Thames Tideway Tunnel
Thames Water Utilities Limited

Application for Development Consent

Application Reference Number: WWO10001

Transport Assessment

Doc Ref: **7.10.06**

King George's Park

Main Report

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

Hard copy available in

Box **50** Folder **A**
January 2013

Thames Tideway Tunnel

Creating a cleaner, healthier River Thames

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Thames Tideway Tunnel

Transport Assessment

Section 9: King George's Park

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9.1 Introduction

9.1.1 This site specific Transport Assessment (TA) presents the findings of the assessment of the transport effects of the Thames Tideway Tunnel project at the King George's Park site located within the London Borough (LB) of Wandsworth.

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

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

9.1.4 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 the *TA*.

9.1.5 The *TA* structure is as follows:

a. Section 9.2 includes a description of the proposed development, detailing construction phasing, vehicle and person trip generation, construction traffic routing. It also provides details on transport during the operational phase.

b. Section 9.3 outlines the assessment methodology used for the *TA* for the construction and operational phases.

c. Section 9.4 details the baseline conditions on the transport network surrounding the King George's Park site, including survey data analysis and accident analysis.

d. Section 9.5 provides the assessment of the construction phase of the project, including a comparison between the construction base case and the construction development case.

e. Section 9.6 provides the assessment of the operational phase of the project.

f. Section 9.7 summarises the *TA* findings.

9.2 Proposed development

9.2.1 The proposed development site is located at the northern end of King George's Park, adjacent to the entrance from Buckhold Road (A218). The site is bounded to the northwest by Buckhold Road (A218), to the south by King George's Park and to the east by Neville Gill Close. Although King George's Park has vehicular access via Buckhold Road and Mapleton Road, there is no vehicular access road to the area of the proposed King George's Park site. Figure 9.2.1 in the King George's Park *Transport Assessment* figures shows the site which currently comprises an area of grassland, which is bordered by and interspersed with trees and crossed by two footpaths.

9.2.2 Construction at the King George's Park site would intercept flows in the existing Frogmore Storm Relief - Buckhold Road and convey them to the Frogmore connection tunnel through a combined sewer overflow (CSO) drop shaft.

Construction

9.2.3 The King George's Park site is bounded to the northwest by Buckhold Road (A218) and by Neville Gill Close to the east. Access to and from the King George's Park site would be via the provision of a new vehicular access on Neville Gill Close, which would be used on a right turn in and left turn out arrangement by construction vehicles. The location of this site access changes slightly between the two works phases.

9.2.4 During construction at the King George's Park site, all materials would be transported by road.

9.2.5 Construction is anticipated to last for approximately two and a half years at the King George's Park site. Early works, such as utility connections and diversions may be undertaken in advance of the main works.

9.2.6 There would be two phases of construction, phase 1 covering site set-up and shaft construction and phase 2 - covering construction of other structures. The access plan and highway layout during construction plan in the King George's Park *Transport Assessment* figures presents the highway layout during construction.

9.2.7 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 Section 9 Appendix E.

9.2.8 During construction it is anticipated that transport networks could be affected as a result of the additional construction traffic associated with the King George's Park site.

9.2.9 The pedestrian refuge on the Neville Gill Close arm of this junction would also need to be relocated to the east to allow adequate road width for construction vehicles to undertake the necessary turning movements into and out of Buckhold Road (A218).

9.2.10 Whilst an area of King George's Park would require closure the existing pedestrian accesses would be maintained. However, the existing

pedestrian path that routes from the access at the northern end of the park (located on Buckhold Road (A218)) would be diverted to avoid the construction site. This would be necessary throughout the construction works and the proposed diversion would be located to around the western perimeter of the construction site.

9.2.11 The construction phase (phase 1 and phase 2) plans in the King George's Park *Transport Assessment* figures show the layout of pedestrian footways during construction

9.2.12 A new site access would be required on Neville Gill Close. It would be necessary to ensure that construction lorries travel in one direction in Neville Gill Close at any one time and do not attempt to pass in this street, as larger vehicles would need to encroach into opposing lanes when turning. Other traffic would continue to operate two-way. The movement of construction vehicles would need to be managed as part of the overall site management regime. This approach has been discussed with the LB of Wandsworth.

9.2.13 Parking for two essential maintenance / operational vehicles would be provided on site. No worker parking would be provided.

9.2.14 A summary of the construction lorry details for the King George's Park site relevant to the construction transport assessment are summarised in Table 9.2.1.

Table 9.2.1 Construction details

Description	Assumption
Assumed peak period of construction lorry movements	Site Year 1 of construction
Assumed average peak daily construction lorry vehicle movements (in peak month of Site Year 1 of construction)	16 movements per day (8 vehicle trips)
Typical types of lorry requiring access (comprising rigid-bodied, flatbed and articulated vehicles)	Office Delivery lorries Temporary construction material lorries including Pipe/Track/Oils/Greases lorries Plant and equipment lorries Readymix mixer lorries Steel Reinforcement lorries Excavation lorries Imported fill lorries Cement tanker lorries Aggregate lorries

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

Construction routes

9.2.15 The access plan and highway layout during construction plan in the King George's Park *Transport Assessment* figures shows the highway layout during construction.

9.2.16 Figure 9.2.2 in the King George's Park *Transport Assessment* figures shows the construction traffic routes for access to/from King George's Park. Construction routes have been discussed with both Transport for London (TfL) and the Local Highway Authority (LHA), the LB of Wandsworth.

9.2.17 Access to the King George's Park site would be via the provision of a new vehicular access on Neville Gill Close, which would be used on a right turn in and left turn out arrangement by construction vehicles.

9.2.18 Neville Gill Close would be accessed via Buckhold Road (A218). The main junctions along the construction traffic routes are:

a. Buckhold Road (A218)/Neville Gill Close

b. Buckhold Road (A218)/ Wandsworth High Street (A3)

c. Wandsworth High Street (A3)/Putney Bridge Road (A3209)

d. Putney Bridge Road (A3209)/Armoury Way (A3)

e. Armoury Way (A3)/Old York Road (A217)

f. Old York Road (A217)/Swandon Way (A217)

9.2.19 Construction vehicles would access Buckhold Road (A218) via Wandsworth High Street (A3) to the north-east, which forms part of the Transport for London Road Network (TLRN) and is a section of the Wandsworth Gyratory. Construction vehicles would access the Wandsworth Gyratory from Swandon Way (A217) to the north, West Hill (A205) to the west and East Hill (A3) to the east.

9.2.20 The exact routeing depends on the material origin and destinations which is detailed in the *Project-wide TA*.

Proposed construction flows

Construction vehicles

9.2.21 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).

9.2.22 It is only in exceptional circumstances that HGV and abnormal load movements could occur up to 22:00 on weekdays for large concrete pours and later at night on agreement with the LB of Wandsworth.

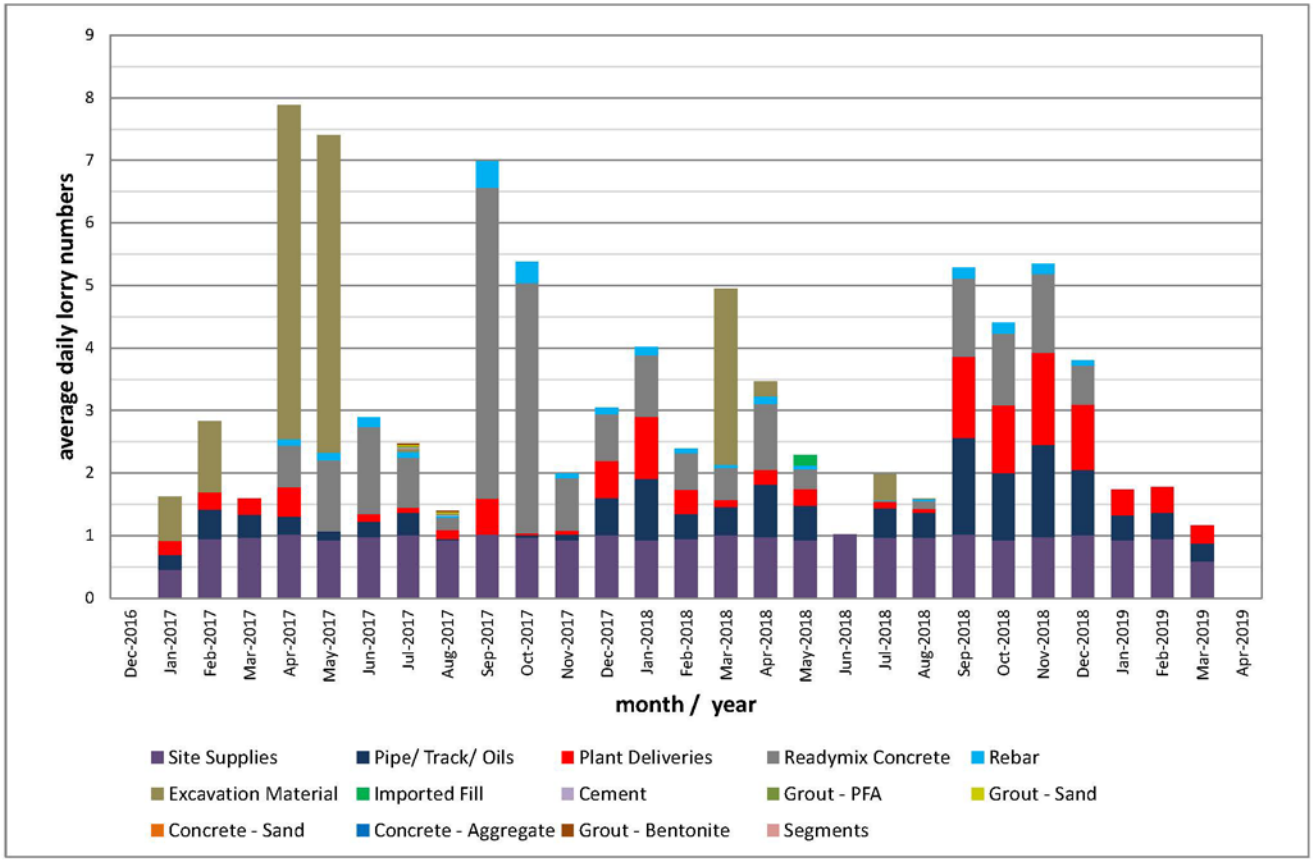
9.2.23 A site-specific peak construction assessment year has been identified. The histogram in Plate 9.2.1 shows that the site specific activity at the King George's Park site would occur in Site Year 1 of construction. This

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

9.2.24 This *TA* assesses the site-specific peak construction year. As detailed in Table 9.2.1 there would be an estimated 16 average peak daily construction lorry vehicle movements. The number of vehicular movements will vary throughout the construction period, and the histogram in Plate 9.2.1 shows the construction vehicle profile during construction.

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

Plate 9.2.1 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.

9.2.26 The histogram shows that the number of vehicular movements varies throughout the construction period with circa 10 months with less than 4 HGV movements a day and 3 months with over 14 movements a day during the five year build programme.

9.2.27 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.

9.2.28 The 07:00 to 09:00 and 17:00 to 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 9.4). 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.

9.2.29 Hourly construction vehicle trips during the inter-peak period are not expected to exceed the hourly trips assumed for the 08:00 to 09:00 and 17:00 to 18:00 periods used in this assessment. The peak travel periods used for the modelling in this assessment are therefore the weekday periods between 08:00 and 09:00 and 17:00 and 18:00.

9.2.30 Other construction vehicle movements associated with site operations and contractor activities would be cars and light goods vehicles (LGVs). The construction worker vehicle movements expected to be generated by the King George's Park site is summarised in Table 9.5.2.

Construction workers

9.2.31 The construction site is expected to require a maximum workforce of 40 workers at any one time. The number and type of workers is shown in Table 9.2.2.

Table 9.2.2 Maximum estimated construction worker numbers

Contractor		Client
Staff*	**Labour****	**Staff*****
08:00-18:00	**08:00-18:00**	**08:00-18:00**
15	20	5

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

9.2.32 Whilst the 2001 Census[i] journey to work data for the King George's Park area shows that the predominant mode of travel is by car, it is considered unlikely that any workers would travel to or from the site by car as there would be no parking provided within the site boundary for workers, parking on surrounding streets is also restricted, and measures to reduce car use would be incorporated into a site-specific *Workplace Travel Plan*.

9.2.33 On this basis, it is anticipated that the predominant mode of travel for workers will be bus, travelling to and from the site from the bus stops closest to the site, including, inter alia, the Broomhill Road bus stops on Buckhold Road (A218) to the south-west and the Wandsworth Southside bus stop on Buckhold Road (A218).

9.2.34 The Census mode shares have therefore been adjusted to reflect increased levels of non-car use by workers at this site. This mode split outlined in Table 9.2.3 and indicates that the predominant mode of travel for journeys to work in this area would be by bus. The mode split outlined in Table 9.2.3 has therefore been used to assess the impacts of worker journeys on the highway and public transport networks.

Table 9.2.3 Transport mode split

Mode	Percentage of trips to site	Equivalent number of worker trips (based on 40 worker trips)	
		AM peak hour (08:00-09:00)	PM peak hour (17:00-18:00)
Bus	27%	11	11
National Rail	23%	9	9
Tube	19%	8	8
Car driver	<1%*	0	0
Car passenger	<1%*	0	0
Cycle	8%	3	3
Walk	18%	7	7
River	1%	0	0
Other (taxi/motorcycle)	4%	2	2
Total	100.0%	40	40

** assuming to be zero for the purpose of this assessment*

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

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

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

Vehicle movements summary

9.2.37 The total anticipated number of construction-related vehicle movements in the peak month of activity at this site is set out in Table 9.2.4.

Table 9.2.4 Peak construction works vehicle movements

Vehicle type	Vehicle movements per time period				
	Total Daily	**0700 to 0800**	**0800 to 0900**	**1700 to 1800**	**1800 to 1900**
Construction lorry vehicle movements 10%*	16	0	2	2	0
Other construction vehicle movements**	36	4	4	4	4
Worker vehicle movements***	nominal	0	0	0	0
Total	**52**	**4**	**6**	**6**	**4**

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

9.2.38 All materials would be transported by road to the King George's Park site. To ensure the assessment of the highway network is robust, it has been based on a combination of the peak hour of movements for construction lorries and other construction vehicles between 07:00 and 09:00 and 17:00 and 19:00. These have been combined and applied to the peak hour to take into account the highest number of movements generated by the site.

9.2.39 Based on the above, an average peak flow of 52 vehicle movements a day is expected during the months of greatest activity during Site Year 1 of construction at the King George's Park site. At other times in the

construction period, vehicle flows would be lower than this average peak figure.

9.2.40 Table 9.2.4 shows that the King George's park site would generate approximately ten vehicle movements in each of the AM and PM two hour peak periods.

Code of Construction Practice

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

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

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

9.2.42 In addition to the general transport measures within the *CoCP Part A*, the *CoCP Part B* (Section 5) relating to the King George's Park site includes the following site-specific measures:

a. access is to be from Neville Gill Close with right turn in, left turn out only

b. pedestrian access diversion would be maintained throughout the works

c. the footpath diversion within the park would be adequately signed.

9.2.43 Based on current travel planning guidance including TfL's 'Travel Planning for new development in London[1]', this development lies within the threshold for producing a Strategic Framework Travel Plan. A *Project Framework Travel Plan* has been prepared based on the TfL ATTrBuTE guidance[ii]. The *Project Framework Travel Plan* addresses project-wide travel planning measures including the need for a Travel Plan Manager, initial travel surveys during construction and a monitoring framework. It also contains requirements and guidelines for the development of site-specific plans. 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 King George's Park site;

b. initial travel surveys to be carried out at King George's Park during construction, and a monitoring framework established;

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

c. a mode split to be established for the King George's Park site construction workers to establish and monitor travel patterns;

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

e. a nominated person with assigned responsibility for managing the Travel Plan monitoring and action plans specifically for the King George's Park site.

Other measures during construction

9.2.44 Embedded design measures which are not outlined in the *CoCP* but are of relevance to the transport assessment at the King George's Park site include the following:

a. relocation of the pedestrian refuge on the Neville Gill Close arm, at the junction with Buckhold Road (A218).

Operation

9.2.45 During operation there would be a new raised hard standing area provided in the northern section of the park which would house the ventilation columns and allow access to the CSO shaft. There will be public access to this area via a ramp and steps on the western side of the hard standing area and the eastern side will be at grade. There would also be timber seating surrounding the hard standing area which would provide vistas of the park.

9.2.46 Once the Thames Tideway Tunnel is operational it is not expected that there would be any significant effects on the transport infrastructure and operation within the local area, because maintenance trips to the King George's Park site would be infrequent and short-term. On this basis the only issues considered during the operational phase are those affecting highway layout and operation.

9.2.47 These elements are considered qualitatively because the minimal effect on the highway network means that a quantitative assessment is not required. The scope of this analysis has been discussed with the LB of Wandsworth and TfL.

9.2.48 During operation, maintenance vehicles would access and egress the King George's Park site via Neville Gill Close. Access would be required for a light commercial vehicle on a three to six monthly maintenance schedule. Additionally there would be more substantive maintenance visits at approximately ten year intervals. This would require access to enable two mobile cranes and associated support vehicles to be brought to the King George's Park site. The cranes would facilitate lowering and recovery of tunnel inspection teams and to provide duty/standby access for personnel. Parking for associated support vehicles would be required on Neville Gill Close which is likely to require temporary parking restrictions.

9.2.49 The permanent highway layout plan in the King George's Park *Transport Assessment* figures presents the highway layout during operation.

9.3 Assessment methodology

Engagement

9.3.1 An extensive scoping and technical engagement process has been undertaken. All consultee comments relevant to the King George's Park site are presented in Volume 9 of the *Environmental Statement*.

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

9.3.3 Whilst the effects associated with transport for the operational phase have been scoped out of the Environmental Impact Assessment (EIA) and are not expected to be significant, the *TA* examines the operational phase in order to satisfy the relevant stakeholders that technical issues have been addressed.

Consultees

9.3.4 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 King George's Park, the LB of Wandsworth has been consulted and the comments which have arisen relating directly to King George's Park have been recorded and responded to accordingly.

9.3.5 The key comments and issues arising from stakeholder engagement are:

a. restricted access means that smaller vans are likely to be utilised on this King George's Park site. Although tracking suggests the suggested routing is manageable, a traffic island may need to be removed

b. works may impact on access to the park and any disruption should be minimised

c. the site assessment should take consideration of proposals for the redevelopment of Cockpen House and the Brewery Site

d. there is a LB of Wandsworth aspiration to relocate the access gates to the park on Buckhold Road (A218);

e. existing recessed and hard paved entrance on Buckhold Road (A218) to be grassed and planted and replaced with other soft landscape works

f. HGV access to the park will require modification of the Neville Gill Close/Buckhold Road (A218) junction to allow sufficient space for construction vehicles entering/exiting Neville Gill Close

g. consideration should be given to the interface between vehicles and pedestrians at the access point due to proximity of day centre on Neville Gill Close

h. if existing parking bays are to be suspended, alternative locations for the parking should be found if required.

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

Construction

9.3.7 The assessment methodology for the construction phase follows that described in the *Project-wide TA*. There are no site-specific variations for undertaking the construction assessment of the King George's Park site.

Construction assessment area

9.3.8 The assessment area for the King George's Park site includes the proposed site access into Neville Gill Close and the junction of Neville Gill Close / Buckhold Road (A218).

9.3.9 These roads and junctions have been assessed for highway, cycle and pedestrian impacts. Effects on local bus services within 640m of the King George's Park site and rail services within 960m of the King George's Park 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).

9.3.10 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.

9.3.11 The assessment for each site takes account of construction vehicle movements associated with King George's Park, together with construction traffic from other Thames Tideway Tunnel sites that would use the highway network in the vicinity of this site being assessed in Site Year 1 of construction.

Construction assessment year

9.3.12 To assess the busiest case scenario for the King George's Park locality, the peak construction traffic year has been identified. This ensures that the assessment for King George's Park takes into consideration the heaviest flow of construction vehicles at this site on local roads for the local modelling assessment.

9.3.13 The site-specific peak construction traffic year at King George's Park is Site Year 1 of construction.

9.3.14 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

9.3.15 The assessment for each site takes account of construction vehicle movements associated with King George's Park, together with construction traffic from other Thames Tideway Tunnel project sites that would use the highway network in the vicinity of this site in Site Year 1 of construction.

9.3.16 Local modelling has been carried out to determine the effect of the development on the local highway network. As the site access for the King George's Park site would be installed only for the purpose of the construction works, the operation of the site access has only been assessed for the construction phase. However, the operation of the adjacent existing junction of Buckhold Road (A218) with Neville Gill Close has been undertaken for the baseline, base case and development case scenarios.

9.3.17 As indicated in the Development Schedule (see Vol 9 Appendix N of the *Environmental Statement*) six of the seven developments identified within 1km of the King George's Park site would be complete and operational by Site Year 1 of construction meaning that they would form part of the base case. These developments are:

a. Southside Shopping Centre, Garratt Lane

b. The Business Village, Broomhill Road

c. Cockpen House, Buckhold Road (A218).

d. Osiers Road Development

e. Units 1-20 Enterprise Way

f. Western Riverside Transfer Station Development.

9.3.18 Development at Wandsworth Riverside Quarter, approximately 670m from the site, would be partially complete and occupied by Site Year 1 of construction. A further phase of development would be under construction at this time. This suggests that the transport assessment should consider cumulative effects.

9.3.19 As indicated in the *Project-wide TA*, the TfL HAMs have been used as part of the assessment. The strategic highway modelling has used three of the HAMs, which cover west, central and east London. These three models cover the locations of all of the Thames Tideway Tunnel project sites and this approach has been agreed with TfL.

9.3.20 The HAMs have been developed by TfL using GLA employment and population forecasts, which are based on the employment and housing projections set out in the London Plan. As a result the assessment inherently takes into account a level of future growth and development across London.

9.3.21 For future year assessments for the King George's Park site, the TfL West London HAM (WeLHAM) has been used to test the strategic highway network impacts associated with this site. Construction traffic associated with other Thames Tideway Tunnel project sites using routes in this area has been included in the WeLHAM scenarios

9.3.22 The model provides factors for the increase in vehicle-kilometres in the borough between the construction base year and 2021. The relevant growth factor for the site was applied to the traffic survey flows collected in 2011 to produce 2021 flows for existing traffic.

9.3.23 Office and operational trips associated with the site were assigned to the TfL WeLHAM model using the EIA scenario and the project peak month. The assigned flows were added to the 2021 flows and the construction flows to provide the turning movements for local modelling.

9.3.24 This provides a robust assessment case as the background traffic is growthed to 2021 rather than 2019 and no allowance has been made for existing traffic diverting away from the routes which run past the site as a consequence of the use of these roads by the additional project-related traffic.

Operation

9.3.25 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 the King George's Park site.

9.3.26 Given the local impact of the transport activity associated with the Thames Tideway Tunnel during the operational phase, only the localised transport effects around the King George's Park site are assessed. Other Thames Tideway Tunnel sites would not affect the area around King George's Park in the operational phase and therefore are not considered in the assessment.

9.3.27 With regard to other developments in the vicinity of the King George's Park site (as detailed in Vol 9 Appendix N of the *Environmental Statement*), all developments within 1km of the King George's Park site and would be complete and operational by Year 1 of operation. As a result, these developments have been included within the operational base case which takes into consideration the effects on highway layout and operation.

Operational assessment area

9.3.28 The assessment area for the operational assessment remains the same as for the construction assessment as outlined in paras. 9.3.6 to 9.3.9.

Operational assessment year

9.3.29 The operational assessment year has been taken as Year 1 of operation. As the number of vehicle movements associated with the operational phase is low, there is no requirement to assess any other year beyond that date.

