project-wide construction peak activity year of 2019.

15.2.25 This *TA* assesses this site-specific peak construction year. As detailed in Table 15.2.4, there would be an estimated 36 (i.e. 18 two-way movements) average peak daily construction lorry vehicle movements and an estimated four peak daily construction barge movements.

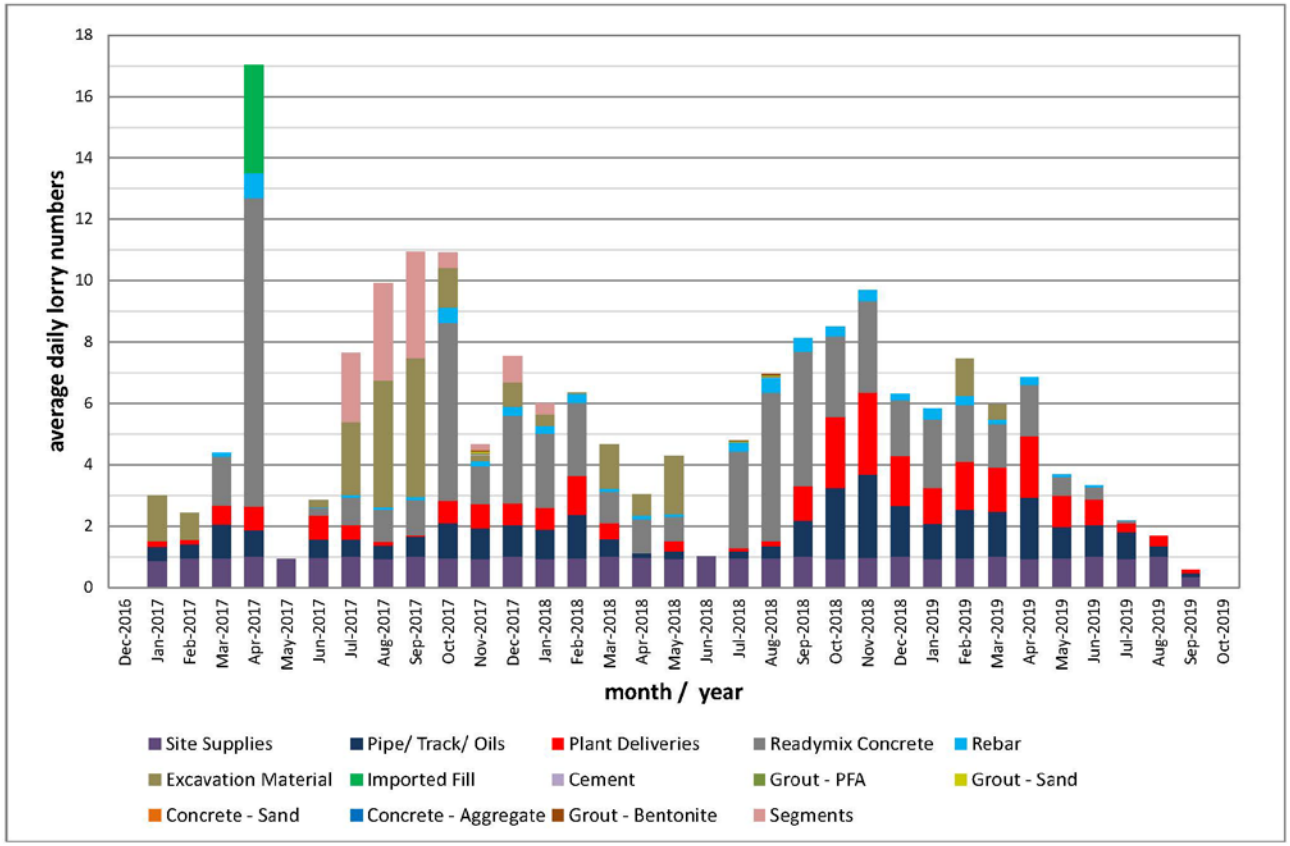
15.2.26 Because of its proximity to the main tunnel drive site at Kirtling Street this assessment for Heathwall Pumping Station utilises the highway modelling assessment from the Kirtling Street assessment. The modelling for Kirtling Street takes into account construction vehicle movements associated with all Thames Tideway Tunnel sites that use the highway network in this area. This includes the Heathwall Pumping Station site and Albert Embankment Foreshore site. The only explicit modelling undertaken for the Heathwall Pumping Station site is the assessment of the site access points from Nine Elms Lane (A3205).

15.2.27 This means that this *TA* considers the conservative case cumulative effects in relation to those developments under construction at Site Year 3 (peak construction year at Kirtling Street site with higher traffic flow), and the construction works in Site Year 1 at the Heathwall Pumping Station site.

15.2.28 The assessment is based on 10% of the daily number of lorry journeys occurring in the peak hours, which has been discussed 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.

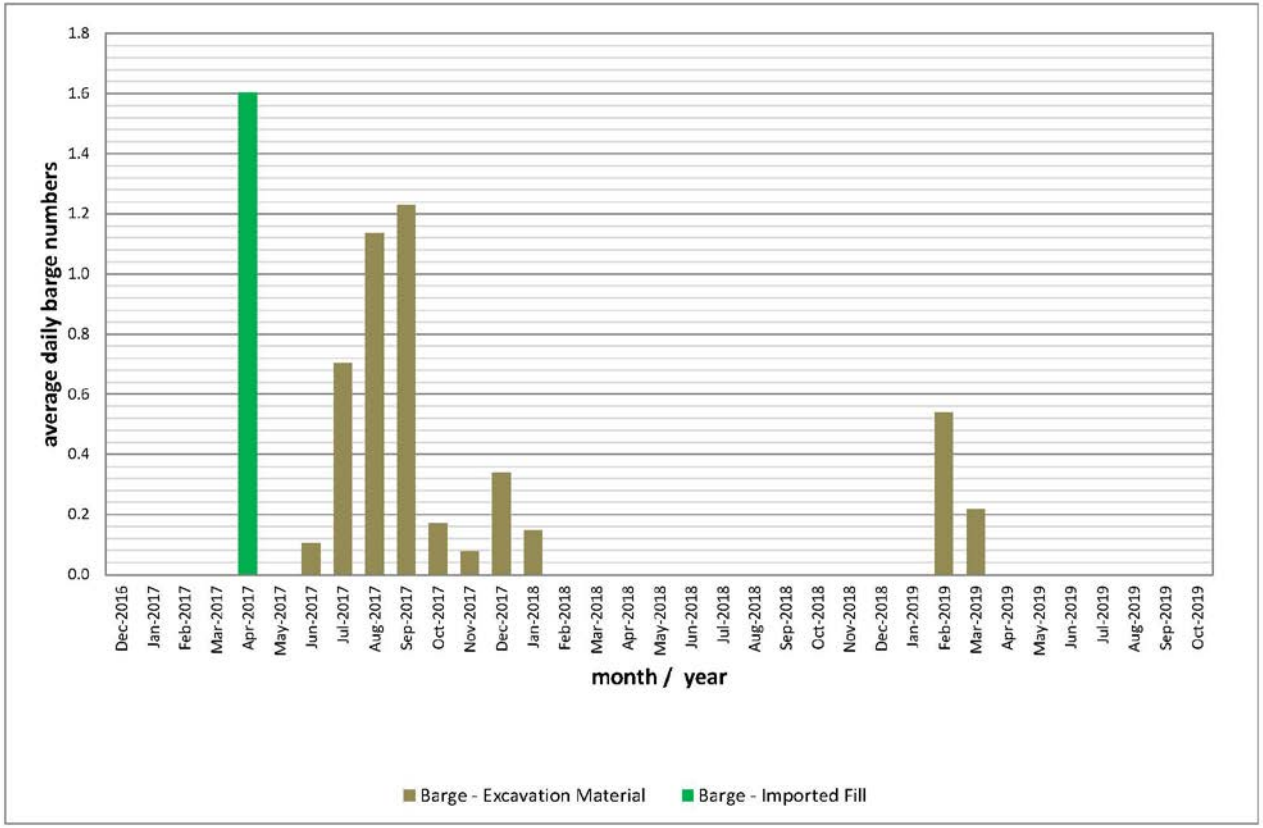
15.2.29 Plate 15.2.1 and Plate 15.2.2 indicate the construction vehicle and construction barge profiles during construction.

Plate 15.2.1 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 15.2.2 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

15.2.30 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.

15.2.31 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 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.

15.2.32 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.

15.2.33 Plate 15.2.1 shows that the number of vehicular movements varies throughout the construction period with one month of 36 movements a day, 6 months with between 16 to 26 HGV movements a day, 15 months with between 8 to 16 HGV movements a day and 11 months with less than 8 movements a day during the three year build programme.

15.2.34 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 Heathwall Pumping Station site are shown in Table 15.2.1

Construction workers

15.2.35 The construction site is expected to require a maximum workforce of approximately 40 workers at any one time. The number and type of workers is shown in Table 15.2.2.

Table 15.2.2 Maximum estimated construction worker numbers

Contractor		Client
Staff[a]	**Labour[b]**	**Staff[c]**
08:00-18:00	**08:00-18:00**	**08:00-18:00**
15	20	5

[a] *Contractor Staff – contract staff brought in to project manage the engineering work and site.*
[b] *Labour – those working on site doing engineering, construction and manual work.*
[c] *Client Staff– engineering and support staff managing the project and supervising the Contractor*

15.2.36 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] journey to work data for the area in the vicinity of the Heathwall Pumping Station site.

15.2.37 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.

15.2.38 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 15.2.3 has been used to assess the impacts of worker journeys on the highway and public transport networks.

15.2.39 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 15.2.3 Transport mode split

Mode	Percentage of trips to site	Equivalent number of worker trips (based on 40 worker trips)	
		AM peak (07:00-08:00)	PM peak (18:00-19:00)
Bus	20%	8	8
National Rail	33%	13	13
Tube	29%	12	12
Car Driver	<1%*	0	0
Car Passenger	<1%*	0	0
Cycle	4%	1	1
Walk	9%	4	4
River	0.3%	0	0
Other (taxi/motorcycle)	5%	2	2
Total	**100%**	**40**	**40**

Note: The peak travel time for construction workers is anticipated to occur between 07:00 – 08:00 and between 18:00 – 19:00, and the PM peak hour trips will be lower

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

*than the AM peak hour trips as shift changes occur at 15:00. * assuming to be zero for the purpose of this assessment*

15.2.40 Information regarding the travel arrangements of these workers would be included in the contractors *Construction Management Plan* and *Workplace Travel Plan* documents for the Heathwall Pumping Station site.

15.2.41 It is difficult to predict with certainty the directions that workers would travel to and from the Heathwall Pumping Station site. Staff could potentially be based in the local area or in the wider Greater London area and are unlikely to have the same trip origin-destination distributions as construction lorries.

15.2.42 As indicated in Table 15.2.3, 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 directions to and from the site would be along Nine Elms Lane (A3205) to the nearest bus stops to the northeast of the site and to Battersea Park National Rail station to the southwest of the site.

Vehicle movements summary

15.2.43 Other construction vehicle movements associated with site operations and contractor activities would be cars and light good vehicles. The construction worker vehicle movements expected to be generated by the Heathwall Pumping Station site is shown in Table 15.2.4.

15.2.44 Table 15.2.4 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 15.2.4 Construction works movements

Vehicle type	Vehicle movements per time period				
	Total Daily	**0700 to 0800**	**0800 to 0900**	**1700 to 1800**	**1800 to 1900**
Construction vehicle movements 10%[a]	36	0	4	4	0
Other construction vehicle movements[b]	36	4	4	4	4
Worker vehicle movements[c]	nominal	0	0	0	0
Total	**72**	**4**	**8**	**8**	**4**

[a] *The assessment is based on 10% of the daily construction lorry movements associated with materials taking place in each of the peak hours.*
[b] *Other construction vehicle movements includes cars and light goods vehicles associated with site operations and contractor activity.*

[c] *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.*

15.2.45 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.

15.2.46 Assuming that 90% of imported and exported cofferdam fill and shaft excavated material is transported by barge with all other material by road, an average peak flow of 72 vehicle movements a day is expected during the months of greatest activity during Year 1 of construction at this site. At other times in the construction period, vehicle flows would be lower than this average peak figure.

15.2.47 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. Table 15.2.4 shows that in the AM and PM peak periods, the Heathwall Pumping Station site would generate a peak of approximately 12 two-way vehicle movements.

15.2.48 In addition to the construction HGV movements associated with the Heathwall Pumping Station site, it is anticipated that there would be 10 two way HGV movements on this road during the peak hours associated with other Thames Tideway Tunnel sites during Year 1 of construction at Heathwall Pumping Station.

Code of Construction Practice

15.2.49 Measures incorporated into the *Code of Construction Practice (CoCP)*[ii] *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

[ii] The *Code of Construction Practice* (*CoCP*) is provided in Vol 1 Appendix A of the *Environmental Statement*. It contains general requirements (*Part A*), and site specific requirements for this site (*Part B*).

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.

15.2.50 In addition to the general transport measures within the *CoCP Part A*, the following transport measures have been incorporated into the *CoCP Part B* (Section 5) relating to the Heathwall Pumping Station site:

a. the site access would be located at the existing access to the pumping station and one of the existing accesses to the adjacent Middle Wharf

b. for general construction vehicle access, no reversing to/from the site onto Nine Elms Lane would be allowed

c. Thames Water operations require 'business as usual' access to the pumping station

d. Pedestrian access would be maintained to and from Battersea Barge during construction, including during its temporary relocation

e. access to the site would be from the west with left turn into the site from Nine Elms Lane (A3035). Egress from the site would be left turn out travelling east towards Vauxhall

f. the contractor is required to put measures in place to prevent vehicles halting on Nine Elms Lane when entering the site. This may include the vehicle notifying the site in advance to ensure the entrance gate is open, locating the security barrier at a distance within the site and use of a traffic marshal

g. due to the site being constrained, the contractor may need to consider the use of a turntable, or restrict lorry size to meet the requirement to prevent reversing operations to/from Nine Elms Lane

h. signage, safe crossing points and other required measures would be provided for pedestrians and cyclists at site accesses to address the potential hazards.

15.2.51 Based on current travel planning guidance including TfL's 'Travel planning for new development in London (TfL, 2011)[1], this development falls within the threshold for producing a Strategic Framework Travel Plan. A *Project Framework Travel Plan* has been prepared based on the TfL ATTrBuTE guidance[2]. The *CoCP Part A* addresses Project-wide travel planning measures, and *CoCP Part B* addresses site-specific measures including the need for a Project Wide Travel Plan Manager, initial travel surveys during construction and a monitoring framework at each site, while I addresses site specific measures. The site-specific travel-planning measures of relevance to the *Project Framework Travel Plan* are as follows:

a. information on existing transport networks and travel initiatives for the Heathwall Pumping Station site including shuttle bus services for staff and labour

b. a mode split established for the Heathwall Pumping Station site construction workers to establish and monitor travel patterns

c. 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

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

Other measures during construction

15.2.52 Embedded design measures which are not outlined in the *CoCP* but are of relevance to the *TA* at the Heathwall Pumping Station site include the following:

a. removal of the footway at the crossover of the easterly site access on Nine Elms lane (A3205).

15.2.53 These measures are detailed further within the construction assessment section.

Operation

15.2.54 During operation all access to the Heathwall Pumping Station site would be returned to the existing layout, with the access to the CSO drop shaft provided via the existing entrance to Middle Wharf, as well as a new gate on the boundary wall between the pumping station and Middle Wharf. There would be no public access to the site.

15.2.55 During operation it is anticipated that there would be no significant issues for 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 the changes to highway operation.

15.2.56 The site would be accessed via Nine Elms Lane (A3205) during the operational phase. During ten-yearly inspections, space to locate two large cranes within the site area would be required. The cranes would facilitate lowering and recovery of tunnel inspection vehicles and to provide duty/standby access for personnel.

15.2.57 There would be potential for some highway 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 Wandsworth and TfL.

15.2.58 During operation, maintenance vehicles would enter the site via an existing access from Nine Elms Lane (A3205) eastbound. Access would be required for a light commercial vehicle on a three to six monthly

maintenance schedule. On occasions there may be a consequent need for small flatbed vehicles to access the site.

15.2.59 Additionally there would be more significant maintenance visits every ten years which would require access to enable two cranes to be brought to the site.

15.3 Assessment methodology

Engagement

15.3.1 An extensive scoping and technical engagement process has been undertaken. All consultee comments relevant to this site are presented in Volume 10 of the *Environmental Statement*

15.3.2 Whilst the effects associated with transport for the operational phase have been scoped out of the *Environmental Statement*, 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

15.3.3 Throughout the scoping and technical engagement process, the key stakeholders with regards to transport, primarily TfL and the relevant borough for each site, have been consulted. For Heathwall Pumping Station, the LB of Wandsworth has been consulted and the comments which have arisen relating directly to Heathwall Pumping Station have been recorded and responded to accordingly.

15.3.4 The key issues arising from the stakeholder engagement are:

a. The Borough prefers the use of barge wherever possible. Any movement of materials into and out of the site should be minimised

b. Consideration should be given to vehicle type and CO_2 emissions (eg, Euro iV etc)

c. Details of traffic generation for all sites during operational and construction phases should be provided

d. The EIA should consider noise, pollution, access and working times related to the transport arrangements

e. Both individual and cumulative impacts should be considered where necessary

f. To minimise disruption in relation to the proposed temporary extension of the cofferdam engagement with the owners of Battersea Barge restaurant would be required

g. It was questioned whether off-site storage would be needed for Heathwall Pumping Station. The opportunity to use Kirtling Street for this purpose was discussed as it has a greater site area

h. The re-alignment of Ponton Road should be taken into consideration in the assessment

i. Ensure that the construction impact does not impede the operation of the Strategic Road Network (SRN)/TLRN

j. The number of vehicle movements between sites must be determined and assessed if Kirtling Street is used as a hub site for Heathwall

k. Investigate whether all movements for vehicles are feasible at the site entrances on Nine Elms Lane

l. The gates at the site accesses must be set back from the highway to a distance that would allow a construction vehicle to wait off the highway if the gate is closed when they arrive.

m. Highway layout is to be assumed to remain the same as existing during construction despite the Battersea Power Station proposals to alter it.

n. Assessment of the impact of lorry movements in the TA must include the cumulative impact of lorry movements from other development within the Opportunity Area.

o. Investigate whether permitting all movements by construction vehicles at the site accesses would create significant impact on traffic.

p. During construction it would be most suitable to divert the Thames Path along Nine Elms Lane (A3205) between Heathwall Pumping Station and Kirtling Street.

q. The likely road layout changes as a consequence of US Embassy proposals in the area should be investigated.

r. St John's Hill, Lavender Hill and Wandsworth Road are local roads with primarily residential and retail frontage and therefore should not be used by construction vehicles. Queenstown Road and Silverthorne Road to the south of the Tarmac and London Concrete Battersea site, which should takes its access from Battersea Park Road (A3205), should also not be used by construction vehicles.

s. Battersea Bridge Road, Prince of Wales Drive, Albert Bridge Road, Latchmere Road and Elspeth Road are residential and contain two low bridges and should be removed if a logical alternative TLRN route is available.

t. Background traffic growth assumptions should be discussed with TfL in relation to their assessment of the Northern Line Extension (NLE).

u. Regarding the Thames Tideway Tunnel assumptions on background traffic growth provided in the summary table, the following comments should be considered:

    i Thames Tideway Tunnel shows a seven year construction period, but shows a steady movement throughout that period. Is it unlikely that the construction traffic profile would be that smooth.

    ii NLE construction is programmed between 2015 and 2018 with NLE expected to open in 2019.

    iii Battersea Power Station – likely construction will commence in 2013 and could extend over this period. However from 2015 there

will also be operational traffic coming from this site as Phase 1 is occupied.

iv US Embassy - A figure should be included for construction traffic (for example 4-6 vehicles during peak hours) , which is due to commence in 2014 and be complete in 2017.

v Embassy Gardens – Construction start in 2012 and a suitable construction vehicle flow should be estimated (for example 6-7 Vehicle during peak hours). There is likely to be some operational traffic from 2015 onwards.

vi New Covent Garden Market - we suggest 2025 as more realistic construction end date. Again there will be construction traffic from later phases and operational traffic from the earlier phases.

vii Market Towers – 2013 is a more realistic start date with a four year build out.

viii Battersea Plant –expect an increase in traffic as it will hopefully supply many of the construction sites in the area.

v. The impact of the proposed diversion of the Thames Path along Nine Elms Lane (A3205) will need assessing and appropriate mitigation put forward, including pedestrian crossings, diversionary signage etc which will need to be discussed further with TfL.

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

Construction

15.3.6 The assessment methodology for the construction phase follows that described in *Project-wide TA*. The baseline and construction base case modelling scenarios for Kirtling Street have been used for the assessment of Heathwall Pumping Station.

15.3.7 The modelling for Kirtling Street takes into account construction vehicle movements associated with all Thames Tideway Tunnel sites that use the highway network in this area. This includes the Heathwall Pumping Station site and Albert Embankment Foreshore site. The only explicit modelling undertaken for the Heathwall Pumping Station site is the assessment of the site access points from Nine Elms Lane (A3205).

Construction assessment area

15.3.8 As stated above, the Kirtling Street modelling has been used as a basis of the Heathwall Pumping Station assessment. The assessment area for the Kirtling Street site includes the local roads off Battersea Park Road - Nine Elms Lane (A3205) as well as the Battersea Park Road (A3205) / Nine Elms Lane (A3205) / Kirtling Street / New Covent Garden access and Nine Elms Lane (A3205) / Cringle Street junctions.

15.3.9 These roads and junctions have been assessed for highway, cycle and pedestrian impacts. The Thames Path has been included within the

assessment due to its proximity to the Heathwall Pumping Station site. Changes to local bus services within 640m (see paras. 15.4.33 to 15.4.39) of the site and rail services within 960m (see paras. 15.4.40 to 15.4.51) of the site have also 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).

15.3.10 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 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.

15.3.11 The assessment for this site takes account of construction vehicle movements associated with Heathwall Pumping Station, together with construction traffic from other Thames Tideway Tunnel sites that would use the highway network in the vicinity of this site in Year 1 of construction at Heathwall Pumping Station.

Construction assessment year

15.3.12 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*.

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

15.3.14 The site-specific peak construction traffic year at Heathwall Pumping Station is Year 1 of construction for both construction lorries and construction barges.

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

Highway network modelling

15.3.16 The assessment of the local highway network includes the redevelopment of Battersea Power Station and the surrounding land, to provide a mixed use development (see Section 5). This is included in the construction development case.

15.3.17 The assessment for each site takes account of construction vehicle movements associated with the Heathwall Pumping Station 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 Year 1 of construction.

15.3.18 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 Heathwall Pumping Station 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 Wandsworth 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.

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

a. Northern Line Extension
b. Vauxhall Square Cap Gemini
c. US Embassy
d. Market Towers
e. Island Site Vauxhall Cross
f. Nine Elms Sainsbury's
g. Spring Mews
h. Nine Elms Pier (Phase 1)
i. Vauxhall Sky Gardens
j. Riverlight
k. Battersea Plant
l. St George's Wharf (Vauxhall Tower)
m. Marco Polo House (Phase 1a and 1b)
n. Battersea Power Station (Phases 1-3)
o. Embassy Gardens (Buildings A02, A05, and A09- A11)
p. New Covent Garden Market (Buildings B4- B6)

15.3.20 There will also be some developments that will be under construction at the same time as construction works at the Heathwall Pumping Station site. These are:

a. 81 Black Prince Road (Parliament Road)[iii]

[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 15 Appendix N of the *Environmental Statement*)

b. 10 Albert Embankment (Hampton House)[iii]

c. 20 Albert Embankment (Wah Kwong House)[iii]

d. Chelsea Barracks

e. Nine Elms Pier (remaining Phases)

f. Marco Polo House (Phase 2)

g. Battersea Power Station (Phase 5 and 6)

h. Nine Elms Parkside (Plots B- D)

i. Embassy Gardens (Buildings A01, A03, A04 and A07)

j. New Covent Garden Market (Buildings B1- B3 and site entrance)

15.3.21 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 Heathwall Pumping Station site.

15.3.22 The assessment of transport effects is based on the Battersea Power Station development being partially completed and partially under construction by Site Year 3 of construction at the Kirtling Street site. This includes a new highway layout at the Kirtling Street / Battersea Park Road (A3205) / Nine Elms Lane (A3205) / New Covent Garden access road junction, which is assumed to be complete before the commencement of construction at Heathwall Pumping Station. However, as there are some uncertainties around the timescale for implementation of the Battersea Power Station development a sensitivity test has been undertaken in which the construction base and development cases assume that development is not progressed within a timescale that coincides with the Thames Tideway Tunnel project, and hence the highway layout will be as existing. This sensitivity test is presented in this TA.

15.3.23 Construction traffic associated with other Thames Tideway Tunnel project sites using routes in this area has also been included in the assessment.

15.3.24 This approach provides a robust assessment case for local modelling as the baseline traffic has been forecast 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 this traffic growth or Thames Tideway Tunnel project related traffic.

Sensitivity testing

15.3.25 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 standard hours of 08:00 to 18:00, this would be agreed in advance with TfL and the Local Highway Authority.

15.3.26 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

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.

15.3.27 As para. 15.3.26 explains, 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.

15.3.28 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).

15.3.29 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.

15.3.30 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

15.3.31 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.

15.3.32 Given the level of transport activity associated with the Thames Tideway Tunnel during the operational phase, impacts from other TT sites including Kirtling Street site, would be localised and would not have operational impacts on the Heathwall Pumping Station site. Therefore, only the localised transport issues around the Heathwall Pumping Station site are assessed (i.e. other Thames Tideway Tunnel sites are not considered).

Operational assessment area

15.3.33 The assessment area for the operational assessment remains the same as for the construction assessment as set out in paras. 15.3.8 to 15.3.11.

Operational assessment year

15.3.34 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 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.

15.4 Baseline

15.4.1 This section sets out the baseline conditions on the local transport network in the vicinity of the Heathwall Pumping Station site in 2012, with the exception of the traffic survey data and public transport timetables which were collected in 2011.

Policy review

15.4.2 The site is located within the LB of Wandsworth; the relevant national, regional and local policy documents have been reviewed. This review is included in Appendix A.