9.4 Baseline

9.4.1 This section sets out the baseline conditions on the local transport network in the vicinity of the King George's Park site in 2012, with the exception of the traffic survey data which was collected in 2011.

Policy review

9.4.2 The King George's Park site is located within the LB of Wandsworth; the relevant national, regional and local policy documents have been reviewed, this review is presented in Appendix A.

Existing land use

9.4.3 The King George's Park site is located in an area of the park which currently comprises an area of grassland, which is bordered by and interspersed with trees and crossed by two footpaths.

9.4.4 The nearest residential area is Park View Court, which is located 25m northwest of the site.

Existing access

9.4.5 Vehicular access to King George's Park can be gained from Buckhold Road in the northwest corner of the park and from Mapleton Avenue in the southeast corner. However, the internal road network does not extend to the proposed site area. The main pedestrian and cycle access to the northern section of the park is from Buckhold Road (A218) and there is a smaller pedestrian access on Neville Gill Close.

Pedestrian network and facilities

9.4.6 The key pedestrian network to and from the King George's Park site is directly related to local public transport services, primarily bus stops. The key pedestrian network related to the King George's Park site includes:

a. Buckhold Road (A218) to and from the south-west - to the bus stops adjacent to Broomhill Road; and

b. Buckhold Road (A218) to and from the north-east – to the Wandsworth Southside bus stop.

9.4.7 The existing pedestrian network and facilities in the vicinity of the King George's Park site are described below and shown on Figure 9.4.1 in the King George's Park *Transport Assessment* figures.

9.4.8 There are several pedestrian access points to the park, one of which is at the northern end of the park on Buckhold Road (A218) near the proposed site. This is one of the primary pedestrian access points to the park. There are dropped kerbs and tactile paving on Buckhold Road (A218) where it meets Neville Gill Close. Plate 9.4.1 shows the footway along Buckhold Road (A218).

Plate 9.4.1 Footway along Buckhold Road (A218)

9.4.9 A signalised pedestrian crossing is located on Buckhold Road (A218) approximately 70m southwest of the Neville Gill Close / Buckhold Road (A218) junction.

9.4.10 There is another existing pedestrian access to King George's Park located to the east of the park on Neville Gill Close. This provides a pedestrian link with the Southside Shopping Centre and Garratt Lane.

9.4.11 The Southside Shopping Centre is located to the east of the King George's Park site. The car park is accessed from Neville Gill Close but no direct pedestrian access is provided to the centre.

9.4.12 The Wandsworth Medical Centre is located to the south of the shopping centre and is accessed from Garratt Lane.

9.4.13 The pavements on the western side of Neville Gill Close are approximately 0.8m wide. The footway on the eastern side of the road varies in width from approximately 2m to 6.5m in places. Plate 9.4.2 shows the footway along Neville Gill Close.

Plate 9.4.2 Footway along Neville Gill Close

Cycle network and facilities

9.4.14 The existing cycle network and facilities in the vicinity of the King George's Park site are described below and shown on Figure 9.4.1 in the King George's Park *Transport Assessment* figures.

National Cycle Routes

9.4.15 National Cycle Route 20 routes along Neville Gill Close and passes the proposed site entrance. This route continues north along Buckhold Road (A218) and then east along Wandsworth High Street (A3).

9.4.16 National Cycle Route 4 routes a walking distance of 600m North of King George's Park site on Enterprise Way.

Barclays Cycle Superhighways

9.4.17 The closest Barclays Cycle Superhighway (CS) to the King George's Park site is CS8, which runs between Ram Street and Millbank. The cycle route starts on Ram Street in Wandsworth which is approximately 350m walking distance from the King George's site and routes along York Road (A3025), Battersea Park, Queens Town Road (A3216), Chelsea Bridge, Grosvenor Road (A3212) and Millbank, with an approximate 30-minute journey from Wandsworth to Millbank.

9.4.18 The closest access point to the CS8 is Ram Street, which is located approximately 340m north east of the site.

Barclays Cycle Hire Scheme

9.4.19 There are currently no Barclays Cycle Hire docking stations within the vicinity of the King George's Park site.

9.4.20 In September 2012, TfL announced proposals to provide around 60 new docking stations across the north of Wandsworth by Spring 2014.

9.4.21 The LB of Wandsworth has advised that there will be a 'contingency' Cycle Hire Docking Station site in Neville Gill Close, immediately to the south of the entrance to the Thames Tideway worksite.

Cycle parking

9.4.22 There are two cycle stands located on the eastern side of Neville Gill Close to the south of the entrance to the Southside multi-storey car park. Six cycle stands are also provided in front of the main access to the Southside Shopping Centre on Wandsworth High Street (A3).

Public transport

Public Transport Accessibility Level

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

9.4.24 Using this methodology the King George's Park site has a PTAL rating of 4, indicating that there is a moderately good provision of public transport in the vicinity of the King George's Park site (with 1a being the lowest accessibility and 6b being the highest accessibility). The following sections detail the public transport services in the vicinity of the site. Figure 9.4.2 in the King George's Park *Transport Assessment* figures shows the public transport services in the vicinity of the King George's Park site.

Bus services

9.4.25 A total of thirteen daytime bus routes and three night bus routes operate within 640m walking distance of the site. These bus routes operate from the following bus stops:

a. Broomhill Road bus stop on Buckhold Road (A218) 200m walking distance south west of the site

b. Wandsworth Southside bus stop on Buckhold Road (A218) 270m walking distance north east of the site.

c. Wandsworth Police Station bus stop on Buckhold Road (A218) 350m north west of the site

d. Wandsworth Plain bus stop on Wandsworth Plain 350m north of the site

e. Garratt Lane/Southside Shopping Centre bus stop on Garratt Lane (A217) 350m east of the site.

9.4.26 Table 9.4.1 provides a summary of the regular bus services and their frequencies during the weekday peaks.

Table 9.4.1 Existing daytime weekday peak hour local bus services and frequency (number of buses per hour)*

Bus number	Origin - destination	Nearest bus stop to King George's Park site	Approximate walking distance from the King George's Park site (m)	Weekday peak hour two-way frequencies	
				AM peak (08:00-09:00)	PM peak (17:00-18:00)
28	Wandsworth to Kensal Rise	Garratt Lane/Southside Shopping Centre	350	6	6
28	Kensal Rise to Wandsworth	Garratt Lane/Southside Shopping Centre	350	6	6
37	Peckham to Putney Heath	Wandsworth Police Station	350	6	6
37	Putney Heath to Peckham	Armoury Way	550	6	6
39	Putney Bridge Station to Clapham Junction Station	Adjacent Broomhill Road on Buckhold Road (A218)	200	8	8
39	Clapham Junction Station to Putney Bridge Station	Adjacent Broomhill Road on Buckhold Road (A218)	200	8	8
44	Tooting Station to Victoria	Garratt Lane/Southside Shopping Centre	350	6	6
44	Victoria to Tooting Station	Garratt Lane/Southside Shopping Centre	350	6	6
87	Wandsworth to Aldwych	Wandsworth Plain	350	10	10
156	Wimbledon to Vauxhall	Adjacent Broomhill Road on Buckhold Road (A218)	200	8	7
156	Vauxhall to Wimbledon	Adjacent Broomhill Road on Buckhold Road (A218)	200	8	8
170	Victoria to Roehampton, Danebury Avenue	Wandsworth Police Station	350	10	7

Bus number	Origin - destination	Nearest bus stop to King George's Park site	Approximate walking distance from the King George's Park site (m)	Weekday peak hour two-way frequencies	
				AM peak (08:00-09:00)	PM peak (17:00-18:00)
170	Roehampton, Danebury Avenue to Victoria	Armoury Way	550	8	8
220	Wandsworth, Mapleton Road to Willesden Junction Station	Garratt Lane/Southside Shopping Centre	350	9	8
220	Willesden Junction Station to Wandsworth, Mapleton Road	Garratt Lane/Southside Shopping Centre	350	10	7
270	Mitcham to Putney Bridge	Garratt Lane/Southside Shopping Centre	350	5	6
270	Putney Bridge to Mitcham	Garratt Lane/Southside Shopping Centre	350	6	6
337	Clapham Junction to Richmond	Wandsworth Police Station	350	6	5
337	Richmond to Clapham Junction	Armoury Way	550	5	6
485	Wandsworth, Armoury Way to Hammersmith Bus Station	Armoury Way	550	2	2
485	Hammersmith Bus Station to Wandsworth, Armoury Way	Wandsworth Police Station	350	2	2

Bus number	Origin - destination	Nearest bus stop to King George's Park site	Approximate walking distance from the King George's Park site (m)	Weekday peak hour two-way frequencies	
				AM peak (08:00-09:00)	PM peak (17:00-18:00)
639*	St John Bosco College to Clapham Junction	Adjacent Broomhill Road on Buckhold Road (A218)	200	0	0
639*	Clapham Junction to St John Bosco College	Adjacent Broomhill Road on Buckhold Road (A218)	200	1	0

**This is a school day bus route and operates one morning service and one afternoon service on Monday to Friday during term time*
Source: Transport for London (TfL) (2011) Timetables. Available at www.tfl.gov.uk (site last accessed March 2012)

9.4.27 There are approximately 68 daytime bus services in total per hour operating in both directions in the AM peak and a total of 64 bus services in total per hour in the PM peak within a 640m walking distance of the King George's Park site.

9.4.28 Taxis (black cabs) can either be booked in advance, hailed on the street or located at designated taxi ranks. There are no taxi ranks in the immediate vicinity of the site.

London Underground

9.4.29 There are no underground stations within 960m walking distance of the King George's site.

9.4.30 The closest underground station, East Putney station, is approximately 1.5km to the west as shown on Figure 9.4.2 in the King George's Park Transport Assessment figures and is accessible by buses which route along Wandsworth High Street (A3) approximately 200m walking distance to the northeast of the King George's Park site. The station is on the Wimbledon branch of the District Line and approximately 15 trains operate in the northbound and southbound directions in the AM and PM peak hours.

National Rail

9.4.31 The closest National Rail station to the King George's Park site is Wandsworth Town rail station and services Waterloo Station and Staines. It is located approximately 1.3km walking distance to the northwest of the King George's Park site and is beyond the 960m threshold used in the PTAL calculations but represents approximately a 16 minute walk.

9.4.32 In the AM and PM peak hours, eight trains travel eastbound towards Waterloo from Wandsworth Town Rail Station and five trains and six trains travel westbound in the AM and PM peak hours respectively.

River services and navigation

9.4.33 The King George's Park site is located approximately 0.9km walking distance to the south of Wandsworth Riverside Quarter pier on the South Bank. This is served by the Transport for London River Bus, operating in an eastbound and westbound direction.

9.4.34 The frequency distribution of the all the services that stop at the pier near the King George's Park site is shown in Table 9.4.2. The eastbound service operates from Monday to Friday during peak hours (0625, 0735 and 0810 in the AM peak and 1815 in the PM peak). No westbound service is provided in the morning peak hours and services call at the Pier at 1755, 1910 and 1945 in the evening.

9.4.35 With respect to the number of vessels passing the Wandsworth Riverside Quarter Pier, it is estimated that the peak hours are between 1100 and 1200 hours, and 1900 and 2000, Monday to Friday. During both these hours around 11 vessels are estimated to pass the site. Given that Wandsworth Riverside Quarter Pier is relatively high upstream and the lack of any freight wharves above Wandsworth, only ad hoc freight vessels will pass this location.

Table 9.4.2 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
Wandsworth Riverside Quarter	1	1	1	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0

Source: http://www.tfl.gov.uk/modalpages/2648.aspx and consultation with aggregates companies, West London Waste Authority, barge operators, Port of London Authority

Highway network and operation

9.4.36 The site is located on Neville Gill Close as shown in Figure 9.2.1 in the King George's Park *Transport Assessment* figures which is a two-way no through road, with a speed limit of 30mph. Neville Gill Close connects with Buckhold Road (A218) to the north, via a priority junction. Buckhold Road (A218) is a single lane carriageway running northeast/ southwest with a speed limit of 30mph.

9.4.37 To the northeast of the King George's Park site, Buckhold Road (A218) joins Wandsworth High Street (A3), which forms part of the TLRN and is a section of the Wandsworth Gyratory. To the southeast, Buckhold Road (A218) connects with Merton Road providing access to the Wimbledon area.

9.4.38 Construction vehicles will access the site via a new vehicular access on Neville Gill Close, which would be used on a right turn in and left turn out only arrangement. It is anticipated that construction vehicles would access Buckhold Road (A218) via Wandsworth High Street (A3) to the north east which is a section of the Wandsworth Gyratory. Construction vehicles would access the Wandsworth Gyratory from Swandon Way (A217) to the north, West Hill (A205) to the west, and East Hill (A3) to the east.

9.4.39 The modelling outputs for the baseline situation for the Neville Gill Close / Buckhold Road junction are shown in Table 9.4.6. The overall junction performance shows that the junction is operating within capacity in the weekday AM and PM peak periods.

Parking

9.4.40 Figure 9.4.3 in the King George's Park *Transport Assessment* figures shows the locations of the existing car parks and car club spaces within the vicinity of the King George's Park site.

Existing on-street car parking

9.4.41 There is on-street parking located on the eastern side of Neville Gill Close. This comprises four bays which are designated for use by blue badge holders only at all times.

9.4.42 Parking restrictions (single yellow lines) located on the western side of Neville Gill Close operate from Monday to Saturday between 07:00 and 19:00. On-street parking is permitted along the western side of Neville Gill Close outside of these hours.

Existing off-street/private car parking

9.4.43 The Traders Hall multi-storey car park is located on Buckhold Road and is open 06:00 to 23:00 Monday to Friday, 06:00 to 21:00 Saturdays and Sundays. The car park provides 315 spaces and there is a charge of £1.20 per hour and a maximum charge of £20.20 per 24 hours. Its access is situated directly across the road from the King George's Park site entrance on Neville Gill Close. The charges are shown in Table 9.4.3.

Table 9.4.3 Traders Hall multi-storey car park parking charges

Duration	Charge
Up to 1 hour	£1.20
Up to 2 hour	£2.40
Up to 3 hour	£3.50
Up to 4 hour	£4.90
Up to 5 hour	£6.40
Up to 6 hour	£7.80
Up to 9 hour	£14.40
Up to 12 hour	£17.30
Up to 24 hour	£20.20
Motorcycle per day	£3.50

9.4.44 The Southside Shopping Centre multi-storey car park is located on Mapleton Crescent and is open 24 hours Monday to Sunday. The car park provides 875 spaces and there is a charge of £1.20 per hour and a maximum charge of £20.20 per 24 hours for its use. It is situated within 300m walking distance from the King George's Park site. The charges are shown in Table 9.4.4.

Table 9.4.4 Southside Shopping Centre multi-storey car park parking charges

Duration	Charge
Up to 1 hour	£1.20
Up to 2 hour	£2.40
Up to 3 hour	£3.50
Up to 4 hour	£4.90
Up to 5 hour	£6.40
Up to 6 hour	£7.80
Up to 9 hour	£14.40
Up to 12 hour	£17.30
Up to 24 hour	£20.20
Motorcycle per day	£3.50

9.4.45 There is a Sainsbury's car park located on 45 Garratt Lane and is open 08:00 to 22:00 Monday to Saturday and 11:00 to 17:00 Sunday. The car park provides 423 spaces and there is no charge for store customers but with a maximum stay of 2 hours. It is situated within 600m walking distance from the King George's Park site entrance. The charges are shown in Table 9.4.5.

Table 9.4.5 Sainsbury's car park parking charges

Duration	Charge
Maximum 2 hours – Store Customers	Free
Maximum 2 hours – Non Customers	£1.70

Coach parking

9.4.46 There are no coach parking facilities in the vicinity of the site, the nearest being Earls Court coach park 4.3km north of the site.

Car clubs

9.4.47 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.

9.4.48 There are a number of car clubs within 640m of the site. The closest car club parking space to the King George's Park site is operated by ZipCar and is approximately 180m walking distance in the Southside car park off of Mapleton Crescent.

9.4.49 The next closest car club spaces are outside Parkview Court at 15 Broomhill Road, north west of the site and outside Ketley House at 63-65 Garratt Lane located south east of the site which are both approximately 500m walking distance away from King George's Park site and are both operated by ZipCar.

Servicing and deliveries

9.4.50 There is an on-street loading bay located on the eastern side of Neville Gill Close, it is approximately 50m south of the King George's Park site. The hours of operation of the bay are Monday to Saturday from 07:00 to 19:00 with a maximum stay of 30 minutes permitted.

9.4.51 There is also access to a service yard located on the eastern side of Neville Gill Close serving the Southside Shopping Centre, approximately 100m south of the King George's Park site.

Baseline survey data

Description of Data

9.4.52 Automatic traffic count data was obtained from TfL for the A217 Swandon Way, outside the DIY home improvement store. The A217 Swandon Way is one of the primary construction traffic routes for the Thames Tideway Tunnel. Five year accident data on roads within the vicinity of the King George's Park site was also obtained from TfL and is discussed in paragraphs 9.4.85 – 9.4.94.

9.4.53 Baseline survey data for the King George's Park site was collected in May and June 2011 and May 2012 to establish the existing transport movements in the area. Manual and automated traffic surveys were undertaken to establish specific traffic, pedestrian and cycle movements including turning volumes, queue lengths, saturation flows, degree of saturation and traffic signal timings where applicable. Figure 9.4.4 in the King George's Park *Transport Assessment* figures shows the survey locations in the vicinity of the King George's Park site. Appendix A of the *Project-wide TA* includes a baseline report which sets out the data collection in further detail.

9.4.54 The scope of the surveys in terms of location and time periods was considered to ensure that the data required for assessment was collected. Junction turning count data was collected at junctions that TfL had advised required assessment. In some cases, ATC data was collected on links to validate the junction turning count data and provide information for noise and air quality assessments.

9.4.55 Pedestrian and cycle count data was collected at locations where flows could be affected either through diversions or the generation of additional trips or where conflicts could occur with construction vehicles.

9.4.56 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 have been surveyed, the busiest survey was used.

9.4.57 The surveys undertaken and their locations are summarised in Table 9.4.6.

Table 9.4.6 Survey types and locations

Survey type and location	Date
Junction turning movement survey	
A218 Buckhold Rd / Neville Gill Close	10th May 2011 and 7th May 2011
A3 Wandsworth High Street / A218 Buckhold Road	7th July 2011 and 9th July 2011
A217 Armoury Way / Dormay Street	10th May 2011 and 7th May 2011
A3 Old York Road / Ram Street / A217 Armoury Way	
Automatic Traffic Count (ATC)	
A217 Swandon Way	20th May 2011 to 24th June 2011
Pedestrian and Cycle Surveys	
Neville Gill Close – south of junction with Buckhold Road (A218)	29th May 2012 and 26th May 2012
Footpath within King George's Park	

9.4.58 Pedestrian and cyclist flow data from the surveys provided the baseline pedestrian traffic data sets which are set out in Table 9.4.7 and Table 9.4.8.

9.4.59 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 9.4.75 to 9.4.84. The following ATC and junction turning movement surveys are on the construction traffic routes to and from the King George's Park site shown on Figure 9.2.2 in the King George's Park *Transport Assessment* figures:

a. ATC on A217 Swandon Way;

b. A218 Buckhold Rd / Neville Gill Close junction survey

c. A3 Wandsworth High Street / A218 Buckhold Road junction survey

d. A217 Armoury Way / Dormay Street junction survey

e. A3 Old York Road / Ram Street / A217 Armoury Way junction survey.

Results of the surveys

9.4.60 The surveys inform the analysis of the baseline situation in the area surrounding the King George's Park site. The findings are summarised in the following sections.

Pedestrians

9.4.61 Pedestrian and cycle surveys were carried out during the AM and PM peak hours at two locations within the King Georges Park site. One location was along the footway and road of Neville Gill Close and the other

was on the footway within King George's Park. Both of these paths are orientated in a north to south direction.

9.4.62 Table 9.4.7 shows the pedestrian flows surrounding the King George's Park site for these two locations during the AM, PM and weekend peak hours.

Table 9.4.7 – Existing Pedestrian FlowsRoad / Route	Direction	Weekday			Weekend
		AM Peak hour (08:00 – 09:00)	Inter-peak Hour (12:00 – 13:00)	PM Peak Hour (17:00 – 18:00)	Saturday peak hour (13:00 – 14:00)
Specific Surveys:					
Neville Gill Close – western footway	Northbound	5	6	3	2
Neville Gill Close – western footway	Southbound	3	19	11	2
Neville Gill Close – eastern footway	Northbound	87	69	48	55
Neville Gill Close – eastern footway	Southbound	19	47	49	41
King George's Park – towards centre of park	Southbound	13	46	34	41
King George's Park – towards Neville Gill Close entrance	Northbound	17	53	18	28
King George's Park – towards Buckhold Road (A218) entrance	Northbound	7	9	22	22

9.4.63 The pedestrian survey during the AM peak hour indicates that there is a much higher proportion of pedestrians travelling northbound along Neville Gill Close and within King George's Park, comprising of 116 compared to only 35 travelling southbound. In the PM peak hour, the pedestrian movements northbound and southbound are more balanced at 91 and 94 respectively.

Cyclists

9.4.64 Cycle surveys were also undertaken at the same locations as the pedestrian surveys, i.e. on Neville Gill Close and within King George's Park. The results from these surveys are summarised in Table 9.4.8.

Table 9.4.8 – Existing Cycle Flows

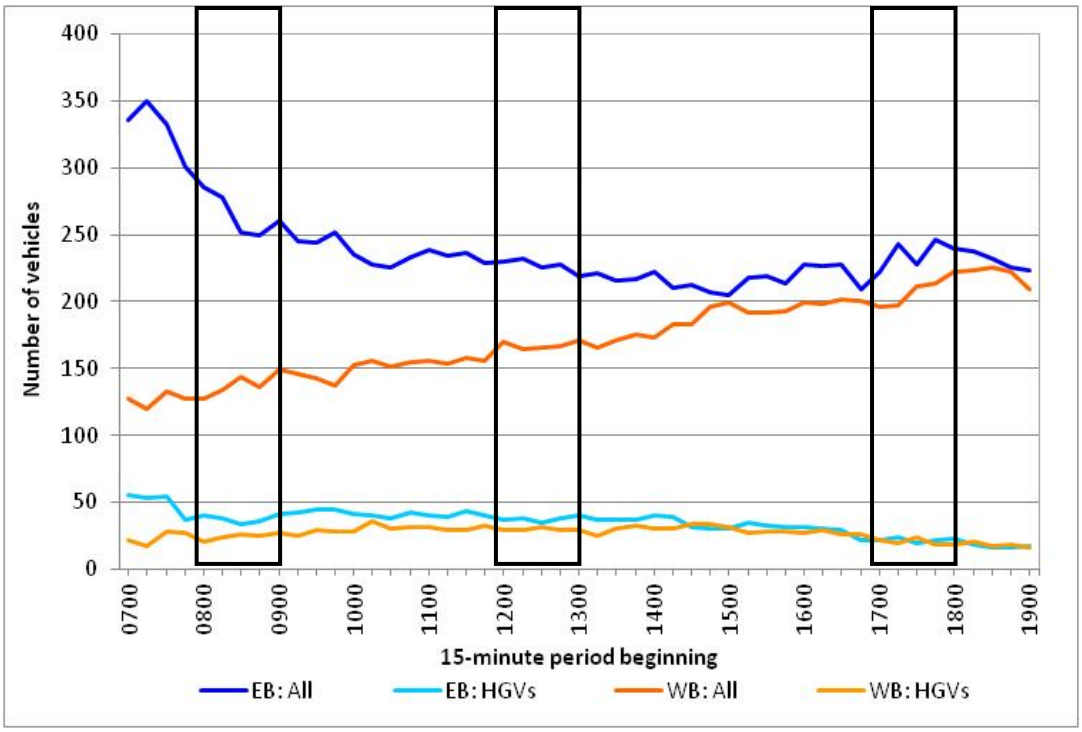
Road / Route	Direction	Weekday			Weekend
		AM Peak hour (08:00 – 09:00)	Inter-peak Hour (12:00 – 13:00)	PM Peak Hour (17:00 – 18:00)	Saturday peak hour (13:00 – 14:00)
Specific Surveys:					
Neville Gill Close	Northbound	32	7	8	8
Neville Gill Close	Southbound	5	4	13	10
King George's Park – towards centre of park	Southbound	1	2	4	1
King George's Park – towards Neville Gill Close entrance	Northbound	3	0	1	0
King George's Park – towards Buckhold Road (A218) entrance	Northbound	3	0	0	0

9.4.65 The cycle survey in the AM peak hour reflects the trend shown by the pedestrian movements. The northbound cyclists reach approximately 38 compared to the relatively small number of six cyclists in the southbound direction. The PM peak hour shows a more balanced movement between the northbound and southbound directions with nine and 17 cyclists respectively.