Existing land use

15.4.3 The site comprises of Thames Water Heathwall Pumping Station, which is an operational foul and storm water pumping station, to the west, Middle Wharf (a former concrete batching plant) to the east and an area of foreshore to the north.

15.4.4 The surrounding area is in a mixed use area comprising commercial, offices, industrial uses, residential properties and moorings. The nearest residential properties are house boat moorings located approximately 50m to the west of the site and Elm Quay Court, to the east of the site.

Existing access

15.4.5 The site can be accessed directly from Nine Elms Lane (A3205), which forms part of the TLRN. There are four existing access points to the site all along the southern boundary of the site, providing access to Nine Elms

Lane (A3205). Two of these access points are associated with the existing pumping station and are located against the eastern and western boundaries of the existing pumping station site. The remaining two access points are the one way entrance and exit to Middle Wharf.

15.4.6 The site is not currently accessible to the public.

Pedestrian network and facilities

15.4.7 The existing pedestrian network and facilities in the vicinity of the site are described below and shown in Figure 15.4.1 in the Heathwall Pumping Station *Transport Assessment* figures.

15.4.8 The key pedestrian network to and from the site is directly related to local public transport services including bus stops and National Rail stations.

15.4.9 The key pedestrian network related to the Heathwall Pumping Station site are:

a. Thames Path

b. Nine Elms Lane - Battersea Park Road (A3205) which provides pedestrian connections to bus stops located on Nine Elms Lane (A3205), and Vauxhall Cross rail stations to the northeast of the site, and to Battersea Park Network Rail station to the southwest of the site.

Thames Path

15.4.10 The Thames Path routes along the riverside north of Battersea Park before routing south to connect with Battersea Park Road (A3205) via The Queen's Circus junction. The path continues east routing down Kirtling Street to return to the riverside. The path meets Nine Elms Lane (A3205) for a short distance at the Heathwall Pumping Station site before it returns to the riverside routing towards Vauxhall Bridge.

15.4.11 Plate 15.4.1 shows the Thames Path at the Heathwall Pumping Station site.

Plate 15.4.1 The Thames Path

Nine Elms Lane

15.4.12 Nine Elms Lane (A3205) provides a continuous southwest-northeast link for pedestrians along the southern side of the River Thames. Nine Elms Lane (A3205) routes parallel to the course of the River Thames.

15.4.13 The footways on either side of Nine Elms Lane (A3205) vary in width between 1.5m and 4m.

15.4.14 Signalised pedestrian crossings are available on all three arms of the junction of Ponton Road and Nine Elms Lane (A3205). These crossing points include tactile paving and dropped kerbs.

15.4.15 Pedestrian crossing facilities with dropped kerbs and tactile paving are provided on the Nine Elms Lane (A3205) and New Covent Garden Market access road arms of the signalised crossroad junction with these roads and Kirtling Street and Battersea Park Road (A3205).

15.4.16 Additional signalised pedestrian crossing facilities are provided at the junctions of Nine Elms Lane (A3205) with St George's Wharf and Wandsworth Road (A3036) to the east of the site and at the junctions of Battersea Park Road (A3205) with Prince of Wales Drive to the west of the site.

15.4.17 At the junction of Cringle Street and Nine Elms Lane no formal crossing points are provided. However dropped kerbs and tactile paving are provided on the Cringle Street arm of the junction.

15.4.18 There are no formal crossing points located at the existing access points to Heathwall Pumping Station or the vacant land to the east of the

pumping station which would form part of the construction site. The carriageway is raised to footway level at these crossing points and there is no tactile paving in place.

15.4.19 Nine Elms Lane (A3205) footway at the access to Heathwall Pumping Station is shown in Plate 15.4.2.

Plate 15.4.2 Footway along Nine Elms Lane (A3205)

Cycle network and facilities

15.4.20 The existing cycle network and facilities in the vicinity of the site are described below and shown in Figure 15.4.1 in the Heathwall Pumping Station *Transport Assessment* figures.

15.4.21 Cyclists are not permitted to use the Thames Path in this area.

15.4.22 The main cycle route within the area is National Cycle Network Route 4 (off-road) which routes along the Nine Elms Lane (A3205) footways north-eastwards and south-westwards. The cycle path is shared with the footway.

15.4.23 Road markings and signage are in place to alert people to the presence of the cycle path. Additionally, cyclists are permitted to use the Nine Elms Lane (A3205) bus lanes which are in operation as bus lanes between 07:00 – 19:00.

15.4.24 Advanced stop lines for cyclists are in place at the junctions of Nine Elms Lane (A3205) with Ponton Road and Kirtling Street.

Plate 15.4.3 Cycle Route along Nine Elms Lane (A3205)

Barclays Cycle Superhighways

15.4.25 Barclays Cycle Superhighways (CS) are new cycle routes that route 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.

15.4.26 The closest CS to the site is CS8 which routes between Wandsworth and Westminster. CS8 passes along Battersea Park Road (A3205) and Queenstown Road (A3216) to Chelsea Bridge (A3126) continuing from there to Westminster. The cycle journey time between Wandsworth and Westminster is approximately 30 minutes. The closest point on CS8 to the Kirtling Street site is at Queenstown Road (A3216) approximately 1.1km walking distance to the southwest of the site.

Barclays Cycle Hire scheme

15.4.27 The closest Barclays Cycle Hire docking station is at Vauxhall Cross, approximately 900m walking distance or 11 minutes walking time to the east of the site. The docking station is located on the western footway of Parry Street (A3036) and accommodates 16 bicycles.

Cycle parking

15.4.28 There is no public cycle parking near to the Heathwall Pumping Station site. The closest cycle parking facilities are provided at the Battersea Park National Rail station on Battersea Park Road (A3205) within the western

footway approximately 1.0km walking distance southwest of the site; where there are two 'Sheffield' style parking stands provided.

15.4.29 Cycle parking facilities are also provided at:

a. Vauxhall Cross rail and bus stations with the Vauxhall gyratory, approximately 1.1km walking distance east of the site with eight 'Sheffield' style stands and several more beneath the bridge arch

b. Queenstown Road rail station approximately 1.3km walking distance southwest of the site with eight 'Sheffield' style stands.

Public transport

Public Transport Accessibility Level

15.4.30 The Public Transport Accessibility Level (PTAL) of the site has been calculated using TfL's approved PTAL methodology (TfL, 2010)[3] (analysis is included in Appendix B). The 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).

15.4.31 Using this methodology the site has a PTAL rating of between 3 and 4, rated as 'moderate' (with 1 being the lowest accessibility and 6b being the highest accessibility). It should be noted that the completion of the planned Northern Line Extension in the area would increase the PTAL rating in the future.

15.4.32 The following sections detail the public transport services in the vicinity of the site which are shown on Figure 15.4.2 in the Heathwall Pumping Station *Transport Assessment* figures.

Bus services

15.4.33 Two day time bus routes operate within 640m walking distance of the site. Table 15.4.1 provides a summary of the bus services operating at the nearest bus stop to the site and their frequencies during the weekday peaks.

15.4.34 These bus routes operate from the following bus stops:

a. Cringle Street (Nine Elms Lane (A3205) – eastbound and westbound 160m walking distance southwest of the site

b. Elm Quay Court (Nine Elms Lane (A3205) – eastbound and westbound – 190m walking distance northeast of the site)

c. Sleaford Street (Nine Elms Lane (A3205) - eastbound and westbound – 450 walking distance southwest of the site)

d. Wandsworth Road (Nine Elms Lane (A3205) – eastbound and westbound – 600m walking distance northeast of the site).

15.4.35 On average there are 17 bus services per hour in the AM peak hour and 17 bus services per hour in the PM peak hour (in each direction) within 640m walking distance of the Heathwall Pumping Station site.

15.4.36 A bus stand is located on Cringle Street that allows TfL buses to park when not in operation. As far as can be established this stand is not regularly used by TfL buses.

15.4.37 There is a night time bus route serving within a 640m walking distance of the site, route 344, which stops at Cringle Street, and is a 24 hour service with two to four buses per hour during the night.

15.4.38 Vauxhall bus station (at Vauxhall Cross within Vauxhall gyratory) is located approximately 950m to the northeast of the site. This bus station is served by a large number of bus services.

15.4.39 On average there are approximately 146 daytime bus services in total per hour in the AM and PM peak to and from Vauxhall bus station. 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.

Table 15.4.1 Existing day time local bus services and frequency (number of buses per hour)*

Bus number	Origin - destination	Nearest bus stop to Heathwall Pumping Station site	Approximate walking distance from Heathwall Pumping Station site (m)	Weekday peak hour two-way frequencies	
				AM peak (08:00-09:00)	PM peak (17:00-18:00)
156	Archway Station – Waterloo Station	Elm Quay Court	150	8	8
	Waterloo Station – Archway Station			8	7
344	Clapham Junction – Liverpool Street Station			9	9
	Liverpool Street Station – Clapham Junction			9	10

**Transport for London (TfL) (2011) Timetables. Available at: www.tfl.gov.uk (Accessed: 13 October 2011)*

London Underground

15.4.40 As shown on Figure 15.4.2 in the Heathwall Pumping Station *Transport Assessment* figures, Vauxhall Underground station, which is served by the Victoria Line, is located approximately 950m walking distance or 12 minutes walking time to the northeast of the site.

15.4.41 Currently in the AM and PM peak hours, the service frequency on the Victoria Line is approximately every two to five minutes, providing up to 21 services per hour in each direction.

15.4.42 Table 15.4.2 provides a summary of the London Underground services and their frequencies during the weekday peaks

Table 15.4.2 Existing London Underground services and frequency (number of services per hour)*

Line	Origin - destination	Approximate walking distance from Heathwall Pumping Station site (m)	Weekday peak hour two-way frequencies	
			AM peak (08:00-09:00)	PM peak (17:00-18:00)
Victoria Line	Seven Sisters – Brixton	950	21	21
	Brixton – Seven Sisters		21	21

Source: Transport for London (TfL) (2011) Timetables. Available at: www.tfl.gov.uk (Accessed: 13 October 2011)

National Rail

15.4.43 As shown in Figure 15.4.2 in the Heathwall Pumping Station *Transport Assessment* figures, the closest National Rail station to the site is Vauxhall rail station, approximately 950m walking distance or 12 minutes walking time to the northeast of the site.

15.4.44 Vauxhall station provides access to Southwestern train services to and from Guildford, Woking, Clapham Junction, Chessington South, Hampton Court and Shepperton in the south and London Waterloo to the north.

15.4.45 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).

15.4.46 Queenstown Road and Battersea Park National Rail stations are located slightly further from the site. Queenstown Road station is located approximately 1.3km walking distance or 16 minutes walking time to the southwest of the site and Battersea Park Station is located 1km walking distance or 13 minutes walking time also to the southwest of the site.

15.4.47 Queenstown Road provides access to Southwest train services and provides northbound services to London Waterloo, and southbound services to Weybridge.

15.4.48 In the AM and PM peak hour there are approximately 16 services (eight southbound and eight northbound services) which call at Queenstown Road.

15.4.49 Battersea Park Station provides access to Southern Railway train services and provides northbound services to London Victoria, and southbound services to Sutton (Surrey), London Bridge and Caterham.

15.4.50 In the AM peak hour there are approximately 28 services (18 southbound and 10 northbound). In the PM peak hour there are approximately 25 services (15 southbound and 10 northbound).

15.4.51 Table 15.4.3 provides a summary of the National Rail services and their frequencies during the weekday peaks.

Table 15.4.3 Existing national rail services and frequency (number of services per hour)[3]

National Rail station	Origin - destination	Approximate walking distance from Heathwall Pumping Station site (m)	Weekday peak hour two-way frequency	
			AM peak (08:00-09:00)	PM peak (17:00-18:00)
Vauxhall	Waterloo – Aldershot, Chessington, Dorking, Effingham Junction, Guildford, Hampton Court, Hounslow, Kingston, Shepperton, Reading, Richmond, Windsor, Woking	950	90	82
Queenstown Road	London – Hounslow, Richmond, Kingston, Windsor, Weybridge, Ascot, Guildford & Reading	1,300	8	8
	Reading, Guildford, Ascot, Weybridge, Windsor, Kingston, Richmond, Hounslow – London		8	8
Battersea Park	London – Luton – London – Milton Keynes Central –– East and West Croydon	1,000	12	7
	East and West Croydon – Milton Keynes Central – London – Luton – London		12	12
	London Bridge – London Victoria (Croydon and East London Line)		4	4
	London Victoria – London Bridge (Croydon and East London Line)		4	4

Source: Railplanner information and timetables: www.nationalrail,co,uk (site last accessed March 2012)

River passenger services

15.4.52 St George Wharf Pier is within approximately 750m walking distance northeast of the site which provides river passenger services. This river passenger service is shown on Figure 15.4.2 in the Heathwall Pumping Station *Transport Assessment* figures.

15.4.53 St George Wharf Pier is served by Thames Clippers services. Thames Clippers services run between St George Wharf Pier and London Eye Millennium Piers in the west and Woolwich Arsenal Pier in the east.

15.4.54 River passenger services at St George Wharf Pier provide a route to Blackfriars Millennium Pier in the AM and PM peak hours with two services in each direction with a frequency of approximately every 30 minutes. Outside of peak hours the service travels from St George Wharf to Bankside via Milbank and Embankment. The frequency of both eastbound services during the weekend is approximately every 30 minutes in peak hours. Embankment Pier, east of St George Wharf is also served by Thames Executive Charters to Putney Pier in the west and Blackfriars Millennium Pier in the northeast. Onward connections can be made at Blackfriars Millennium Pier for eastbound piers as far as Woolwich Arsenal. St George Wharf Pier is currently accessed from the western footway of Vauxhall Bridge Road (A202) and ticketing is located at the entrance to the pier.

15.4.55 The frequency distribution of the all the services that stop at the pier near the Heathwall Pumping Station site are shown in the river navigation section.

River navigation

15.4.56 The site is located approximately 370m east of Cringle Dock, which is a waste transfer station for the Western Riverside Waste Authority. Waste arriving at this facility is containerised and transported by barge to the new Belvedere energy from waste plant. This is a daily operation and comprises arriving and departing tugs towing up to three barges.

15.4.57 The dock itself is of a ‘finger’ design, meaning it is cut headlong into the embankment, with barges being berthed within the dock and along the river wall to the west of the dock entrance. Currently tugs arriving and departing the dock have to manoeuvre around the existing operational aggregates jetty that forms part of the Kirtling Street site. This operation can only be performed when the river is in the correct tidal state, as the dock and foreshore dry out at low tide.

15.4.58 The site is also located approximately 355m east of Kirtling Wharf, which is a concrete batching facility for Cemex. Aggregates arriving at this facility from either Cemex’s Dagenham Terminal or Angerstein Wharf in Charlton is batched and delivered to construction sites via concrete lorries. This is a weekly operation with two to four barges per week, depending on demand, arriving at the site.

15.4.59 Access from these facilities to Cringle Dock and Kirtling Wharf would also be affected by the temporary jetty serving the Kirtling Street site. This could lead to minor delays to barges docking and leaving the jetty.

15.4.60 With respect to river navigation, the closest pier to the site is St George Wharf Pier, which is downstream and located 750m away, on the south side of the River Thames.

15.4.61 Other river traffic, including commercial freight and passenger traffic, and private leisure traffic, pass the Heathwall Pumping Station site and it is estimated that the peak hour is between 14:00 to 15:00, Monday to Friday. During this hour it is estimated that about 11 vessels typically pass the site. There are also a further two to three vessels (on average) calling at Cringle Dock. This figure however, is not constant as freight vessel transit patterns are influenced by the rising and falling tide. Therefore, such a peak will only occur every 10 to 12 days when the tide is at its highest.

15.4.62 Table 15.4.4 shows the estimated typical passing river traffic rate.

Table 15.4.4 Aggregated typical river movement frequencies (number of 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
Heathwall Pumping Station	1	2	5	2	2	1	1	6	11	6	9	2	2	2	0	0	0	0

Taxis

15.4.63 There are no taxi rank facilities within 960m of the site.

Highway network and operation

15.4.64 The site is located on Nine Elms Lane (A3205) which forms part of the TLRN and is a four lane single carriageway of which one lane on each side of the road is a bus lane. A 30mph speed limit applies and the road is suitable for HGVs and long vehicles. The road links to the Vauxhall Cross roundabout (A3036) in the east and Queenstown Road (A3216) in the west.

15.4.65 Construction vehicles would approach and depart from the Heathwall Pumping Station site via the following network of A roads as shown in Figure 15.2.2 in the Heathwall Pumping Station *Transport Assessment* figures:

a. Nine Elms Lane – Battersea Park Road (A3205)

b. Queenstown Road (A3216)

c. Wandsworth Road (A3036) and Albert Embankment (A3036)

d. Parry Street (A3205) and South Lambert Road (A203)

e. Vauxhall gyratory.

15.4.66 Nine Elms Lane (A3205) / Battersea Park Road (A3205) forms part of the TLRN and is a four lane carriageway of which one lane on each side of the road is a bus lane.

15.4.67 The Nine Elms Lane (A3205) / Battersea Park Road (A3205) / Kirtling Street / New Covent Garden access road junction is controlled by traffic signals. This junction provides access to New Covent Garden Market and the junction has advanced right-turn lanes provided for both Kirtling Street and New Covent Garden Market.

15.4.68 There are further signalised junctions along Nine Elms Lane (A3205) / Battersea Park Road (A3205) to the southwest of Kirtling Street, including those at Prince of Wales Drive and Queenstown Road (A3216). To the northeast there are also a number of signalised junctions, including Ponton Road, St George Wharf and Wandsworth Road (A3036).

15.4.69 Nine Elms Lane (A3205) links to the Parry Street (A3205) / Wandsworth Road (A3036) junction to the north and Battersea Park Road (A3205) to Queenstown Road (A3216) to the south.

15.4.70 Queenstown Road (A3216) is a three lane single carriageway travelling in a north-south direction including a northbound bus lane providing access to Battersea Park and Central London. Queenstown Road forms part of the SRN.

15.4.71 Nine Elms (A3205) / Parry Street (A3205) / Wandsworth Road (A3036) junction is a four-arm signalised junction and northwards of this junction, Wandsworth Road (A3036) provides a connection with the Vauxhall gyratory.

15.4.72 The Parry Street (A3036) / South Lambeth Road junction is a three-arm signalised junction and northwards of this junction, South Lambeth Road (A202) provides a connection with the Vauxhall gyratory.

15.4.73 Vauxhall gyratory, to the northeast of the site, provides a six lane one way system which includes a bus lane around Vauxhall Cross which itself provides access to Vauxhall London Underground and bus stations.

15.4.74 The existing capacity on the highway network has been established based on the baseline modelling results from the highway assessment of the nearby Kirtling Street site.

15.4.75 The modelling outputs for the baseline situation of the signalised Battersea Park Road (A3205) / Nine Elms Lane (A3205) / Kirtling Street / New Covent Garden access road junction and the priority Nine Elms Lane (A3205) / Cringle Street junction are shown in Table 15.4.10 and Table 15.4.11. The overall junction performances show that both junctions are operating within capacity in the weekday AM and PM peak hours.

Parking

15.4.76 Figure 15.4.3 in the Heathwall Pumping Station *Transport Assessment* figures shows the locations of the existing car and coach parking within the vicinity of the Heathwall Pumping Station site.

Existing on-street car parking

15.4.77 On-street parking in place along Kirtling Street and Cringle Street which are approximately 200m or three minutes walking time from the Heathwall Pumping Station site. The majority of the parking provision is restricted to one side of the carriageway; however some sections of Kirtling Street have parking on both sides of the carriageway.

15.4.78 Parking in the side streets in this area is unrestricted and not subject to a controlled parking zone (CPZ).

15.4.79 No on-street parking permitted along Nine Elms Lane (A3205) or Battersea Park Road (A3205), which form part of the TLRN.

15.4.80 Table 15.4.5 summarises the parking restrictions and the number of bays on the roads in the vicinity of the site.

Table 15.4.5 Existing on-street car parking

Road name	Type of parking restrictions and number of bays
	Unrestricted
Kirtling Street	10
Cringle Street	56
Sleaford Street	28
Total	**94**

15.4.81 There are a total of 94 unrestricted parking bays on Kirtling Street, Cringle Street and Sleaford Street.

15.4.82 There is also on-street parking in place along Ponton Road on the southern side of Nine Elms Lane (A3205). The parking provision is provided on both sides of the carriageway.

Existing off-street/private car parking

15.4.83 A Sainsbury's car park is located on Wandsworth Road approximately 1km walking distance (13 minute walk time) east of Kirtling Street site and is open Monday to Friday between 07:00 - 23:00, Saturday between 07:00 - 22:00 and Sunday 12:00 - 18:00. This car park has 450 parking bays and is intended for customers' use only.

15.4.84 The riverboat communities on Nine Elms have 14 parking spaces within the 'Riverlight' development that is adjacent to the Kirtling Street site.

Coach parking

15.4.85 The nearest coach parking is New Covent Garden Market Coach Park which is immediately southwest of the site at the junction between Kirtling Street and Battersea Park Road (A3205). There are 25 bays available which are intended for customers' use only.

Car clubs

15.4.86 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.

15.4.87 The nearest car club parking space to the site is located in St George's Wharf car park; approximately 850m walking distance northeast of the site. Three cars are available at this location and are operated by Zipcar.

15.4.88 Further car club spaces are available on Thessaly Road to the south-west of the site and Bondway Road and Lawn Lane to the south-east of the site.

Servicing and deliveries

15.4.89 Off-street loading bays located south-west of the site and accessed from Kirtling Street are used to service the Nine Elms Pier houseboats. These bays are temporary until the Riverlight development has been completed, when the house boat resident servicing will take place from within the Riverlight development.

15.4.90 There are no on-street loading bays available near to the Heathwall Pumping Station site. Nine Elms Lane (A2305) is a Red Route and no stopping is permitted along this road at any time. There are however, a number of unrestricted parking areas along Cringle Street and Kirtling Street which could be used for on-street servicing and deliveries.

Baseline survey data

Description of data

15.4.91 Automatic Traffic Count (ATC) data for Nine Elms Lane (A3205) was obtained from TfL and was analysed to identify traffic flows along this road

in May to June 2011. These flows are discussed in paras. 15.4.113 to 15.4.119.

15.4.92 Five year accident data on the roads in the vicinity of the site was obtained from TfL. This data is discussed in paras. 15.4.137 to 15.4.144.

15.4.93 Baseline survey data were collected in May, July, and September 2011 to establish the existing transport movements in the area. Figure 15.4.4 in the Heathwall Pumping Station *Transport Assessment* figures shows the survey locations in the vicinity of the Kirtling Street site. The Project Wide *TA* includes the baseline report which provides full detail of the surveys undertaken and the data collected.

15.4.94 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.

15.4.95 The surveys included manual and automated traffic surveys undertaken to establish specific traffic, pedestrian and cycle movements including turning volumes, queue lengths, saturation flows, degree of saturation and traffic signal timings. Parking surveys were also undertaken to establish the usage of on-street car parking. The third phase of surveys was conducted in September 2011 to establish the summer usage of Thames Path.

15.4.96 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.

15.4.97 The surveys undertaken and their locations are summarised in Table 15.4.6 and shown on Figure 15.4.4 in the Heathwall Pumping Station *Transport Assessment* figures.

Table 15.4.6 Survey types and locations

Survey type and location	Date
Junction turning movement survey (including pedestrian and cycle movements)	
Battersea Park Road (A3205) / Nine Elms Lane (A3205) / Kirtling Street	17th and 21st May 2011
Nine Elms Lane (A3205) / Cringle Street	17th and 21st May 2011
Automatic Traffic Count (ATC)	
Nine Elms Lane (A3205), 650m east of Ponton Road (approximately 50m to the northeast of Ponton Road)	20th May to 12th June 2011

Survey type and location	Date
Pedestrian and cycle survey	
Nine Elms Lane (A3205) northern footway at riverside path access approximately 280m north of Cringle Street at the junction of the western Heathwall Pumping Station site access	14th and 10th Sept 2011
Thames Path adjacent to Battersea Barge restaurant	17th and 21st May 2011
Battersea Park Road (A3205), between Sleaford Street and Thessaly Road	17th and 21st May 2011
Nine Elms Lane (A3205) northern footway across Kirtling Street	14th and 10th Sept 2011
Nine Elms Lane (A3205) northern footway across Cringle Street	14th and 10th Sept 2011
Parking surveys	
Battersea Park Road (A3205) / Nine Elms Lane (A3205) between Kirtling Street and 100m east of Sleaford Street, and Sleaford Street	9th and 11th June 2011
Kirtling Street and Cringle Street	9th and 11th June 2011

15.4.98 Pedestrian and cyclist flow data from the pedestrian and cyclist surveys provided the baseline pedestrian traffic data sets which are set out in Table 15.4.7 and Table 15.4.8.

15.4.99 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. 15.4.124 to 15.4.135.

15.4.100 The following junction surveys and ATCs are on construction traffic routes to and from the Heathwall Pumping Station site:

a. Battersea Park Road (A3205) / Nine Elms Lane (A3205) / Kirtling Street / New Covent Garden Market access road

b. Nine Elms Lane (A3205) / Cringle Street

c. Nine Elms Lane (A3205), approximately 50m northeast of Ponton Road.

Results of the surveys

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

Pedestrians

15.4.102 Pedestrian surveys were undertaken at five locations around the site as on Figure 15.4.4 in the Heathwall Pumping Station *Transport Assessment* figures during the AM and PM peak hours.

15.4.103 Pedestrian surveys were also undertaken at the Battersea Park Road (A3205) / Nine Elms Lane (A3025) / Kirtling Street / New Covent Garden Market access road pedestrian crossings and Nine Elms Lane (A3205) / Cringle Street pedestrian crossings as part of the junction surveys.

15.4.104 Table 15.4.7 indicates the survey locations and flow of pedestrians along the main routes surrounding the site.

15.4.105 The pedestrian surveys show that there is a higher volume of pedestrian and cycle movements along Nine Elms Lane - Battersea Park Road (A3205) than along the Thames Path.

15.4.106 The pedestrian surveys show that there is a low flow of pedestrians during the AM peak hour along the Thames Path footway adjacent to the Battersea Barge restaurant of approximately 21 pedestrians in total. During the PM peak hour the flow is similar with approximately 11 pedestrians in total on the Thames Path. There was no notable variation between the May and September surveys.