Traffic flows

9.4.66 The ATC data has been analysed to identify the existing traffic flows along Swandon Way. Swandon Way is one of the primary construction traffic routes to and from the King George's Park site. The weekday vehicle and HGV flows for a 12-hour period (0700-1900) are shown in Plate 9.4.3. The Saturday and Sunday vehicle and HGV flows for a 12-hour period (0700-1900) are shown in Plates 9.4.5 and 9.4.6 respectively.

Plate 9.4.3 Weekday ATC profile

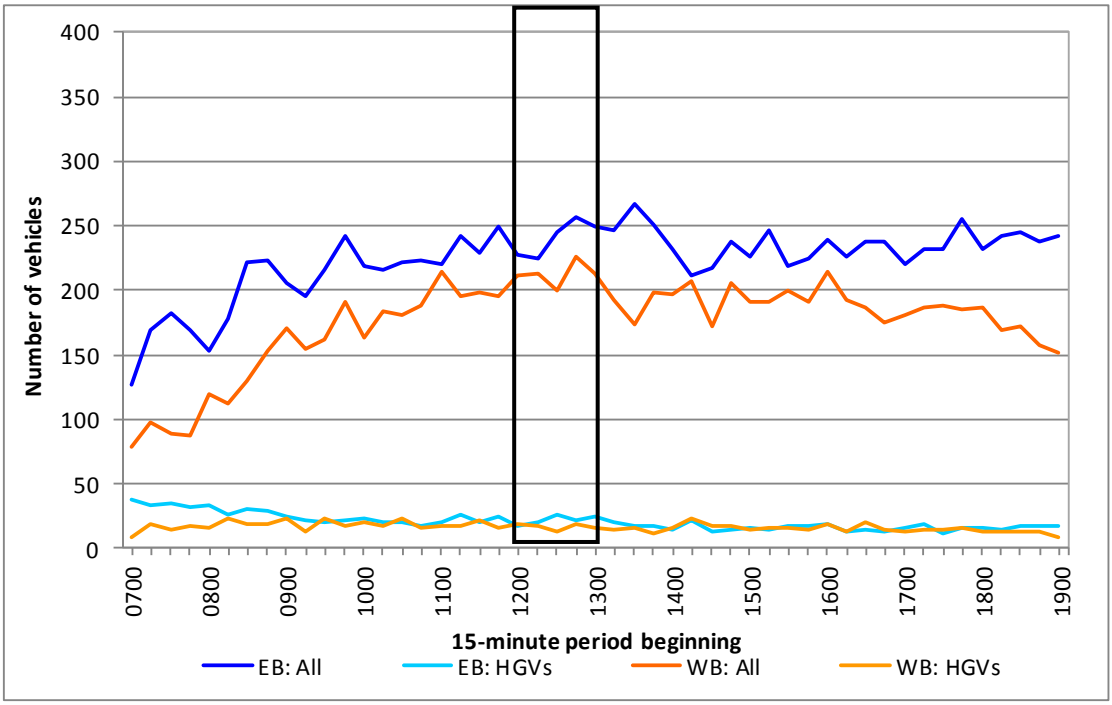


EB – East Bound, WB – West Bound. The black box represents the peak hour traffic flows used for the traffic assessment

9.4.67 The weekday ATC data shows that between 08:00 – 09:00 there are approximately 1,607 two-way vehicle movements. The busiest 15 minute peak period in this period occurred after 08:00 with approximately 286 eastbound vehicles and approximately 127 westbound vehicles.

9.4.68 For the period between 17:00 – 18:00 there are approximately 1,829 two-way vehicle movements. The busiest 15 minute peak period in this period occurred after 18:00 with approximately 240 eastbound vehicles and approximately 223 westbound vehicles.

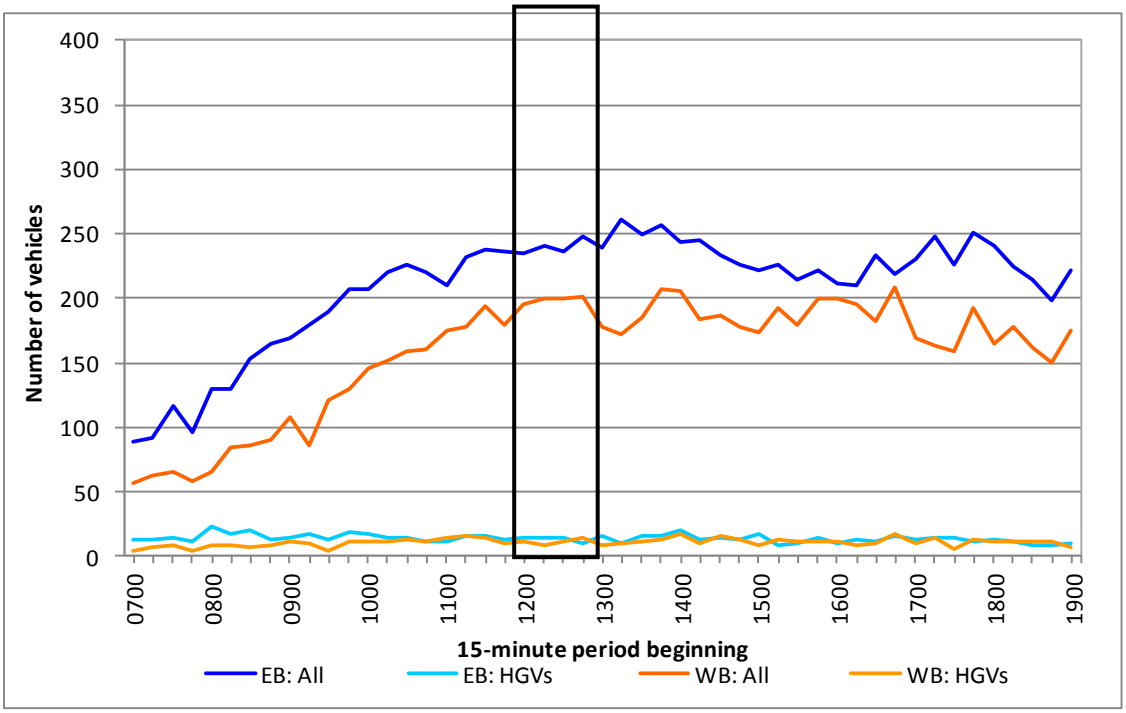
Plate 9.4.4 Saturday ATC profile



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

9.4.69 Analysis of the data showed that the Saturday peak travel period occurred between 12:15 – 13:15 with 1,829 two-way vehicle movements recorded. This is equal to the 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 on a Saturday.

Plate 9.4.5 Sunday ATC profile



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

9.4.70 Analysis of the data showed that the Sunday peak travel period occurred between 11:45 – 12:45 with 1,757 two-way vehicle movements recorded. This is less than the 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.

9.4.71 Traffic flow diagrams for the AM and PM peak hours containing the traffic flow information collected during the ATC surveys and junction surveys in 2011 are shown in Figures 9.4.5 to 9.4.6 in the King George's Park *Transport Assessment* figures.

9.4.72 The turning movement survey on Buckhold Road (A218) and Neville Gill Close shows a higher traffic flow during the AM peak compared to the PM peak. In the AM peak, the maximum turning movement is from Buckhold Road (A218) left turning into Neville Gill Close with 47 vehicles. There are 75 vehicles that make a left turn onto Buckhold Road (A218) from Neville Gill Close in the PM peak hour.

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

Parking

9.4.74 As a result of the limited on street parking at this site, as detailed in paras 9.4.41 and 9.4.42, no parking surveys were undertaken for this site.

Local highway modelling

9.4.75 To establish the existing capacity of the local highway network, a scope was discussed with TfL and LB of Wandsworth to model the Buckhold

Road (A218) / Neville Gill Close priority junction using PICADY software. The baseline model incorporated the current traffic and transport conditions within the vicinity of the King George's Park site and followed the methodology outlined in the *Project-wide TA.*

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

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

9.4.78 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

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

9.4.80 The weekday AM and PM baseline model flows for King George's Park were compared against observed queue lengths for the peak periods (from junction surveys) to validate the PICADY model and ensure reasonable representation of existing conditions.

9.4.81 Figure 9.4.5 and 9.4.6 in the King George's Park *Transport Assessment* figures indicate the traffic flows which were used for the baseline AM and PM peak hour assessments which take into account the observed flows and the TfL model output flows.

9.4.82 Table 9.4.9 summarises the baseline performance of the Neville Gill Close / Buckhold Road (A218) junction.

Table 9.4.9 PICADY model outputs, baseline

Approach	Movement	Weekday							
		AM peak hour (08:00-09:00)				PM peak hour (17:00-18:00)			
		Flow (veh)	RFC	Max. Queue (veh)	Delay (seconds per veh)	Flow (veh)	RFC	Max. Queue (veh)	Delay (seconds per veh)
Neville Gill Close	Left or right onto Buckhold Road (A218)	73	19%	0	13	122	30%	0	13
Buckhold Road	Right turn into Neville Gill Close	40	8%	0	7	62	14%	0	9

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

9.4.83 The overall junction performance shows that the junction is currently operating within capacity in the weekday AM and PM peak hours. The validated model indicates that the greatest delay is 13 seconds per vehicle in the AM peak hour and the PM peak hour. However, there is no queuing at the junction during either peak period. The delay to vehicles is greatest during the PM peak hour for vehicles turning right out of Neville Gill Close onto Buckhold Road (A218).

9.4.84 Model outputs are included in Appendix C which indicates the lane structure.

Accident analysis

9.4.85 Data has been obtained for a 5 year period, up until the 31st March 2011. Figure 9.4.7 in the King George's Park *Transport Assessment* figures indicates the accidents that have occurred within the vicinity of the site. The following roads and junctions have been analysed:

a. Wandsworth High Street (A3);
b. West Hill / Broomhill Road / Merton Road / Wandsworth High Street (A3) / Putney Bridge Road (A3209) junction;
c. Wandsworth High Street (A3) / Dutch Yard junction;
d. Wandsworth High Street (A3)/ Carters Yard junction;
e. Wandsworth High Street (A3) / Newton's Yard junction;
f. Wandsworth High Street (A3)/ Wandsworth Plain / Church Row junction;
g. Wandsworth High Street (A3) / Buckhold Road (A218) junction;
h. Buckhold Road (A218)/ Hardwick Way junction;
i. Neville Gill Close / Buckhold Road (A218) junction;
j. Wandsworth High Street(A3) / Garratt Lane (A217) / Ram Street junction;
k. Garratt Lane (A217)

9.4.86 A total of 14 serious accidents and 79 slight accidents occurred in the study area over the five-year accident data analysed. There were no fatal accidents.

9.4.87 The majority of accidents occurred along Wandsworth High Street (A3), with 13 classified as serious accidents and 71 classified as slight. The accidents were dispersed throughout the stretch of road analysed. However, significant clusters of accidents are evident at the junctions adjoining Wandsworth High Street (A3). In particular, Wandsworth High Street / Buckhold Road (A218) and Wandsworth High Street (A3) / Garratt Lane / Ram Street junctions experienced 17 and 18 accidents over the five year period respectively.

9.4.88 The 14 serious accidents involved cars, pedestrians, motorcyclists, a taxi and LGVs. No Medium Goods Vehicles (MGVs) or HGVs were involved in the serious rated accidents. Primary factors for the cause of accidents included failing to look properly, poor turns or manoeuvre and exceeding

the speed limit. The accidents involving pedestrians were largely the result of pedestrians failing to look or use pedestrian crossings properly in conjunction with vehicle drivers failing to look properly.

9.4.89 Of the total accidents, 12 involved LGVs, MGVs and HGVs. The majority of these led to slight accidents, however two accidents (involving LGVs) were serious. The majority of accidents occurred as a result of human error rather than as a result of the highway layout, infrastructure or geometry.

9.4.90 Table 9.4.10 indicates the accidents that have occurred within the vicinity of the site.

Table 9.4.10 Accident severity from 2006 to 2011

Location	Slight	Serious	Fatal	Total
Wandsworth High Street	20	1	0	21
West Hill / Broomhill Road / Merton Road junction	5	3	0	8
Wandsworth High Street / Putney Bridge Road junction	7	2	0	9
Merton Road	1	0	0	1
Putney Bridge Road	1	0	0	1
Wandsworth High Street / Dutch Yard junction	2	1	0	3
Wandsworth High Street / Carters Yard junction	2	0	0	2
Wandsworth High Street / Newton's Yard junction	1	0	0	1
Wandsworth High Street / Wandsworth Plain / Church Row junction	5	0	0	5
Wandsworth High Street / Buckhold Road junction	14	3	0	17
Buckhold Road	2	0	0	2
Buckhold Road / Hardwick Way junction	0	1	0	1
Neville Gill Close / Buckhold Road junction	2	0	0	2
Wandsworth High Street / Garratt Lane / Ram Street junction	15	3	0	18
Garrett Lane	2	0	0	2
Total	**79**	**14**	**0**	**93**

9.4.91 Figure 9.4.8 in the King George's Park *Transport Assessment* figures shows the pedestrian and cyclist accidents by severity.

9.4.92 The records show that there were 38 accidents involving pedestrians and / or cyclists. All but five incidents occurred on the roads to be used by construction vehicles within the study area. Inspection of the data showed that 18 of these 31 incidents occurred at junctions with signalised control facilities, with the remaining accidents occurring at locations without signal control.

9.4.93 In the context of the construction HGV movements associated with the King George's Park site, the accident risk to these modes of travel would be managed by providing pedestrian and cyclist awareness training for commercial drivers associated with the construction works as set out in the CoCP. For sections of road affected by roadworks, 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[2].

9.4.94 Appendix D provides a full analysis of accidents within the local area surrounding the King George's Park site.

9.5 Construction assessment

9.5.1 The assessment, including both qualitative and quantitative analysis has been undertaken drawing on discussions with TfL and the Local highway authorites, 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.

9.5.2 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 King George's Park site or from other sites**.**

Construction base case

9.5.3 As described in Section 9.3, the construction assessment year for transport issues in relation to this site is Site Year 1 of construction.

Pedestrians and cyclists

9.5.4 As part of the proposed Business Village development it is planned to provide new public routes and spaces by Site Year 1 of construction. Additionally, the proposed Cockpen House development would include a new pedestrian route to Hardwicks Square by Site Year 1 of construction. These changes to the pedestrian and cycle network have been taken into consideration in the construction base case.

9.5.5 The LB of Wandsworth stated that it has identified a contingency site for a Barclays Cycle Hire docking station immediately to the south of the Neville

Gill Close site access. Details of this will be investigated prior to commencement of operations.

Public transport

9.5.6 At the time of undertaking the assessment, there were no firm proposals by TfL to alter bus routes within the vicinity of King George's Park. The assessment has therefore assumed that bus routes would be unchanged from the baseline.

9.5.7 In terms of the public transport network, it is expected that as a result of the TfL London Underground Upgrade Plan[iii] , compared to the current baseline, capacity will increase by approximately 24% on the District Line, although it is clear that a significant proportion of this increase is attributed to the revised service patterns implemented in 2009, which will already be reflected in the baseline data.

9.5.8 Network Rail has announced plans to increase the number of carriages serving Wandsworth Town rail station to ten in 2014.

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

9.5.10 Due to traffic growth in the construction base case compared to the baseline situation, there would be an increase in delay of a maximum of approximately one second on Neville Gill Close. There would be no increases in delay on Buckhold Road (A218) as a result of traffic growth. As no bus services currently operate along Neville Gill Road, there would be no impact on bus journey times in the vicinity of the King George's Park site in the construction base case.

9.5.11 It is anticipated that patronage on public transport services may change between the baseline situation and Site Year 1 of construction. Future patronage changes on bus, rail and river 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, Thames Tideway Tunnel are unable to estimate how much of these upgrades will have been completed by the construction base case or how much will be remaining.

9.5.12 Therefore, in order to ensure that a busiest case scenario is addressed in assessing the result of additional construction worker journeys by public transport, the capacity for public transport services including London Underground and National Rail services in the construction base case has been assumed to be the same as in the baseline situation, as, given the

[iii] London Underground Upgrade Plan, http://www.tfl.gov.uk/assets/downloads/corporate/our-upgrade-plan-london-underground-february-2011.pdf

distance to the nearest stations, no significant changes are likely to occur that will affect the King George's Park site.

River navigation

9.5.13 It is expected that river services may increase from baseline conditions as a result of planned service changes which were being tendered at the time of writing.

Highway network and operation

9.5.14 Baseline traffic flows (from the junction surveys) have been used and forecasting carried out to understand the capacity on the highway network in the vicinity of the King George's Park site in Site Year 1 of construction without the Thames Tideway Tunnel project. The scope of this analysis has been discussed with LB of Wandsworth and TfL. The construction base case traffic flows at the junction of Buckhold Road (A218) and Neville Gill Close are shown on Figures 9.4.5 and 9.4.6 in the King George's Park *Transport Assessment* figures.

9.5.15 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 *Project-wide TA*.

9.5.16 For the King George's Park site, the TfL WeLHAM model has been used. The model provides factors for the increase in vehicle kilometres in the LB of Wandsworth between the base year and 2021. The relevant growth factor is described in para 9.5.8 which was applied to the survey flows undertaken in 2011 to produce flows for 2021.

9.5.17 It should be noted that these represent growth over the period to 2021, which is beyond Site Year 1 of construction at King George's Park and therefore ensures that the construction base case for the highway network is robust.

Committed developments

9.5.18 The base case in Site Year 1 of construction takes into account the developments at the Wandsworth Business Village on Broomhill Road and Cockpen House on Buckhold Road (A218).

9.5.19 As part of the Wandsworth Business Park development it is proposed that the vehicle access to the Business Village will be located close to the Buckhold Road (A218) / Neville Gill Close junction on the opposite side of Buckhold Road (A218) from Neville Gill Close. The proposals for this new access include the redesign of road markings to provide a right turn lane into the site access from Buckhold Road (A218). This requires the shortening of the existing right-turn lane into Neville Gill Close. This change in highway operation has been incorporated into the assessment.

Local highway modelling

9.5.20 The growth factors for the LB of Wandsworth based on the WeLHAM model have been discussed with TfL and the LB of Wandsworth and applied to the baseline traffic flows. The growth factors are:

a. Weekday AM Peak growth factor : 3.6%

b. Weekday PM Peak growth factor : 4.6%

9.5.21 Para 9.3.8 explains the definition of the assessment area for local highway network modelling. At this site, the assessment examines only the nearest junction of the construction vehicle route with the TLRN.

9.5.22 The maximum predicted traffic flow generated by the two new developments located at a close proximity to the King George's Park site, Wandsworth Business Village and Cockpen House, have also been applied to the construction base case PICADY model.

9.5.23 The results from the construction base case PICADY model indicate that there will be very slight increases to RFC with the largest increase in the PM peak flow from 122 vehicles per hour to 130 vehicles per hour turning out of Neville Gill Close in the construction base case compared to baseline conditions. The results indicate that the local highway network will operate within capacity in both the AM and PM peak hour when taking into account construction base case traffic flows.

9.5.24 Table 9.5.1 shows the results of the construction base case PICADY model outputs for the Neville Gill Close / Buckhold Road (A218) priority junction.

Table 9.5.1 Construction base case PICADY model outputs

Approach	Movement	Weekday							
		AM peak hour (08:00-09:00)				PM peak hour (17:00-18:00)			
		Flow (veh)	RFC	Max. Queue (veh)	Delay (seconds per veh)	Flow (veh)	RFC	Max. Queue (veh)	Delay (seconds per veh)
Neville Gill Close	Left or right onto Buckhold Road	76	20%	0	13	128	32%	0	14
Buckhold Road	Right turn into Neville Gill Close	41	8%	0	7	65	15%	0	10

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

Construction development case

9.5.25 This section summarises the findings of the assessment undertaken for the peak year of construction at the King George's Park site (Site Year 1 of construction).

9.5.26 Information regarding the travel arrangements of the workers associated with the site will be included in the *Project Framework Travel Plan* and site-specific *Workplace Travel Plan* documents.

Pedestrian routes

9.5.27 There are existing pedestrian accesses to King George's Park located at the northern end of the park on Buckhold Road (A218) and to the east of the park located on Neville Gill Close.

9.5.28 As discussed in Section 9.2, the pedestrian diversions in King George's Park would result in changes to the pedestrian movements around King George's Park. The construction phase (phase 1 and phase 2) plans in the King George's Park *Transport Assessment* figures shows the layout of pedestrian footways during construction.

9.5.29 Pedestrians using the footpath on the western side of Neville Gill Close would also be required to undertake an additional crossing at the proposed site access. However the number of pedestrians that use this footpath would be very low as the footpath is narrow and pedestrians are more likely to use the footpath on the eastern side of Neville Gill Close. This observation is supported by the baseline pedestrian survey.

9.5.30 To assess a busiest case scenario, it has been anticipated that all worker trips would finish and start their journeys from the site by foot. As a result the 40 worker trips generated by the King George's Park site have been added to the construction base case pedestrian flows during the AM and PM peak hours.

9.5.31 Taking into consideration the pedestrian diversions and increase in worker trips, the greatest effect would be on Buckhold Road (A218) where it meets Neville Gill Close and on the northern internal footway within King George's Park.

9.5.32 Although some pedestrians would have to make one additional crossing across the proposed vehicular access to the King George's Park site, pedestrian flows are low with a maximum of approximately 14 on this side of the road and construction traffic movements would total only a maximum of two HGV movements per hour. This is not significant.

9.5.33 It is anticipated that the pedestrian diversions around the King George's Park construction site would result in a journey time increase of approximately 30 seconds, due to the extension of the journey by 40m, based on a walking speed of 4.8km/hour. This is not significant.

9.5.34 During all construction work and on any section of road subject to temporary diversions or restrictions imposed by roadworks associated with the King George's Park 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[3] to ensure safe passage for mobility and vision impaired pedestrians.

Cycle routes

9.5.35 There would be an increase in the number of construction vehicles on Neville Gill Close which is designated as part of National Cycle Route 20. This would increase the potential for cyclist and vehicle conflicts. However, cyclists using the highway would experience a minimal additional delay to journey time as a result of the construction works at the King George's Park site, experiencing a maximum increase of seven seconds delay on Neville Gill Close turning right into the site access.

9.5.36 The current alignment of National Cycle Route 20 on the eastern side of Neville Gill Close would be retained. With regard to accidents and safety, cyclists would not be required to make any additional road crossings, cycle flows are relatively low at a maximum of 34 along Neville Gill Close, and the increase in construction traffic flow would be a maximum of two HGV movements per hour. The proposed construction arrangements at King George's Park would therefore only result in a very small increase in risk to cyclists.

9.5.37 Measures set out in the *CoCP* described in paras 9.2.39 to 9.2.41 include increasing driver awareness of restrictions on the road network and 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 King George's Park 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[4]) to ensure safe passage for cyclists.

9.5.38 During the construction period, the operation and layout of the road network will not change. 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

9.5.39 A total of thirteen daytime bus routes operate within 640m of the King George's Park site serving local destinations. Additional construction vehicles serving the King George's Park site may affect some bus routes and bus journey times along Buckhold Road (A218). The effect on journey times is detailed under the 'Highway Operation and Network' assessment and shows that there would be an increase in vehicle delay on Buckhold Road (A218) of one second and an increase of a maximum of approximately seven seconds on Neville Gill Close. The construction at King George's Park is therefore not anticipated to cause a significant change for bus users.

9.5.40 It is expected that approximately 11 additional two-way worker trips would be made by bus during the AM and PM peak hours, which would result in

less than one worker trip per bus based on a service of 68 and 64 buses in total per hour within 640m walking distance during the AM and PM peak hours respectively.

9.5.41 As London Underground and National Rail stations are all more than 960m from the King Georges Park site it is possible that workers using these services as their main mode of transport would complete their journeys by bus or on foot.

9.5.42 If the additional 17 workers in the AM peak and 17 in the PM peak expected to travel by rail and underground were to complete their journeys by bus, this would increase the additional demand on bus services to approximately 28 journeys in the AM peak hour and 28 in the PM peak hour. This would still equate to approximately less than one additional journey per bus and therefore would not have a significant effect on bus patronage.

9.5.43 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 patronage

9.5.44 No underground stations are within 960m of the King George's Park site and therefore none would be directly affected by the construction site development. It is anticipated that approximately eight construction workers and labourers would use London Underground services to access the King George's Park site.

9.5.45 East Putney is the closest London Underground station to the King George's Park site and services 15 trains in both the northbound and southbound directions in the AM and PM peak hours. This equates to less than one additional person per train during peak hours.

9.5.46 This small number of additional passengers on the London Underground services could be easily accommodated within existing capacity.

National Rail and patronage

9.5.47 On National Rail services there would be nine additional workers, which equates to less than one additional passenger per train based on the AM peak hour service of 13 arrivals and PM peak hour service of 14 departures at Wandsworth Town rail station.

9.5.48 This additional demand could be easily accommodated within existing capacity.

River services and patronage

9.5.49 The King George's Park site is located approximately 0.9km walking distance to the south of Wandsworth Riverside Quarter pier on the South Bank.

9.5.50 During construction, no river passenger services would be directly affected. It is anticipated that less than 1% of construction workers and labourers would use the river services to access the construction site, which would result in less than one construction worker per boat service.

9.5.51 This would result in a negligible impact on river services and patronage.

Parking

9.5.52 During construction, there would be no changes to parking within the vicinity of King George's Park.

9.5.53 Measures would also be taken for this site to discourage workers from travelling by car, instead promoting the use of public transport, walking or cycling. These measures are included in the *Travel Plan* and *CoCP.*

9.5.54 There is an on-street loading bay located on the eastern side of Neville Gill Close and access to the Southside Shopping Centre services yard is also made from an access point located on the eastern side of Neville Gill Close. There are no proposals to suspend loading bays during construction. The influence of the development on parking would therefore be negligible.

Highway assessment

Highway layout

9.5.55 The access plan and highway layout during construction plan in the King George's Park *Transport Assessment* figures shows the highway layout during construction works at the King George's Park site. During the construction phases the pedestrian refuge on the Neville Gill Close arm would be relocated. These modifications would not be significant but would be implemented to ease the movement of construction vehicles into and out of Neville Gill Close. The highway layout during construction vehicle swept path analysis plan in the King George's Park *Transport Assessment* figures presents the swept path movements and shows that the construction vehicles are able to safely enter and leave the King George's Park site.

9.5.56 A new site access would be required on Neville Gill Close. It would be necessary to ensure that construction lorries travel in one direction in Neville Gill Close at any one time and do not attempt to pass in this street, as larger vehicles would need to encroach into opposing lanes when turning. Other traffic would continue to operate two-way. The one-way operation of vehicles would need to be managed as part of the overall site management regime (under the measures set out in the *CoCP Part A*. This approach has been discussed with the LB of Wandsworth.

Highway network

9.5.57 Construction lorry movements would be limited to the day shift only (08:00 to 18:00 Monday to Friday and 08:00 to 13:00 Saturday) except in exceptional circumstances when HGV and abnormal load movements could occur up to 22:00 on weekday for large concrete pours and later at night on agreement with the LB of Wandsworth.

9.5.58 Table 9.2.4 shows the vehicle movement assumptions for the local peak traffic periods. These are based on the peak months of construction activity at the King George's Park site.

9.5.59 Table 9.2.4 shows an average peak flow of 52 vehicle movements a day is expected during the months of greatest activity during Site Year 1 of

construction at the King George's Park site. At other times in the construction period, vehicle flows would be lower than this average peak figure.

9.5.60 The busiest peak in the AM and PM period for each type of movement (construction, other and worker) 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.

9.5.61 It is anticipated that along Neville Gill Close there would be an additional one to two two-way construction HGV movements during the peak hour as a result of the King George's Park construction site. In addition, there would potentially be one vehicle every fortnight transporting hazardous loads to or from this site during construction. Based on these HGV flows and given that the proposed vehicular access is not located on a strategic road, this impact is not considered significant.

9.5.62 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.

9.5.63 The assignment of construction lorry trips has been undertaken using OmniTrans[iv] software, which enables a fixed assignment to be created for these trips in order to ensure that they are assigned only to the proposed construction routes. The OmniTrans outputs also identify lorry traffic which would be associated with the King George's Park site, or with other Thames Tideway Tunnel project sites, that would use routes in the vicinity of the King George's Park site. Figure 9.5.1 shows the OmniTrans plot for the local road network around the King George's Park site.

9.5.64 In addition to the construction HGV movements associated with the King George's Park site, it is anticipated that there would be no HGV movements on Buckhold Road or Neville Gill Close during the peak hours associated with other Thames Tideway Tunnel sites during Site Year 1 of construction at King George's Park.

9.5.65 Changes to the highway network during construction and the additional construction traffic generated by the project may lead to local changes in traffic flow and capacity. Local modelling has been undertaken to assess the effect on the highway operation resulting from these changes.

9.5.66 The local PICADY model for the Buckhold Road (A218) / Neville Gill Close junction 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 (i.e., comparison of base and development cases). The development case

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

traffic flows are shown on Figures 9.4.5 and 9.4.6 in the King George's Park site *TA* figures.

9.5.67 A summary of the construction assessment results for the junction of Buckhold Road (A218) and Neville Gill Close in the weekday AM and PM peak hours is presented in Table 9.5.2 and Table 9.5.3.

9.5.68 A summary of the construction assessment results for the Neville Gill Close / New Access road junction for AM and PM peak hours is presented in Table 9.5.4.

Table 9.5.2 Construction development case PICADY model outputs for Neville Gill Close / Buckhold Road (A218) junction (AM peak)

Approach	Arm	Flow (vehs)	Weekday								
			AM peak hour (08:00-09:00)								
			RFC			Max. Queue (veh)			Delay (seconds per veh)		
			Base case	Devt case	Change	Base case	Devt case	Change	Base case	Devt case	Change
Neville Gill Close	Left or right onto Buckhold Road (A218)	78	20%	22%	+2%	0	0	0	13	14	+1
Buckhold Road (A218)	Right turn into Neville Gill Close	42	8%	8%	0%	0	0	0	7	8	+1

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

Table 9.5.3 Construction development case PICADY model outputs for Neville Gill Close / Buckhold Road (A218) junction (PM peak)

Approach	Arm	Flow (vehs)	Weekday								
			PM peak hour (17:00-18:00)								
			RFC			Max. Queue (veh)			Delay (seconds per veh)		
			Base case	Devt case	Change	Base case	Devt case	Change	Base case	Devt case	Change
Neville Gill Close	Left or right onto Buckhold Road (A218)	130	32%	34%	0%	0	0	0	14	15	+1
Buckhold Road (A218)	Right turn into Neville Gill Close	66	15%	15%	0%	0	0	0	10	10	0

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

Table 9.5.4 Construction development case PICADY model outputs for access road / Neville Gill Close junction (AM and PM Peak hours)

Approach	Movement	Weekday							
		AM peak hour (08:00-09:00)				PM peak hour (17:00-18:00)			
		Flow (veh)	RFC	Max. Queue (vehs)	Delay (seconds per veh)	Flow (vehs)	RFC	Max. Queue (vehs)	Delay (seconds per veh)
New Access Road	Left or Right turn	3	1%	0.00	6	4	1%	0.01	6
Neville Gill Close	Right turn	5	1%	0.01	6	4	1%	0.01	7

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

9.5.69 The construction base case model indicates that the local highway will be operating within capacity without the proposals at the King George's Park site. The construction traffic generated by the King George's Park site would produce a marginal increase in demand during the AM and PM peaks. The delay in vehicles increases by a maximum of one second. This is not significant.

9.5.70 The results show that the construction traffic generated by the King George's Park site would create a delay of six seconds in the AM peak hour and seven seconds in the PM peak hour. The PICADY model indicates that the local highway would continue to operate within capacity at the King George's Park site with the development proposals in place.

9.5.71 The construction assessment indicates that there would be no significant impact on the road network during the AM and PM peak hours as a result of the additional construction traffic.

Construction mitigation

9.5.72 The project has been designed to limit the issues arising on transport networks as far as possible and many measures have been embedded directly in the design of the project. These are summarised in Table 9.5.5.

Table 9.5.5 King George's Park design measures

Phase	Issues	Design measures
Construction	Creating access points	• Creation of gated accesses for the right-turn in / left turn-out movement for construction traffic • Traffic management in and out of the site
	Buckhold Road (A218) / Neville Gill Road junction	• Movement of traffic island to ensure safe traffic flow and pedestrian crossing point
	Diversion of pedestrian path in the park	• Diversion of the Path would be adequately signed
Operation	Creating access point	• Provision of new dropped kerb access point • To accommodate ten yearly maintenance vehicles.

9.5.73 These embedded measures, discussed in Section 9.2, 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.

9.6 Operational assessment

9.6.1 This section summarises the findings of the assessment undertaken for Year 1 of operation at the King George's Park site.

9.6.2 The assessment of the operational phase is limited to the physical issues associated with accessing the site from the highway network as outlined in Section 9.2. This has been discussed with LB Wandsworth and TfL

Operational base case

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

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

Operational development case

9.6.5 The operational assessment has taken into consideration those elements that would be affected, which primarily comprise the short-term impacts on highway layout and operation when maintenance visits are made to the King George's Park site.

9.6.6 The assessment of the operational phase is therefore limited to the physical issues associated with accessing the King George's Park site from the highway network, i.e., highway layout and operation, as outlined in the following section. This has been discussed with the LB of Wandsworth and TfL.

9.6.7 The transport demands created by the development in the operational phase would be extremely low and limited to occasional maintenance visits with certain instances where larger cranes may be required for access to the shaft and tunnel every ten years. As outlined in section 9.2, during the operational phase, the King George's Park site would be accessed via the new vehicular access on Neville Gill Close at the junction with Buckhold Road proposed by the LB of Wandsworth. The permanent highway layout plan in the King George's Park *Transport Assessment* figures shows the highway layout during the operational phase.

Highway layout and operation

9.6.8 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 need for flatbed vehicles to access the King George's Park site.

9.6.9 During ten-yearly inspections an area to locate two large cranes within the King George's Park site area would be required. Hardstanding is designed for 2x 25tt cranes, approximately 8.3m long . A number of supporting vehicles will also be in attendance. They will need to park in Neville Gill Close. The cranes would facilitate duty/standby access for personnel.

9.6.10 To assess the effect of these on the highway layout, swept path analyses have been undertaken for the largest vehicles expected to access the site; an 11.4m mobile crane, 10m articulated vehicle and 10.7m articulated vehicle. The permanent highway layout vehicle swept path analysis plan in the King George's Park *Transport Assessment* figures shows the swept path movements during operation and shows that operational vehicles would be able to safely enter and leave the site. Temporary parking suspensions on Neville Gill Close are likely to be required to accommodate support vehicles.

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

9.6.12 Due to the infrequent nature of maintenance trips there is anticipated to be no significant change to the surrounding highway network during the operational phase at King George's Park.

9.7 Summary of site specific TA

9.7.1 The outcomes of this *TA* are indicated in Table 9.7.1.

Table 9.7.1 King George's Park transport assessment results

Phase	Mode of transport	Key Findings
Construction	Pedestrians	Approximately 30 second delay to pedestrian journeys due to minor change to pedestrian route within King George's Park of 40m.
	Cyclists	A very small increase in risk to cyclists as a result of the construction traffic on Neville Gill Close.
	Bus patronage and operators	Approximately 11 worker trips would be made by bus per peak period which could be accommodated on base case bus services. This could rise to 28 per peak period if LUL and National Rail trips finish their journey by bus. A negligible delay to bus services would be anticipated.
	London Underground and National Rail patronage	Approximately eight and nine worker trips would be made by LUL or National Rail respectively per peak period, which could be accommodated on base case services.
	River passenger services and patronage	River services would not be affected during construction.
	Parking	Parking would not be affected during construction.
	Highway network and operation	Approximately 52 additional daily movements would be produced by the construction works at King George's Park. The pedestrian refuge would be relocated to accommodate construction vehicles. The Buckhold Road junction with Neville Gill Close will be operating within capacity in the construction base case. The addition of the Thames Tideway Tunnel traffic would not impact significantly on the operation of the junction.

Phase	Mode of transport	Key Findings
Operation	Highway layout and operation	Traffic management would be required on Neville Gill Close when large cranes require access to the site, approximately every ten years. Some network delay may be experienced by other road users when large vehicles are accessing the site, however this would be infrequent and temporary. Temporary parking suspensions on Neville Gill Close are likely to be required to accommodate support vehicles.

References

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

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

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

[4] Department for Transport (DfT), *Traffic Advisory Leaflet 15/99 - Cyclists at Road Works, December 1999.*

Thames Tideway Tunnel
Thames Water Utilities Limited

Application for Development Consent

Application Reference Number: WWO10001

Transport Assessment

Doc Ref: **7.10.06**

King George's Park

Appendices

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

Hard copy available in

Box **50** Folder **A**
January 2013

Thames Tideway Tunnel

Creating a cleaner, healthier River Thames

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Thames Tideway Tunnel

Transport Assessment

Section 9 Appendices: King George's Park

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Appendix A – Policy review

A.1 Introduction

A.1.1 There are a number of documents containing planning policies that are relevant to transport matters for the proposed development at Chelsea Embankment Foreshore. 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 Royal Borough (RB) of Kensington and Chelsea.

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 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 for Waste Water seeks a sustainable long term solution to address the untreated sewage discharged into the river Thames and Thames Tideway Tunnel has been considered as the preferred solution.

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

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

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

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

A.2.13 The NPS for Waste Water 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:

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

connectivity and promote the vitality and viability of town centres, and that provide enhanced travel facilities for pedestrians and cyclists";

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

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

A.4 Local policy

A.4.1 The London Borough of 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.

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Appendix B – PTAL analysis

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PTAI Study Report File Summary

PTAI Run Parameters

PTAI Run	20122609160613
Description	20122609160613
Run by user	PTAL web application
Date	26/09/2012

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:	525463, 174502

Mode	Stop	Route	Distance (metres)	Frequency (vph)	Weight	Walk time (mins)	SWT (mins)	TAT (mins)	EDF	AI
BUS	BUCKHOLD RD NEVILLE GILL CL	39	34.06	8	1	0.43	5.75	6.18	4.86	4.86
BUS	BUCKHOLD RD NEVILLE GILL CL	156	34.06	7.5	0.5	0.43	6	6.43	4.67	2.33
BUS	HIGH STREET/ARNDALE CENT	220	206.44	7.5	0.5	2.58	6	8.58	3.5	1.75
BUS	ARNDALE CENT	28	371.41	8	0.5	4.64	5.75	10.39	2.89	1.44
BUS	ARNDALE CENT	44	371.41	6	0.5	4.64	7	11.64	2.58	1.29
BUS	HIGH STREET/ARNDALE CENT	270	206.44	6	0.5	2.58	7	9.58	3.13	1.57
BUS	HIGH STREET/ARNDALE CENT	485	206.44	2	0.5	2.58	17	19.58	1.53	0.77
BUS	HIGH STREET/ARNDALE CENT	337	206.44	5	0.5	2.58	8	10.58	2.84	1.42
BUS	HIGH STREET/ARNDALE CENT	37	206.44	6	0.5	2.58	7	9.58	3.13	1.57
BUS	HIGH STREET/ARNDALE CENT	170	206.44	7.5	0.5	2.58	6	8.58	3.5	1.75

Mode	Stop	Route	Distance (metres)	Frequency (vph)	Weight	Walk time (mins)	SWT (mins)	TAT (mins)	EDF	AI
BUS	HIGH STREET/ARNDALE CENT	87	206.44	10	0.5	2.58	5	7.58	3.96	1.98

Total AI for this POI is 20.73.
PTAL Rating is 5.

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Appendix C – Local modelling outputs

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C.1 Baseline results, AM peak hour

Buckhold Road/Neville Gill Close Junction existing priority layout

Errors and Warnings

Parameter	Values
Warning	No Errors Or Warnings

Geometric Data

Geometric Parameters

Parameter	Minor Arm B
Major Road Carriageway Width (m)	6.40
Major Road Kerbed Central Reserve Width (m)	0.00
Major Road Right Turning Lane Width (m)	2.20
Minor Road Width 0m Back from Junction (m)	9.50
Minor Road Width 5m Back from Junction (m)	3.50
Minor Road Width 10m Back from Junction (m)	3.20
Minor Road Width 15m Back from Junction (m)	3.15
Minor Road Width 20m Back from Junction (m)	3.30
Minor Road Flare Length (veh)	1
Minor Road Visibility To Right (m)	28
Minor Road Visibility To Left (m)	20
Major Road Right Turn Visibility (m)	60
Major Road Right Turn Blocks Traffic	Yes

Slope and Intercept Values

Stream	Intercept for Stream B-A	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	0.000	0.000	0.000	0.000	0.000
B-C	0.000	0.000	0.000	-	-
C-B	608.710	0.232	0.232	-	-

Note: Streams may be combined in which case capacity will be adjusted
These values do not allow for any site-specific corrections

Demand Data

Modelling Periods

Parameter	Period	Duration (min)	Segment Length (min)
First Modelling Period	08:00-09:00	60	15

Direct Entry Flows

Demand Set: Base 2011 AM Peak
Modelling Period: 08:00-09:00

Segment: 08:00-08:15

Arm	Flow (veh/interval)
Arm A	84.75
Arm B	18.25

Arm	Flow (veh / interval)
Arm C	202.00

Segment: 08:15-08:30

Arm	Flow (veh / interval)
Arm A	84.75
Arm B	18.25
Arm C	202.00

Segment: 08:30-08:45

Arm	Flow (veh / interval)
Arm A	84.75
Arm B	18.25
Arm C	202.00

Segment: 08:45-09:00

Arm	Flow (veh / interval)
Arm A	84.75
Arm B	18.25
Arm C	202.00

Turning Counts

Demand Set: Base 2011 AM Peak
Modelling Period: 08:00-09:00

From / To	Arm A	Arm B	Arm C
Arm A	-	54	285
Arm B	50	-	23
Arm C	768	40	-

Turning proportions are calculated from turning count data

Turning Proportions

Demand Set: Base 2011 AM Peak
Modelling Period: 08:00-09:00

From / To	Arm A	Arm B	Arm C
Arm A	0.000	0.159	0.841
Arm B	0.685	0.000	0.315
Arm C	0.950	0.050	0.000

Heavy Vehicles Percentages

Demand Set: Base 2011 AM Peak
Modelling Period: 08:00-09:00

From / To	Arm A	Arm B	Arm C
Arm A	-	1.1	1.1
Arm B	0.0	-	0.0
Arm C	0.3	0.3	-

Queues & Delays

Demand Set: Sum of Demand Sets for Modelling Period: 08:00 - 09:00
Modelling Period: 08:00-09:00

Segment	Stream	Demand (veh / min)	Capacity (veh / min)	RFC	Ped. Flow (ped / min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min / segment)	Delay (veh.min / segment)	Mean Arriving Vehicle Delay (min)
08:00-08:15	B-A	0.83	5.46	0.153	-	0.00	0.18	-	2.5	0.22
	B-C	0.38	10.40	0.037	-	0.00	0.04	-	0.6	0.10
	C-AB	0.67	8.80	0.076	-	0.00	0.08	-	1.2	0.12
	C-A	-	-	-	-	-	-	-	-	-
	A-B	0.90	-	-	-	-	-	-	-	-
	A-C	4.75	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
08:15-08:30	B-A	0.83	5.46	0.153	-	0.18	0.18	-	2.7	0.22
	B-C	0.38	10.40	0.037	-	0.04	0.04	-	0.6	0.10
	C-AB	0.67	8.80	0.076	-	0.08	0.08	-	1.2	0.12
	C-A	-	-	-	-	-	-	-	-	-
	A-B	0.90	-	-	-	-	-	-	-	-
	A-C	4.75	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
08:30-08:45	B-A	0.83	5.46	0.153	-	0.18	0.18	-	2.7	0.22
	B-C	0.38	10.39	0.037	-	0.04	0.04	-	0.6	0.10
	C-AB	0.67	8.80	0.076	-	0.08	0.08	-	1.2	0.12
	C-A	-	-	-	-	-	-	-	-	-
	A-B	0.90	-	-	-	-	-	-	-	-
	A-C	4.75	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
08:45-09:00	B-A	0.83	5.46	0.153	-	0.18	0.18	-	2.7	0.22
	B-C	0.38	10.39	0.037	-	0.04	0.04	-	0.6	0.10
	C-AB	0.67	8.80	0.076	-	0.08	0.08	-	1.3	0.12
	C-A	-	-	-	-	-	-	-	-	-
	A-B	0.90	-	-	-	-	-	-	-	-
	A-C	4.75	-	-	-	-	-	-	-	-

Entry capacities marked with an '(X)' are dominated by a pedestrian crossing in that time segment.
In time segments marked with a '(B)', traffic leaving the junction may block back from a crossing so impairing normal operation of the junction.
Delays marked with '##' could not be calculated.

Overall Queues & Delays

Queueing Delay Information Over Whole Period

Demand Set: Sum of Demand Sets for Modelling Period: 08:00 - 09:00
Modelling Period: 08:00-09:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-A	50.0	50.0	10.6	0.2	10.6	0.2
B-C	23.0	23.0	2.3	0.1	2.3	0.1
C-AB	40.0	40.0	4.9	0.1	4.9	0.1
C-A	-	-	-	-	-	-

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
A-B	54.0	54.0	-	-	-	-
A-C	285.0	285.0	-	-	-	-
All	**1220.0**	**1220.0**	**17.8**	**0.0**	**17.8**	**0.0**

Delay is that occurring only within the time period.
Inclusive delay includes delay suffered by vehicles which are still queuing after the end of the time period.
These will only be significantly different if there is a large queue remaining at the end of the time period.