15.4.107 A survey along Battersea Park Road (A3025) between Thessaly Road and Sleaford Street indicated a higher volume of pedestrian movements during the AM peak hour of approximately 205 pedestrians in total. During the PM peak hour the flow is slightly lower with approximately 170 pedestrians in total on this section of road.

15.4.108 Pedestrian flows between Kirtling Street and the Thames Path link to the north of Cringle Street were recorded as less than 45 two-way movements in the AM peak and less than 63 in the PM peak.

Table 15.4.7 Existing pedestrian flow

Road/route	Direction	Weekday			Weekend
		AM peak (08:00-09:00)	Inter-peak (12:00-13:00)	PM peak (17:00-18:00)	Saturday peak hour (13:00-14:00)
Thames Path adjacent to Battersea Barge restaurant (May 2011)	Westbound	8	9	4	3
	Eastbound	13	16	7	10
Thames Path adjacent to Battersea Barge restaurant (Sept 2011)	Westbound	3	3	6	-
	Eastbound	5	0	8	-
Battersea Park Road(A3205), between Sleaford Street and Thessaly Road	Westbound	102	61	97	81
	Eastbound	103	44	73	50
Nine Elms Lane(A3205) northern footway across Kirtling Street	Northeastbound	32	15	31	48
	Southwestbound	13	11	31	46
Nine Elms Lane (A3205) northern footway across Cringle Street	Northeastbound	31	8	34	64
	Southwestbound	6	5	26	35
Nine Elms Lane (A3205) northern footway at riverside path access approximately 280m north of Cringle Street at the Heathwall Pumping Station access -					
Thames Path to Nine Elms Lane (A3205) east	Northeastbound	11	3	1	9
Nine Elms Lane (A3205) east to Thames Path	Northwestbound	1	4	1	2
Nine Elms Lane (A3205) east to Nine Elms Lane (A3205) west	Northwestbound	8	10	27	34
Nine Elms Lane (A3205) west to Nine Elms Lane (A3205) east	Southeastbound	29	13	36	45

Road/route	Direction	Weekday			Weekend
		AM peak (08:00-09:00)	Inter-peak (12:00-13:00)	PM peak (17:00-18:00)	Saturday peak hour (13:00-14:00)
Battersea Park Road (A3205)/ Nine Elms Lane (A3025) / Kirtling Street pedestrian crossings -					
Nine Elms Lane (northeast arm)	Southeastbound	2	0	1	1
	Northwestbound	5	1	1	1
New Covent Garden access (southeast arm)	Southwestbound	19	5	28	17
	Northeastbound	36	4	17	19
Kirtling Street (northwest arm)	Northeastbound	36	13	15	16
	Southwestbound	19	16	25	26
Nine Elms Lane (A3205) / Cringle Street pedestrian crossings -					
Nine Elms Lane (southwest arm)	Eastbound	2	3	2	0
	Westbound	18	2	5	5

Cyclists

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

15.4.110 Table 15.4.8 indicates the flows of cyclists along the main routes surrounding the site.

15.4.111 The cycle surveys show that movements in and out of both Kirtling Street and Cringle Street were low, as were the cyclist movements on Thames Path. There was no discernible variation between the May and September surveys.

15.4.112 The junction survey counts suggest a large amount of cyclist travelling northeast bound along Battersea Park Road (A3205) and Nine Elms Lane (A3205) up to 279 cyclists in the AM peak. In the PM peak, this reduced to less than 55. In the opposite direction, cyclist movements amounted to less than 34 southwest bound in the AM peak and less than 84 in the PM peak (at the Nine Elms Lane (A3205) / Cringle Street junction).

Table 15.4.8 Existing cycle traffic

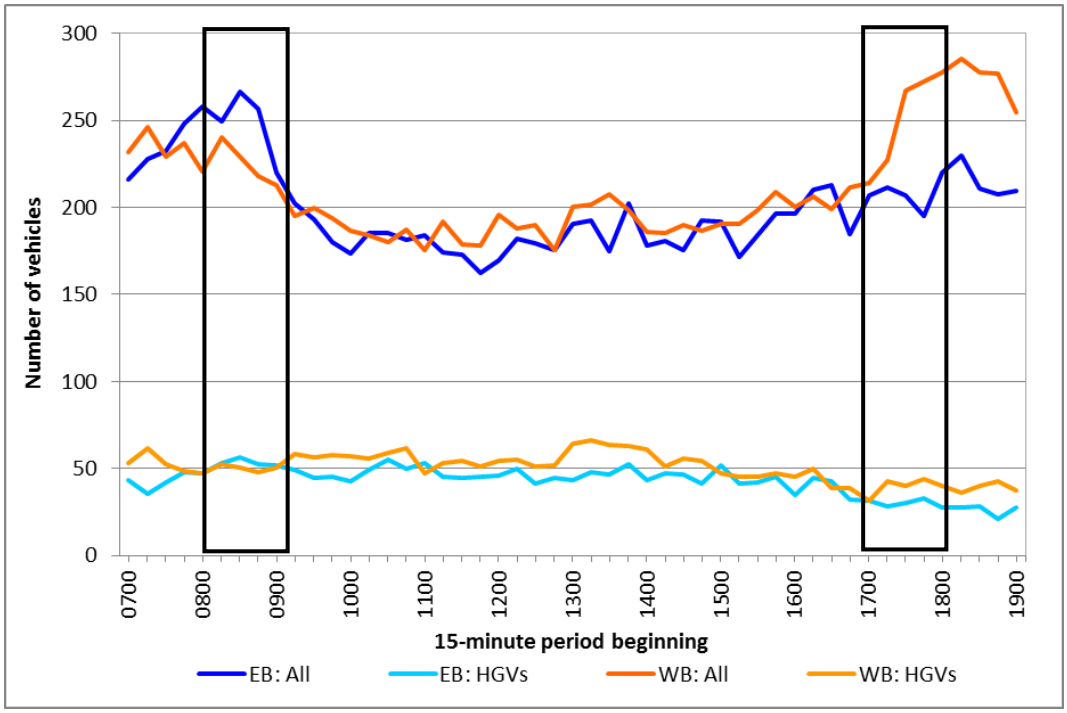
Road/route	Direction	Weekday			Weekend
		AM peak (08:00-09:00)	Inter-peak (12:00-13:00)	PM peak (17:00-18:00)	Saturday peak hour (13:00-14:00)
Thames Path adjacent to Battersea Barge restaurant (May 2011)	Westbound	2	2	1	1
	Eastbound	0	1	2	2
Thames Path adjacent to Battersea Barge restaurant (Sept 2011)	Westbound	2	0	2	-
	Eastbound	0	0	0	-
Battersea Park Road(A3205), between Sleaford Street and Thessaly Road	Westbound	8	4	3	2
	Eastbound	3	7	14	7
Nine Elms Lane(A3205) northern footway across Kirtling Street	Northeastbound	1	2	1	5
	Southwestbound	2	1	8	3
Nine Elms Lane (A3205) northern footway across Cringle Street	Northeastbound	0	3	4	5
	Southwestbound	1	0	9	1
Nine Elms Lane (A3205) northern footway at riverside path access approximately 280m north of Cringle Street -					
Thames Path to Nine Elms Lane (A3205) east	Northeastbound	0	0	2	0
Nine Elms Lane (A3205) east to Thames Path	Northwestbound	0	0	0	0
Nine Elms Lane (A3205) east to Nine Elms Lane (A3205) west	Northwestbound	1	0	10	3
Nine Elms Lane (A3205) west to Nine Elms Lane (A3205) east	Southeastbound	1	3	6	5

Road/route	Direction	Weekday			Weekend
		AM peak (08:00-09:00)	Inter-peak (12:00-13:00)	PM peak (17:00-18:00)	Saturday peak hour (13:00-14:00)
Battersea Park Road (A3205)/ Nine Elms Lane (A3025) / Kirtling Street on carriageway -					
Nine Elms Lane (northeast arm)	Northeastbound	272	17	51	31
	Southwestbound	1	0	2	1
New Covent Garden access (southeast arm)	Southeastbound	2	0	2	2
	Northwestbound	0	3	0	2
Nine Elms Lane (southwest arm)	Southwestbound	1	4	6	3
	Northeastbound	279	18	53	32
Kirtling Street (northwest arm)	Northwestbound	5	1	1	0
	Southeastbound	0	1	5	1
Nine Elms Lane / Cringle Street on carriageway					
Nine Elms Lane (northeast arm)	Northeastbound	268	17	55	32
	Southwestbound	33	9	83	23
Nine Elms Lane (southwest arm)	Southwestbound	34	9	84	25
	Northeastbound	267	17	54	33
Cringle Street (west arm)	Westbound	0	0	0	1
	Eastbound	2	0	2	2

Traffic flows

15.4.113 The ATC data has been analysed to identify the existing traffic flows along Nine Elms Lane (A3205) northeast of its junction with Ponton Road. The weekday vehicle and HGV flows for a 12-hour period (07:00-19:00) are presented in Table 15.4.4 as this is when the greatest impacts from the project are likely to be experienced.

Plate 15.4.4 Existing 15-minute traffic flows along Nine Elms Lane (A3205) 650m east of Ponton Road (weekday ATC survey)



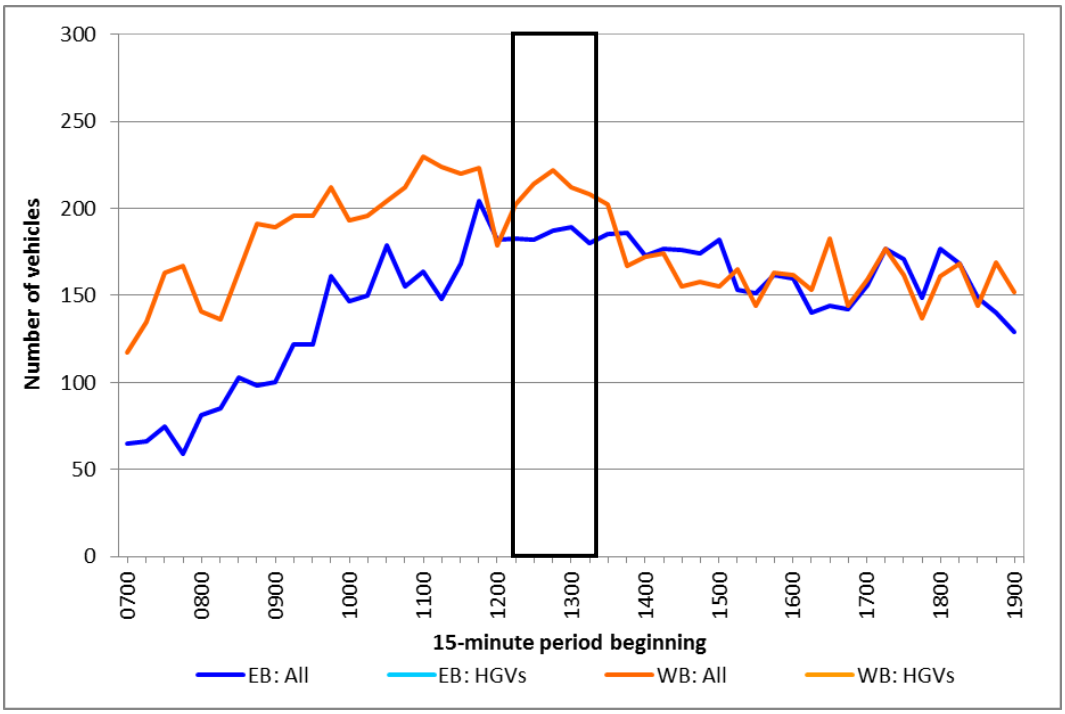
EB – East Bound, WB – West Bound. The black box represents the peak hour traffic flows used for the traffic assessment

15.4.114 The weekday ATC data shows that between 08:00 – 09:00 there are approximately 1,938 two-way vehicle movements. The busiest 15 minute peak period in this period occurred after 08:30 with approximately 266 eastbound vehicles and approximately 229 westbound vehicles.

15.4.115 For the period between 17:00 – 18:00 there are approximately 1,801 two-way vehicle movements. The busiest 15 minute peak period in this period occurred after 17:30 with approximately 207 eastbound vehicles and approximately 267 westbound vehicles.

15.4.116 The Saturday vehicle and HGV flows for a 12-hour period (07:00-19:00) are presented in

Plate 15.4.5 Existing 15-minute traffic flows along Nine Elms Lane (A3205) 650m east of Ponton Road (Saturday ATC survey)

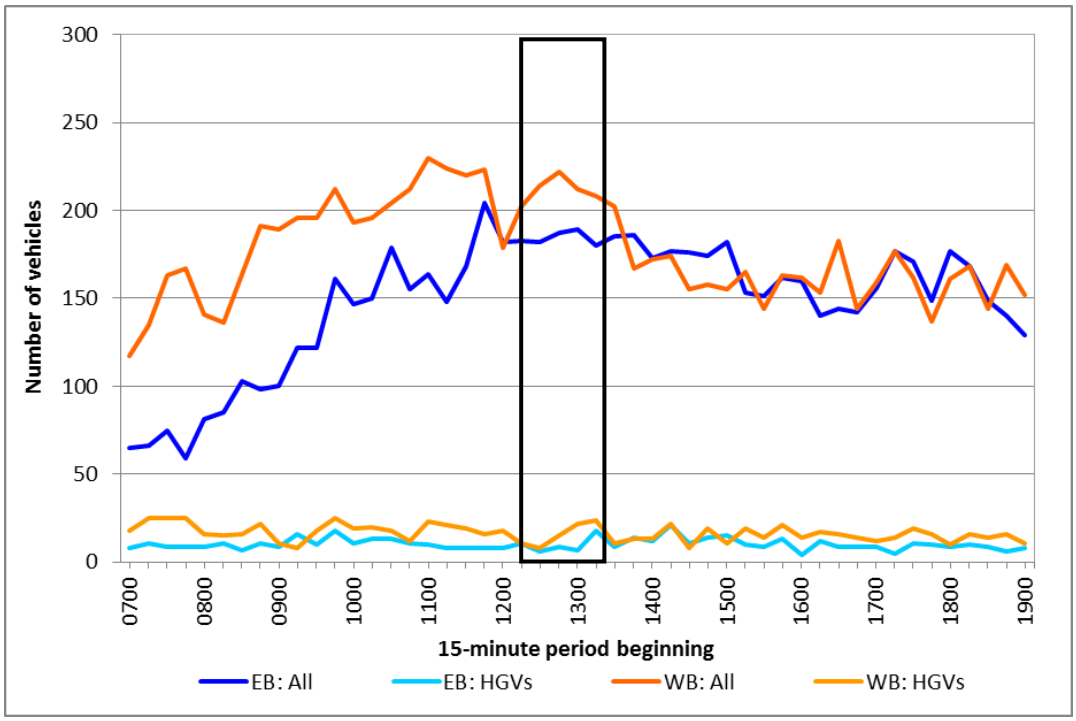


EB – East Bound, WB – West Bound. The black box represents the peak hour traffic flows used for the traffic assessment

15.4.117 Analysis of the data showed that the Saturday peak travel period occurred between 12:15 – 13:15 with 1,411 two-way vehicle movements recorded. This is less than the AM and PM weekday two-way traffic flows and the period falls within the normal weekend construction works vehicle movements period of between 08:00 – 13:00.

15.4.118 The Sunday vehicle and HGV flows for a 12-hour period (07:00-19:00) are presented in Plate 15.4.6.

Plate 15.4.5 Existing 15-minute traffic flows along Nine Elms Lane (A3205) 650m east of Ponton Road (Saturday ATC survey)



EB – East Bound, WB – West Bound. The black box represents the peak hour traffic flows used for the traffic assessment

15.4.119 Analysis of the data showed that the Sunday peak travel period occurred between 12:15 – 13:15 with 1,594 two-way vehicle movements recorded. This is less than the AM and PM weekday two-way traffic flows and the period falls within/outside of the normal weekend construction works vehicle movements period of between 08:00 – 13:00.

Parking

15.4.120 Car parking availability and usage surveys in the area surrounding Heathwall Pumping Station site were undertaken during the AM, inter-peak and PM peaks on a weekday and during the Saturday peak periods.

15.4.121 Table 15.4.9 presents a summary of the parking availability and usage and Plate 15.4.7 depicts the results as a histogram.

15.4.122 The results of the parking surveys indicate that the usage of the on-street parking along Kirtling Street and Cringle Street is moderately well used but that there is spare capacity available on both weekdays and at weekends during the peak and off-peak periods.

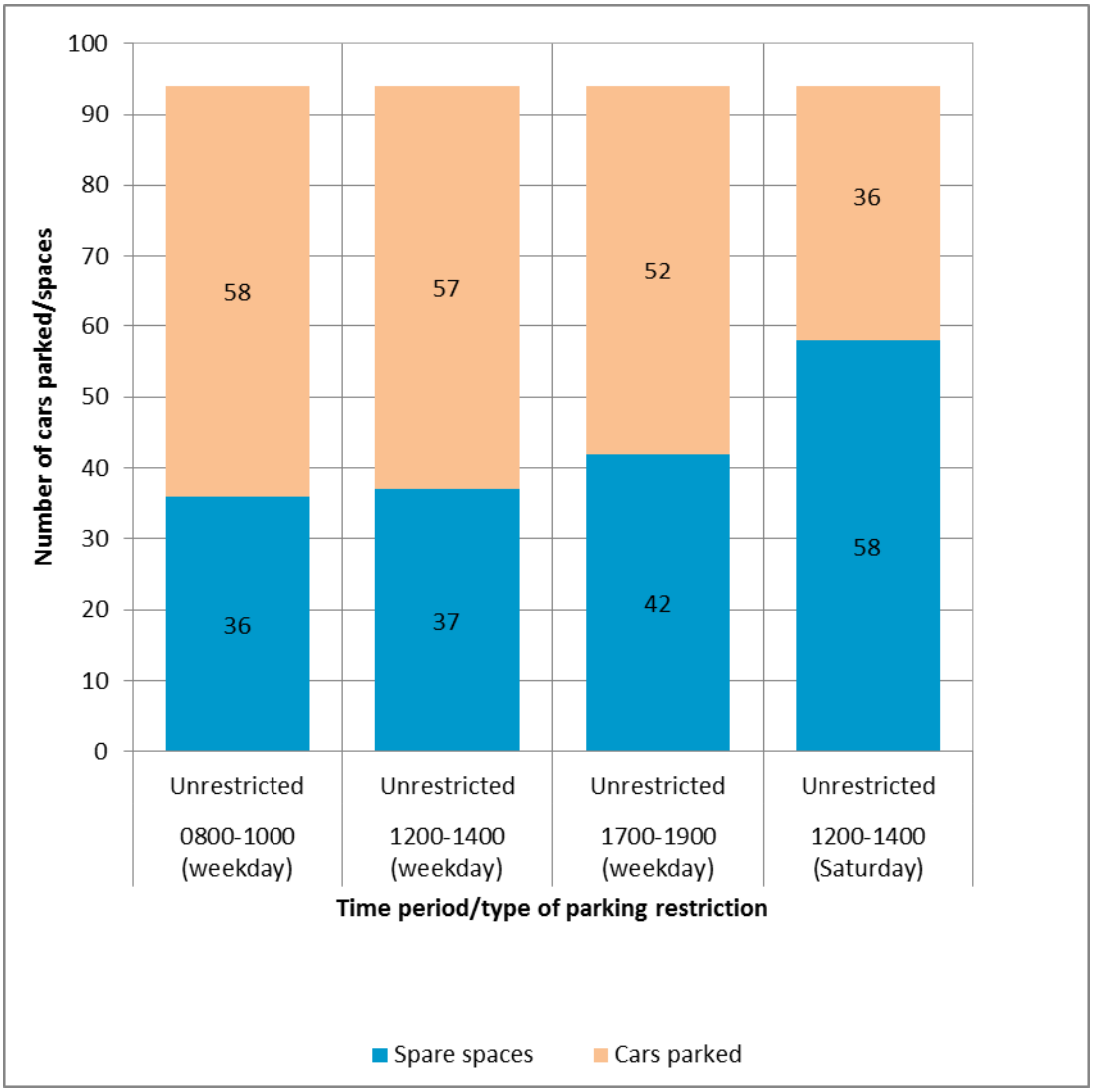
15.4.123 The parking survey suggested that about 60% of all available spaces were used throughout the day. The utilisation is lower in the Saturday peak when compared to the weekday.

Table 15.4.9 Parking bay availability and usage

Location	Number and Type of Bays		No. of spaces available			
			Weekday			Saturday
			08:00-10:00	12:00-14:00	17:00-19:00	12:00-14:00
Kirtling Street	No. of unrestricted parking bays	56	19	20	23	36
Cringle Street	No. of unrestricted parking bays	10	8	6	6	10
Sleaford Street	No. of unrestricted parking bays	28	9	11	13	12

Note: Parking spaces available based on an assumed length of 5m per vehicle

Plate 15.4.6 Existing on-street car parking availability and usage



Local highway modelling

15.4.124 It was agreed with TfL and the LB of Wandsworth that the baseline Kirtling Street model output would provide the baseline for the Heathwall Pumping Station site. The scope discussed with TfL and the LB of Wandsworth for the Kirtling Street site was to model the signalised Kirtling Street / Nine Elms Lane (A3205) / Battersea Park Road (A3205) / New Covent Garden access road junction in LINSIG and the Nine Elms Lane (A3025) / Cringle Street priority junction in PICADY.

15.4.125 Traffic models for these junctions have been developed for this assessment. The models have been constructed using on-site measurements of classified vehicle volumes and queue lengths.

15.4.126 The signal timings used in the assessment of the Kirtling Street / Nine Elms Lane (A3205) / Battersea Park Road (A3205) / New Covent Garden access road junction have been obtained from the TfL Signal Timing Sheet for this junction.

15.4.127 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. 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.

15.4.128 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.

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

15.4.130 The weekday AM and PM baseline model flows for the two junctions were compared against observed queue lengths for the peak periods to validate the LINSIG and PICADY models and ensure reasonable representation of existing conditions.

15.4.131 Figures 15.4.5 and 15.4.6 in the Heathwall Pumping Station *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. Model outputs are included in Appendix C which indicates the lane structure used for the assessment of the junction.

15.4.132 Table 15.4.10 summarises the baseline performance of the signalised Battersea Park Road (A3205) / Nine Elms Lane (A3205) / Kirtling Street / New Covent Garden Market access road junction.

15.4.133 Table 15.4.11 below summarises the baseline performance of the priority Nine Elms Lane (A3205) / Cringle Street junction.

Table 15.4.10 Baseline LINSIG model outputs

Approach	Movement	Weekday							
		AM peak				PM peak			
		(08:00-09:00)				(17:00-18:00)			
		Flow (PCU)	DoS	MMQ (PCU)	Delay (seconds per PCU)	Flow (PCU)	DoS	MMQ (PCU)	Delay (seconds per PCU)
Kirtling Street	Left Ahead Right	27	9%	1	32	33	10%	1	32
Nine Elms Lane (A3205)	Left Ahead	467	50%	7	19	448	48%	7	19
	Ahead Right	418	46%	7	20	412	46%	7	20
New Covent Garden Market	Left	67	10%	1	18	68	10%	1	18
	Right Ahead	27	8%	1	33	22	7%	0	33
Battersea Park Road (A3205)	Left Ahead	377	41%	6	16	380	41%	6	17
	Right	484	44%	6	19	419	40%	6	17
		Practical Reserve Capacity (PRC)		Total Delay (PCU hours)		Practical Reserve Capacity (PRC)		Total Delay (PCU hours)	
Overall junction performance		79.7%		10		85.9%		9	

Notes: DoS represents Degree of Saturation; the ratio of flow to capacity. MMQ represents Mean Maximum Queue for the busiest-case 15 minute modelled period (in vehicle lengths). Delay represents the mean delay per PCU. PRC represents Practical Reserve Capacity; measure of how much additional traffic could pass through a junction whilst maintaining a maximum DoS of 90% on all lanes. PCU value for a car is one PCU. Vans and three-axle vehicles are 1.5 PCUs, vehicles with four or more axles are 2.3 PCUs. Buses and coaches are two PCUs. Motorcycles are 0.4 PCUs and pedal cycles are 0.2 PCUs.

Table 15.4.11 Baseline PICADY model outputs

Approach	Movement	Weekday							
		AM peak				PM peak			
		(08:00-09:00)				(17:00-18:00)			
		Flow (vehs)	RFC	Max. Queue (vehs)	Delay (seconds per veh)	Flow (vehs)	RFC	Max. Queue (vehs)	Delay (seconds per veh)
Cringle Street	Left Ahead Right	18	8%	0	16	62	19%	0	14
Nine Elms Lane (E) (A3205)	Right	25	8%	0	13	25	7%	0	10

Notes: RFC represents Ratio of Flow to Capacity. Queue represents number of vehicles in queue. Delay represents the mean delay per vehicle. Nine Elms Lane (A3205) westbound is not included in table as PICADY model only considers movements where vehicles have to give way.

15.4.134 The LINSIG model outputs demonstrate that the Kirtling Street / Nine Elms Lane (A3205) / Battersea Park Road (A3205) / New Covent Garden Market access road junction is currently operating within capacity in the weekday AM and PM peak hours. The validated model indicates that the AM and PM peak hours are relatively balanced and the Nine Elms Lane (A3205) westbound left and ahead movement is operating within capacity in the baseline, with a Mean Maximum Queue length of approximately seven PCUs estimated in both the AM and PM peak. The delay to vehicles is most significant during the AM and PM peak hours on the New Covent Garden Market right ahead movement, which currently experiences an average of 33 seconds of delay.

15.4.135 The LINSIG junction model output shows that total junction delay is 10 PCU hours in the AM peak period assessed and 9 PCU hours in the PM peak period assessed. These equate to 19 seconds in both the AM and PM peak periods assessed.

15.4.136 The PICADY model outputs demonstrate that the Nine Elms Lane (A3205) / Cringle Street junction is currently operating within capacity in the weekday AM and PM peak hours. The validated model indicates that the PM peak hour is the busiest period and that the traffic turning out of Cringle Street is operating at 19% RFC in that period, but with no queues generated. The longest delay occurs at the AM peak hour with 16 seconds delay on the exit from Cringle Street.

Accident analysis

15.4.137 Accident data within the vicinity of the site has been obtained from TfL and analysed to determine if there are any specific road safety issues, trends or patterns evident on the surrounding highway network.