PICADY 5 Run Successful

C.2 Baseline results, AM peak hour

Buckhold Road/Neville Gill Close Junction existing priority layout

Errors and Warnings

Parameter	Values
Warning	No Errors Or Warnings

Geometric Data

Geometric Parameters

Parameter	Minor Arm B
Major Road Carriageway Width (m)	6.40
Major Road Kerbed Central Reserve Width (m)	0.00
Major Road Right Turning Lane Width (m)	2.20
Minor Road Width 0m Back from Junction (m)	9.50
Minor Road Width 5m Back from Junction (m)	3.50
Minor Road Width 10m Back from Junction (m)	3.20
Minor Road Width 15m Back from Junction (m)	3.15
Minor Road Width 20m Back from Junction (m)	3.30
Minor Road Flare Length (veh)	1
Minor Road Visibility To Right (m)	28
Minor Road Visibility To Left (m)	20
Major Road Right Turn Visibility (m)	60
Major Road Right Turn Blocks Traffic	Yes

Slope and Intercept Values

Stream	Intercept for Stream B-A	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	0.000	0.000	0.000	0.000	0.000
B-C	0.000	0.000	0.000	-	-
C-B	608.710	0.232	0.232	-	-

Note: Streams may be combined in which case capacity will be adjusted
These values do not allow for any site-specific corrections

Demand Data

Modelling Periods

Parameter	Period	Duration (min)	Segment Length (min)
First Modelling Period	17:00-18:00	60	15

Direct Entry Flows

Demand Set: Base 2011 PM Peak
Modelling Period: 17:00-18:00

Segment: 17:00-17:15

Arm	Flow (veh/interval)
Arm A	172.25
Arm B	30.50

Arm	Flow (veh / interval)
Arm C	111.00

Segment: 17:15-17:30

Arm	Flow (veh / interval)
Arm A	172.25
Arm B	30.50
Arm C	111.00

Segment: 17:30-17:45

Arm	Flow (veh / interval)
Arm A	172.25
Arm B	30.50
Arm C	111.00

Segment: 17:45-18:00

Arm	Flow (veh / interval)
Arm A	172.25
Arm B	30.50
Arm C	111.00

Turning Counts

Demand Set: Base 2011 PM Peak
Modelling Period: 17:00-18:00

From / To	Arm A	Arm B	Arm C
Arm A	-	71	618
Arm B	47	-	75
Arm C	382	62	-

Turning proportions are calculated from turning count data

Turning Proportions

Demand Set: Base 2011 PM Peak
Modelling Period: 17:00-18:00

From / To	Arm A	Arm B	Arm C
Arm A	0.000	0.103	0.897
Arm B	0.385	0.000	0.615
Arm C	0.860	0.140	0.000

Heavy Vehicles Percentages

Demand Set: Base 2011 PM Peak
Modelling Period: 17:00-18:00

From / To	Arm A	Arm B	Arm C
Arm A	-	0.0	0.0
Arm B	0.0	-	0.0
Arm C	0.0	0.0	-

Queues & Delays

Demand Set: Sum of Demand Sets for Modelling Period: 17:00 - 18:00
Modelling Period: 17:00-18:00

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:00-17:15	B-A	0.78	5.33	0.147	-	0.00	0.17	-	2.4	0.22
	B-C	1.25	8.29	0.151	-	0.00	0.18	-	2.5	0.14
	C-AB	1.03	7.48	0.138	-	0.00	0.16	-	2.4	0.15
	C-A	-	-	-	-	-	-	-	-	-
	A-B	1.18	-	-	-	-	-	-	-	-
	A-C	10.30	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
17:15-17:30	B-A	0.78	5.33	0.147	-	0.17	0.17	-	2.6	0.22
	B-C	1.25	8.28	0.151	-	0.18	0.18	-	2.6	0.14
	C-AB	1.03	7.48	0.138	-	0.16	0.16	-	2.4	0.16
	C-A	-	-	-	-	-	-	-	-	-
	A-B	1.18	-	-	-	-	-	-	-	-
	A-C	10.30	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
17:30-17:45	B-A	0.78	5.33	0.147	-	0.17	0.17	-	2.6	0.22
	B-C	1.25	8.28	0.151	-	0.18	0.18	-	2.7	0.14
	C-AB	1.03	7.48	0.138	-	0.16	0.16	-	2.4	0.16
	C-A	-	-	-	-	-	-	-	-	-
	A-B	1.18	-	-	-	-	-	-	-	-
	A-C	10.30	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
17:45-18:00	B-A	0.78	5.33	0.147	-	0.17	0.17	-	2.6	0.22
	B-C	1.25	8.28	0.151	-	0.18	0.18	-	2.7	0.14
	C-AB	1.03	7.48	0.138	-	0.16	0.16	-	2.4	0.16
	C-A	-	-	-	-	-	-	-	-	-
	A-B	1.18	-	-	-	-	-	-	-	-
	A-C	10.30	-	-	-	-	-	-	-	-

Entry capacities marked with an '(X)' are dominated by a pedestrian crossing in that time segment.
In time segments marked with a '(B)', traffic leaving the junction may block back from a crossing so impairing normal operation of the junction.
Delays marked with '##' could not be calculated.

Overall Queues & Delays

Queueing Delay Information Over Whole Period

Demand Set: Sum of Demand Sets for Modelling Period: 17:00 - 18:00
Modelling Period: 17:00-18:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-A	47.0	47.0	10.1	0.2	10.1	0.2
B-C	75.0	75.0	10.5	0.1	10.5	0.1
C-AB	62.0	62.0	9.7	0.2	9.7	0.2
C-A	-	-	-	-	-	-

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
A-B	71.0	71.0	-	-	-	-
A-C	618.0	618.0	-	-	-	-
All	**1255.0**	**1255.0**	**30.3**	**0.0**	**30.3**	**0.0**

Delay is that occurring only within the time period.
Inclusive delay includes delay suffered by vehicles which are still queuing after the end of the time period.
These will only be significantly different if there is a large queue remaining at the end of the time period.

PICADY 5 Run Successful

C.3 Construction base case results, AM peak hour

Buckhold Road/Neville Gill Close Junction existing priority layout

Errors and Warnings

Parameter	Values
Warning	No Errors Or Warnings

Geometric Data

Geometric Parameters

Parameter	Minor Arm B
Major Road Carriageway Width (m)	6.40
Major Road Kerbed Central Reserve Width (m)	0.00
Major Road Right Turning Lane Width (m)	2.20
Minor Road Width 0m Back from Junction (m)	9.50
Minor Road Width 5m Back from Junction (m)	3.50
Minor Road Width 10m Back from Junction (m)	3.20
Minor Road Width 15m Back from Junction (m)	3.15
Minor Road Width 20m Back from Junction (m)	3.30
Minor Road Flare Length (veh)	1
Minor Road Visibility To Right (m)	28
Minor Road Visibility To Left (m)	20
Major Road Right Turn Visibility (m)	60

Parameter	Minor Arm B
Major Road Right Turn Blocks Traffic	Yes

Slope and Intercept Values

Stream	Intercept for Stream B-A	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	0.000	0.000	0.000	0.000	0.000
B-C	0.000	0.000	0.000	-	-
C-B	608.710	0.232	0.232	-	-

Note: Streams may be combined in which case capacity will be adjusted
These values do not allow for any site-specific corrections

Demand Data

Modelling Periods

Parameter	Period	Duration (min)	Segment Length (min)
First Modelling Period	08:00-09:00	60	15

Direct Entry Flows

Demand Set: Future 2021 AM Peak
Modelling Period: 08:00-09:00

Segment: 08:00-08:15

Arm	Flow

	(veh / interval)
Arm A	87.80
Arm B	18.91
Arm C	209.27

Segment: 08:15-08:30

Arm	Flow (veh / interval)
Arm A	87.80
Arm B	18.91
Arm C	209.27

Segment: 08:30-08:45

Arm	Flow (veh / interval)
Arm A	87.80
Arm B	18.91
Arm C	209.27

Segment: 08:45-09:00

Arm	Flow (veh / interval)
Arm A	87.80
Arm B	18.91
Arm C	209.27

Turning Counts

Demand Set: Future 2021 AM Peak
Modelling Period: 08:00-09:00

From / To	Arm A	Arm B	Arm C
Arm A	-	56	295
Arm B	52	-	24
Arm C	796	41	-

Turning proportions are calculated from turning count data

Turning Proportions

Demand Set: Future 2021 AM Peak
Modelling Period: 08:00-09:00

From / To	Arm A	Arm B	Arm C
Arm A	0.000	0.160	0.840
Arm B	0.684	0.000	0.316
Arm C	0.951	0.049	0.000

Heavy Vehicles Percentages

Demand Set: Future 2021 AM Peak
Modelling Period: 08:00-09:00

From / To	Arm A	Arm B	Arm C
Arm A	-	0.9	0.9
Arm B	0.0	-	0.0
Arm C	0.3	0.3	-

Queues & Delays

Demand Set: Sum of Demand Sets for Modelling Period: 08:00 - 09:00
Modelling Period: 08:00-09:00

Segment	Stream	Demand (veh / min)	Capacity (veh / min)	RFC	Ped. Flow (ped / min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min / segment)	Delay (veh.min / segment)	Mean Arriving Vehicle Delay (min)
08:00-08:15	B-A	0.86	5.34	0.161	-	0.00	0.19	-	2.7	0.22
	B-C	0.40	10.33	0.039	-	0.00	0.04	-	0.6	0.10
	C-AB	0.68	8.75	0.078	-	0.00	0.08	-	1.3	0.12
	C-A	-	-	-	-	-	-	-	-	-
	A-B	0.93	-	-	-	-	-	-	-	-
	A-C	4.92	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
08:15-08:30	B-A	0.86	5.34	0.161	-	0.19	0.19	-	2.9	0.22
	B-C	0.40	10.32	0.039	-	0.04	0.04	-	0.6	0.10
	C-AB	0.68	8.75	0.078	-	0.08	0.09	-	1.3	0.12
	C-A	-	-	-	-	-	-	-	-	-
	A-B	0.93	-	-	-	-	-	-	-	-
	A-C	4.92	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
08:30-08:45	B-A	0.86	5.34	0.161	-	0.19	0.19	-	2.9	0.22
	B-C	0.40	10.32	0.039	-	0.04	0.04	-	0.6	0.10
	C-AB	0.68	8.75	0.078	-	0.09	0.09	-	1.3	0.12
	C-A	-	-	-	-	-	-	-	-	-
	A-B	0.93	-	-	-	-	-	-	-	-
	A-C	4.92	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
08:45-09:00	B-A	0.86	5.34	0.161	-	0.19	0.19	-	2.9	0.22
	B-C	0.40	10.32	0.039	-	0.04	0.04	-	0.6	0.10
	C-AB	0.68	8.75	0.078	-	0.09	0.09	-	1.3	0.12
	C-A	-	-	-	-	-	-	-	-	-
	A-B	0.93	-	-	-	-	-	-	-	-
	A-C	4.92	-	-	-	-	-	-	-	-

Entry capacities marked with an '(X)' are dominated by a pedestrian crossing in that time segment.
In time segments marked with a '(B)', traffic leaving the junction may block back from a crossing so impairing normal operation of the junction.
Delays marked with '##' could not be calculated.

Overall Queues & Delays

Queueing Delay Information Over Whole Period

Demand Set: Sum of Demand Sets for Modelling Period: 08:00 - 09:00
Modelling Period: 08:00-09:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-A	51.8	51.8	11.3	0.2	11.3	0.2
B-C	23.9	23.9	2.4	0.1	2.4	0.1
C-AB	41.0	41.0	5.1	0.1	5.1	0.1
C-A	-	-	-	-	-	-

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
A-B	56.0	56.0	-	-	-	-
A-C	295.2	295.2	-	-	-	-
All	**1263.9**	**1263.9**	**18.8**	**0.0**	**18.8**	**0.0**

Delay is that occurring only within the time period.
Inclusive delay includes delay suffered by vehicles which are still queuing after the end of the time period.
These will only be significantly different if there is a large queue remaining at the end of the time period.

PICADY 5 Run Successful

C.4 Construction base case results, PM peak hour

Buckhold Road/Neville Gill Close Junction existing priority layout

Errors and Warnings

Parameter	Values
Warning	No Errors Or Warnings

Geometric Data

Geometric Parameters

Parameter	Minor Arm B
Major Road Carriageway Width (m)	6.40
Major Road Kerbed Central Reserve Width (m)	0.00
Major Road Right Turning Lane Width (m)	2.20
Minor Road Width 0m Back from Junction (m)	9.50
Minor Road Width 5m Back from Junction (m)	3.50
Minor Road Width 10m Back from Junction (m)	3.20
Minor Road Width 15m Back from Junction (m)	3.15
Minor Road Width 20m Back from Junction (m)	3.30
Minor Road Flare Length (veh)	1
Minor Road Visibility To Right (m)	28
Minor Road Visibility To Left (m)	20
Major Road Right Turn Visibility (m)	60

Major Road Right Turn Blocks Traffic	Yes

Slope and Intercept Values

Stream	Intercept for Stream B-A	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	0.000	0.000	0.000	0.000	0.000
B-C	0.000	0.000	0.000	-	-
C-B	608.710	0.232	0.232	-	-

Note: Streams may be combined in which case capacity will be adjusted
These values do not allow for any site-specific corrections

Demand Data

Modelling Periods

Parameter	Period	Duration (min)	Segment Length (min)
First Modelling Period	17:00-18:00	60	15

Direct Entry Flows

Demand Set: Future 2021 PM Peak
Modelling Period: 17:00-18:00

Segment: 17:00-17:15

Arm	Flow (veh/interval)

Arm	Flow (veh / interval)
Arm A	180.17
Arm B	31.90
Arm C	116.16

Segment: 17:15-17:30

Arm	Flow (veh / interval)
Arm A	180.17
Arm B	31.90
Arm C	116.16

Segment: 17:30-17:45

Arm	Flow (veh / interval)
Arm A	180.17
Arm B	31.90
Arm C	116.16

Segment: 17:45-18:00

Arm	Flow (veh / interval)
Arm A	180.17
Arm B	31.90
Arm C	116.16

Turning Counts

Demand Set: Future 2021 PM Peak
Modelling Period: 17:00-18:00

From / To	Arm A	Arm B	Arm C
Arm A	-	74	646
Arm B	49	-	78
Arm C	400	65	-

Turning proportions are calculated from turning count data

Turning Proportions

Demand Set: Future 2021 PM Peak
Modelling Period: 17:00-18:00

From / To	Arm A	Arm B	Arm C
Arm A	0.000	0.103	0.897
Arm B	0.386	0.000	0.614
Arm C	0.860	0.140	0.000

Heavy Vehicles Percentages

Demand Set: Future 2021 PM Peak
Modelling Period: 17:00-18:00

From / To	Arm A	Arm B	Arm C
Arm A	-	0.0	0.0
Arm B	0.0	-	0.0
Arm C	0.0	0.0	-

Queues & Delays

Demand Set: Sum of Demand Sets for Modelling Period: 17:00 - 18:00
Modelling Period: 17:00-18:00

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:00-17:15	B-A	0.82	5.14	0.160	-	0.00	0.19	-	2.6	0.23
	B-C	1.31	8.13	0.161	-	0.00	0.19	-	2.7	0.15
	C-AB	1.08	7.36	0.147	-	0.00	0.17	-	2.6	0.16
	C-A	-	-	-	-	-	-	-	-	-
	A-B	1.23	-	-	-	-	-	-	-	-
	A-C	10.78	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
17:15-17:30	B-A	0.82	5.11	0.161	-	0.19	0.19	-	2.8	0.23
	B-C	1.31	8.16	0.160	-	0.19	0.19	-	2.8	0.15
	C-AB	1.08	7.36	0.147	-	0.17	0.17	-	2.6	0.16
	C-A	-	-	-	-	-	-	-	-	-
	A-B	1.23	-	-	-	-	-	-	-	-
	A-C	10.78	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
17:30-17:45	B-A	0.82	5.11	0.161	-	0.19	0.19	-	2.8	0.23
	B-C	1.31	8.16	0.160	-	0.19	0.19	-	2.8	0.15
	C-AB	1.08	7.36	0.147	-	0.17	0.17	-	2.6	0.16
	C-A	-	-	-	-	-	-	-	-	-
	A-B	1.23	-	-	-	-	-	-	-	-
	A-C	10.78	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
17:45-18:00	B-A	0.82	5.11	0.161	-	0.19	0.19	-	2.9	0.23
	B-C	1.31	8.16	0.160	-	0.19	0.19	-	2.8	0.15
	C-AB	1.08	7.36	0.147	-	0.17	0.18	-	2.6	0.16
	C-A	-	-	-	-	-	-	-	-	-
	A-B	1.23	-	-	-	-	-	-	-	-
	A-C	10.78	-	-	-	-	-	-	-	-

Entry capacities marked with an '(X)' are dominated by a pedestrian crossing in that time segment.
In time segments marked with a '(B)', traffic leaving the junction may block back from a crossing so impairing normal operation of the junction.
Delays marked with '##' could not be calculated.

Overall Queues & Delays

Queueing Delay Information Over Whole Period

Demand Set: Sum of Demand Sets for Modelling Period: 17:00 - 18:00
Modelling Period: 17:00-18:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-A	49.2	49.2	11.2	0.2	11.2	0.2
B-C	78.4	78.4	11.3	0.1	11.3	0.1
C-AB	64.9	64.9	10.5	0.2	10.5	0.2
C-A	-	-	-	-	-	-

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
A-B	74.1	74.1	-	-	-	-
A-C	646.6	646.6	-	-	-	-
All	**1312.9**	**1312.9**	**32.9**	**0.0**	**32.9**	**0.0**

Delay is that occurring only within the time period.
Inclusive delay includes delay suffered by vehicles which are still queuing after the end of the time period.
These will only be significantly different if there is a large queue remaining at the end of the time period.

PICADY 5 Run Successful

C.5 Construction development case results, AM peak hour

Buckhold Road/Neville Gill Close Junction existing priority layout

Errors and Warnings

Parameter	Values
Warning	No Errors Or Warnings

Geometric Data

Geometric Parameters

Parameter	Minor Arm B
Major Road Carriageway Width (m)	6.40
Major Road Kerbed Central Reserve Width (m)	0.00
Major Road Right Turning Lane Width (m)	2.20
Minor Road Width 0m Back from Junction (m)	10.00
Minor Road Width 5m Back from Junction (m)	4.50
Minor Road Width 10m Back from Junction (m)	3.50
Minor Road Width 15m Back from Junction (m)	3.15
Minor Road Width 20m Back from Junction (m)	3.30
Minor Road Flare Length (veh)	1
Minor Road Visibility To Right (m)	28
Minor Road Visibility To Left (m)	20
Major Road Right Turn Visibility (m)	60
Major Road Right Turn Blocks Traffic	Yes

Slope and Intercept Values

Stream	Intercept for Stream B-A	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	0.000	0.000	0.000	0.000	0.000
B-C	0.000	0.000	0.000	-	-
C-B	608.710	0.232	0.232	-	-

Note: Streams may be combined in which case capacity will be adjusted
These values do not allow for any site-specific corrections

Demand Data

Modelling Periods

Parameter	Period	Duration (min)	Segment Length (min)
First Modelling Period	08:00-09:00	60	15

Direct Entry Flows

Demand Set: Future and Proposed AM Peak
Modelling Period: 08:00-09:00

Segment: 08:00-08:15

Arm	Flow (veh/interval)
Arm A	99.72
Arm B	19.58

Arm	Flow (veh / interval)
Arm C	211.02

Segment: 08:15-08:30

Arm	Flow (veh / interval)
Arm A	99.72
Arm B	19.58
Arm C	211.02

Segment: 08:30-08:45

Arm	Flow (veh / interval)
Arm A	99.72
Arm B	19.58
Arm C	211.02

Segment: 08:45-09:00

Arm	Flow (veh / interval)
Arm A	99.72
Arm B	19.58
Arm C	211.02

Turning Counts

Demand Set: Future and Proposed AM Peak
Modelling Period: 08:00-09:00

From / To	Arm A	Arm B	Arm C
Arm A	-	59	340
Arm B	53	-	25
Arm C	802	42	-

Turning proportions are calculated from turning count data

Turning Proportions

Demand Set: Future and Proposed AM Peak
Modelling Period: 08:00-09:00

From / To	Arm A	Arm B	Arm C
Arm A	0.000	0.148	0.852
Arm B	0.679	0.000	0.321
Arm C	0.950	0.050	0.000

Heavy Vehicles Percentages

Demand Set: Future and Proposed AM Peak
Modelling Period: 08:00-09:00

From / To	Arm A	Arm B	Arm C
Arm A	-	1.2	0.9
Arm B	1.3	-	0.0
Arm C	0.3	0.0	-

Queues & Delays

Demand Set: Sum of Demand Sets for Modelling Period: 08:00 - 09:00
Modelling Period: 08:00-09:00

Segment	Stream	Demand (veh / min)	Capacity (veh / min)	RFC	Ped. Flow (ped / min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min / segment)	Delay (veh.min / segment)	Mean Arriving Vehicle Delay (min)
08:00-08:15	B-A	0.89	5.22	0.170	-	0.00	0.20	-	2.8	0.23
	B-C	0.42	8.97	0.047	-	0.00	0.05	-	0.7	0.12
	C-AB	0.70	8.59	0.081	-	0.00	0.09	-	1.3	0.13
	C-A	-	-	-	-	-	-	-	-	-
	A-B	0.98	-	-	-	-	-	-	-	-
	A-C	5.66	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
08:15-08:30	B-A	0.89	5.22	0.170	-	0.20	0.20	-	3.0	0.23
	B-C	0.42	8.96	0.047	-	0.05	0.05	-	0.7	0.12
	C-AB	0.70	8.59	0.081	-	0.09	0.09	-	1.3	0.13
	C-A	-	-	-	-	-	-	-	-	-
	A-B	0.98	-	-	-	-	-	-	-	-
	A-C	5.66	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
08:30-08:45	B-A	0.89	5.22	0.170	-	0.20	0.20	-	3.0	0.23
	B-C	0.42	8.96	0.047	-	0.05	0.05	-	0.7	0.12
	C-AB	0.70	8.59	0.081	-	0.09	0.09	-	1.3	0.13
	C-A	-	-	-	-	-	-	-	-	-
	A-B	0.98	-	-	-	-	-	-	-	-
	A-C	5.66	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
08:45-09:00	B-A	0.89	5.22	0.170	-	0.20	0.20	-	3.1	0.23
	B-C	0.42	8.96	0.047	-	0.05	0.05	-	0.7	0.12
	C-AB	0.70	8.59	0.081	-	0.09	0.09	-	1.4	0.13
	C-A	-	-	-	-	-	-	-	-	-
	A-B	0.98	-	-	-	-	-	-	-	-
	A-C	5.66	-	-	-	-	-	-	-	-

Entry capacities marked with an '(X)' are dominated by a pedestrian crossing in that time segment.
In time segments marked with a '(B)', traffic leaving the junction may block back from a crossing so impairing normal operation of the junction.
Delays marked with '##' could not be calculated.

Overall Queues & Delays

Queueing Delay Information Over Whole Period

Demand Set: Sum of Demand Sets for Modelling Period: 08:00 - 09:00
Modelling Period: 08:00-09:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-A	53.2	53.2	12.0	0.2	12.0	0.2
B-C	25.1	25.1	2.9	0.1	2.9	0.1
C-AB	42.0	42.0	5.4	0.1	5.4	0.1
C-A	-	-	-	-	-	-

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
A-B	59.0	59.0	-	-	-	-
A-C	339.9	339.9	-	-	-	-
All	**1321.3**	**1321.3**	**20.2**	**0.0**	**20.2**	**0.0**

Delay is that occurring only within the time period.
Inclusive delay includes delay suffered by vehicles which are still queuing after the end of the time period.
These will only be significantly different if there is a large queue remaining at the end of the time period.