15.4.138 Data has been obtained for a 5 year period, up until the 31st March 2011. Figure 15.4.7 in the Heathwall Pumping Station *Transport Assessment* figures indicates the accidents that have occurred within the vicinity of the site. The following roads and junctions have been analysed:

a. Nine Elms Lane (A3205)

b. Nine Elms Lane (A3205)/ Ponton Road junction.

15.4.139 Table 15.4.12 and Figure 15.4.8 in the Heathwall Pumping Station *Transport Assessment* figures provide a summary of the accident locations, total number of accidents and the associated level of accident severity. Appendix D provides a full analysis of the accidents.

Table 15.4.12 Accident severity from 2006 to 2011

Location (Road / Junction)	Slight	Serious	Fatal	Total
Nine Elms Lane (A3205)	7	2	0	9
Nine Elms Lane / Ponton Road junction	6	1	0	7
Total	13	3	0	16

15.4.140 During the 5 year period, a total of 16 accidents occurred on Nine Elms Lane (within the study area analysed) and at the junction of Nine Elms Lane and Ponton Road. Of these accidents, 13 were categorised as slight and 3 were serious with the majority of accidents occurring on Nine Elms Lane.

15.4.141 In general, the accidents largely involved motorcyclists. One accident involved a cyclist and the rest involved cars. None of the accidents involved pedestrians or HGVs. LGVs were involved in three accidents, of which two were rated as slight and one was serious.

15.4.142 Of the serious accidents, two occurred on Nine Elms Road and one occurred at the junction with Ponton Road. The cause of accident was attributed to factors such as aggressive driving, following too closely and failing to look properly.

15.4.143 The records show that there was one accident involving pedestrians and cyclists, which was of slight severity. This occurred at the Nine Elms Lane/ Ponton Road junction which has signal control facilities, which is to be used by construction vehicles within the study area.

15.4.144 In the context of the temporary HGV movements associated with the Heathwall Pumping Station 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[iv].

15.5 Construction assessment

15.5.1 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.

15.5.2 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 under construction. The construction base case does not include any traffic related to the Thames Tideway Tunnel, whether from the Heathwall Pumping Station site or from other sites.

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

Construction base case

15.5.3 As described in Section 15.3, the construction assessment year for transport effects in relation to this site is Year 1 of construction.

Pedestrians and cyclists

15.5.4 Changes to the pedestrian and cycle network by Year 1 of construction would occur as a result of the developments at Battersea Power Station, the US Embassy and Embassy Gardens, Nine Elms Parkside and Vauxhall Sky Gardens (see committed developments paras. 15.5.14 and 15.5.14a). The changes include:

a. providing signalised pedestrian crossing facilities on all arms of the Nine Elms Lane (A3205) / Battersea Park Road (A3205) / Kirtling Street / New Convent Garden Market access junction

b. re-routing of the Thames Path from Nine Elms Lane to Cringle Street via the new Battersea Power Station development

c. improved public realm surrounding Nine Elms Parkside and Vauxhall Sky Gardens

d. realignment of Ponton Road inclusive of pedestrian refuge islands at the junction.

Public transport

15.5.5 Changes to the public transport network by Year 1 of construction as a result of the developments at Battersea Power Station and Nine Elms Pier include the possible extension of the London Underground Northern Line and a new London Underground station (see committed developments paras. 15.5.14 and 15.5.14a). The completion of the Northern Line extension would increase the PTAL level from baseline (para. 15.4.31).

15.5.6 All other planned upgrades included in the TfL London Underground Upgrade Plan, such as capacity improvements on Jubilee, Victoria, Northern, Hammersmith and City, Metropolitan and District lines, are also planned to be in place by the construction base case.

15.5.7 Due to the traffic growth in the construction base case compared to the baseline situation, bus journey times along Battersea Park Road - Nine Elms Lane (A3205) and within the wider area will be affected. The effect on journey times on this route is detailed in the construction base case highway network assessment (see paras. 15.5.18 and 15.5.24) and the results show that there would be a maximum increase in delay for bus users of 28 seconds over the baseline case.

15.5.8 It is anticipated that patronage on public transport services may change between the baseline situation and Year 1 of construction. Future patronage changes on underground networks 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 on the Bakerloo, Piccadilly and Central lines however the best way of delivering these improvements, including the timescales, are currently being investigated by TfL. At this stage, the extent to which these upgrades will have been completed by the construction base case is

unknown. 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 in the construction base case has been assumed to remain the same as capacity in the baseline situation. This ensures a robust assessment.

River navigation

15.5.9 There are no proposals to alter river passenger services or river navigation patterns from the current baseline conditions. The number of barge movements generated by the Cemex site may increase as a result of increased demand from new development, but this will depend on a number of factors such as the level and timing of development, construction techniques (i.e. steel or concrete frame) and whether Cemex is chosen as the source to meet the demand. Given these uncertainties the construction base case in Site Year 1 of construction remains similar to the baseline position.

Highway network operation

15.5.10 Baseline traffic flows (determined from the junction surveys) have been used and forecasting carried out to understand the capacity on the highway network in the vicinity of the Heathwall Pumping Station site in Year 1 of construction without the Thames Tideway Tunnel project. The scope of this analysis has been discussed with the LB of Wandsworth and TfL.

15.5.11 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*.

15.5.12 The relevant growth factors for this site were was applied to the 2011 survey flows to produce flows for the base and development cases.

15.5.13 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

15.5.14 There are a number of committed developments that will be complete and operational by Site Year 1 of construction. These developments have been included in the construction base case modelling detailed in this section in paras. 15.5.18 to 15.5.24 and include:

a. Northern Line Extension

b. Battersea Plant

c. Nine Elms Pier (Phase 1)

d. Riverlight development, Nine Elms Lane (Blocks B through to F)

e. Battersea Power Station (Phase 1 and 2)
f. Embassy Gardens (Buildings A09,10 & A11)
g. US Embassy
h. Marco Polo House (Phase 1a)
i. Nine Elms Sainsbury's
j. Market Towers
k. Vauxhall Sky Gardens
l. St Georges Wharf (Vauxhall Tower)
m. 81 Black Prince Road (Parliament Road)
n. Spring Mews, Vauxhall

15.5.15 There will be some developments that that will be under construction during Site Year 1 of construction. These developments have been included in the construction base case modelling detailed in this section in paras. 15.5.18 to 15.5.24 and include:

a. Battersea Power Station[v]
b. Riverlight development, Nine Elms Lane (Block A)v
c. Nine Elms Parkside (Blocks C&D)v
d. Battersea Power Station (Phase 3)
e. Embassy Gardens (Buildings A01,A02, A03, A04, A05 & A07)
f. New Covent Garden Market ((Buildings B1 through to B6)
g. Marco Polo House (Phase 1b & 2)
h. Vauxhall Square
i. Chelsea Barracks
j. Island Site
k. 10 Albert Embankment (Hampton House)
l. 20 Albert Embankment (Wah Kwong House).

15.5.16 Changes to the highway network and operation by Year 1 of construction are as a result of the developments at Battersea Power Station, US Embassy and Nine Elms Parkside. Changes include

a. suspension of parking on Kirtling Street and Cringle Street (as a result of the Battersea Power Station development proposals)
b. provision of a dedicated right-turn land from Nine Elms Lane (A3205) into Kirtling Street

[v] 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 15 Appendix N of the *Environmental Statement*)

c. provision of two lanes on the Kirtling Street arm of the Nine Elms Lane (A3205) / Battersea Park Road (A3205) / Kirtling Street / New Convent Garden Market access junction

d. realignment of Ponton Road (as a result of the US Embassy development proposals)

e. upgrade of the Ponton Road / Nine Elms Lane (A3205) junction and potentially two new junctions along Nine Elms Lane (A3205) (as a result of the US Embassy development proposals)

f. conversion of the Nine Elms Lane (A3205) / Cringle Street junction into a crossroads to create a new access road for the Nine Elms Parkside development

15.5.17 The assessment of transport effects is based on the Battersea Power Station development being partially completed and partially under construction by Site Year 3 of construction at the Kirtling Street site. This includes a new highway layout at the Battersea Park Road (A3205) / Nine Elms Lane (A3205) / Kirtling Street / New Covent Garden access junction. However, as there are some uncertainties around the timescale for implementation of the Battersea Power Station development a sensitivity test has been undertaken in which the construction base and development cases assume that development is not progressed within a timescale that coincides with the Thames Tideway Tunnel project, and hence the highway layout will be as existing. This sensitivity test is presented in the assessment.

Local highway modelling

15.5.18 The modelling included the committed developments detailed in paras. 15.5.14 and 15.5.15 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 Wandsworth and TfL based on the information available at the time.

15.5.19 Para. 15.3.8 to 15.3.10 explains the definition of the assessment area for local highway network modelling. At this site, the assessment examines only the two nearest junctions of the construction vehicle routes with the TLRN at both Kirtling Street and Cringle Street.

15.5.20 The construction base case LINSIG and PICADY model outputs for the Battersea Park Road (A3205) / Nine Elms Lane (A3205) / Kirtling Street / New Covent Garden Market access road junction and the Nine Elms Lane (A3205) / Cringle Street / Nine Elms Parkside junction are shown in Table 15.5.1 and Table 15.5.2.

15.5.21 The construction development case includes the optimisation of signal timings for the Kirtling Street / Nine Elms Lane (A3205) / Battersea Park Road (A3205) / New Covent Garden Market access road junction in order to minimise journey time increases within the local area.

Table 15.5.1 Construction base case - LINSIG model outputs with the Battersea Power Station development

Approach	Movement	Weekday							
		AM peak				PM peak			
		(08:00-09:00)				(17:00-18:00)			
		Flow (PCU)	DoS	MMQ (PCU)	Delay (seconds per PCU)	Flow (PCU)	DoS	MMQ (PCU)	Delay (Seconds per PCU)
Kirtling Street	Left	4	3%	0	58	6	5%	0	59
	Right	52	37%	2	64	43	31%	1	62
Nine Elms Lane (A3205)	Left Ahead	574	75%	14	36	596	78%	16	38
	Ahead	520	70%	13	36	553	75%	15	37
New Covent Garden Market	Left	96	72%	4	91	93	70%	4	88
	Right Ahead	40	29%	1	62	33	24%	1	60
Battersea Park Road	Left Ahead	480	75%	13	41	518	81%	15	45
	Right Ahead	603	79%	15	43	576	80%	15	43
		Practical Reserve Capacity (PRC)		Total Delay (PCU hours)		Practical Reserve Capacity (PRC)		Total Delay (PCU hours)	
Overall junction performance		13.3%		28		10.8%		29	

Notes: DoS represents Degree of Saturation; the ratio of flow to capacity. MMQ represents Mean Maximum Queue for the busiest-case 15 minute modelled period (in vehicle lengths). Delay represents the mean delay per PCU. PRC represents Practical Reserve Capacity; measure of how much additional traffic could pass through a junction whilst maintaining a maximum DoS of 90% on all lanes. PCU value for a car is one PCU. Vans and three-axle vehicles are 1.5 PCUs, vehicles with four or more axles are 2.3 PCUs. Buses and coaches are two PCUs. Motorcycles are 0.4 PCUs and pedal cycles are 0.2 PCUs.

Table 15.5.2 Construction base case - PICADY model outputs with the Battersea Power Station development

Approach	Movement	Weekday							
		AM peak				PM peak			
		(08:00-09:00)				(17:00-18:00)			
		Flow (vehs)	RFC	Max. Queue (vehs)	Delay (seconds per veh)	Flow (vehs)	RFC	Max. Queue (vehs)	Delay (seconds per veh)
Cringle Street	Left Ahead Right	71	36%	1	29	126	58%	1	39
Nine Elms Lane (W) (A3205)	Right	2	1%	0	19	3	2%	0	20
Nine Elms Parkside	Left	5	2%	0	17	4	2%	0	18
	Right	3	4%	0	50	2	3%	0	60
Nine Elms Lane (E) (A3205)	Right	81	37%	1	26	78	33%	0	23

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

15.5.22 The resulting construction base case LINSIG model output for the Kirtling Street / Nine Elms Lane (A3205) / Battersea Park Road (A3205) / New Covent Garden Market access road junction indicates that the Degree of Saturation on some approaches, namely Battersea Park Road (A3205) will increase to near capacity of 81% for left ahead lane and 80% for the right ahead lane in the PM peak hour. At the same approach the Mean Maximum Queue length of approximately 15 PCUs was estimated in both AM and PM peak hour. Overall, the junction will be operating within capacity.

15.5.23 The LINSIG junction model output shows that total junction delay is 28 PCU hours in the AM and 29 PCU Hours in the PM peak periods assessed. These equate to 42 seconds per PCU in the AM and 43 in the PM peak periods assessed.

15.5.24 The construction base case PICADY model output for Nine Elms Lane (A3205) / Cringle Street / Nine Elms Parkside junction indicates that the local network will continue within capacity. The maximum Ration of Flow to Capacity will be in the PM Peak hour on the Cringle Street approach with 58%. The longest delay occurs at the PM peak hour with 60 seconds delay on the right-turn exit from Nine Elms Parkside.

Construction development case

15.5.25 This section summarises the findings of the assessment undertaken for the peak year of construction at the Heathwall Pumping Station site (Year 1 of construction).

Pedestrian routes

15.5.26 As discussed in Section 15.2, the creation of the eastern vehicle access would result in minor changes to the pedestrian network around Heathwall Pumping Station. The highway layout during construction vehicle swept path analysis (phases 1-3) plan is provided in the Heathwall Pumping Station *Transport Assessment* figures and shows that the construction vehicles would be able to safely enter and leave the site.

15.5.27 It would be necessary to remove a section of footpath (approximately 5m) along Nine Elms Lane (A3205) adjacent to the proposed eastern vehicle access. This removal of footway would ensure that the access would be wide enough for construction traffic to access and egress the site safely. However, other than for a short period while the crossover is being modified, no pedestrian route diversions would be required.

15.5.28 To assess a busiest case scenario, it has been anticipated that all worker trips would finish their journeys by foot. As a result the 40 worker pedestrian trips would be generated by the site, which would equate to seven across the AM and PM peak hours.

15.5.29 It is likely that the majority of trips made by foot would route along Nine Elms Lane (A3205).

15.5.30 The footways which would most likely to be affected by the worker trips would be Nine Elms Lane and the Thames Path. A forecast distribution of worker pedestrian trips can be determined by considering the mode split shown in Table 15.2.3 and the location of the nearest rail/tube stations and

bus stops. Based on this, it is assumed that approximately 35% would be travelling along Nine Elms Lane or along the Thames Path to the west of the Heathwall Pumping Station site, and approximately 65% would be travelling along Nine Elms Lane and the Thames Path to the east of the Heathwall Pumping Station site.

15.5.31 This would equate to a maximum of 12 construction workers in the AM and PM peak hours along Nine Elms Lane and the Thames Path to the west of the Heathwall Pumping Station site.

15.5.32 Along Nine Elms Lane and the Thames Path to the east of the Heathwall Pumping Station site, there would be a maximum of 21 workers in the AM and PM peak hours.

15.5.33 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.

15.5.34 As detailed in Section 15.2, there are no pedestrian diversions and as a result of the construction site. There could be delays at the site accesses when vehicles are entering and leaving the site, however as these would be less than 30 seconds on each occasion and pedestrians would not encounter these delays regularly due to the frequency of vehicle movements approximately eight movements per hour, the increase to pedestrian delay would be minimal.

15.5.35 The need for pedestrians to cross the site accesses would introduce a small risk of increased pedestrian accidents and to address this, appropriate pedestrian and vehicle management measures and signage would be provided on the site accesses.

15.5.36 During all construction work and on any section of road subject to temporary diversions or restrictions imposed by roadworks associated with the Heathwall Pumping Station 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[vi] to ensure safe passage for mobility and vision impaired pedestrians.

Cycle routes

15.5.37 Cyclists using the off-road cycle route along Nine Elms Lane (A3205) would not experience additional delay to journey time because there would be no route diversions. As a result there is minimal change to cyclist delay anticipated.

15.5.38 Cyclists using the shared footway / cycleway would experience similar changes at the site accesses to those encountered by pedestrians on the same route. This could result in a small increase in risk to cyclists within

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

the area, which would be addressed through appropriate management measures at the site accesses.

15.5.39 Cyclists using the highway could experience delay to their journey time as a result of the construction works at the Heathwall Pumping Station site. The effect on journey times on this route is detailed in the construction development case highway network assessment (see para. 15.5.64 to 15.5.74) and the results show that there would be a maximum increase in delay for cyclists using the roadspace of 2 seconds over the construction base case.

15.5.40 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.

15.5.41 As indicated in paragraph 15.5.38, works would include the following measures affecting cyclists:

a. vehicles accessing the site shall instruct the site traffic marshal in advance in order that the gate will be open on arrival and no waiting will occur on the highway.

15.5.42 Measures set out in the *CoCP* described in para. 15.5.29 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 Heathwall Pumping Station 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[vii]) to ensure safe passage for cyclists.

15.5.43 During the construction period, the operation and layout of the road network will not change other than to construct a site access crossover point on Cringle Street. A minimum carriageway width of either 4m (where HGVs can safely overtake cyclists) or 3.25m (where HGVs cannot overtake cyclists) would be retained for traffic in each direction. Where necessary, carriageway widths of less than 3.25m would be agreed with the LB of Wandsworth prior to execution of any works.

Bus routes and patronage

15.5.44 There are two bus services which operate along Nine Elms Lane (A3205). Additional construction vehicles serving the site may affect these bus routes and bus journey times along Nine Elms Lane (A3205) and within the wider area.

15.5.45 As a result of the additional construction traffic within the local area, there may be a slight increase in the journey times. The effect on journey times on this route is detailed in the construction development case highway

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

network assessment (see paras. 15.5.64 to 15.5.74) and the results show that there would be a maximum increase in delay for bus users of 2 seconds over the construction base case.

15.5.46 It is expected that approximately eight additional two-way worker trips would be made by bus during the AM and PM peak hours. Bus routes in the immediate vicinity provide a total of 34 buses within 640m walking distance during the AM and PM peak hours.

15.5.47 Additional bus services are available at Vauxhall bus station, less than 1km walking distance away.

15.5.48 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

15.5.49 No Underground or 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 approximately 25 construction workers in both the AM and PM peak periods would use London Underground or National Rail services to access the site. This would be split into 13 additional person trips on National Rail services and 12 additional person trips on London Underground services.

15.5.50 On London Underground services this equates to less than one person per train during the AM and PM peak hours based on a frequency of up to 60 trains during the peaks. On National Rail services there would a maximum of one additional passenger per train based on a frequency of over 100 trains during the peaks serving the site from all train stations.

15.5.51 Based on the quantitative assessment of patronage and the impact criteria on rail patronage set out in the ES, this would result in a negligible impact on London Underground and National Rail patronage.

River passenger services and patronage

15.5.52 There are river passenger services passing Heathwall 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 Heathwall barges, but there might be a minor effect on days when high tides occur at these times as this when Heathwall barges are most likely to be moving.

15.5.53 It is anticipated that 0.3% of construction workers and labourers would use the river services to access the construction site. This represents a maximum of one additional journey per river service in the AM peak calling at St George Wharf Pier, which would be easily be accommodated within existing capacity.

River navigation and access

15.5.54 During construction it is anticipated that 90% of cofferdam import and export and shaft excavated material export would be transported by barge.

The peak number of barge movements is within Year 1 of construction with a daily average of two barges (two 2-way trips) a day.

15.5.55 As outlined in Section 15.2, temporary cofferdams would be constructed to serve the Heathwall Pumping Station site.

15.5.56 As the number of barges movements at the Heathwall Pumping Station is between one and two it is anticipated that there would be minimal change to river navigation in the vicinity of the site as a result of the barges arriving at Heathwall Pumping Station.

15.5.57 It is noted that a separate navigational risk assessment has been undertaken for the temporary construction works and barges to be used at Heathwall Pumping Station. This is reported separately outside of the TA and will provide further detail in regard management of potential river impacts.

15.5.58 It is anticipated that 350T barges would be used at this site. Barges would be hauled by tugs which would be capable of hauling two 350T barges together. For the purposes of this assessment it is assumed that one tug pulls one barge.

15.5.59 The Project-wide impacts of vessels being used for the Thames Tideway Tunnel are outlined in the Project-wide TA.

Parking

15.5.60 Nine Elms Lane (A3205) 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 changes to on-street parking or private parking in the vicinity of the area during construction at the Heathwall Pumping Station site.

15.5.61 As there would therefore be no change to parking in the vicinity of the Heathwall Pumping Station site compared to the construction base case there would be a negligible impact on parking.

Highway assessment

Highway layout

15.5.62 The access plan and highway layout during construction (phases 1-3) plans are provided in the Heathwall Pumping Station *Transport Assessment* figures. The site would be accessed via Nine Elms Lane (A3205), on a 'left-turn in, left-turn out' basis.

15.5.63 The highway layout during construction vehicle swept path analysis (phases 1-3) plan is provided in the Heathwall Pumping Station *Transport Assessment* figures and show that the construction vehicles would be able to safely enter and leave the site.

Highway network

15.5.64 Table 15.2.4 in Section 2 shows the vehicle movement assumptions for the local peak traffic periods based on the peak months of construction activity at this site.

15.5.65 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.

15.5.66 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.

15.5.67 The assignment of construction lorry trips has been undertaken using OmniTrans[viii] 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 Heathwall Pumping Station site, or with other Thames Tideway Tunnel project sites, that would use routes in the vicinity of the Heathwall Pumping Station site. Figure 15.5.1 in the Heathwall Pumping Station *Transport Assessment* figures shows the OmniTrans plot for the local road network around the Heathwall Pumping Station site.

15.5.68 Highway changes may lead to local changes in traffic flow and capacity, as a result local modelling has been undertaken to assess the effect on the highway operation resulting from the layout changes and construction traffic flows.

15.5.69 The construction development case has been used to apply the construction traffic demands and local geometrical changes to the construction base case to determine the changes in the highway network operation due to the project (ie, comparison of base and development cases).

15.5.70 When entering the site, construction traffic would route eastbound along Nine Elms Lane (A3205) and turn left, into the site access. Exiting the site, construction vehicles would turn left to continue eastbound on Nine Elms Lane (A3205). A PICADY model has been used to assess the construction traffic demands at the two site accesses to determine the operation of these accesses and any implications that might arise on Nine Elms Lane (A3205).

15.5.71 The assessment for the Kirtling Street site also examines the operation of the Battersea Park Road (A3205) / Nine Elms Lane (A3205) / Kirtling Street / New Covent Garden Market access road signalised junction using a LINSIG model, and Nine Elms Road (A3205) / Cringle Street / Nine Elms Parkside priority junction using a PICADY model. The outcomes of these assessments, which includes all Thames Tideway Tunnel construction

[viii] *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

traffic passing through the area, are also referred to in this assessment of Heathwall Pumping Station site.

15.5.72 The construction development case model includes the optimisation of traffic signal timings in order to maximise capacity and minimise overall delay at this junction.

15.5.73 A summary of the construction assessment results for the weekday AM and PM peak hours is presented in Table 15.5.3 to Table 15.5.7.

15.5.74 The modelling included the committed developments detailed in paras. 15.5.14 and 15.5.15 for the construction development case model.

Table 15.5.3 Site Access PICADY model outputs, construction development case

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 per veh)	Flow (vehs)	RFC	Max. Queue (vehs)	Delay (seconds per veh)
Site Access	Left onto Nine Elms Lane (A3205)	4	2%	0	18	5	2%	0	16

Notes: RFC represents Ratio of Flow to Capacity. Queue represents number of vehicles in queue. Delay represents the mean delay per vehicle. Nine Elms Lane (A3205) westbound is not included in table as PICADY model only considers movements where vehicles have to give way.

Table 15.5.4 Construction development case LINSIG model outputs with the Battersea Power Station development (AM peak hour)

Approach	Movement	Flow (PCU)	Weekday								
			AM peak hour (08:00-09:00)								
			DoS			MMQ (PCU)			Delay (seconds per PCU)		
			Base case	Devt case	Change	Base case	Devt case	Change	Base case	Devt case	Change
Kirtling Street	Left	4	3%	3%	0%	0	0	0	58	58	0
	Right	52	37%	37%	0%	2	2	0	64	64	0
Nine Elms Lane (A3205)	Left Ahead	576	75%	75%	0%	14	15	+1	36	36	0
	Right Ahead	540	70%	73%	+3%	13	14	+1	36	37	+1
New Covent Garden Market	Left	96	72%	72%	0%	4	4	0	91	91	0
	Right Ahead	40	29%	29%	0%	1	1	0	62	62	0
Battersea Park Road	Left Ahead	484	75%	76%	+1%	13	14	+1	41	42	+1
	Right Ahead	607	79%	80%	+1%	15	15	0	43	44	+1
			Practical Reserve Capacity (PRC)						Total Delay (PCU hours)		
Overall junction performance			13.3%	12.5%	-0.8%				28	28	0

Notes: DoS represents Degree of Saturation; the ratio of flow to capacity. MMQ represents Mean Maximum Queue for the busiest-case 15 minute modelled period (in vehicle lengths). Delay represents the mean delay per PCU. PRC represents Practical Reserve Capacity; measure of how much additional traffic could pass through a junction whilst maintaining a maximum DoS of 90% on all lanes. PCU value for a car is one PCU. Vans and three-axle vehicles are 1.5 PCUs, vehicles with four or more axles are 2.3 PCUs. Buses and coaches are two PCUs. Motorcycles are 0.4 PCUs and pedal cycles are 0.2 PCUs. Thames Tideway Tunnel construction vehicles would be a mixture of

three- and four-axle vehicles and have therefore been given a PCU value of two. Assessment has assumed that traffic signal optimisation has been undertaken as detailed in Section 2.

Table 15.5.5 Construction development case LINSIG model outputs with the Battersea Power Station development (PM peak hour)

Approach	Movement	Flow (PCU)	Weekday								
			PM peak hour (17:00-18:00)								
			DoS			MMQ (PCU)			Delay (Seconds per PCU)		
			Base case	Devt case	Change	Base case	Devt case	Change	Base case	Devt case	Change
Kirtling Street	Left	6	5%	5%	0%	0	0	0	59	59	0
	Right	43	31%	31%	0%	1	1	0	62	62	0
Nine Elms Lane (A3205)	Left Ahead	598	78%	79%	+1%	16	16	0	38	38	0
	Right Ahead	572	75%	77%	+2%	15	15	0	37	39	+2
New Covent Garden Market	Left	93	70%	70%	0	4	4	0	88	88	0
	Right Ahead	33	24%	24%	0	1	1	0	60	60	0
Battersea Park Road	Left Ahead	521	81%	82%	+1%	15	15	0	45	46	+1
	Right Ahead	579	80%	80%	0	15	16	+1	43	43	0
			Practical Reserve Capacity (PRC)						Total Delay (PCU hours)		
Overall junction performance			10.8%	10.0%	-0.8%				29	30	+1

Notes: DoS represents Degree of Saturation; the ratio of flow to capacity. MMQ represents Mean Maximum Queue for the busiest-case 15 minute modelled period (in vehicle lengths). Delay represents the mean delay per PCU. PRC represents Practical Reserve Capacity; measure of how much additional traffic could pass through a junction whilst maintaining a maximum DoS of 90% on all lanes. PCU value for a car is one PCU. Vans and three-axle vehicles are 1.5

PCUs, vehicles with four or more axles are 2.3 PCUs. Buses and coaches are two PCUs. Motorcycles are 0.4 PCUs and pedal cycles are 0.2 PCUs Thames Tideway Tunnel construction vehicles would be a mixture of three- and four-axle vehicles and have therefore been given a PCU value of two. Assessment has assumed that traffic signal optimisation has been undertaken as detailed in Section 2.

Table 15.5.6 Construction development case PICADY model outputs with Battersea Power Station (AM peak hour)

Approach	Movement	Flow (vehs)	Weekday								
			AM peak hour (08:00-09:00)								
			RFC			Max. Queue (vehs)			Delay (seconds per veh)		
			Base case	Devt case	Change	Base case	Devt case	Change	Base case	Devt case	Change
Cringle Street	Left Ahead Right	83	36%	43%	+7%	1	1	0	29	34	+5
Nine Elms Lane (W) (A3205)	Right	2	1%	1%	0	0	0	0	19	19	0
Nine Elms Parkside	Left	5	2%	2%	0	0	0	0	17	17	0
Nine Elms Parkside	Right	3	4%	4%	0	0	0	0	50	52	+2
Nine Elms Lane (E) (A3205)	Right	81	37%	37%	0	1	1	0	26	26	0

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

Table 15.5.7 Construction development case PICADY model outputs with Battersea Power Station (PM peak hour)

Approach	Movement	Flow (vehs)	Weekday								
			AM peak hour (17:00-18:00)								
			RFC			Max. Queue (vehs)			Delay (seconds per veh)		
			Base case	Devt case	Change	Base case	Devt case	Change	Base case	Devt case	Change
Cringle Street	Left Ahead Right	139	58%	66%	+8%	1	2	+1	39	49	+10
Nine Elms Lane (W) (A3205)	Right	3	2%	2%	0	0	0	0	20	20	0
Nine Elms Parkside	Left	4	2%	2%	0	0	0	0	18	18	0
Nine Elms Parkside	Right	2	3%	3%	0	0	0	0	60	64	+4
Nine Elms Lane (E) (A3205)	Right	78	33%	33%	0	0	0	0	23	23	0

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

15.5.75 The results of the PICADY modelling of Heathwall Pumping Station site access do not suggest any problems in the junction's operation either for the main road circulation or the vehicles that access and egress the Heathwall Pumping Station site.

15.5.76 The construction development case PICADY model indicates that the additional public road network delay during the AM and PM peak hours as a result of the additional construction traffic would increase delay along Nine Elms Lane (A3205) by a maximum of 11 seconds per vehicle at the junction of Nine Elms Lane (A3205) / Heathwall Pumping Station site access. The small increase in queue lengths and delay would not affect adjacent junctions.

15.5.77 The LINSIG model results suggest that the junction would continue to operate within capacity with Battersea Park Road (A3205) reaching 80% in the AM peak and 82% in the PM peak. The increase in Mean Maximum Queue length for this movement would be one additional PCU. This suggests that the changes caused as a result of construction traffic on road network delay at this junction would be negligible for both peak periods.

15.5.78 The LINSIG junction model output shows that total junction delay is 28 PCU hours in the AM peak period assessed and 30 PCU hours in the PM peak period assessed. These equate to 42 seconds per PCU in the AM peak period assessed and 44 seconds per PCU in the PM peak period assessed.

15.5.79 The PICADY model outputs suggest that the Nine Elms Lane (A3205) / Cringle Street / Nine Elms Parkside junction would continue to operate within capacity in the construction development case. The maximum increase in delay would be ten seconds in the PM peak hour for vehicles turning out of Cringle Street, with a corresponding increase in queue length of one vehicle. The ratio of flow to capacity for this movement would increase by 8% in the PM peak hour, which would be the maximum increase at this junction. This indicates that there would be an insignificant change at the junction as a result of the additional construction traffic.

Construction mitigation

15.5.80 The project has been designed to limit the effects on transport networks as far as possible and many measures have been embedded directly in the design of the project. These measures are summarised in

15.5.81 Table 15.5.8. No additional measures are proposed for transport and therefore there is no mitigation identified for the construction phase.

Table 15.5.8 Heathwall Pumping Station Foreshore site design measures

Phase	Issues	Design measures
Construction	Creating access point	• Creation of a left-turn in/left-turn out site access for construction traffic

Phase	Issues	Design measures
	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.
	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	• Provision of permanent kerbing at site access to accommodate ten yearly maintenance vehicles - architect to advice on finishes / material.

15.5.82 These embedded measures, discussed in Section 15.2, 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

15.5.83 The assessment outcomes reported earlier are based on the Transport Strategy for this site as outlined in Section 15.3. In that scenario, the construction development case assumes that the Battersea Power Station development is in place along with improvements at the Battersea Park Road (A3205) / Nine Elms Lane (A3205) / Kirtling Street / New Covent Garden Market access road junction.

15.5.84 A sensitivity test has been carried out to examine the implications of the Battersea Power Station development and associated junction improvements not being in place. This sensitivity test has been included in the Kirtling Street *TA,* and is not repeated here.

15.5.85 A sensitivity test has been undertaken for Heathwall Pumping Station to examine the implications of variation in the number of construction vehicle movements in the peak month of activity at this site, including the possibility that river transport is not available for short periods of time which could temporarily increase vehicle numbers. For the Heathwall Pumping Station site, there would be 100 movements a day (50 two-way trips) associated with construction vehicles. As discussed in paras. 15.3.8 and 15.3.9 on the construction assessment area, the sensitivity tests for

this scenario for the Kirtling Street / Nine Elms Lane / Battersea Park Road / New Covent Garden access junction and the Cringle Street / Nine Elms Lane / Nine Elms Parkside junction have been taken from the Kirtling Street site modelling results, which models 794 movements per day (397 two-way vehicle trips).

15.5.86 The committed schemes outlined in paras. 15.5.14 and 15.5.14a within this section are included in this sensitivity test.

Highway network and operation

15.5.87 Summaries of the site access PICADY modelling for the sensitivity test for the site access are presented in Table 15.5.9 and Table 15.5.10.

15.5.88 The results of the local junction LINSIG modelling for the sensitivity test for the Battersea Park Road (A3205) / Nine Elms Lane (A3205) / Kirtling Street / New Covent Garden junction are presented in Table 15.5.11 and Table 15.5.12.

15.5.89 Summaries of the construction assessment results from the PICADY model for the Nine Elms Lane (A3205) / Cringle Street / Nine Elms Parkside junction in the weekday AM and PM peak hours using the sensitivity test figures are presented in Table 15.5.13 and Table 15.5.14.

Table 15.5.9 Construction development case PICADY model outputs for the sensitivity test (AM peak)

Approach	Movement	Flow (vehs)	Weekday								
			AM peak hour (08:00-09:00)								
			RFC			Max. Queue (vehs)			Delay (seconds per veh)		
			Devt case	Sensitivity test	Change	Devt case	Sensitivity test	Change	Devt case	Sensitivity test	Change
Site Access	Left onto Nine Elms Lane (A3205)	7	2%	4%	+2%	0	0	0	18	21	+3

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

Table 15.5.10 Construction development case PICADY model outputs for sensitivity test (PM peak)

Approach	Movement	Flow (vehs)	Weekday								
			PM peak hour (17:00-18:00)								
			DoS			Max. Queue (vehs)			Delay (seconds per veh)		
			Devt case	Sensitivity test	Change	Devt case	Sensitivity test	Change	Devt case	Sensitivity test	Change
Site Access	Left onto Nine Elms Lane (A3205)	8	2%	4%	+2%	0	0	0	16	18	+2

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

Table 15.5.11 Construction case and development case LINSIG model outputs for the sensitivity test (AM peak hour)

Approach	Movement	Flow (PCU)	Weekday								
			AM peak hour (08:00-09:00)								
			DoS			MMQ (PCU)			Delay (Seconds per PCU)		
			Base case	Sensit'y test	Change	Base case	Sensit'y test	Change	Base case	Sensit'y test	Change
Kirtling Street	Left	4	3%	3%	0%	0	0	0	55	58	+3
	Right	52	37%	37%	0%	2	2	0	64	64	0
Nine Elms Lane (A3205)	Left Ahead	576	75%	75%	0%	14	15	+1	38	26	+12
	Right Ahead	594	70%	78%	+8%	13	16	+3	40	41	+1
New Covent Garden Market	Left	96	72%	72%	0%	4	4	0	77	91	+14
	Right Ahead	40	29%	29%	0%	1	1	0	61	62	+1
Battersea Park Road	Left Ahead	485	75%	76%	+1%	13	14	+1	44	42	-2
	Right Ahead	607	79%	80%	+1%	15	15	0	47	44	-3
			Practical Reserve Capacity (PRC)						Total Delay (PCU hours)		
Overall junction performance			13.3%	12.5%	-0.8%				28	29	+1

Notes: DoS represents Degree of Saturation; the ratio of flow to capacity. MMQ represents Mean Maximum Queue for the busiest-case 15 minute modelled period (in vehicle lengths). Delay represents the mean delay per PCU. PRC represents Practical Reserve Capacity; measure of how much additional traffic could pass through a junction whilst maintaining a maximum DoS of 90% on all lanes. PCU value for a car is one PCU. Vans and three-axle vehicles are 1.5 PCUs, vehicles with four or more axles are 2.3 PCUs. Buses and coaches are two PCUs. Motorcycles are 0.4 PCUs and pedal cycles are 0.2 PCUs. Thames Tideway Tunnel construction vehicles would be a mixture of three- and four-axle vehicles and have therefore been given a PCU value of two. Assessment has assumed that traffic signal optimisation has been undertaken as detailed in Section 2.

Table 15.5.12 Construction case and development case LINSIG model outputs for the sensitivity test (PM peak hour)

Approach	Movement	Flow (PCU)	Weekday								
			PM peak hour (17:00-18:00)								
			DoS			MMQ (PCU)			Delay (Seconds per PCU)		
			Base case	Sensit'y test	Change	Base case	Sensit'y test	Change	Base case	Sensit'y test	Change
Kirtling Street	Left	6	5%	5%	0%	0	0	0	59	59	0
	Right	43	31%	31%	0%	1	1	0	62	62	0
Nine Elms Lane (A3205)	Left Ahead	598	78%	79%	+1%	16	16	0	38	38	0
	Right Ahead	626	75%	83%	+8%	15	17	+2	38	44	+6
New Covent Garden Market	Left	93	70%	70%	0%	4	4	0	88	88	0
	Right Ahead	33	24%	24%	0%	1	1	0	60	60	0
Battersea Park Road	Left Ahead	521	81%	82%	+1%	15	15	0	45	46	+1
	Right Ahead	579	80%	80%	0%	16	16	0	43	43	0
			Practical Reserve Capacity (PRC)						Total Delay (PCU hours)		
Overall junction performance			10.8%	8.9%	-1.9%				29	31	+1

Notes: DoS represents Degree of Saturation; the ratio of flow to capacity. MMQ represents Mean Maximum Queue for the busiest-case 15 minute modelled period (in vehicle lengths). Delay represents the mean delay per PCU. PRC represents Practical Reserve Capacity; measure of how much additional traffic could pass through a junction whilst maintaining a maximum DoS of 90% on all lanes. PCU value for a car is one PCU. Vans and three-axle vehicles are 1.5 PCUs, vehicles with four or more axles are 2.3 PCUs. Buses and coaches are two PCUs. Motorcycles are 0.4 PCUs and pedal cycles are 0.2 PCUs. Thames Tideway Tunnel construction vehicles would be a mixture of three- and four-axle vehicles and have therefore been given a PCU value of two. Assessment has assumed that traffic signal optimisation has been undertaken as detailed in Section 2.

Table 15.5.13 Construction case and development case PICADY model outputs for the sensitivity test (AM peak hour)

Approach	Movement	Flow (vehs)	Weekday								
			AM peak hour (08:00-09:00)								
			RFC			Max. Queue (vehs)			Delay (seconds per veh)		
			Base case	Devt case	Sensitivity test	Base case	Devt case	Sensitivity test	Base case	Devt case	Sensitivity test
Cringle Street	Left Ahead Right	110	36%	43%	57%	1	1	1	29	34	43
Nine Elms Lane (W) (A3205)	Right	2	1%	1%	1%	0	0	0	19	19	19
Nine Elms Parkside	Left	5	2%	2%	2%	0	0	0	17	17	17
Nine Elms Parkside	Right	3	4%	4%	5%	0	0	0	50	52	60
Nine Elms Lane (E) (A3205)	Right	81	37%	37%	37%	1	1	1	26	26	26

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

Table 15.5.14 Construction case and development case PICADY model outputs for the sensitivity test (PM peak hour)

Approach	Movement	Flow (vehs)	Weekday								
			PM peak hour (17:00-18:00)								
			RFC			Max. Queue (vehs)			Delay (seconds per veh)		
			Base case	Devt case	Sensitivity test	Base case	Devt case	Sensitivity test	Base case	Devt case	Sensitivity test
Cringle Street	Left Ahead Right	166	58%	66%	79%	1	2	3	39	49	77
Nine Elms Lane (W) (A3205)	Right	3	2%	2%	2%	0	0	0	20	20	21
Nine Elms Parkside	Left	4	2%	2%	2%	0	0	0	18	18	18
Nine Elms Parkside	Right	2	3%	3%	4%	0	0	0	60	64	77
Nine Elms Lane (E) (A3205)	Right	78	33%	33%	33%	0	0	0	23	23	23

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

15.5.90 The PICADY results suggest that the site accesses would operate within capacity with a maximum additional delay of three seconds per vehicle on the Nine Elms Lane (A3205) left-turn lane into Kirtling Street in the AM peak and two additional seconds of delay per vehicle in the PM peak hours.

15.5.91 The LINSIG assessment results suggest that under the sensitivity test, the Battersea Park Road (A3205) / Nine Elms Lane (A3205) / Kirtling Street / New Covent Garden access junction would operate within capacity with a maximum additional delay of six seconds per PCU compared with the construction base case on the Nine Elms Lane (A3205) right-turn lane into Kirtling Street in the PM peak hour.

15.5.92 The LINSIG junction model output shows that total junction delay is 29 PCU hours in the AM peak and 31 in the PM peak periods assessed. These equate to 43 seconds per PCU in the AM peak period assessed and 45 seconds per PCU in the PM peak period assessed.

15.5.93 The PICADY assessment for Nine Elms Lane (A3205) / Cringle Street / Nine Elms Parkside junction indicates that the local network will continue to operate within capacity. The longest delay over the construction development case occurs at the PM peak hour on the Cringle Street approach with an additional delay of approximately 27 seconds per vehicle.

15.6 Operational assessment

15.6.1 This section summarises the findings of the assessment undertaken for Year 1 of operation at the Heathwall Pumping Station site.

15.6.2 The assessment of the operational phase is therefore limited to the physical issues associated with accessing the site from the highway network as outlined in Section 2. This has been discussed with the LB of Wandsworth and TfL.

Operational base case

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

15.6.4 The elements of the transport network that would be affected during operation are highway layout and operation. For the purposes of the operational base case, it is anticipated that the highway layout and parking will be as indicated in the construction base case.

Operational development case

15.6.5 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 larger cranes required for access to the shaft and tunnel every ten years.

15.6.6 As outlined in section 2, during the operational phase, the access arrangements to Heathwall Pumping Station would be reinstated to the current layout, with access provided via the two existing accesses to the

Pumping Station, and the existing two accesses to neighbouring Middle Wharf.

15.6.7 The operational assessment has taken into consideration those elements that would be affected, which comprise the short-term changes to highway operation when maintenance visits are made to the site.

15.6.8 The permanent highway layout (area 1 and 2) plan is provided in the Heathwall Pumping Station *Transport Assessment* figures and indicates the operational phase permanent works.

Parking

15.6.9 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 Heathwall Pumping Station site.

Highway layout and operation

15.6.10 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.

15.6.11 The site would be accessed from Nine Elms Lane (A3205) from the eastbound carriageway during the operational phase.

15.6.12 During ten-yearly inspections, space to locate two large cranes within the site area would be required. The cranes would facilitate lowering and recovery of tunnel inspection vehicles and to provide duty/standby access for personnel. To assess the effect of these on the highway layout, swept paths have been undertaken for the largest vehicles including an 11.36m mobile cranes, a 10m rigid vehicle and a 10.7m articulated vehicle. The permanent highway layout vehicle swept path analysis plan is provided in the Heathwall Pumping Station *Transport Assessment* figures and show safe access/ egress at the site for the operational phase.

15.6.13 When larger vehicles are required to service the site there may also 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.

15.6.14 Due to the infrequent nature of maintenance trips there is anticipated to be a negligible impact on the surrounding highway network.

Operational mitigation

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

15.7 Summary of site-specific TA

15.7.1 The outcomes of this *TA* demonstrate the key findings indicated in Table 15.7.1

Table 15.7.1 Heathwall Pumping Station Transport Assessment results

Phase	Mode of transport	Key Findings
Construction	Pedestrians	A section of footpath (approximately 5m) would be removed, but there would be minimal delay to pedestrian journeys as there would be no diversions, other than for a short period while the modifications to the crossover is made. Appropriate management and signage would be provided on the pedestrian route at site accesses to minimise the risk of pedestrian accidents.
	Cyclists	Minimal delay experienced by cyclists using the off-road cycle route along Nine Elms Lane (A3205) as there will be no route diversions. Delay of less than 5 seconds to cyclists using the carriageway of Nine Elms Lane (A3205) due to additional construction vehicle movements.
	Bus patronage and operators	Approximately eight additional two-way worker trips would be made by bus during the AM and PM peak hours which could be accommodated on base case bus services Maximum delay to bus services would be approximately two seconds in the peak periods assessed over the construction base case.
	London Underground and National Rail patronage	Approximately 25 worker trips would be made by London Underground or National Rail which could be accommodated on base case services.
	River passenger services and patronage	River passenger services would not be affected during construction.
	River navigation	There would be an assumed average peak of four barge movements a day during Year 1 of construction which is not anticipated to affect existing river navigation patterns.
	Parking	There is no on-street parking available in the immediate vicinity of the site on Nine Elms Lane (A3205) and no changes would be made as a result of construction at Heathwall Pumping Station.

Phase	Mode of transport	Key Findings
	Highway network and operation	There would be no changes to the layout of the existing highway network other than to form the construction site accesses. Approximately 70 additional daily movements would be produced by the construction works during the months of greatest activity during Year 1 of construction. The Cringle Street junction with Nine Elms Lane (A3205) will be also operating within capacity in the construction base case. The addition of the Thames Tideway Tunnel traffic (anticipated to be 96 two-way vehicle movements per day peak year 3 of Kirtling Street site) has negligible impact (max 0 pcu queue) on the operation of the junction.
Operation	Parking	No change expected to car parking in the vicinity of the site compared to the construction phase.
	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] TfL, *Travel Planning for new development in London,* Transport for London (2011)

[2] 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/.

[3] Transport for London, Transport Assessment Best Practice guidance. (April 2010).

This page is intentionally blank

Thames Tideway Tunnel
Thames Water Utilities Limited

Application for Development Consent

Application Reference Number: WWO10001

Transport Assessment

Doc Ref: **7.10.12**

Heathwall Pumping Station

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

This page is intentionally blank

Thames Tideway Tunnel

Transport Assessment

Section 15 Appendices: Heathwall Pumping Station

List of contents

Page number

This page is intentionally blank

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 Heathwall Pumping Station. 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 Wandsworth.

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 the 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 *Draft Project Framework Travel Plan* which accompanies this application.

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:

A.3.13 **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";*

A.3.14 **Policy 5** seeks *"to ensure efficient and effective access for people and goods within central London";*

A.3.15 **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";*

A.3.16 **Policy 9** states that the Mayor *"will use the local and strategic development control processes";*

A.3.17 **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";*

A.3.18 **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*

A.3.19 **Policy 15** and **Policy 16** indicate that the Mayor will seek to reduce emissions of air pollutants and noise impacts from transport respectively.

A.3.20 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 Wandsworth has a number of policies relevant to transport within the Local Development Framework (LDF) and the Unitary Development Plan (UDP). Both reflect national and regional focused policies and are referred to below where appropriate.

Local Development Framework

A.4.2 The emerging LDF aims to guide and manage development and regeneration in the borough until 2025. The Core Strategy of the LDF – adopted in October 2010 – 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 this document are concerned with ensuring improvements are made to the public transport, river wharves and accessibility, reducing carbon emissions, and encouraging the use of sustainable transport within the borough.

A.4.4 **Policy PL 3 – Transport** – outlines how the borough will improve the transport network by ensuring *'quality cycling conditions will be delivered'* and *'improved conditions for walking'* along the Thames Path and other accessible routes will be delivered.

A.4.5 **Policy PL 9 – River Thames and the riverside** - outlines that '*greater use will be made of the river'* and that the 'five wharves will continue to be safeguarded', while the redevelopment of these wharves will be accepted *'if the wharf is no longer viable or capable of being made viable for cargo handling uses'*. Further'*existing river infrastructure that provides access to the river and the foreshore, such as piers, jetties, drawdocks, slipways, steps and stairs will be protected and new facilities, including piers for river buses, promoted'.*

A.4.6 *'Putney Embankment's special recreational character and function'* will be protected, particularly for river sports. Also this policy commits to stating that *'development will not be permitted which encroaches onto the river*

foreshore' and opportunities will be taken in consultation with partner agencies, to *'create habitat and reduce flood risk'*.

A.4.7 Also measures will be made to protect and enhance the river as a valuable resource for wild life, in particular at the mouth of the River Wandle.

A.4.8 **Policy PL 10 – The Wandle Valley** - identifies that *'improved accessibility within the corridor and to the riverside will be pursued including the provision of pedestrian and cycle ways'*.

A.4.9 It further outlines the council will support the recreation development of *'King George's Park and north of Wandsworth town centre to the River Wandle mouth'*.

A.4.10 **Policy PL 12 – Central Wandsworth and the Wandle Delta** outlines a number of proposals within central Wandsworth and the Wandle Delta. Amongst them are:

- The Ram Brewery development is to provide a 'high quality public realm' linking the riverside and the juinction of Wandsworth Plain and Armoury Way,
- The banks of the River Wandle will be improved to provide a resource for wild life and recreation and enhancing the existing open space at Causeway Island,
- Wandsworth Business Village 'will provide pedestrian and cycle links to the south via a new park side promenade at Neville Gill Close' which will access King George's Park.

A.4.11 The council further state that 'the impact of traffic on the town centre should be reduced in partnership with TfL' and they will achieve this 'through developer contributions and funds from TfL and other transport infrastructure providers'.

A.4.12 **Policy IS 1 – Sustainable development** - supports '*measures that mitigate and adapt to climate change and reduce emissions of carbon dioxide, and will promote a sustainable relationship between development and transport so as to minimise the need to travel'*.

Development Management Policies (LB of Wandsworth, Feb 2012)

A.4.13 The DMP was adopted by the LB of Wandsworth in February 2012 and supports the Core Strategy. It sets out the Council's detailed policies for managing development in the borough. The policies in the DMP and the SSA replace all of the remaining policies in the Councils Unitary Development Plan (UDP) which have not previously expired or been superseded by the policies in the Core Strategy.

A.4.14 Transport policies within this document are concerned with ensuring sustainable urban design, riverside walking and cycling and parking within the borough.

A.4.15 **Policy DMS 1 – General development principles - Sustainable urban design and the quality** – identifies that developments must ensure that they do *'not harm the amenity of occupiers/users and nearby properties through unacceptable'* traffic congestion, it *'is adequately served by public*

transport', is *'designed to reduce the need to travel and minimise car use'* and is *'accessible to people with disabilities'*.

A.4.16 **Policy DMO 6 – Riverside development** – distinguishes developments adjoining the River Thames and River Wandle which *'promotes sustainable transport'* and in particular *'provides access to public transport routes including the incorporation of a public riverside walk and cycle-path'*.

A.4.17 **Policy DMT1 – Transport impacts of development** – recognises that developments do *'not have a negative impact on the transport system, including public transport capacity and the highway network'*.

A.4.18 **Policy DMT 2 – Parking and servicing** – ascertains that developments will be permitted once 'off-street car parking is provided subject to the maximum levels' set out by the borough.

A.4.19 **Policy DMT 3 – Riverside walking and cycling routes** - permits developments along the Thames and Wandle once provision has been made *'for a riveside walk at least 6 metres wide (Thames) or 3 metres wide (Wandle)'*, *'new accesses lining the riverside walk to the surrounding area are a least 3 metres wide'* and *'riverside routes incorporate provision for cyclists, ensuring pedestrian safety'*.

Site Specific Allocations Document (LB of Wandsworth, Feb, 2012)

A.4.20 The SSAD was adopted by LB Wandsworth in February 2012 and supports the Core Strategy.

A.4.21 **Battersea Park Station** – is classified as being *'within the Vauxhall/Nine Elms/ Battersea Opportunity Area'* and is a key strategic site that will *'deliver transport improvements'* and *'significant public transport provision'* will be needed. Amongst this provision will be an extension to the London Underground Northern Line, river passenger pier including provision of a river bus service, a bus service between BPS and Wandsworth Road and enhancement for the strategic Nine Elms Lane/Battersea Park Road *'to overcome the hostile environment for pedestrians and cyclists that currently exists'*. A Thames Path *'linking with existing and proposed Thames paths must be provided'*.