PICADY 5 Run Successful

C.6 Construction development case results, PM peak hour

Buckhold Road/Neville Gill Close Junction existing priority layout

Errors and Warnings

Parameter	Values
Warning	No Errors Or Warnings

Geometric Data

Geometric Parameters

Parameter	Minor Arm B
Major Road Carriageway Width (m)	6.40
Major Road Kerbed Central Reserve Width (m)	2.10
Major Road Right Turning Lane Width (m)	2.20
Minor Road Width 0m Back from Junction (m)	10.00
Minor Road Width 5m Back from Junction (m)	4.50
Minor Road Width 10m Back from Junction (m)	3.50
Minor Road Width 15m Back from Junction (m)	3.15
Minor Road Width 20m Back from Junction (m)	3.30
Minor Road Flare Length (veh)	1
Minor Road Visibility To Right (m)	28
Minor Road Visibility To Left (m)	20
Major Road Right Turn Visibility (m)	60

Parameter	Minor Arm B
Major Road Right Turn Blocks Traffic	Yes

Slope and Intercept Values

Stream	Intercept for Stream B-A	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	0.000	0.000	0.000	0.000	0.000
B-C	0.000	0.000	0.000	-	-
C-B	608.710	0.232	0.232	-	-

Note: Streams may be combined in which case capacity will be adjusted
These values do not allow for any site-specific corrections

Demand Data

Modelling Periods

Parameter	Period	Duration (min)	Segment Length (min)
First Modelling Period	17:00-18:00	60	15

Direct Entry Flows

Demand Set: Future and Proposed PM Peak
Modelling Period: 17:00-18:00

Segment: 17:00-17:15

Arm	Flow (veh / interval)
Arm A	180.59
Arm B	32.57
Arm C	126.11

Segment: 17:15-17:30

Arm	Flow (veh / interval)
Arm A	180.59
Arm B	32.57
Arm C	126.11

Segment: 17:30-17:45

Arm	Flow (veh / interval)
Arm A	180.59
Arm B	32.57
Arm C	126.11

Segment: 17:45-18:00

Arm	Flow (veh / interval)
Arm A	180.59
Arm B	32.57
Arm C	126.11

Turning Counts

Demand Set: Future and Proposed PM Peak
Modelling Period: 17:00-18:00

From / To	Arm A	Arm B	Arm C
Arm A	-	76	646
Arm B	51	-	79
Arm C	439	66	-

Turning proportions are calculated from turning count data

Turning Proportions

Demand Set: Future and Proposed PM Peak
Modelling Period: 17:00-18:00

From / To	Arm A	Arm B	Arm C
Arm A	0.000	0.105	0.895
Arm B	0.392	0.000	0.608
Arm C	0.869	0.131	0.000

Heavy Vehicles Percentages

Demand Set: Future and Proposed PM Peak
Modelling Period: 17:00-18:00

From / To	Arm A	Arm B	Arm C
Arm A	-	0.9	0.0
Arm B	1.3	-	0.0
Arm C	0.0	0.0	-

Queues & Delays

Demand Set: Sum of Demand Sets for Modelling Period: 17:00 - 18:00
Modelling Period: 17:00-18:00

Segment	Stream	Demand (veh/min)	Capacity (veh/min)	RFC	Ped. Flow (ped/min)	Start Queue (veh)	End Queue (veh)	Geometric Delay (veh.min/segment)	Delay (veh.min/segment)	Mean Arriving Vehicle Delay (min)
17:00-17:15	B-A	0.85	4.85	0.176	-	0.00	0.21	-	2.9	0.25
	B-C	1.32	8.24	0.160	-	0.00	0.19	-	2.7	0.14
	C-AB	1.10	7.35	0.149	-	0.00	0.18	-	2.6	0.16
	C-A	-	-	-	-	-	-	-	-	-
	A-B	1.27	-	-	-	-	-	-	-	-
	A-C	10.77	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
17:15-17:30	B-A	0.85	4.85	0.176	-	0.21	0.21	-	3.2	0.25
	B-C	1.32	8.23	0.160	-	0.19	0.19	-	2.8	0.14
	C-AB	1.10	7.35	0.149	-	0.18	0.18	-	2.7	0.16
	C-A	-	-	-	-	-	-	-	-	-
	A-B	1.27	-	-	-	-	-	-	-	-
	A-C	10.77	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
17:30-17:45	B-A	0.85	4.85	0.176	-	0.21	0.21	-	3.2	0.25
	B-C	1.32	8.23	0.160	-	0.19	0.19	-	2.8	0.14
	C-AB	1.10	7.35	0.149	-	0.18	0.18	-	2.7	0.16
	C-A	-	-	-	-	-	-	-	-	-
	A-B	1.27	-	-	-	-	-	-	-	-
	A-C	10.77	-	-	-	-	-	-	-	-

Segment	Stream	Demand(veh/min)	Capacity(veh/min)	RFC	Ped.Flow(ped/min)	Start Queue(veh)	End Queue(veh)	Geometric Delay(veh.min/segment)	Delay(veh.min/segment)	Mean ArrivingVehicle Delay(min)
17:45-18:00	B-A	0.85	4.85	0.176	-	0.21	0.21	-	3.2	0.25
	B-C	1.32	8.23	0.160	-	0.19	0.19	-	2.9	0.14
	C-AB	1.10	7.35	0.149	-	0.18	0.18	-	2.7	0.16
	C-A	-	-	-	-	-	-	-	-	-
	A-B	1.27	-	-	-	-	-	-	-	-
	A-C	10.77	-	-	-	-	-	-	-	-

Entry capacities marked with an '(X)' are dominated by a pedestrian crossing in that time segment.
In time segments marked with a '(B)', traffic leaving the junction may block back from a crossing so impairing normal operation of the junction.
Delays marked with '##' could not be calculated.

Overall Queues & Delays

Queueing Delay Information Over Whole Period

Demand Set: Sum of Demand Sets for Modelling Period: 17:00 - 18:00
Modelling Period: 17:00-18:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-A	51.1	51.1	12.4	0.2	12.5	0.2
B-C	79.2	79.2	11.3	0.1	11.3	0.1
C-AB	65.9	65.9	10.7	0.2	10.7	0.2
C-A	-	-	-	-	-	-

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
A-B	76.0	76.0	-	-	-	-
A-C	646.3	646.3	-	-	-	-
All	**1357.1**	**1357.1**	**34.4**	**0.0**	**34.4**	**0.0**

Delay is that occurring only within the time period.
Inclusive delay includes delay suffered by vehicles which are still queuing after the end of the time period.
These will only be significantly different if there is a large queue remaining at the end of the time period.

PICADY 5 Run Successful

C.7 Construction development case results, AM peak hour

Neville Gill Close/New site access priority layout

Errors and Warnings

Parameter	Values
Warning	No Errors Or Warnings

Geometric Data

Geometric Parameters

Parameter	Minor Arm B
Major Road Carriageway Width (m)	7.80
Major Road Kerbed Central Reserve Width (m)	0.00
Major Road Right Turning Lane Width (m)	2.20
Minor Road First Lane Width (m)	5.00
Minor Road Visibility To Right (m)	35
Minor Road Visibility To Left (m)	30
Major Road Right Turn Visibility (m)	100
Major Road Right Turn Blocks Traffic	Yes (if over 0 veh)

Slope and Intercept Values

Stream	Intercept for Stream	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	605.533	0.102	0.257	0.162	0.367
B-C	775.316	0.110	0.277	-	-
C-B	631.874	0.226	0.226	-	-

Note: Streams may be combined in which case capacity will be adjusted
These values do not allow for any site-specific corrections

Demand Data

Modelling Periods

Parameter	Period	Duration (min)	Segment Length (min)
First Modelling Period	08:00-09:00	60	15

Direct Entry Flows

Demand Set: Future and Proposed AM Peak
Modelling Period: 08:00-09:00

Segment: 08:00-08:15

Arm	Flow (veh/interval)
Arm A	18.90
Arm B	0.68
Arm C	25.28

Segment: 08:15-08:30

Arm	Flow (veh / interval)
Arm A	18.90
Arm B	0.68
Arm C	25.28

Segment: 08:30-08:45

Arm	Flow (veh / interval)
Arm A	18.90
Arm B	0.68
Arm C	25.28

Segment: 08:45-09:00

Arm	Flow (veh / interval)
Arm A	18.90
Arm B	0.68
Arm C	25.28

Turning Counts

Demand Set: Future and Proposed AM Peak
Modelling Period: 08:00-09:00

From / To	Arm A	Arm B	Arm C
Arm A	-	0	76

From / To	Arm A	Arm B	Arm C
Arm B	0	-	3
Arm C	97	4	-

Turning proportions are calculated from turning count data

Turning Proportions

Demand Set: Future and Proposed AM Peak
Modelling Period: 08:00-09:00

From / To	Arm A	Arm B	Arm C
Arm A	0.000	0.000	1.000
Arm B	0.000	0.000	1.000
Arm C	0.960	0.040	0.000

Heavy Vehicles Percentages

Demand Set: Future and Proposed AM Peak
Modelling Period: 08:00-09:00

From / To	Arm A	Arm B	Arm C
Arm A	-	0.0	0.0
Arm B	25.9	-	25.9
Arm C	18.9	18.9	-

Overall Queues & Delays

Queueing Delay Information Over Whole Period

Demand Set: Sum of Demand Sets for Modelling Period: 08:00 - 09:00
Modelling Period: 08:00-09:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-AC	2.7	2.7	0.3	0.1	0.3	0.1
C-AB	4.8	4.8	0.5	0.1	0.5	0.1
C-A	96.3	96.3	-	-	-	-
A-B	0.0	0.0	-	-	-	-
A-C	75.6	75.6	-	-	-	-
All	**179.4**	**179.4**	**0.8**	**0.0**	**0.8**	**0.0**

C.8 Construction development case results, PM peak hour

Neville Gill Close/New site access priority layout

Errors and Warnings

Parameter	Values
Warning	No Errors Or Warnings

Geometric Data

Geometric Parameters

Parameter	Minor Arm B
Major Road Carriageway Width (m)	7.80
Major Road Kerbed Central Reserve Width (m)	0.00
Major Road Right Turning Lane Width (m)	2.20
Minor Road First Lane Width (m)	5.00
Minor Road Visibility To Right (m)	35
Minor Road Visibility To Left (m)	30
Major Road Right Turn Visibility (m)	100
Major Road Right Turn Blocks Traffic	Yes (if over 0 veh)

Slope and Intercept Values

Stream	Intercept for	Slope for	Slope for	Slope for	Slope for

	Stream	A-B	A-C	C-A	C-B
B-A	605.533	0.102	0.257	0.162	0.367
B-C	775.316	0.110	0.277	-	-
C-B	631.874	0.226	0.226	-	-

Note: Streams may be combined in which case capacity will be adjusted
These values do not allow for any site-specific corrections

Demand Data

Modelling Periods

Parameter	Period	Duration (min)	Segment Length (min)
First Modelling Period	17:00-18:00	60	15

Direct Entry Flows

Demand Set: Future and Proposed PM Peak
Modelling Period: 17:00-18:00

Segment: 17:00-17:15

Arm	Flow (veh / interval)
Arm A	31.90
Arm B	0.93
Arm C	35.45

Segment: 17:15-17:30

Arm	Flow (veh / interval)
Arm A	31.90
Arm B	0.93
Arm C	35.45

Segment: 17:30-17:45

Arm	Flow (veh / interval)
Arm A	31.90
Arm B	0.93
Arm C	35.45

Segment: 17:45-18:00

Arm	Flow (veh / interval)
Arm A	31.90
Arm B	0.93
Arm C	35.45

Turning Counts

Demand Set: Future and Proposed PM Peak
Modelling Period: 17:00-18:00

From / To	Arm A	Arm B	Arm C
Arm A	-	0	128
Arm B	0	-	4

From / To	Arm A	Arm B	Arm C
Arm C	139	3	-

Turning proportions are calculated from turning count data

Turning Proportions

Demand Set: Future and Proposed PM Peak
Modelling Period: 17:00-18:00

From / To	Arm A	Arm B	Arm C
Arm A	0.000	0.000	1.000
Arm B	0.000	0.000	1.000
Arm C	0.979	0.021	0.000

Heavy Vehicles Percentages

Demand Set: Future and Proposed PM Peak
Modelling Period: 17:00-18:00

From / To	Arm A	Arm B	Arm C
Arm A	-	0.0	0.0
Arm B	18.9	-	18.9
Arm C	25.9	25.9	-

Overall Queues & Delays

Queueing Delay Information Over Whole Period

Demand Set: Sum of Demand Sets for Modelling Period: 17:00 - 18:00
Modelling Period: 17:00-18:00

Stream	Total Demand (veh)	Total Demand (veh/h)	Queueing Delay (min)	Queueing Delay (min/veh)	Inclusive Delay (min)	Inclusive Delay (min/veh)
B-AC	3.7	3.7	0.4	0.1	0.4	0.1
C-AB	3.9	3.9	0.4	0.1	0.4	0.1
C-A	137.9	137.9	-	-	-	-
A-B	0.0	0.0	-	-	-	-
A-C	127.6	127.6	-	-	-	-
All	**273.1**	**273.1**	**0.8**	**0.0**	**0.8**	**0.0**

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 local 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 analysed. The following roads and junctions have been analysed:

a. Wandsworth High Street;
b. West Hill / Broomhill Road / Merton Road / Wandsworth High Street / Putney Bridge Road junction;
c. Wandsworth High Street / Dutch Yard junction;
d. Wandsworth High Street / Carters Yard junction;
e. Wandsworth High Street / Newton's Yard junction;
f. Wandsworth High Street / Wandsworth Plain / Church Row junction;
g. Wandsworth High Street / Buckhold Road junction;
h. Buckhold Road / Hardwick Way junction;
i. Neville Gill Close / Buckhold Road junction;
j. Wandsworth High Street / Garratt Lane / Ram Street junction; and
k. Garratt Lane.

D.1.3 The table below also indicates the level of severity for each accident. Accident analysis has been explored in more detail, for each junction, in the following sections.

Table D.1 Summary of Accidents Recorded

Location (Junction)	Slight	Serious	Fatal	Total
Wandsworth High Street	20	1	0	**21**
West Hill / Broomhill Road / Merton Road junction	5	3	0	**8**
Wandsworth High Street / Putney Bridge Road junction	7	2	0	**9**
Merton Road	1	0	0	**1**
Putney Bridge Road	1	0	0	**1**
Wandsworth High Street / Dutch Yard junction	2	1	0	**3**
Wandsworth High Street / Carters Yard junction	2	0	0	**2**

Location (Junction)	Slight	Serious	Fatal	Total
Wandsworth High Street / Newton's Yard junction	1	0	0	**1**
Wandsworth High Street / Wandsworth Plain / Church Row junction	5	0	0	**5**
Wandsworth High Street / Buckhold Road junction	14	3	0	**17**
Buckhold Road	2	0	0	**2**
Buckhold Road / Hardwick Way junction	0	1	0	**1**
Neville Gill Close / Buckhold Road junction	2	0	0	**2**
Wandsworth High Street / Garratt Lane / Ram Street junction	15	3	0	**18**
Garrett Lane	2	0	0	**2**
Total	**79**	**14**	**0**	**93**

D.1.4 A total of 93 accidents were recorded during the 5 year period. Of these accidents, 79 were identified as slight and 14 were identified as serious. There have been no fatal accidents within the vicinity of the site.

Wandsworth High Street (A3)

D.1.5 Wandsworth High Street (A3) – part of Transport for London's Road Network (TLRN) – forms part of the one-way system with Fairfield Street, West Hill and Armoury Way. Wandsworth High Street routes traffic east to west and is mainly a two-lane carriageway.

D.1.6 This section provides an analysis of the accidents that occurred along Wandsworth High Street and at the following junctions:

a. West Hill / Broomhill Road / Merton Road / Wandsworth High Street / Putney Bridge Road junction;

b. Wandsworth High Street / Dutch Yard junction;

c. Wandsworth High Street / Carters Yard junction;

d. Wandsworth High Street / Newton's Yard junction;

e. Wandsworth High Street / Wandsworth Plain / Church Row junction;

f. Wandsworth High Street / Buckhold Road junction; and

g. Wandsworth High Street / Garratt Lane / Ram Street junction.

D.1.7 In total, 84 accidents occurred at this location; 13 accidents were classified as serious in severity and 71 were slight. There have been no fatal accidents at this location.

D.1.8 The majority of accidents occurred along the road of Wandsworth High Street. The accidents are relatively dispersed throughout the stretch of road analysed. However, significant clusters of accidents are evident at the junctions adjoining Wandsworth High Street. In particular, at the Wandsworth High Street / Buckhold Road and Wandsworth High Street /

Garratt Lane / Ram Street junctions, where there were 17 and 18 accidents over the 5 year period, respectively.

D.1.9 In total, 13 accidents were rated as serious. These accidents involved cars, pedestrians, motorcyclists, a taxi and LGVs. Primary factors for the cause of accident included failing to look properly, poor turn or manoeuvre and exceeding the speed limit. The accidents involving pedestrians were largely the result of pedestrians failing to look or use pedestrian crossings properly in conjunction with vehicle drivers failing to look properly.

D.1.10 The slight accidents were mainly the result of vehicles driving too close together, undertaking a poor turn or manoeuvre, exceeding the speed limit and both vehicles and pedestrians failing to look properly.

D.1.11 Of these accidents 12 involved LGVs, MGVs and HGVs. The majority of these accidents led to slight accidents, including the (2) accidents involving the HGVs, which occurred at the junction with Carters Yard. There were 2 serious accidents which involved LGVs colliding with cyclists, these occurred at the junction with West Hill / Broomhill Road and with Garratt Lane and Ram Street. Both of these accidents were primarily a result of human error such as the LGV drivers failing to look properly and undertaking a poor turn or manoeuvre, rather than as a result of the highway layout.

Putney Bridge Road (A3209)

D.1.12 Putney Bridge Road (A3209) lies to the north west of the site. It links to Wandsworth High Street (A3) to the south and Fulham High Street (A219) to the north-west. Putney Bridge Road within the study area is a single lane carriageway, which is part of the on-way system and adjacent to Armoury Way (A3).

D.1.13 There has been one slight accident on this road during the 5 year period, which involved the collision of a car and a cyclist as a result of the cyclist failing to look properly and riding recklessly / in a hurry.

Merton Road (A218)

D.1.14 Merton Road (A218) is located to the west of the site and it routes in a southward direction from West Hill (A3), towards the area of Colliers Wood. Within the study area, Merton Road is a two-way single lane road.

D.1.15 There has been one slight accident on this road during the 5 year period, which involved the collision of a car and a pedestrian. The contributing factor was recorded as the pedestrian failing to look properly and crossing the road at a point masked by a stationary vehicle.

Buckhold Road (A218)

D.1.16 Buckhold Road (A218) runs along the west side of the development site and meets with the Wandsworth High Street to the north. Within the study area analysed, Buckhold Road is a two-way (single lane) carriageway.

D.1.17 This section provides an analysis of the accidents that occurred along Buckhold Road and at the following junctions:

a. Buckhold Road / Hardwick Way junction; and

b. Neville Gill Close / Buckhold Road.

D.1.18 The junction of Buckhold Road and Wandsworth High Street has already been analysed in a previous section.

D.1.19 Over the 5 year period, a total of 5 accidents occurred within this area; 4 accidents were slight and one accident was serious. The serious accident involved an elderly passenger on a bus who fell as the bus braked.

D.1.20 Of the slight accidents, 3 involved pedestrians including a child aged 15. The majority of these accidents were caused by the pedestrians failing, acting carelessly or in a hurry and failing to judge the speed of other vehicles.

Garratt Lane

D.1.21 Garratt Lane (A217) is located to the west of the site. The road routes south from the junction with Wandsworth High Street and Ram Street, providing a link to Earlsfield. Within the study area analysed, Garratt Lane is a two-way (single lane) carriageway with an adjacent bus lane on both sides of the road.

D.1.22 This analysis considers the accidents on Garratt Lane only, the accidents which occurred at the junction with Wandsworth High Street and Ram Street have been analysed in a previous section.

D.1.23 Over the 5 year period, a total of 2 accidents occurred along Garratt Lane (within the study area analysed). Both of these accidents were recorded as slight in severity and involved the collision of a car and a pedestrian and a cyclist and a pedestrian. In both cases, the pedestrian failed to look properly and acted carelessly / recklessly or in a hurry.

D.2 Summary and conclusion

D.2.1 During the 5 year period, a total of 93 accidents occurred within the vicinity of site. The majority of the accidents (79) were rated as slight in severity, however 14 accidents were serious. There were no fatal accidents.

D.2.2 The highest number of accidents was recorded along Wandsworth High Street. In total, 84 accidents occurred along Wandsworth High Street and at the adjoining junctions within ths study area analysed.

D.2.3 Overall, the majority of both the serious and the slight accidents occurred as a result of factors such as vehicle drivers and pedestrians failing to look properly and driving or acting carelessly / recklessly or in a hurry. Therefore, highlighting that the majority of accidents were not due to a fault in the highway lay out or geometry.

D.2.4 Of the total accidents, 12 involved LGVs, MGVs and HGVs. The majority of these lead to slight accidents, however 2 accidents (involving LGVs) were serious.

D.2.5 In summary, it is considered that the majority of accidents occurred as a result of human error rather than as a result of the highway layout, infrastructure or geometry.

Appendix E – Road Safety Audit

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Your ref -
Our ref 211146-00/cvl

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Thames Tideway Tunnel
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Paddington,
London W2 1AF
For the attention of Dermot Scanlon

13 February 2013

Dear Sirs

Thames Tideway Tunnel
King George's Park – Stage 1 Road Safety Audit

I have the pleasure of enclosing our King George's Park – 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

- Neville Gill Close and Buckhold Road, to the north of the site, form part of National Cycle Network Route 20. Any traffic management proposed on these roads should take full account of cycles. Furthermore, delivery drivers should be made aware of the presence of the cycle routes and the likely increased risk of cycle / goods vehicle conflict.
- It is not clear from the swept path analysis drawings if there is sufficient space to turn a 16.5m articulated HGV within the manoeuvring area of the King George's Park Site.

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 - King George's Park

Stage 1 Road Safety Audit

RSA1.1a

Rev A | 13 February 2013

Job number 211146-03

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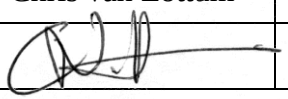
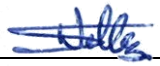
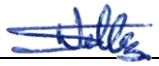
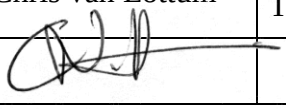
ARUP

Document Verification

ARUP

Job title		Thames Tideway Tunnel - King George's Park		**Job number** 211146-03	
Document title		Stage 1 Road Safety Audit		**File reference**	
Document ref		RSA1.1a			
Revision	**Date**	**Filename**	RP CVL TTT 06 King George RSA1.1 130213 Rev A.docx		
Issue	10 Jan 2013	**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 06 King George 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			
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		Name			
		Signature			
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		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 Tunnel at King George's Park, Buckhold Road, 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 Tuesday 4th December 2012; weather conditions at the time of the site visit were bright and cold and the road surface was damp.

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

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

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

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

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

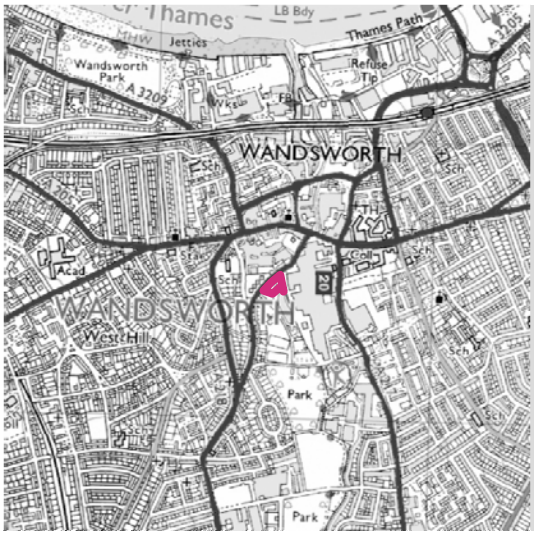
All problems and recommendations identified by this audit are referenced to the design drawings and the locations have been indicated on the attached plan.