A.4.22 **Riverlight Development** – identifies that improvements would be made to the *'Riverside walk and cycle route'* as well as the junction between Cringle Street and Nine Elms Lane. Also within this SSAD the importance of the safeguarded wharves at Cringle Dock, Kirtling Wharf and Middle Wharf will *'require their retention and continued operation'*. As for BPS there will be *'significant public transport provision*' here as well.

A.4.23 **US Embassy** – outlines the proposed realignment of Ponton Road, as well as potential for a proposed river crossing. As the same for BPS, there will be *'significant public transport provision*' here as well.

A.4.24 **Embassy Gardens –** ascertains that a public realm is expected to run through the site in conjunction with the proposed *'linear park linking Vauxhall to BPS*'. As the same for BPS, there will be *'significant public transport provision*' here as well.

A.4.25 **Nine Elms Parkside** - recognises that provisions are to be made for *'improved pedestrian and cycle links through the site to provide improved permeability particularly between Nine Elms Lane and Wandsworth Road'*. There is to be a site access onto Nine Elms Lane at the junction of Cringle Street and Nine Elms Lane, making it a four arm junction. As for BPS there will be *'significant public transport provision*' here as well. As in Embassy Gardens there are proposals for a public realm to run through the site linking BPS and Vauxhall.

A.4.26 **New Covent Garden Market** – identifies that the public realm and the existing main access to NCGM 'will need particularly careful treatment' to ensure that the public realm will continue *'across what will continue to be a major junction'* at Kirtling Street/Battersea Park Road.

A.4.27 **Wandsworth Business Village** – outlines that provision will be given for three new connections providing public access through the site. A new pedestrian crossing facility on Buckhold Road will need to be provided, as well improvements to the King George Park entrance and Neville Gill Close promenade.

A.4.28 **Ram Brewey/ Capita Studios** – distinguishes that there should be *'provision for new riverside walks on both banks of the River Wandle'*. Proposals to change the trunk road system with the Wandsworth One-Way System will be required. Also, proposals are to be made to improve the bus services, provide a public realm and the provision of land to public highway, riverside walks and cycle paths surrounding the site.

Supplementary Planning Guidance

A.4.29 The SPG supports and is a document with important local views which support local areas within the borough and their relevant transport issues.

A.4.30 Transport policies within these documents are concerned with views of surrounding buildings and landmarks within the borough.

Unitary Development Plan (LB of Wandsworth, Aug 2003)

A.4.31 The UDP was adopted by the London Borough of Wandsworth in August 2003. Due to the merging 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 September 2007 are outline below.

A.4.32 **Policy RDP1: Regeneration and Development Principles** - outline that without *'adequate and satisfactory provision for pedestrian access and for parking'* a development will not be permitted.

A.4.33 **Policy RDP5: Regeneration and Development Principles** – further identifies that the beneficial effects resulting from a lighting scheme on site must not affect 'vehicle users and pedestrians'.

A.4.34 **Policy TBE1: Townscape and Built Environment** - classifies that a development *'provides safe and convenient access for cyclists and pedestrians'*.

A.4.35 **Policy R2: River Thames and Riverside** - ascertains that developments will not be permitted unless *'provision is made for riverside walk at least 6m wide along the entire river frontage'* and *'any new accesses linking the riverside walk to the surrounding area are at least 3m wide'*.

A.4.36 **Policy R7: River Thames and Riverside** – further recognises that proposals for piers and jetties will be permitted provided *'they do not harm the use of the docks and working wharves or other existing uses of the river'.*

A.4.37 **Policy R8: River Thames and Riverside** – identifies that the *'loss of drawdocks, slipways, steps and stairs which give safe access to the river and foreshore'* within development proposals will not be permitted.

A.4.38 **Policy R9: River Thames and Riverside** – distinguishes that for proposals adjoining the River Wandle the council will seek the provision of a riverside walk at least 3m wide and improved access to the riverside.

A.4.39 **Policy R11: River Thames and Riverside** – further identifies that the Council will seek developments within Causeway Island for *'river related uses'*.

A.4.40 **Policy R14: River Thames and Riverside** – further categorizes that the Council will not permit the loss of uses and facilities relying on access to the Thames within the Putney Embankment Area.

A.4.41 **Policy H3: Housing** – identifies that developments harming the *'amenities of predominantly residential areas'* because of traffic generation.

A.4.42 **Policy T2: Transport** – recognises that developments that would *'generate sufficient traffic to harm the environment, or create congestion or hazards on the road network'* would not be permitted by Council.

A.4.43 **Policy T5: Transport** – further pinpoints that *'new developments will only be permitted where they provide safe, secure and direct access for pedestrians, connected to existing pedestrian routes in the surrounding area'*.

A.4.44 **Policy T7: Transport** – distinguishes that for non-residential developments *'adequate servicing arrangements'* must be made for *'commercial vehicles'* in order for the Council to permit planning.

A.4.45 **Policy T8: Transport** – categorizes that developments that propose *'new or expanded wharves and railheads will be permitted where they do not cause harm to the environment and are located so that there is suitable road access'*.

A.4.46 **Policy T12: Transport** – classifies that the loss of off-street parking spaces in areas in or adjacent t the House Conversion Restraint Areas will be resisted.

Appendix B: PTAL analysis

This page is intentionally blank

PTAI Study Report File Summary

PTAI Run Parameters

PTAI Run	20120210095859
Description	20120210095859
Run by user	PTAL web application
Date	02/10/2012

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:	529550, 177599

Mode	Stop	Route	Distance (metres)	Frequency (vph)	Weight	Walk time (mins)	SWT (mins)	TAT (mins)	EDF	AI
BUS	JACK BARCLAY ROLLS ROYCE	156	133.16	7.5	0.5	1.66	6.0	7.66	3.91	1.96
BUS	JACK BARCLAY ROLLS ROYCE	344	133.16	10	1	1.66	5.0	6.66	4.5	4.5

Total AI for this POI is 6.46.
PTAL Rating is 2.

Appendix C: Local modelling outputs

This page is intentionally blank

C.1 Construction development case results, AM peak hour

Nine Elms Lane (A3205)/New site access priority layout

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Heathwall			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
Dev Case EIA, AM	Dev Case EIA	AM		Varies by Arm	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	18.46	C

Junction Network Options

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

Arms

Arms

Arm	Name	Description	Arm Type
A	Nine Elms Lane (W)		Major
B	New Site Access		Minor
C	Nine Elms Lane (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	6.20		0.00		2.20	0.00		

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	5.00										35	30

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	604.530	0.109	0.276	0.174	0.394
1	B-C	771.538	0.117	0.296	-	-

1	C-B	573.963	0.220	0.220	-	-

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	1356.000
	B	0.000	0.000	4.000

	C	1066.000	0.000	0.000

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

		To		
		A	B	C
From	A	0.00	0.00	1.00
	B	0.00	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	1.616	1.117
	B	1.000	1.000	1.616
	C	1.190	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	61.586	11.743
	B	0.000	0.000	61.586
	C	18.962	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	18.46	0.02	C
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A
A-B	-	-	-	-
A-C	-	-	-	-

C.2 Construction development case results, PM peak hour

Nine Elms Lane (A3205)/New site access priority layout

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Heathwall			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
Dev Case EIA, PM	Dev Case EIA	PM		Varies by Arm	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	15.68	C

Junction Network Options

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

Arms

Arms

Arm	Name	Description	Arm Type
A	Nine Elms Lane (W)		Major
B	New Site Access		Minor
C	Nine Elms Lane (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	6.20		0.00		2.20	0.00		

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	5.00										35	30

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	604.530	0.109	0.276	0.174	0.394
1	B-C	771.538	0.117	0.296	-	-
1	C-B	573.963	0.220	0.220	-	-

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			
From		A	B	C

	A	0.000	4.000	1155.000
	B	0.000	0.000	5.000
	C	1255.000	0.000	0.000

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

		To		
		A	B	C
From	A	0.00	0.00	1.00
	B	0.00	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	1.616	1.145
	B	1.000	1.000	1.616
	C	1.148	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	61.586	14.452
	B	0.000	0.000	61.586
	C	14.812	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	15.68	0.02	C
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A
A-B	-	-	-	-
A-C	-	-	-	-

C.3 Construction development case results, “all by road” sensitivity test, AM peak hour

Nine Elms Lane (A3205)/New site access priority layout

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Heathwall			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
Dev Case ABR, AM	Dev Case ABR	AM		Varies by Arm	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	21.35	C

Junction Network Options

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

Arms

Arms

Arm	Name	Description	Arm Type
A	Nine Elms Lane (W)		Major
B	New Site Access		Minor
C	Nine Elms Lane (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	6.20		0.00		2.20	0.00		

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	5.00										35	30

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	604.530	0.109	0.276	0.174	0.394
1	B-C	771.538	0.117	0.296	-	-
1	C-B	573.963	0.220	0.220	-	-

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	8.000	1356.000
	B	0.000	0.000	7.000
	C	1066.000	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	0.00	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	1.827	1.117
	B	1.000	1.000	1.827
	C	1.190	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	82.654	11.743
	B	0.000	0.000	82.654
	C	18.962	0.000	0.000

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.04	21.35	0.04	C

C-A	-	-	-	-
C-B	0.00	0.00	0.00	A
A-B	-	-	-	-
A-C	-	-	-	-

C.4 Construction development case results, “all by road” sensitivity test, PM peak hour

Nine Elms Lane (A3205)/New site access priority layout

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Heathwall			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
Dev Case ABR, PM	Dev Case ABR	PM		Varies by Arm	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	18.08	C

Junction Network Options

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

Arms

Arms

Arm	Name	Description	Arm Type
A	Nine Elms Lane (W)		Major
B	New Site Access		Minor
C	Nine Elms Lane (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	6.20		0.00		2.20	0.00		

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	5.00										35	30

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	604.530	0.109	0.276	0.174	0.394
1	B-C	771.538	0.117	0.296	-	-
1	C-B	573.963	0.220	0.220	-	-

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			
From		**A**	**B**	**C**

	A	0.000	7.000	1155.000
	B	0.000	0.000	8.000
	C	1255.000	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	0.00	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	1.100	1.827	1.145
	B	1.000	1.100	1.827
	C	1.148	1.000	1.100

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	10.000	82.654	14.452
	B	0.000	10.000	82.654
	C	14.812	0.000	10.000

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.04	18.08	0.04	C
C-A	-	-	-	-
C-B	0.00	0.00	0.00	A
A-B	-	-	-	-
A-C	-	-	-	-

This page is intentionally blank

Appendix D: Accident Analysis

D.1 Existing Highway Safety Analysis

D.1.1 Accident data within the vicinity of the site has been obtained from Transport for London (TfL) and analysed to determine if there are any specific road safety issues, trends or patterns evident on the surrounding highway network.

D.1.2 Data has been obtained for a 5 year period, up until the 31st March 2011. Figure 1.1 shows the extent of the study area which has been reviewed. The following roads and junctions have been analysed:

- Nine Elms Lane (A3205); and
- Nine Elms Lane / Ponton Road.

D.1.3 Table D.1 provides a summary of the accident locations, the total number of accidents and the associated level of accident severity.

Vol X Table D.1 Accident severity 2006 to 2011

Location	Slight	Serious	Fatal	Total
Nine Elms Lane (A3205)	7	2	0	9
Nine Elms Lane / Ponton Road junction	6	1	0	7
Total	**13**	**3**	**0**	**16**

D.1.4 During the 5 year period, a total of 16 accidents have been recorded within the study area analysed. Of these accidents, 13 were categorised as slight and 3 were identified as serious. Accident analysis, for each accident location, is provided in the following sections.

Nine Elms Lane (A3205)

D.1.5 Heathwall Pumping station is sited adjacent to the River Thames, to the north of Nine Elms Lane (A3205). It is proposed that Nine Elms Lane will be the primary route for construction traffic accessing and egressing the site.

D.1.6 Nine Elms Lane (A3205) - part of the Transport for London's Road Network (TLRN) - links to Battersea in the south-west and Vauxhall in the north-east. Part of the carriageway is a two-way road with adjacent bus lanes routing in both a north-east and south-west direction. Within the study area analysed, the road forks approximately 70 metres west of the junction with Ponton Road up until the junction with the A3036 in the east. Along this stretch of road, the carriageway increases to three lanes in both directions.

D.1.7 The majority of accidents (9 accidents) within the study area occurred along Nine Elms Lane. These accidents are relatively dispersed along the stretch of road within the study area. Although, there is a small cluster of 3 accidents approximately 210 metres west of the junction with Wandsworth Road. All of these accidents involved motorcyclists and the key causes were recorded as failing to look properly and poor turn or manoeuvre.

D.1.8 Of the total accidents along Nine Elms Lane, 2 were classified as serious. One of these accidents occurred approximately 150 metres west of the junction with Ponton Road, where a car made a U-turn causing a collision with a motorcyclist. Aggressive driving was noted as the contributing factor to the cause of the accident. The other serious accident took place approximately 90 metres east of the Nine Elms junction with Cringle Street. This involved the collision of two cars as a result of driving too closely and sudden breaking.

D.1.9 Nearly all of the slight accidents that occurred along Nine Elms involved motorcyclists and the cause was often attributed to failing to look properly and undertaking a poor turn or manoeuvre.

D.1.10 Additionally, there were 7 accidents which occurred at the junction of Nine Elms Lane and Ponton Road. Of these accidents, 6 were rated as slight in severity and one accident was identified as serious.

D.1.11 The serious accident involved a Goods Vehicle (less than 3.5 tonnes) crossing into the path of a motorcyclist. Failing to look properly and undertaking a poor turn or manoeuvre were the factors attributed to the cause of accident.

D.1.12 The remaining 6 accidents - identified as slight - at the junction with Ponton Road involved cars, a motorcycle and one accident involved a cyclist. This accident occurred as a result of a vehicle passing too closely to the cyclist. Common factors relating to the other accidents included failing to look properly, undertaking a poor turn or manoeuvre and defective / sudden breaking.

D.1.13 Of the total accidents, 3 accidents included LGVs. Two of the accidents were rated as slight in severity and one led to a serious accident which has been described above.

D.2 Summary and Conclusion

D.2.1 During the 5 year period, a total of 16 accidents occurred on Nine Elms Lane (within the study area analysed) and at the junction of Nine Elms Lane and Ponton Road. Of these accidents, 13 were categorised as slight and 3 were serious with the majority of accidents occurring on Nine Elms Lane.

D.2.2 In general, the accidents largely involved motorcyclists. One accident involved a cyclist and the rest involved cars. None of the accidents involved pedestrians or HGVs. LGVs were involved in 3 accidents, of which 2 were rated as slight and one was serious.

D.2.3 Of the serious accidents, 2 occurred on Nine Elms Road and one occurred at the junction with Ponton Road. The cause of accident were attributed to factors such as aggressive driving, following too closely and failing to look properly. Thus, suggesting that these accidents have occurred as a result of human error rather than as a result of the highway geometry.

D.2.4 Furthermore, the majority of the slight accidents were also caused by factors associated with human error.

D.2.5 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.

This page is intentionally blank

Appendix E: Road Safety Audit

This page is intentionally blank

Your ref -
Our ref 211146-00/cvl

ARUP

Central Square
Forth Street
Newcastle upon Tyne
NE1 3PL
United Kingdom

t +44 191 261 6080
f +44 191 261 7879

chris.van-lottum@arup.com-
www.arup.com

Thames Tideway Tunnel
The Point (7th Floor),
37 North Wharf Road,
Paddington,
London W2 1AF
For the attention of Dermot Scanlon

13 February 2013

Dear Sirs

Thames Tideway Tunnel
Heathwall Pumping Station – Stage 1 Road Safety Audit

I have the pleasure of enclosing our Heathwall Pumping Station – Stage 1 Road Safety Audit report. In addition to the enclosed report the Audit Team noted the following points outwith the remit of the audit. I would be grateful if you would bring these issues to the attention of the Highway Authority, Designer and/or Maintainer as appropriate.

Additional Comments

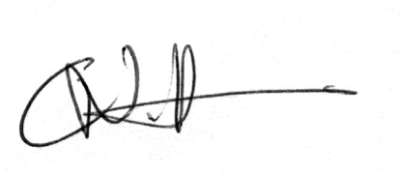
- Nine Elms Road is a signed cycle route to the west of Kirtling Street and to the east has shared use segregated pedestrian / cycle paths on either side. Any traffic management proposed on these roads should take full account of cycles. Delivery drivers and site staff should be made aware of the presence of the cycle routes and the likely increased risk of cycle / goods vehicle conflict in the site induction and construction method statements. Furthermore Thames Water Utilities Limited staff maintaining the existing pumping station throughout the duration of the works using the existing access on Nine Elms Road should also be briefed accordingly.

IMG_8592.jpg

- It is not sufficiently clear from the swept path analysis drawings whether there is sufficient space to turn the 10.7m small articulated HGV and the 12m rigid HGV within the manoeuvring area of the Heathwall Pumping Station.

If you have any further queries regarding this letter or 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 - Heathwall Pumping Station

Stage 1 Road Safety Audit

RSA1.1a

Rev A | 13 February 2013

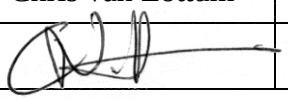
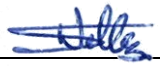
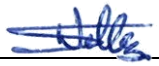
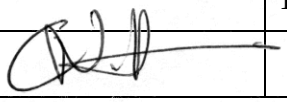
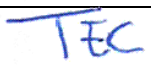
Job number 211146-03

Ove Arup & Partners Ltd
Central Square
Forth Street
Newcastle-upon-Tyne NE1 3PL
United Kingdom
www.arup.com

ARUP

Document Verification

ARUP

Job title		Thames Tideway Tunnel - Heathwall Pumping Station		**Job number** 211146-03	
Document title		Stage 1 Road Safety Audit		**File reference**	
Document ref		RSA1.1a			
Revision	**Date**	**Filename**	RP CVL TTT 12 Heathwall RSA1.1 130213 Rev A.docx		
Issue	19 Dec 2012	**Description**	Issue Document		
			Prepared by	Checked by	Approved by
		Name	Chris van Lottum	Steve Wells	Steve Wells
		Signature			
Rev A	13 Feb 2013	**Filename**	RP CVL TTT 12 Heathwall RSA1.1 130213 Rev A.docx		
		Description	Revised information received		
			Prepared by	Checked by	Approved by
		Name	Chris van Lottum	Tom Corke	Steve Wells
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			
		Filename			
		Description			
			Prepared by	Checked by	Approved by
		Name			
		Signature			
				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 Heathwall Pumping Station, Nine Elms Lane in the London Borough of Wandsworth.

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.

At the time of the site visit the public footpath along the western boundary of the site was diverted through the Heathwall Pumping Station site to facilitate the St James's Developments 'Riverlight' development. As it stands there would be insufficient space to the west of the Pumping Station to implement the Thames Tideway Tunnel scheme.

IMG_8587.jpg

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.

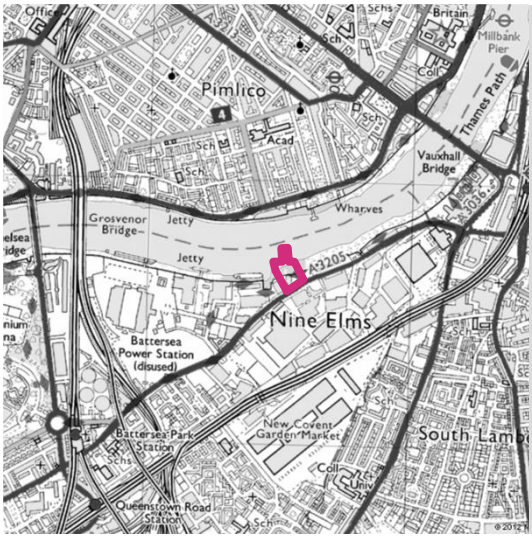
This audit has been undertaken in accordance with the Terms of Reference set out in TfL Procedure 'Road Safety Audit SQA-0170 – Issue 4'; and the Audit Team members meet the training and experience requirements set out therein. The Audit Team has examined and reported only on the road safety implications 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

Heathwall Pumping Station is located on the south bank of the River Thames and is accessed directly from the A3205 Nine Elms Lane between Vauxhall and Battersea Park.

1.2 Scheme Description

The site would have two site accesses via Nine Elms Lane (A3205), which forms part of the Transport for London Road Network (TLRN). Both accesses would be arranged on a 'left in, left out' basis, with a turning facility provided within the site to allow vehicles to turn and exit facing forwards.

The eastern access would require widening to facilitate the movement of construction traffic. A short term pedestrian diversion may be required while the crossover is being modified.

2 Stage 1 Road Safety Audit

No items have been identified by the Audit Team.

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.

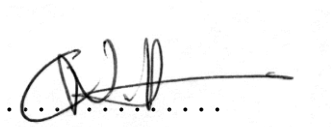
Audit Team Leader

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

Senior Engineer

Arup

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



13 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

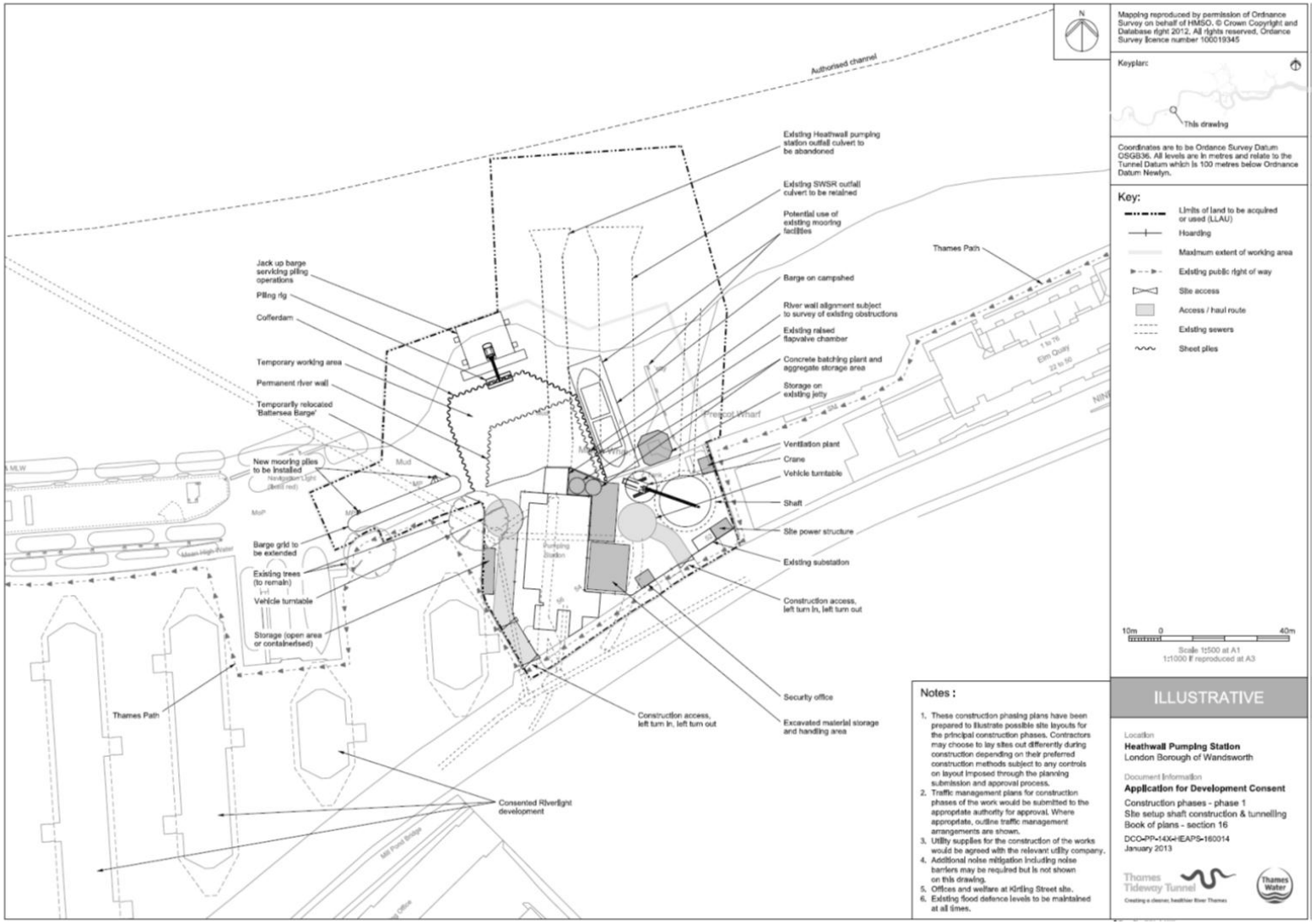


Figure 1 Location of Recommendations

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	-	11/12/2012

A1.2 Drawings

Title	Reference	Revision
Transport - site location plan	1PL03-TT-50660	Jan 2013
Transport - construction traffic routes	1PL03-TT-50652	Jan 2013
Transport - accident locations	1PL03-TT-50756	Jan 2013
Construction phases - phase 1 - Site setup shaft construction & tunnelling	DCO-PP-14X-HEAPS-160014	Jan 2013
Construction phases - phase 3 - Site demobilisation	DCO-PP-14X-HEAPS-160016	Jan 2013
Highway layout during construction (Area 1) Ph 1	DCO-PP-14X-HEAPS-160020	Jan 2013
Permanent highway layout – Area 1 Work	DCO-PP-14X-HEAPS-160021	Jan 2013
Highway layout during construction (Area 1) – Vehicle swept path analysis	DCO-PP-14X-HEAPS-160023	Jan 2013
Permanent highway layout (Area 1) – Vehicle swept path analysis	DCO-PP-14X-HEAPS-160024	Jan 2013

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 – Heathwall Pumping Station**	
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 Heathwall Pumping Station in the London Borough of Wandsworth.

1.2 There were no recommendations made for the Heathwall Pumping Station site in the Stage 1 Road Safety Audit. However the audit team made the following comments, this technical note provides the Designer's Response to the comments raised.

2 Stage 1 Road Safety Audit

2.1 Comments

Nine Elms Road is a signed cycle route to the west of Kirtling Street and to the east has shared use segregated pedestrian / cycle paths on either side. Any traffic management proposed on these roads should take full account of cycles. Delivery drivers and site staff should be made aware of the presence of the cycle routes and the likely increased risk of cycle / goods vehicle conflict in the site induction and construction method statements.