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

Road Safety Audit is based upon a qualitative risk assessment process and there is no measure of the success achieved by any recommendations given herein. Road

Safety Audit cannot guarantee the safe operation of the scheme under consideration in this report as accidents are rare and random events and are largely caused by factors outside the Audit Team's influence, such as driving behaviour and, to a lesser extent, vehicle condition.

1.1 Site Description



Scheme Location

The King George's Park site is situated on the west side of Wandsworth town centre adjacent to the A218 Buckhold Street with access from Neville Gill Close, immediately adjacent to the Southside Shopping Centre.

1.2 Scheme Description

Access to and from the site would be via a new vehicular access on Neville Gill Close. The pedestrian refuge on the Neville Gill Close arm of the junction with Buckhold Road would need to be relocated to allow for construction vehicle movements.

2 Stage 1 Road Safety Audit

The Recommendations below are numbered as follows:

STAGE . AUDIT NUMBER . RECOMMENDATION NUMBER

2.1 Construction Layout

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

	Location:	Buckhold Road
	Summary:	Pedestrian diversion away from a desire line may result in pedestrian / vehicle conflicts.
	Description:	A signal controlled pedestrian crossing has been installed on Buckhold Road close to the main park entrance, presumably to safely accommodate a desire line for pedestrians exiting the park.

IMG_8456.jpg

With the main entrance blocked, and pedestrians diverted to the eastern side of the park, there may be a risk of increased conflict between pedestrians and traffic on Buckhold Road.

S1.1.2 **Recommendation:** Suspend the existing pedestrian crossing for the duration of the works, and provide a temporary crossing close to the eastern access to the park.

Location: Neville Gill Close

Summary: Site congestion could result in construction vehicles blocking other traffic leading to congestion and conflict.

Description: The proposed site entrance is very close to the junction of Neville Gill Close and Buckhold Road.

A construction vehicle waiting to turn right into the site will block traffic movements into the junction causing congestion and leading to conflict.

S1.1.3 **Recommendation:** Identify an off-site waiting area for construction traffic so that vehicles can be called forward when the site access is available.

	Location:	Neville Gill Close
	Summary:	Swept path shows HGV conflict with pedestrian refuge.
	Description:	The swept path analysis for a 16.5m articulated and 12.0m rigid HGVs exiting the site to Buckhold Road conflicts with the pedestrian refuge at the junction of Neville Gill Close with Buckhold Way. Notwithstanding the damage to a vehicle caused by a collision with the refuge; there is a risk of injury to a pedestrian using the refuge.
S1.1.5	**Recommendation:**	Relocate the refuge as appropriate so as to facilitate all anticipated traffic movements.

	Location:	Neville Gill Close
	Summary:	Swept path shows HGV conflict with site hoarding
	Description:	The swept path analysis for 16.5m articulated and 12.0m rigid HGVs accessing the site to / from Neville Gill Close conflicts with the hoarding on north side of the access. Notwithstanding the damage to a vehicle caused by a collision with the gate and hoarding, if the movement cannot be completed without conflict, it will be necessary for HGV drivers to reverse back to complete their manoeuvre placing other road users at risk from a collision as a result of reduced rearward visibility.
S1.1.4	**Recommendation:**	Widen the site entrance to accommodate the movement allowing HGVs to enter and exit the site in a forward direction of movement.

2.2 Permanent Layout

	Location:	Neville Gill Close
	Summary:	Swept path shows HGV conflict with footway.
	Description:	The swept path analyses for a range of vehicles exiting the site to Buckhold Road all overrun the footway on the western side of the site access. There is a risk of conflict with, and injury to, a pedestrian using the footway.
S1.1.6	**Recommendation:**	Widen the site entrance to accommodate the swept paths.

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

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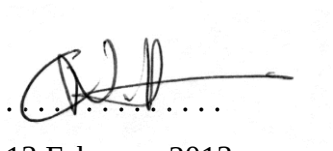

13 February 2013

Audit Team Member

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

Senior Engineer

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Figures

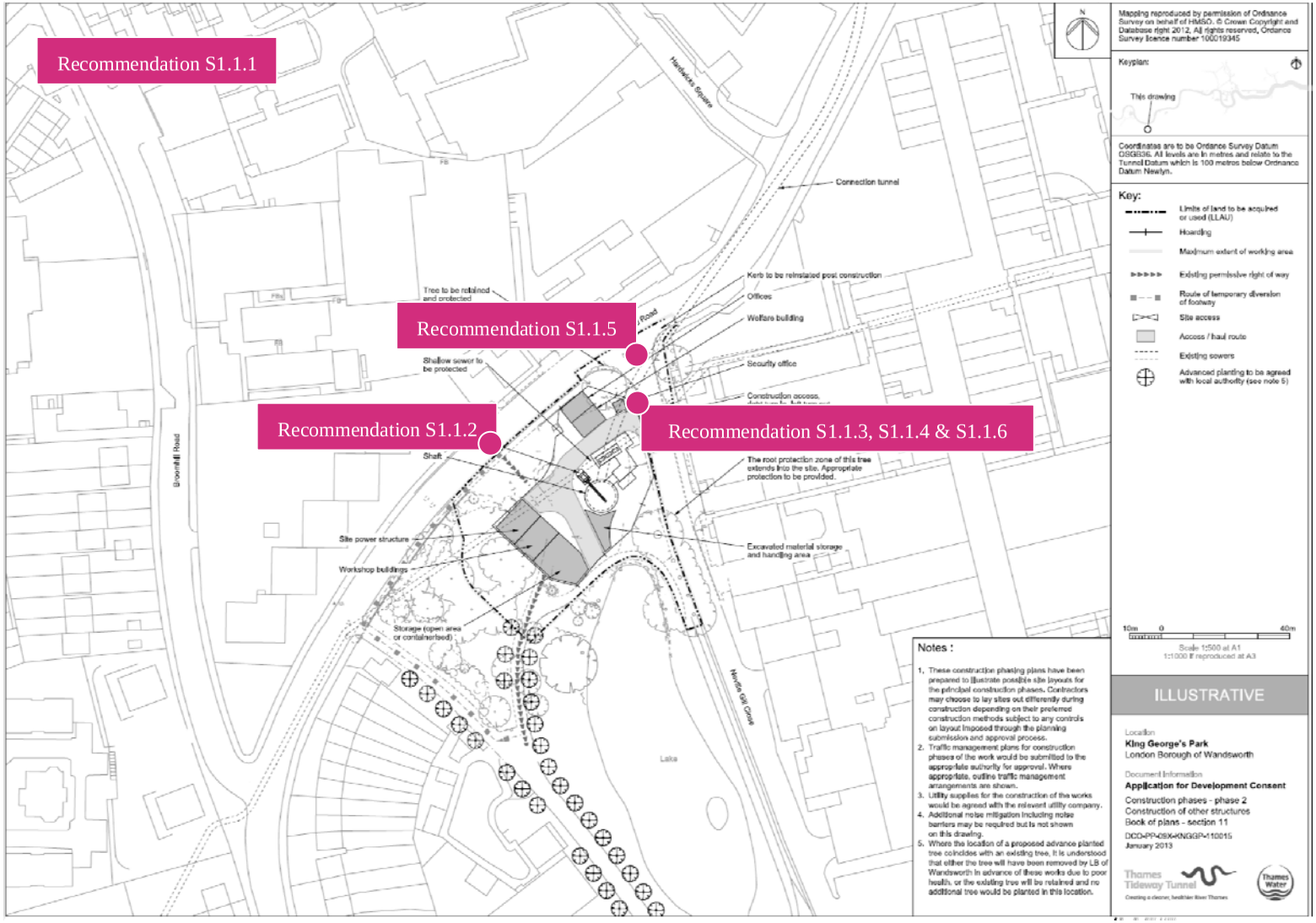

Figure 1 Location of Recommendations

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	-	19/12/2012
Road Accident Data	-	-

A1.2 Drawings

Title	Reference	Revision
Transport - site location plan	1PL03-TT-50615	Jan 2013
Transport - construction traffic routes	1PL03-TT-50607	Jan 2013
Transport - accident locations	1PL03-TT-50751	Jan 2013
Construction phases - phase 2 – Construction of other structures	DCO-PP-09X-KNGGP-110015	Jan 2013
Highway layout during construction (Area 1 work)	DCO-PP-09X-KNGGP-110018	Jan 2013
Permanent highway layout – Area 1 work	DCO-PP-09X-KNGGP-110019	Jan 2013
Highway layout during construction – Vehicle swept path analysis	DCO-PP-09X-KNGGP-110021	Jan 2013
Permanent highway layout – Vehicle swept path analysis	DCO-PP-09X-KNGGP-110022	Jan 2013

TECHNICAL NOTE

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Job Name	**Thames Tideway Tunnel – King George's Park**	
Job No.	22104	
Note No.	001	
Date	15rd 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 King George's Park in the London Borough of Wandsworth.

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

2 Stage 1 Road Safety Audit

2.1 Location: Neville Gill Close

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

Description: There is an existing accident risk relating to vehicles turning in and out Neville Gill Close and colliding with vulnerable road users.

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

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

Recommendation Accepted – Delivery drivers and site staff will be made aware of the presence of vulnerable road users as part of the site induction. Traffic management layouts will also take into consideration the likelihood of HGV and plant turning movements. This will be included in the Code of Construction Practice at Stage 2 (Detailed Design).

2.2 Location: Buckhold Road

Summary: Pedestrian diversion away from a desire line may result in pedestrian / vehicle conflicts.

Description: A signal controlled pedestrian crossing has been installed on Buckhold Road close to the main park entrance, presumably to safely accommodate a desire line for pedestrians exiting the park.

With the main entrance blocked, and pedestrians diverted to the eastern side of the park, there may be a risk of increased conflict between pedestrians and traffic on Buckhold Road.

S1.1.2 Recommendation: Suspend the existing pedestrian crossing for the duration of the works, and provide a temporary crossing close to the eastern access to the park.

Recommendation Accepted – The pedestrian crossing arrangements on Buckhold Road has yet to be finalised as the existing pedestrian crossing may be relocated as part of the Wandsworth Business Village development. The location of the pedestrian crossing will be confirmed at Stage 2 (Detailed Design).

2.3 Location: Neville Gill Close

Summary: Site congestion could result in construction vehicles blocking other traffic leading to congestion and conflict.

Description: The proposed site entrance is very close to the junction of Neville Gill Close and Buckhold Road.

A construction vehicle waiting to turn right into the site will block traffic movements into the junction causing congestion and leading to conflict.

S1.1.3 Recommendation: Identify an off-site waiting area for construction traffic so that vehicles can be called forward when the site access is available.

Recommendation Accepted – The arrival and departure of vehicles will be managed so as to avoid congestion at the site. The requirement to provide an off-site waiting area will be examined at Stage 2 (Detailed Design).

2.4 Location: Neville Gill Close

Summary: Swept path shows HGV conflict with pedestrian refuge.

Description: The swept path analysis for a 16.5m HGV exiting the site to Buckhold Road conflicts with the pedestrian refuge at the junction of Neville Gill Close with Buckhold Way.

Notwithstanding the damage to a vehicle caused by a collision with the refuge; there is a risk of injury to a pedestrian using the refuge.

S1.1.5 Recommendation: Relocate the refuge as appropriate so as to facilitate all anticipated traffic movements.

Recommendation Accepted – The pedestrian refuge will be relocated in the construction phase to accommodate the turning movements of all anticipated traffic as shown in the construction plan. The exact location of the refuge will be detailed at Stage 2 (Detailed Design).

2.5 Location: Neville Gill Close

Summary: Swept path shows HGV conflict with site hoarding

Description: The swept path analysis for a16.5m articulated and 12m rigid HGVs accessing the site to / from Neville Gill Close conflcts with the hoarding on north side of the access.

Notwithstanding the damage to a vehicle caused by a collision with the gate and hoarding , if the movement cannot be completed without conflict, it will be necessary for HGV drivers to reveres back to complete their manoeuvre placing other road users at risk from a collision as a result of reduced rearward visibility.

S1.1.4 Recommendation: Widen the site entrance to accomadate the movement allowing HGVs to enter and exit the site in a forward direction of movement.

Recommendation Accepted – The swept path analysis will be reviewed and the gate either set back or widened as part of the Stage 2 (Detailed Design).

2.6 Location: Neville Gill Close

Summary: Swept path shows HGV conflict with footway.

Description: The swept path analyses for a range of vehicles exiting the site to Buckhold Road all overrun the footway on the western side of the site access.

There is a risk of conflict with, and injury to, a pedestrian using the footway.

S1.1.6 Recommendation: Widen the site entrance to accommodate the swept paths.

Recommendation Accepted – The width of the site access and the alignment of the hoarding will be detailed at Stage 2 (Detailed Design).

3 Response to Comments provided in addition to the Stage 1 Road Safety Audit

3.1 Additional Comments

Neville Gill Close and Buckhold Road, to the north of the site, form part of the National Cycle Network Route 20. Any traffic management proposed on these roads should take full account of cycles. Furthermore, delivery drivers should be made aware of the presence of the cycle routes and the likely increased risk of cycle / goods vehicle conflict.

Comment Response – Delivery drivers and site staff will be made aware of the presence of cyclists on Neville Gill Close and Buckhold Road as part of the site induction. This will be included in the Code of Construction Practice at Stage 2 (Detailed Design).

3.2 Additional Comments

It is not clear from the swept path analysis drawings if there is sufficient space to turn around a 16.5m articulated HGV within the manoeuvring area of the King George's Park Site.

Comment Reponse – The area available on-site for vehicle turning manoeuvring will be determined at Stage 2 (Detailed Design).

Thames Tideway Tunnel
Thames Water Utilities Limited

Application for Development Consent

Application Reference Number: WWO10001

Transport Assessment

Doc Ref: **7.10.06**

King George's Park

Figures

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

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January 2013

Thames Tideway Tunnel

Creating a cleaner, healthier River Thames

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Thames Tideway Tunnel

Transport Assessment

Section 9: King George's Park figures

List of contents

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Plans

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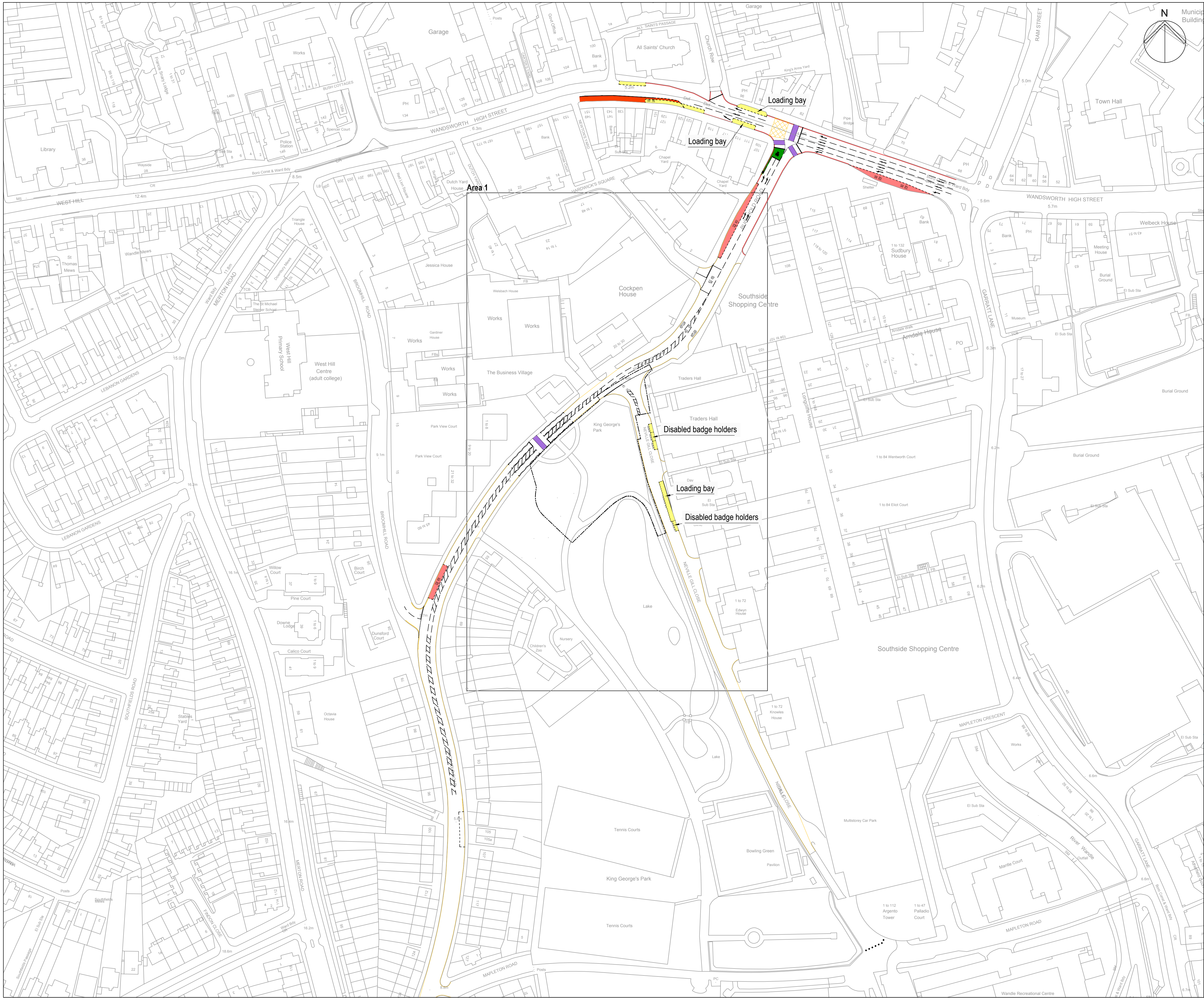
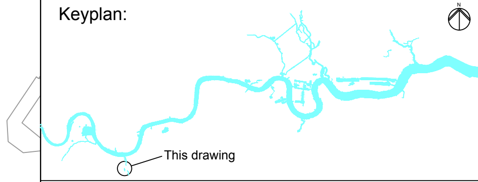
King George's Park

THAMES TIDEWAY TUNNEL - SCHEDULE OF ASSOCIATED HIGHWAY WORKS

Drawing Number	Works Reference	Location	Item of Work	Date of Implementation
DCO-PP-09X-KNGGP-110018	PWH3X_C01	Neville Gill Close - Neville Gill Close / Buckhold Road junction	Relocation of the existing pedestrian refuge to the east to accommodate turning movements of the HGVs.	TBC
	PWH3X_C02	Neville Gill Close - South of the Neville Gill Close / Buckhold Road junction	Provision of a gated construction site access on the western side of Neville Gill Close.	TBC
	PWH3X_C03	Buckhold Road - west of junction with Neville Gill Close	Existing pedestrian crossing on Buckhold Road to be maintained	TBC
	PWH3X_C04	Neville Gill Close - east side	Potential realignment of north eastern kerb line at junction with Buckhold Road	TBC
DCO-PP-09X-KNGGP-110019	PWH3X_P01	Neville Gill Close - Neville Gill Close / Buckhold Road junction	Reinstatement of pedestrian refuge in its location for the construction phase to allow adequate road width for maintenance vehicles to exit the site.	TBC
	PWH3X_P02	Neville Gill Close - South of the Neville Gill Close / Buckhold Road junction	Reinstatement of the footway on the north western side of Neville Gill Close.	TBC
	PWH3X_P03	Neville Gill Close - South of the Neville Gill Close / Buckhold Road junction	Provision of a gated permanent maintenance access.	TBC
	PWH3X_P04	Neville Gill Close - east side	Reinstatement of north eastern kerb line at junction with Buckhold Road if item PWH3X_C04 implemented.	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
- On street parking
- Bus stop / stand
- Bus lane
- Cycle lane
- Pedestrian crossing
- Bollards

Revised

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

On street parking

Disabled badge holders - at any time
Loading bay - no loading Mon - Sat 7:00am - 7:00pm

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 For The Use Of Tactile Paving, Dft, 1998
- Accessible Bus Stop Design Guidance, Tfl, 2006

Stage
Existing

10m 0 100m

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

FOR INFORMATION

Location
King George's Park
London Borough of Wandsworth

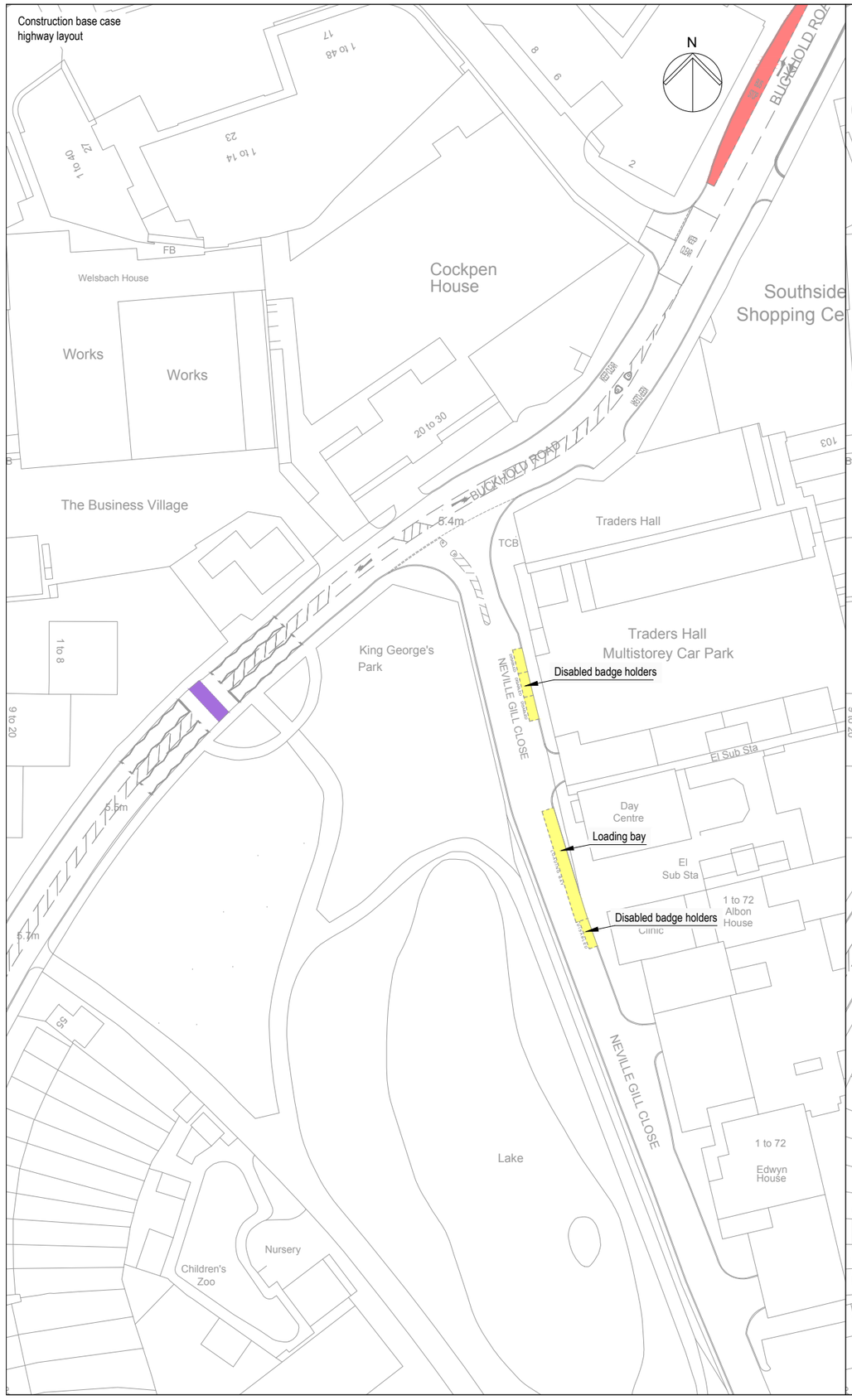
Document Information
Application for Development Consent
Existing highway layout