Furthermore Thames Water staff maintaining the existing pumping station throughout the duration of the works using the existing access on Nine Elms Road should also be briefed accordingly.

Comment Response – Site staff and delivery drivers associated with the Thames Water site will be briefed on the presence of cyclists on Nine Elms Road as part of the site induction. This measure will be included in the Code of Construction Practice at Stage 2 (Detailed Design).

This page is intentionally blank

Thames Tideway Tunnel
Thames Water Utilities Limited

Application for Development Consent

Application Reference Number: WWO10001

Transport Assessment

Doc Ref: **7.10.12**

Heathwall Pumping Station

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

This page is intentionally blank

Thames Tideway Tunnel

Transport Assessment

Section 15: Heathwall Pumping Station figures

List of contents

This page is intentionally blank

Plans

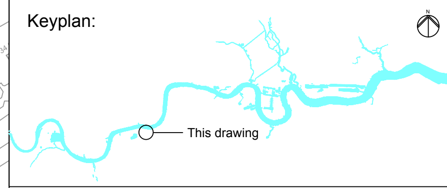
This page is intentionally blank

Heathwall Pumping Station

THAMES TIDEWAY TUNNEL - SCHEDULE OF ASSOCIATED HIGHWAY WORKS

Drawing Number	Works Reference	Location	Item of Work	Date of Implementation
DCO-PP-14X-HEAPS-160020	PWH10_C01	Nine Elms Lane / East Site Access Junction	Widening of existing access to 7m to accommodate the turning movements of the HGVs. Realignment of kerb on the western side of the access will be required.	TBC
	PWH10_C02	Nine Elms Lane / West Site Access Junction	Provision of a gated site access at the location of an existing access to Heathwall Pumping Station.	TBC
DCO-PP-14X-HEAPS-160021	PWH10_P01	Nine Elms Lane / East Site Access Junction	Reinstatement of footpath and cycle path on the western side of the access in line with the existing junction alignment.	TBC
	PWH10_P02	Nine Elms Lane / East Site Access Junction	Provision of a gated access point for the use of maintenance vehicles.	TBC

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
- Bus lanes
- Bus stop / stand
- Pedestrian crossing
- Cycle lane / advance stop line

Revised

- Limit of land to be acquired or used (LLAU)

Stage

Existing

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

10m 0 100m

Scale 1:1000 at A1
1:2000 if reproduced at A3

FOR INFORMATION

Location

Heathwall Pumping Station
London Borough of Wandsworth

Document Information

Application for Development Consent
Existing highway layout

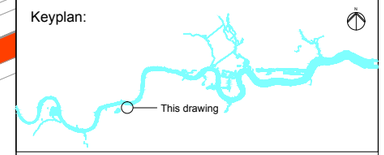
DCO-PP-14X-HEAPS-160019
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

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
- Red route parking restrictions
- Bus lane
- Pedestrian crossing
- Cycle lane / advance stop line

Revised
- Removal of footway
- Suspended cycle facility
- Illustrative on-site manoeuvring zone
- Visibility splay - 2.4m x 43m (ssd adjust for bonnet length)
- Site hut
- Site hoarding
- Access gate
- Limit of land to be acquired or used (LLAU)
- PWH10_C00 See schedule of works

Stage
Phase 1

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

10m 0 40m

Scale 1:500 at A1
1:1000 if reproduced at A3

ILLUSTRATIVE

Location
Heathwall Pumping Station
London Borough of Wandsworth

Document Information
Application for Development Consent
Highway layout during construction (Area 1) Ph 1

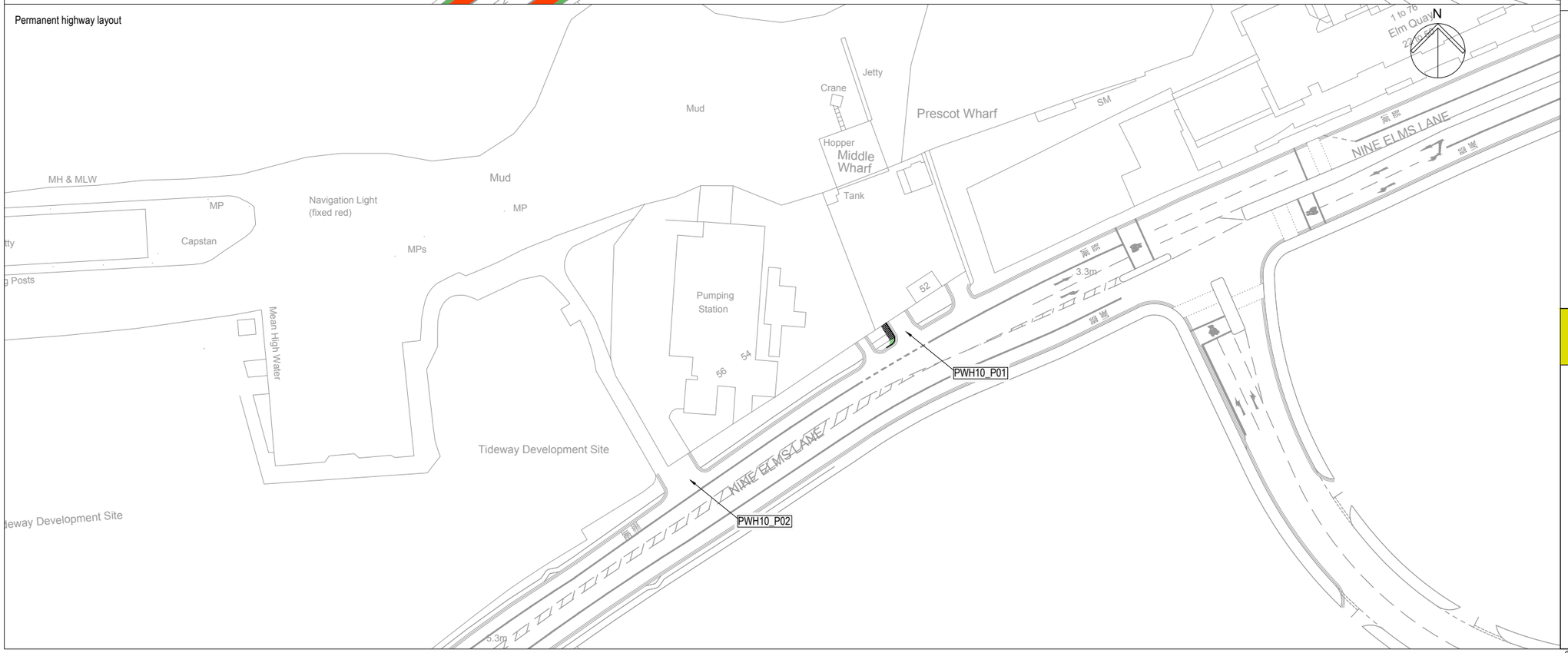
DCO-PP-14X-HEAPS-160020
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

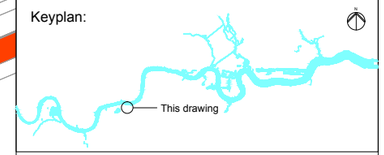
Thames Water

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
- Red route parking restrictions
- Bus lane
- Pedestrian crossing
- Cycle lane / advance stop line

Revised
- Reinstated footway
- Reinstated cycle facility
- PWH10_P00 See schedule of works

Stage
Permanent phase

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

10m 0 40m

Scale 1:500 at A1
1:1000 if reproduced at A3

ILLUSTRATIVE

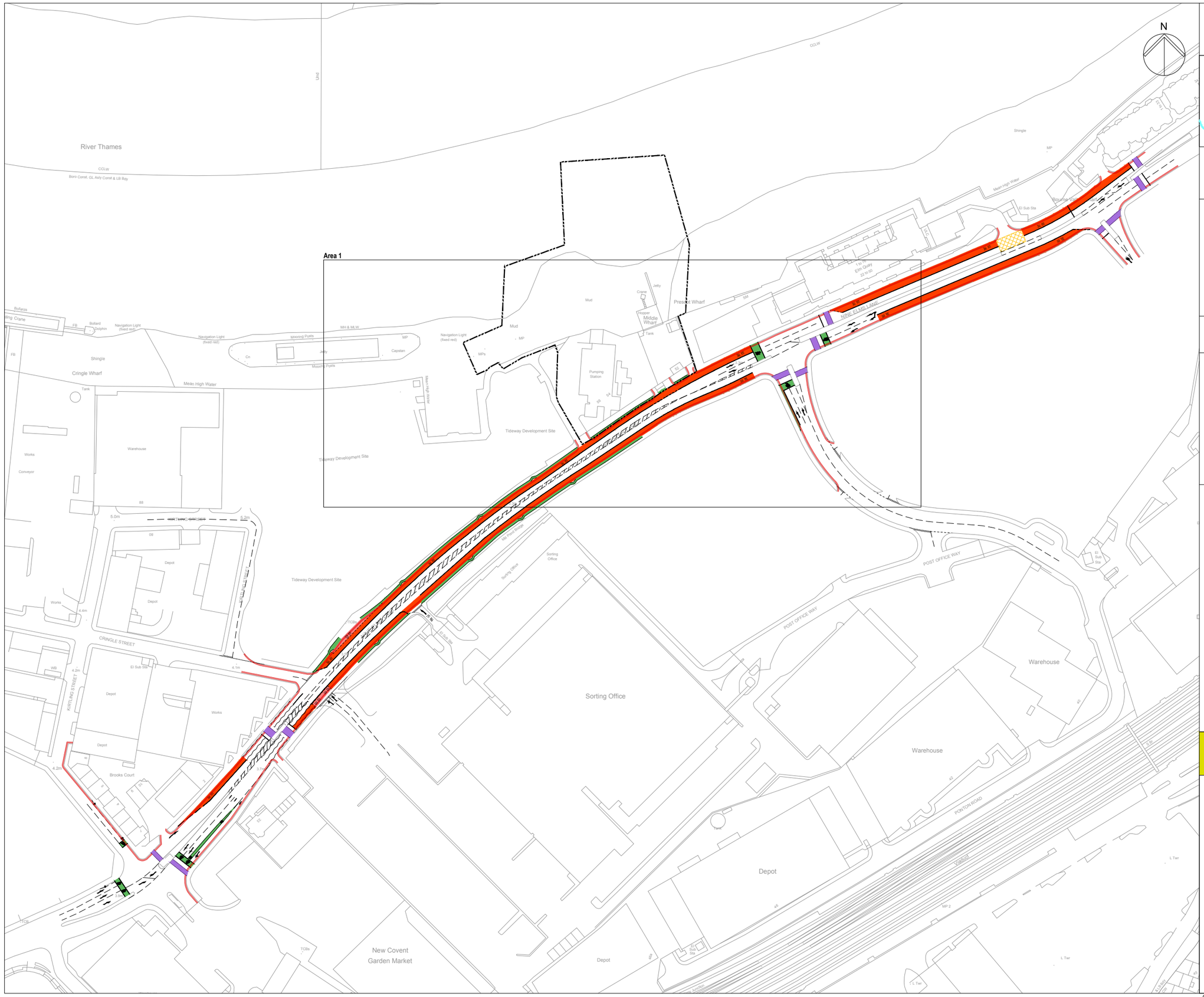
Location
Heathwall Pumping Station
London Borough of Wandsworth

Document Information
Application for Development Consent
Permanent highway layout - Area 1 Work

DCO-PP-14X-HEAPS-160021
January 2013

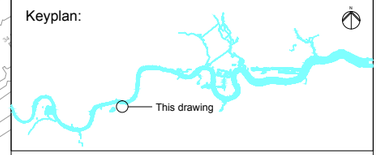
Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water



Mapping reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown Copyright and Database right 2012. All rights reserved. Ordnance Survey licence number 100019345

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
- Bus stop / stand
- Bus lanes
- Pedestrian crossing
- Cycle lane / advance stop line

Revised

- Limit of land to be acquired or used (LLAU)

Stage

Construction base case

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

10m 0 40m

Scale 1:500 at A1
1:1000 if reproduced at A3

ILLUSTRATIVE

Location

Heathwall Pumping Station
London Borough of Wandsworth

Document Information

Application for Development Consent

Construction base case highway layout

DCO-PP-14X-HEAPS-160022
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

10.7m Small articulated vehicle
Speed = 20km/h

10.7m Small articulated vehicle

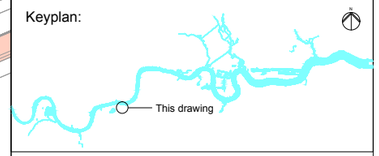
Small articulated vehicle	
Overall length	10.700m
Overall width	2.360m
Overall body height	3.604m
Min body ground clearance	0.382m
Track width	2.240m
Lock to lock time	6.00s
Kerb to kerb turning radius	5.740m

12.0m Rigid vehicle
Speed = 20km/h to western access
from eastern access
15km/h from western access
to eastern access

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
- Red route parking restrictions
- Bus lane
- Pedestrian crossing
- Cycle lane / advance stop line

Revised
- Illustrative on-site manoeuvring zone
- Removal of footway
- Suspended cycle facility
- 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

Stage
Phase 1

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

10m 0 40m

Scale 1:500 at A1
1:1000 if reproduced at A3

ILLUSTRATIVE

Location
Heathwall Pumping Station
London Borough of Wandsworth

Document Information
Application for Development Consent

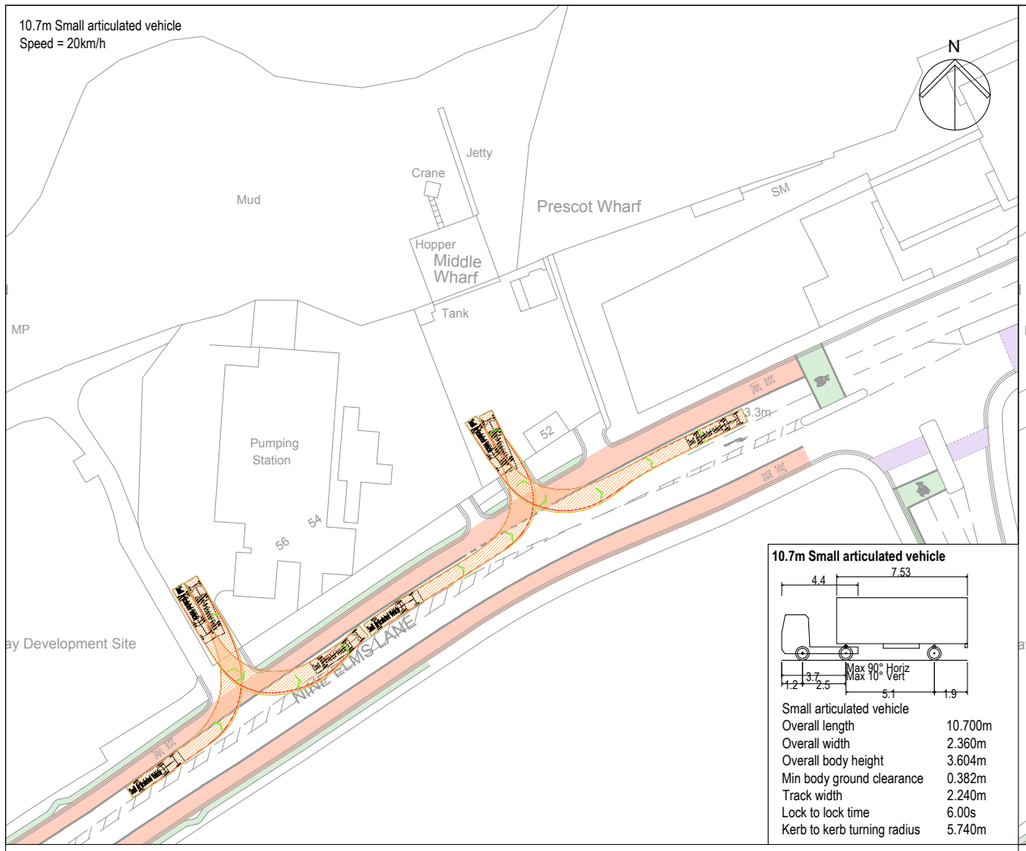
Highway layout during construction (Area 1)
Vehicle swept path analysis

DCO-PP-14X-HEAPS-160023
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

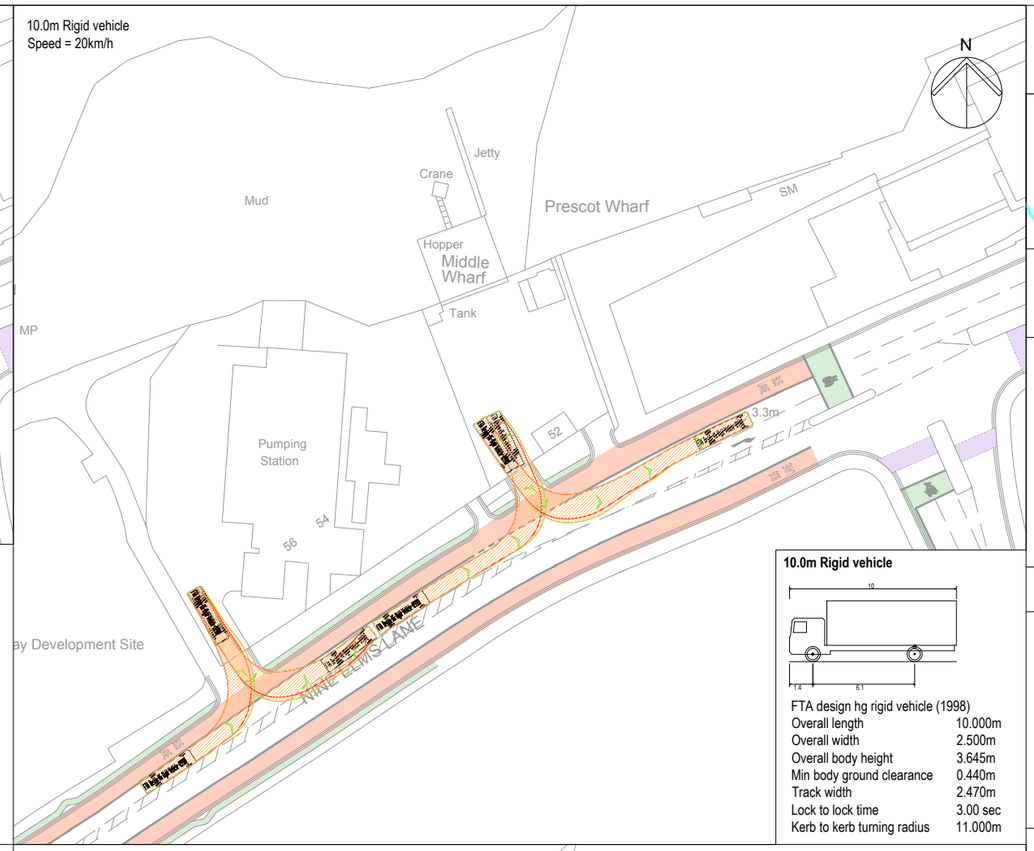
10.7m Small articulated vehicle
Speed = 20km/h



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	6.00s
Kerb to kerb turning radius	5.740m

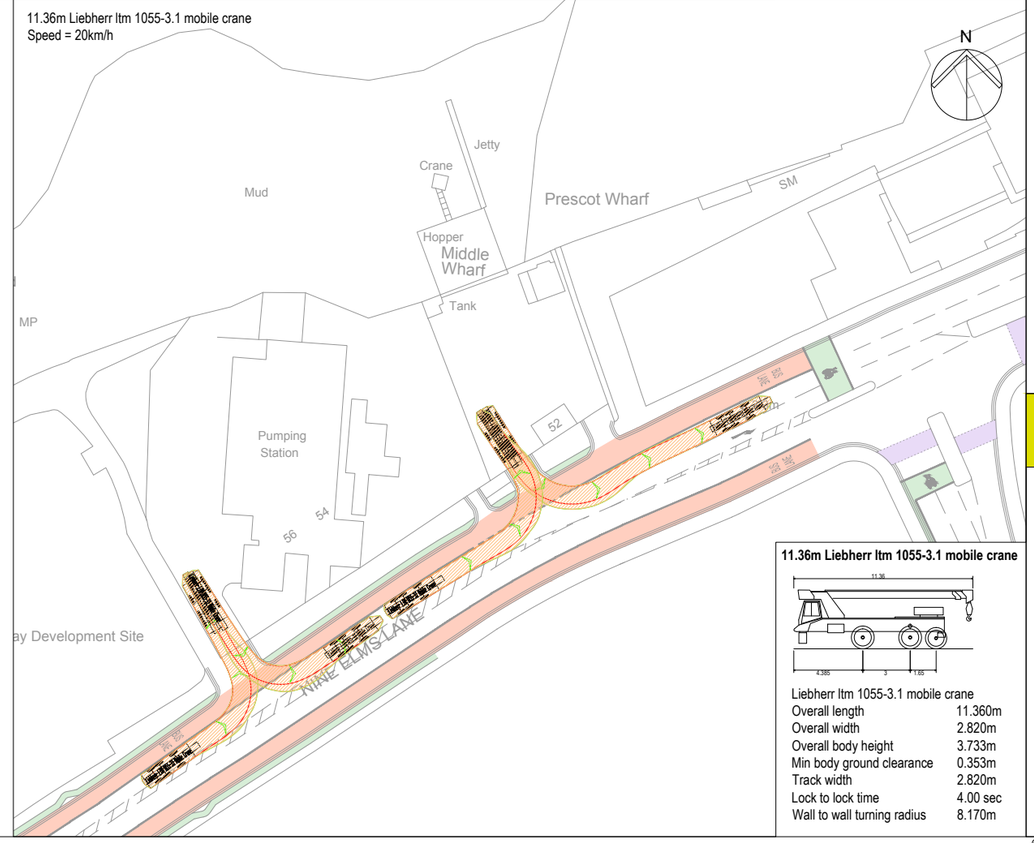
10.0m Rigid vehicle
Speed = 20km/h



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

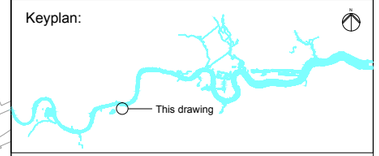
11.36m Liebherr ltm 1055-3.1 mobile crane
Speed = 20km/h



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
- Red route parking restrictions
- Bus lane
- Pedestrian crossing
- Cycle lane / advance stop line

Vehicle swept path analysis
- Vehicle body outlines
- Vehicle chassis outline
- Vehicle swept path

Stage
Permanent phase

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

10m 0 40m

Scale 1:500 at A1
1:1000 if reproduced at A3

ILLUSTRATIVE

Location
Heathwall Pumping Station
London Borough of Wandsworth

Document Information
Application for Development Consent
Permanent highway layout (Area 1)
Vehicle swept path analysis

DCO-PP-14X-HEAPS-160024
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

This page is intentionally left blank

Transport assessment figures

This page is intentionally blank

Keyplan:

Key

- Pumping station
- TFL road network
- Limits of Land to be Acquired or Used
- Local authority boundary

Western Pumping Station

Heathwall Pumping Station

Nine Elms Lane

Queenstown Road

Battersea Park Road

CITY OF WESTMINSTER

KENSINGTON & CHELSEA

WANDSWORTH

LAMBETH

Pimlico

Nine Elms

South Lambeth

Vauxhall

Spring Gdns

Vauxhall Park

New Covent Garden Market

Battersea Power Station (disused)

Millenium Arena (Sports Arena)

A202

A3036

A3205

A203

A3216

110 55 0 110 m

Scale 1 : 7,500 at A3

FOR INFORMATION

Location

Heathwall Pumping Station
London Borough Of Wandsworth

Document Information

Transport Assessment

Transport - site location plan

Figure 15.2.1

1PL03-TT-50660
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Keyplan:

Key

- 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

Heathwall Pumping Station
London Borough Of Wandsworth

Document Information

Transport Assessment

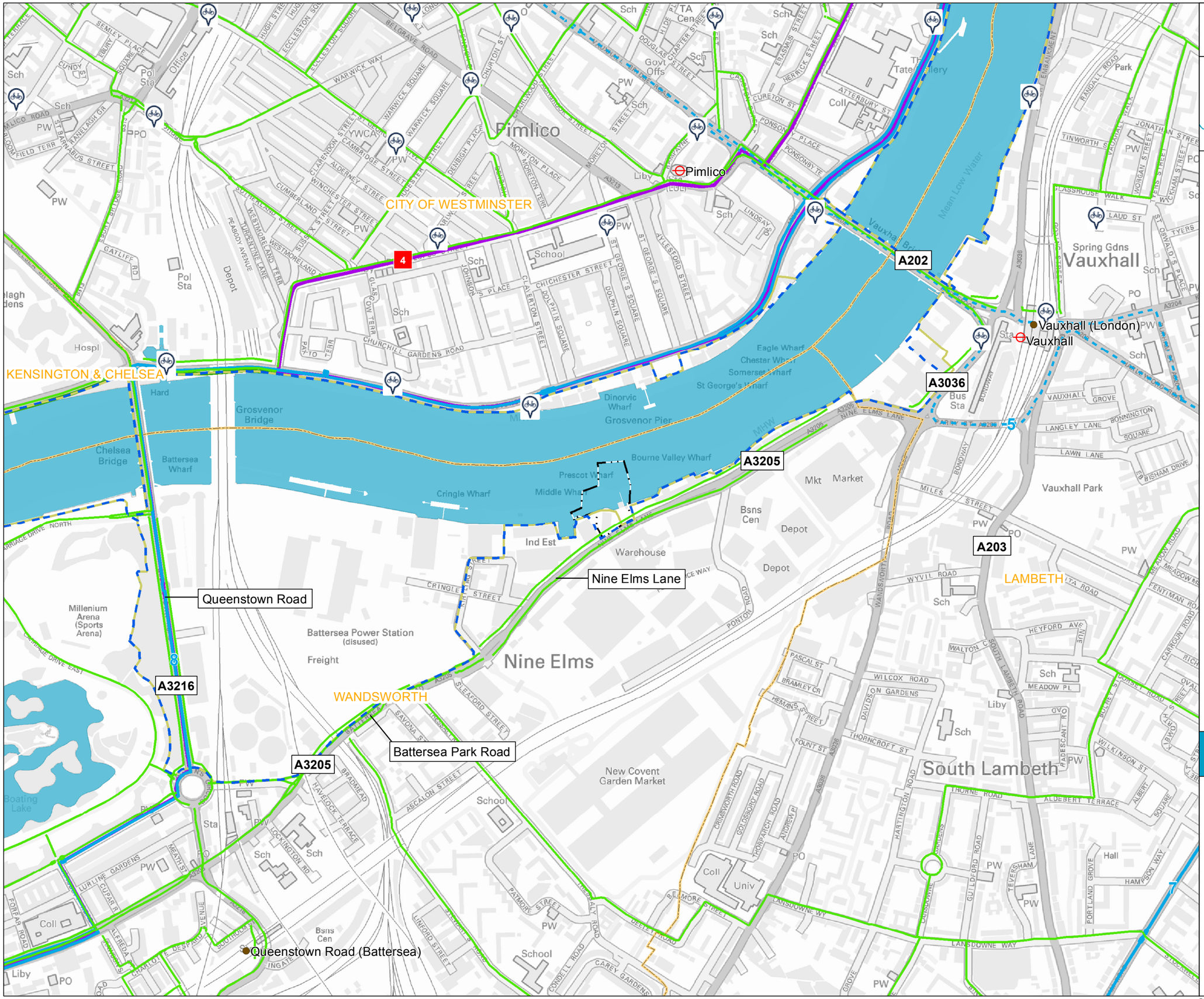
Transport - construction traffic routes

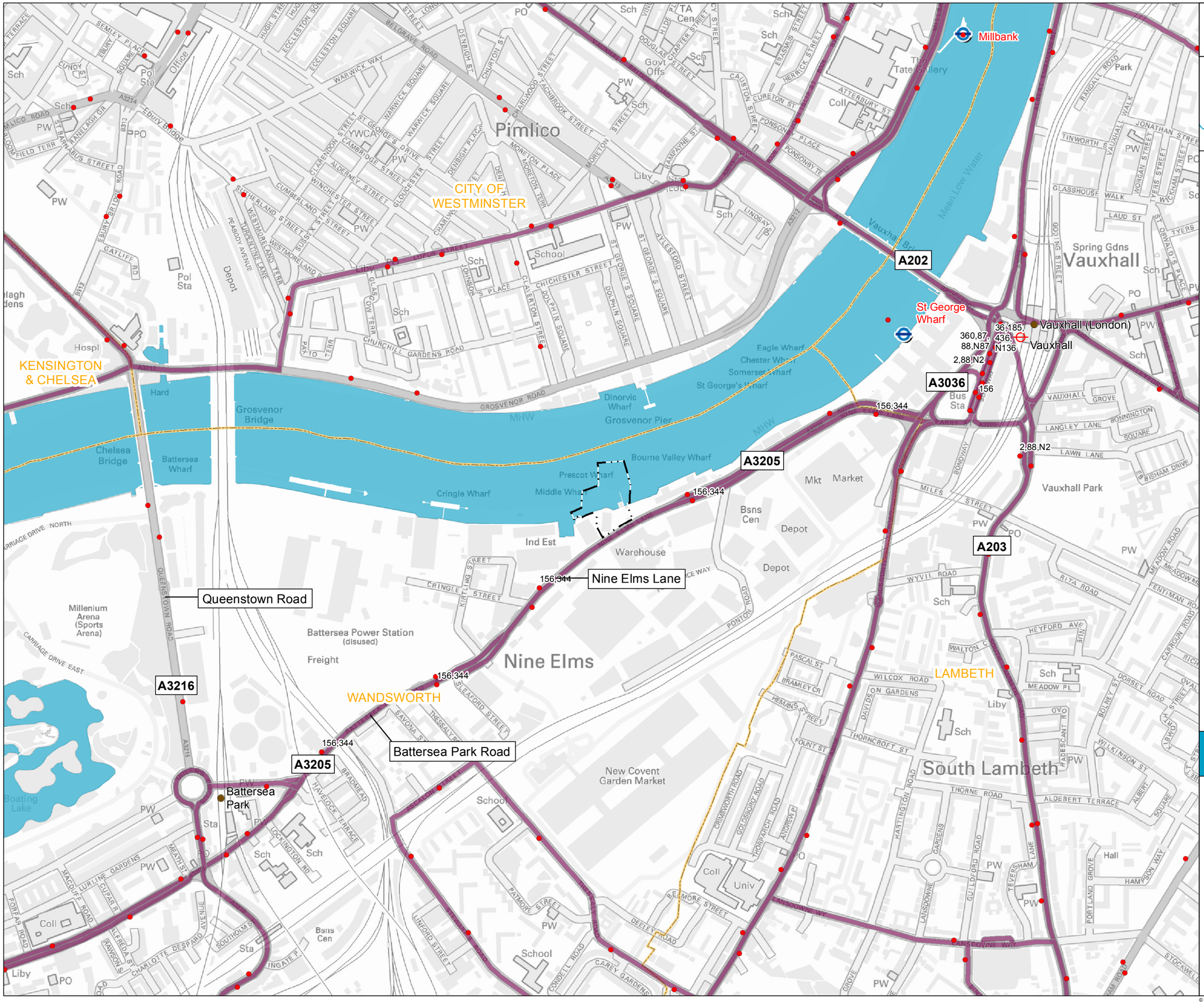
Figure 15.2.2

1PL03-TT-50652
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water


Pimlico
CITY OF WESTMINSTER
KENSINGTON & CHELSEA
WANDSWORTH
LAMBETH
Vauxhall
Spring Gdns
Nine Elms
South Lambeth
New Covent Garden Market
Battersea Power Station (disused)
Millenium Arena (Sports Arena)
Vauxhall (London)
Queenstown Road (Battersea)
Pimlico
Vauxhall
Queenstown Road
Nine Elms Lane
Battersea Park Road
A202
A3036
A3205
A203
A3216
Mean Low Water
Vauxhall Bridge
Grosvenor Bridge
Chelsea Bridge
Grosvenor Pier
Bourne Valley Wharf
Eagle Wharf
Chester Wharf
Somerset Wharf
St George's Wharf
Dinorvic Wharf
Prescot Wharf
Middle Wharf
Cringle Wharf
Battersea Wharf
Ind Est
Warehouse
Depot
Bsns Cen
Mkt
Market
Vauxhall Park
Freight
Boating Lake
Hospl
Depot
Pol Sta
Sta
Bus Sta
School
Coll
Univ
Hall
Liby
PO
PW
Sch
Mapping reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown Copyright and Database right 2012. All rights reserved. Ordnance Survey licence number 100019345
Keyplan:
Key
National rail stations with cycle parking
Underground stations with cycle parking
Barclays cycle hire docking stations
London cycle routes
Cycle superhighway (open)
Cycle superhighway (open 2013)
Thames path
London strategic walk network
National cycle network
Route Type
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
Heathwall Pumping Station
London Borough Of Wandsworth
Document Information
Transport Assessment
Transport - pedestrian and cycle network
Figure 15.4.1
1PL03-TT-50668
January 2013
Thames Tideway Tunnel
Creating a cleaner, healthier River Thames
Thames Water
© Thames Water Utilities Ltd 2008



Keyplan:

Key

- TFL bus stops
- Pier locations
- National rail stations
- London underground stations
- TfL bus routes
- Limits of Land to be Acquired or Used
- Local authority boundary

FOR INFORMATION

Location

Heathwall Pumping Station
London Borough Of Wandsworth

Document Information

Transport Assessment

Transport - public transport

Figure 15.4.2

1PL03-TT-50676
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Keyplan:

Key

- City Car
- Green Wheels
- Zip Car
- Council parking
- Private car parking
- Coach Parking
- 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

Heathwall Pumping Station
London Borough of Wandsworth

Document Information

Transport Assessment

Transport - parking

Figure 15.4.3

1PL03-TT-50684
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Keyplan:

Key

- Automatic traffic count surveys
- Pedestrian and cycle surveys
- Junction surveys
- Parking surveys
- Limits of Land to be Acquired or Used
- Local authority boundary

60 30 0 60 m

Scale 1 : 4,000 at A3

FOR INFORMATION

Location

Heathwall Pumping Station
London Borough Of Wandsworth

Document Information

Transport Assessment

Transport - survey locations

Figure 15.4.4

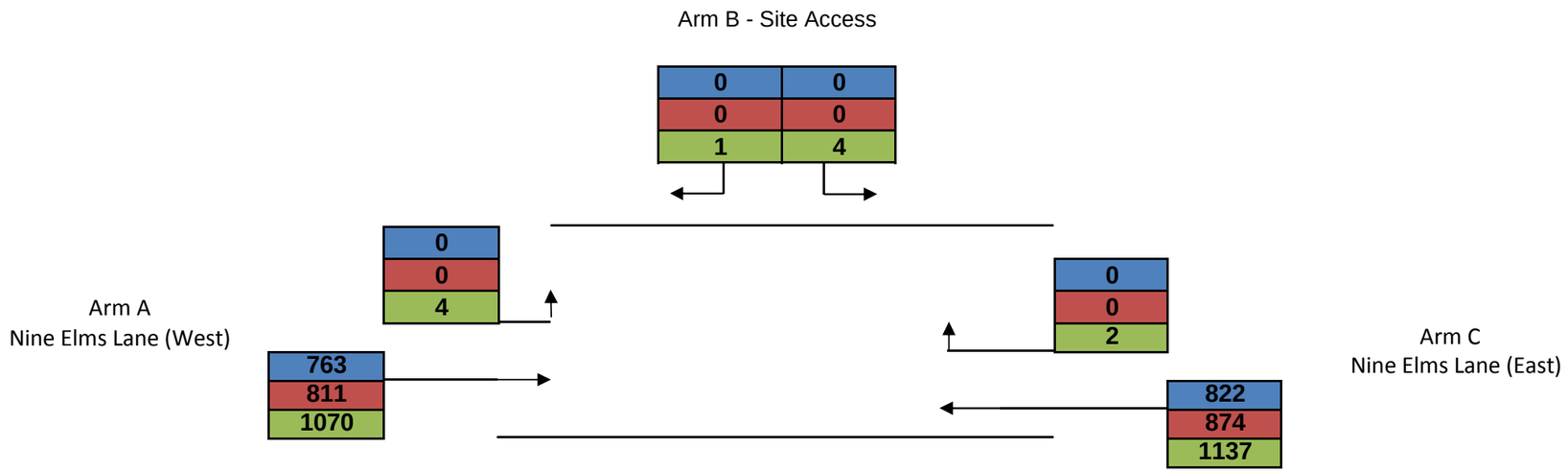
1PL03-TT-50692
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Site: Heathwall
Borough: Wandsworth
Junction: Nine Elms Lane Site
Junction no.: PBA 27

Data: Existing 2011 Traffic Flow in PCUs - AM Peak Hour from Traffic Survey



FOR INFORMATION

Location
Heathwall PS
London Borough of Wandsworth

Document Information
Transport Assessment

Baseline, Construction and Development case traffic flow (AM peak hour)

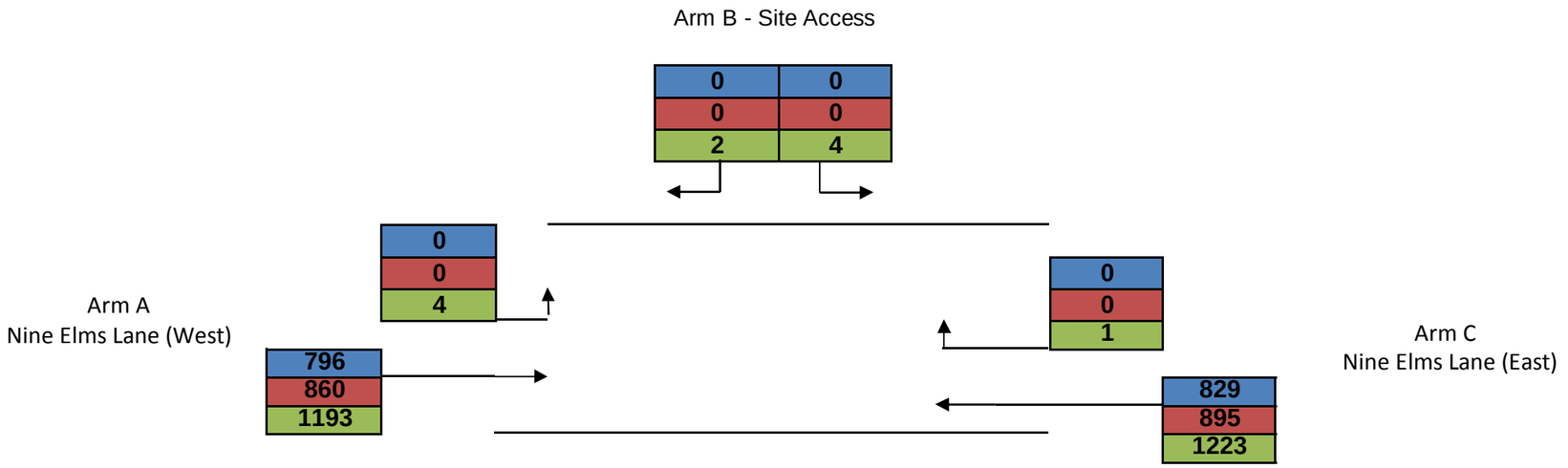
Figure 15.4.5
1PL03-TT-50911
January 2013

Thames Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Site: Heathwall
Borough: Wandsworth
Junction: Nine Elms Lane Site
Junction no.: PBA 27

Data: Existing 2011 Traffic Flow in PCUs - PM Peak Hour from Traffic Survey



FOR INFORMATION

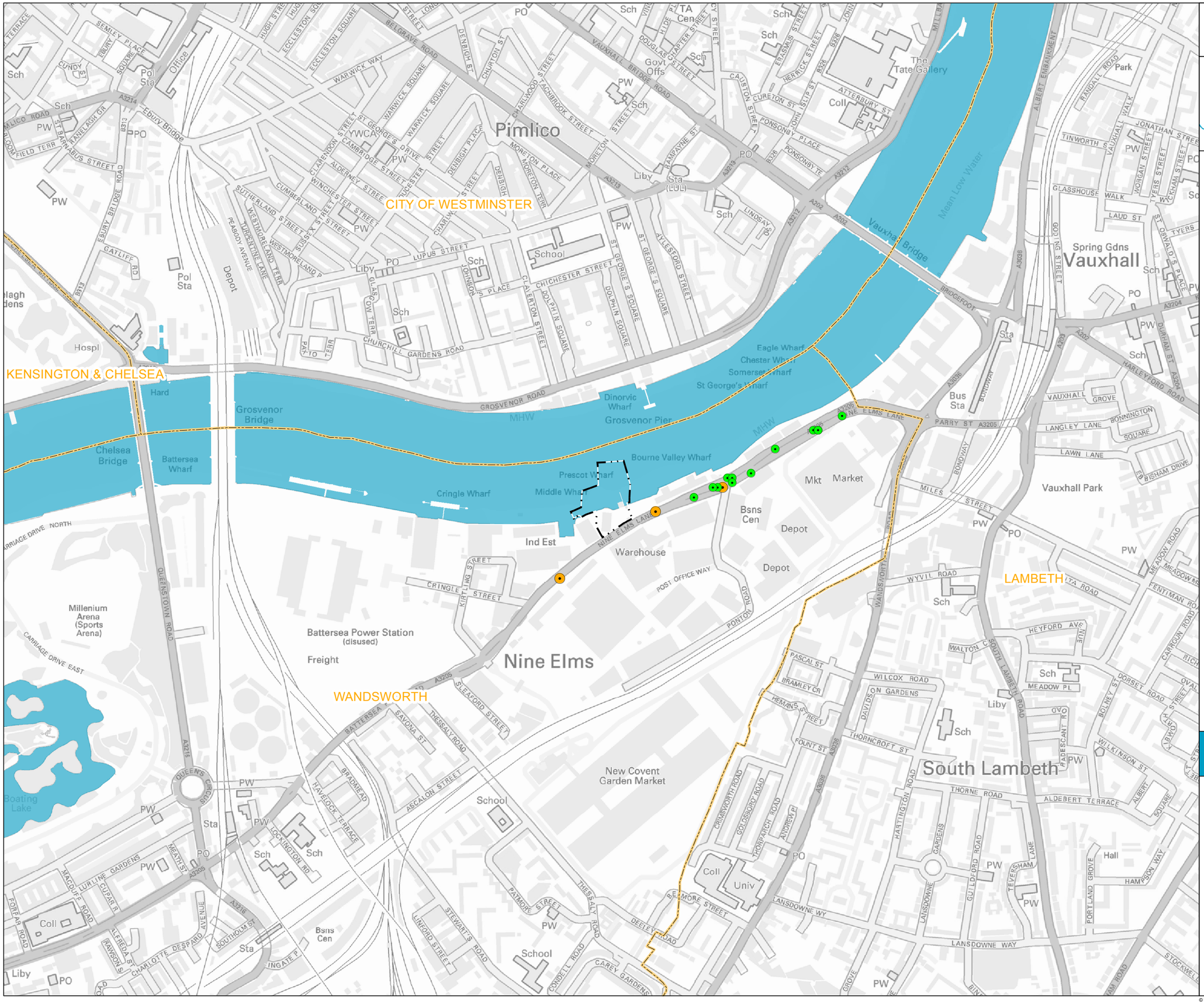
Location
Heathwall PS
London Borough of Wandsworth

Document Information
Transport Assessment

Baseline, Construction and Development case traffic flow (PM peak hour)

Figure 15.4.6
1PL03-TT-50935
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames
Thames Water



Mapping reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown Copyright and Database right 2012. All rights reserved. Ordnance Survey licence number 100019345

Keyplan:

Key

- Slight
- Serious
- 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

Heathwall Pumping Station
London Borough Of Wandsworth

Document Information

Transport Assessment

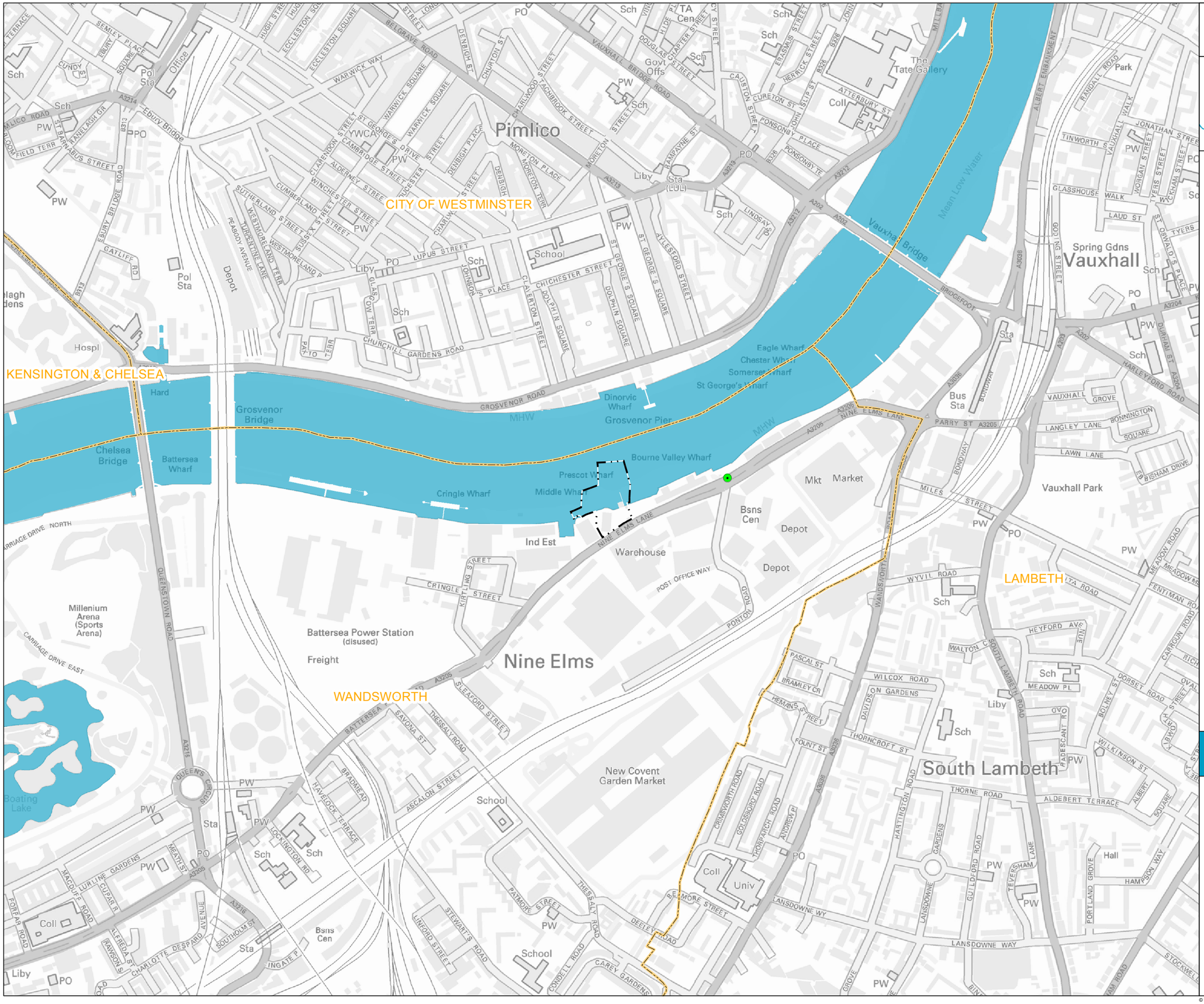
Transport - accident locations

Figure 15.4.7

1PL03-TT-50756
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water



Keyplan:

Key

Severity

- Slight
- 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

Heathwall Pumping Station
London Borough Of Wandsworth

Document Information

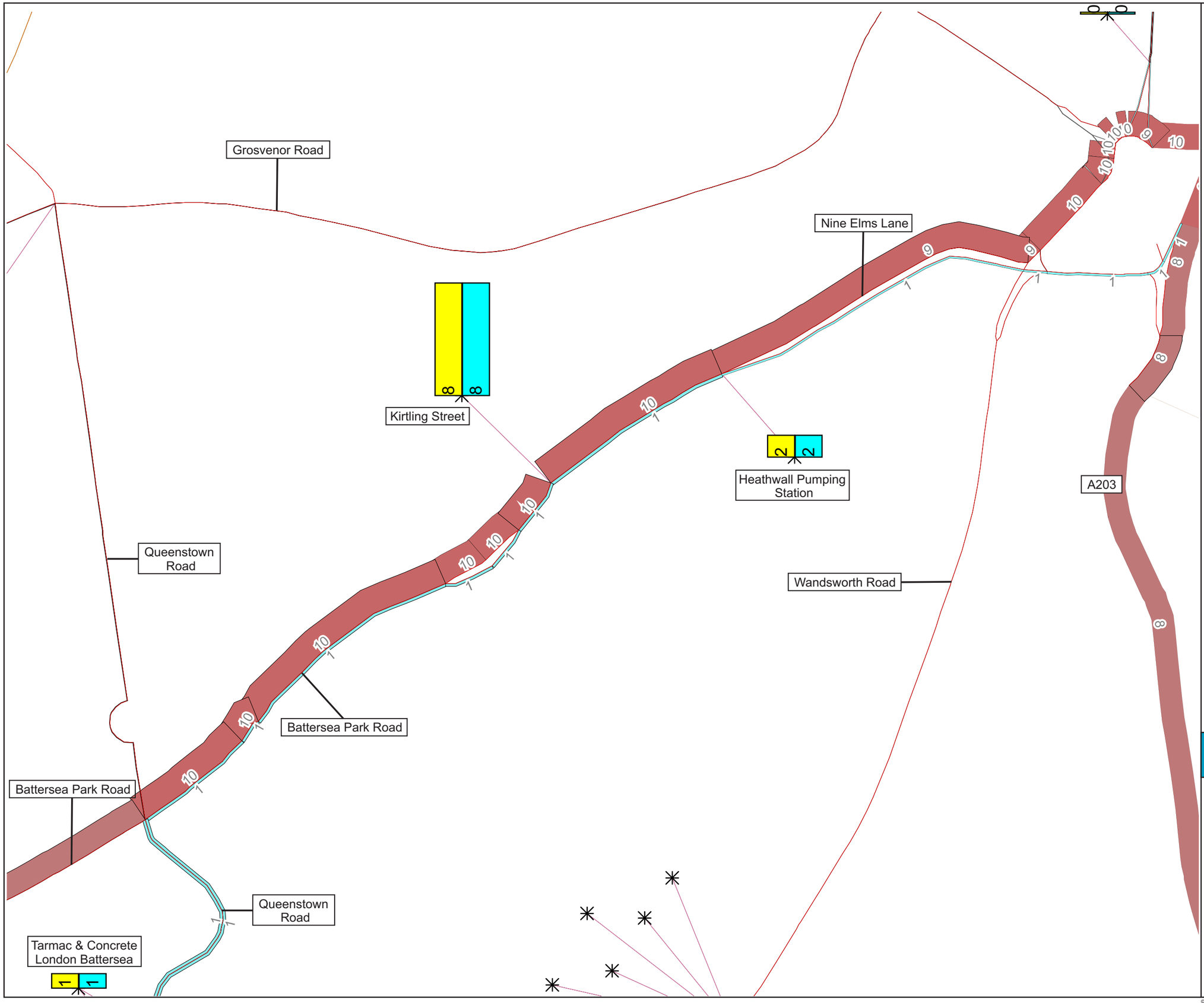
Transport Assessment

Transport - pedestrian and cyclist accidents by severity
Figure 15.4.8

1PL03-TT-50840
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water



Hourly construction lorries arrivals and departures

- Arrivals
- Departures

Hourly construction lorries movements

- 0 - 1
- 1 - 2
- 2 - 3
- 3 - 4
- 4 - 5
- 5 - 6
- 6 - 7
- 7 - 8
- 8 - 9
- 9 - 10
- 10 - 11
- 11 - 12
- 12 - 13
- 13 - 14
- 14 - 15
- > 15

Note: Construction vehicle flows include all Thames Tideway Tunnel sites on this network during this period.

FOR INFORMATION

Location

Heathwall Pumping Station
London Borough of Wandsworth

Document Information

Transport Assessment
Hourly Construction Lorry Movements - Site Year 1 of Construction

Figure 15.5.1

1PL03-TT-50884

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

This page is intentionally left blank

This page is intentionally blank

Thames Water Utilities Limited
Clearwater Court, Vastern Road, Reading RG1 8DB

DCO-DT-000-ZZZZZ-071012