DCO-PP-09X-KNGGP-110017
January 2013

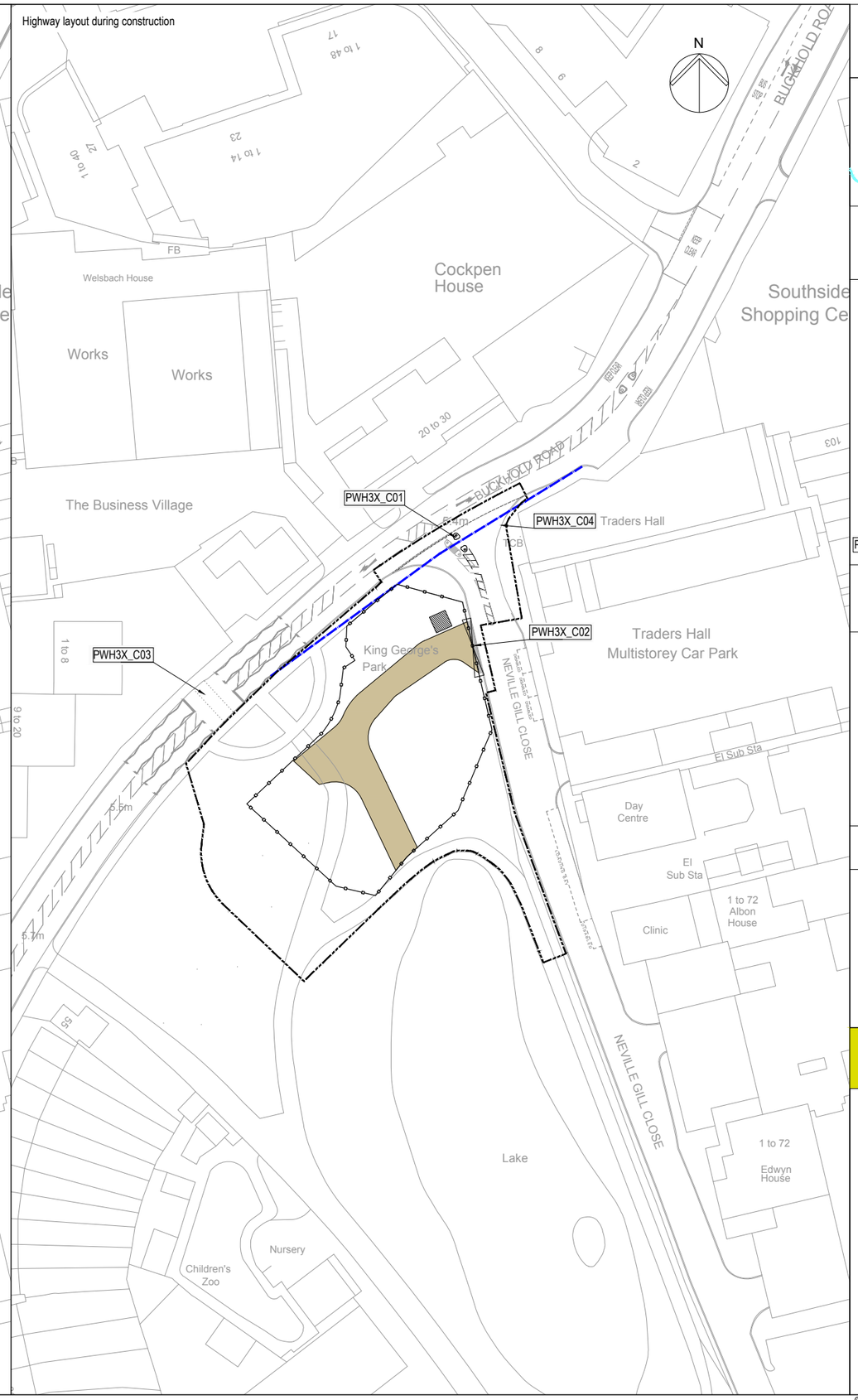
Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

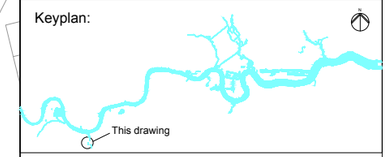
Construction base case highway layout



Highway layout during construction



Keyplan:



Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key

Existing

- Parking restrictions
- On street parking
- Bus stop / stand
- Pedestrian crossing

Revised

- Removal of footpaths
- Illustrative on-site manoeuvring zone
- Site hoarding
- Site hut
- Access gate
- Visibility splay - 2.4m x 43m (ssd adjust for bonnet Length)
- Limit of land to be acquired or used (LLAU)
- PWH3X_00 See schedule of works

On street parking

Disabled badge holders - At any time
Loading bay - No loading Mon - Sat 7:00am - 7:00pm

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 For The Use Of Tactile Paving, Dft, 1998
- Accessible Bus Stop Design Guidance, Tfl, 2006

Stage
Phase 2

10m 0 40m

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

ILLUSTRATIVE

Location
King George's Park
London Borough of Wandsworth

Document Information
Application for Development Consent

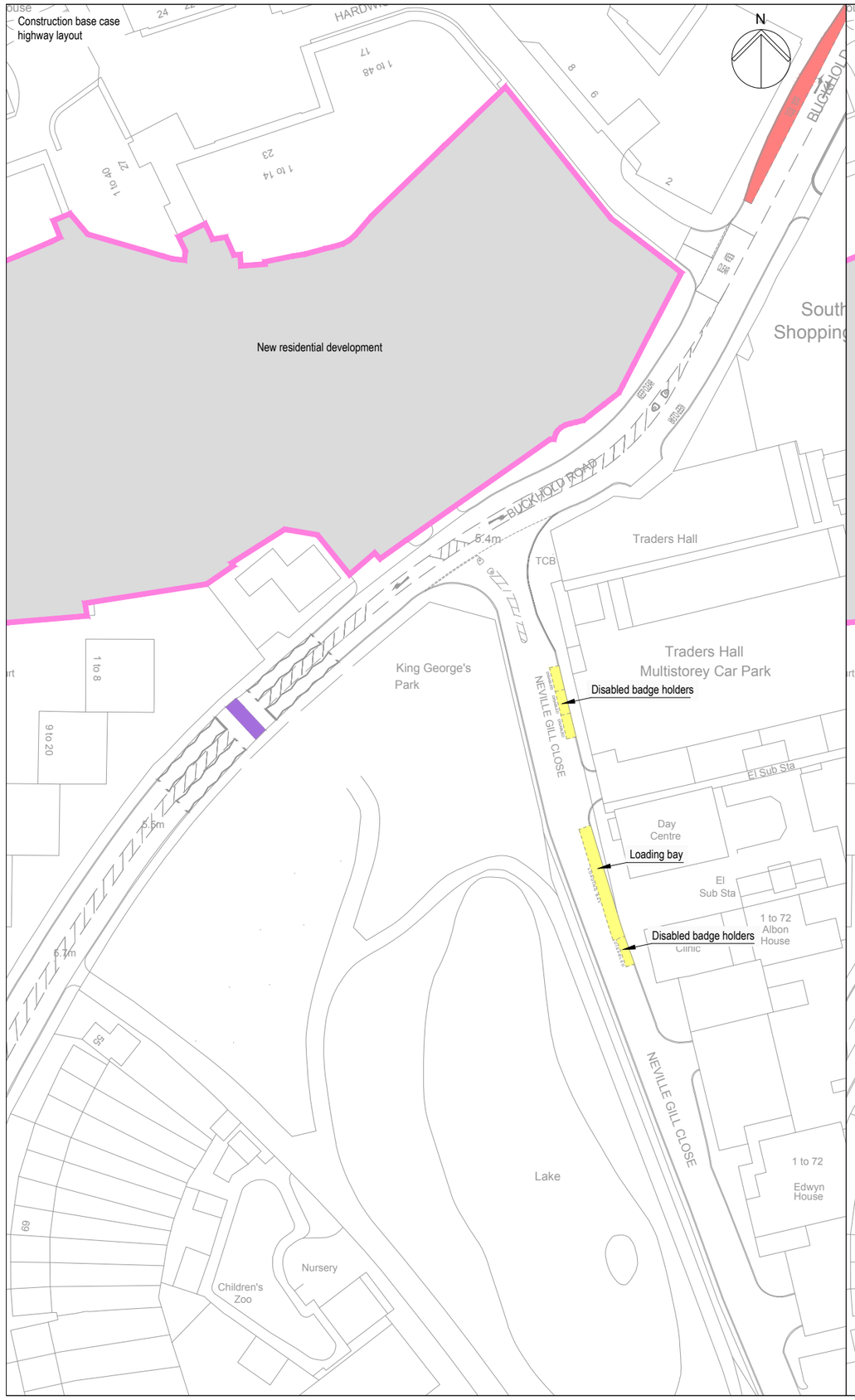
Highway layout during construction
(Area 1 work)

DCO-PP-09X-KNGGP-110018
January 2013

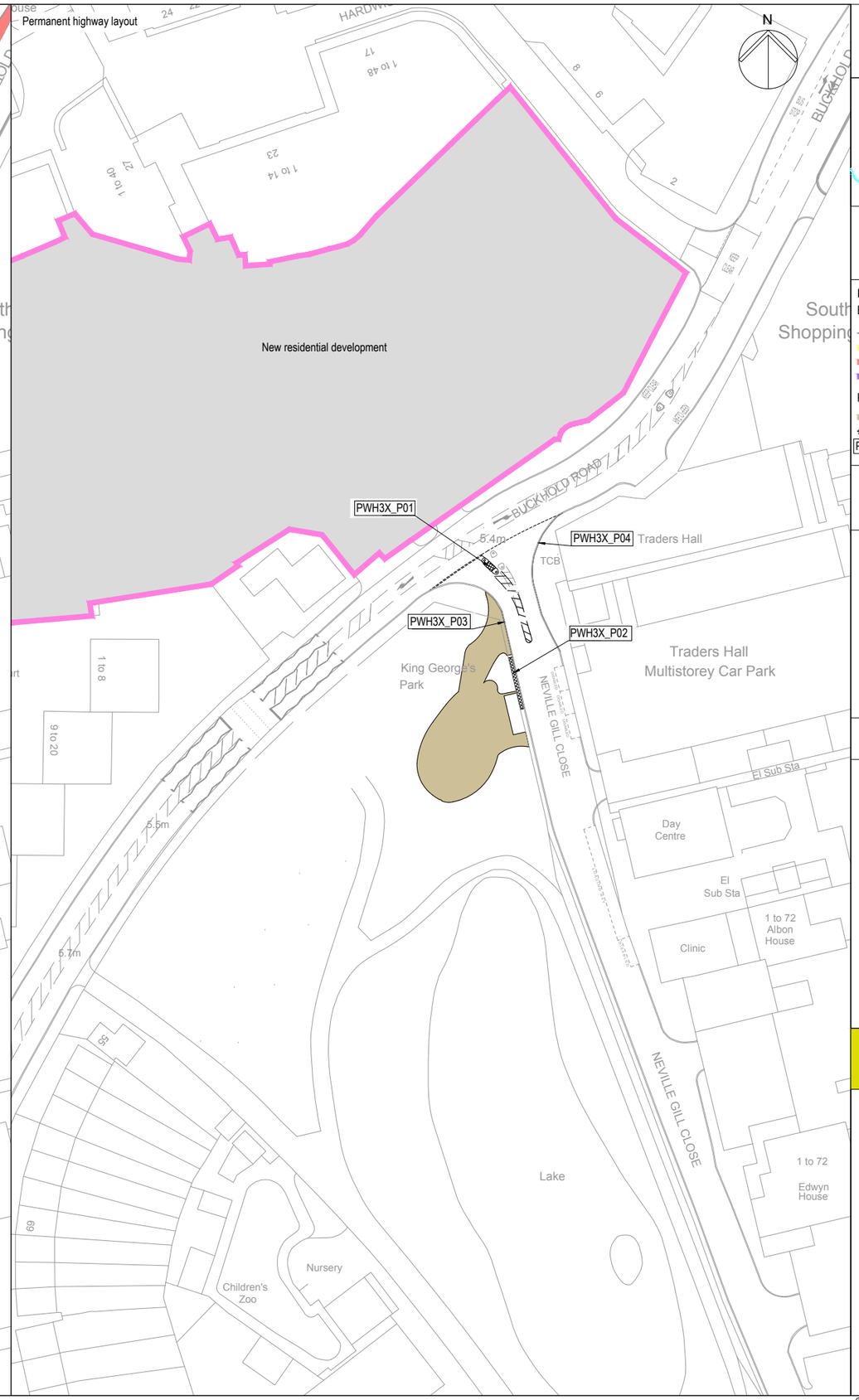
Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

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

- Parking restrictions
- On street parking
- Bus stop / stand
- Pedestrian crossing

Revised

- Illustrative on-site manoeuvring zone
- Reinstated footway
- PWH3X_P00 See schedule of works

On street parking

Disabled badge holders - At any time
Loading bay - No loading Mon - Sat 7:00am - 7:00pm

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 For The Use Of Tactile Paving, Dft, 1998
- Accessible Bus Stop Design Guidance, Tfl, 2006

Stage
Permanent phase

10m 0 40m

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

ILLUSTRATIVE

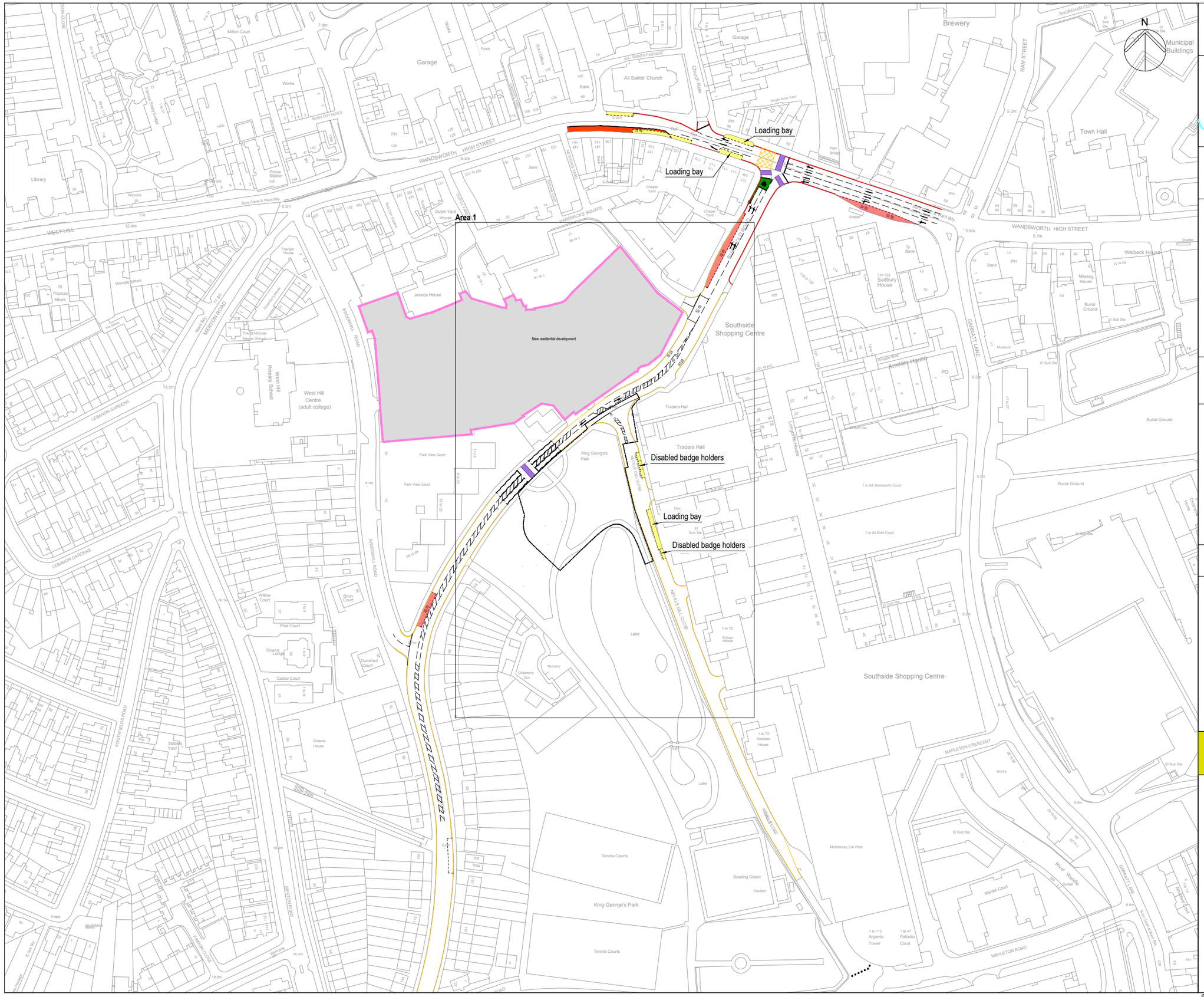
Location
King George's Park
London Borough of Wandsworth

Document Information
Application for Development Consent
Permanent highway layout
Area 1 work

DCO-PP-09X-KNGGP-110019
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water



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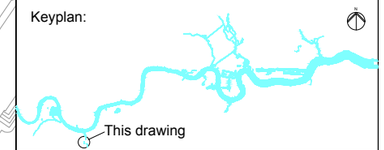


Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key

Existing

- Red route
- Parking restrictions
- On street parking
- Bus stop / stand
- Bus lane
- Cycle lane
- Pedestrian crossing
- Bollards

Revised

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

On street parking

Disabled badge holders - at any time
Loading bay - no loading mon - sat 7:00am - 7:00pm

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 For The Use Of Tactile Paving, Dft, 1998
- Accessible Bus Stop Design Guidance, Tfl, 2006

Stage
Construction base case

10m 0 40m

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

ILLUSTRATIVE

Location
King George's Park
London Borough of Wandsworth

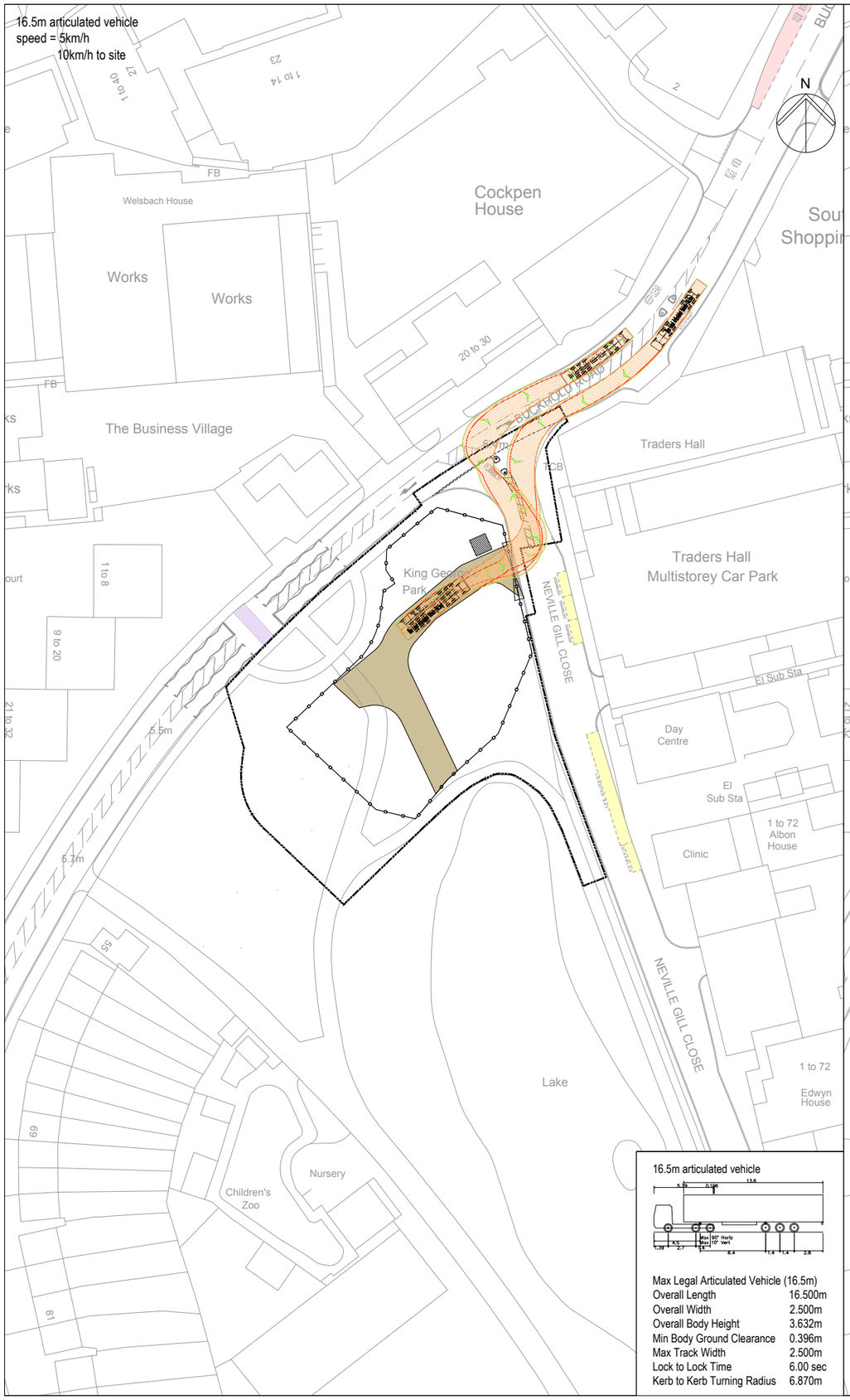
Document Information
Application for Development Consent
Construction base case highway layout

DCO-PP-09X-KNGGP-110020
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

16.5m articulated vehicle
speed = 5km/h
10km/h to site



16.5m articulated vehicle

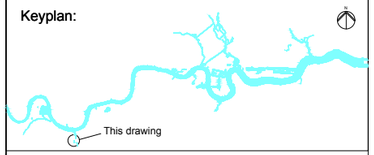
Max Legal Articulated Vehicle (16.5m)	
Overall Length	16.500m
Overall Width	2.500m
Overall Body Height	3.632m
Min Body Ground Clearance	0.396m
Max Track Width	2.500m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	6.870m

12.0m rigid vehicle
speed = 5km/h from site
10km/h to site

12m rigid vehicle

Rigid Truck	
Overall Length	12.000m
Overall Width	2.500m
Overall Body Height	3.928m
Min Body Ground Clearance	0.412m
Track Width	2.471m
Lock to Lock Time	6.00 sec
Kerb to Kerb Turning Radius	11.900m

Keyplan:



Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key

Existing
- Parking restrictions
- On street parking
- Bus stop / stand
- Pedestrian crossing

Revised
- Removal of footpaths
- Illustrative on-site manoeuvring zone
- Site hoarding
- Site hut
- Access gate
- Limit of land to be acquired or used (LLAU)

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

Standards
- Design Manual For Roads And Bridges, Dft, 1992
- Traffic Signs Regulations & General Directions, Tso, 2002
- Traffic Signs Manual, Dft, 2006
- Manual For Streets, Dft, 2007
- Manual For Streets 2, Ciht, 2010
- Designing For Deliveries, Fta, 1998
- Cycle Infrastructure Design Ltn 2/08, Dft, 2008
- Design Of Pedestrian Crossings Ltn 2/95, Dft, 1995
- Guidance For The Use Of Tactile Paving, Dft, 1998
- Accessible Bus Stop Design Guidance, Tfl, 2006

Stage
Phase 2

10m 0 40m

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

ILLUSTRATIVE

Location
King George's Park
London Borough of Wandsworth

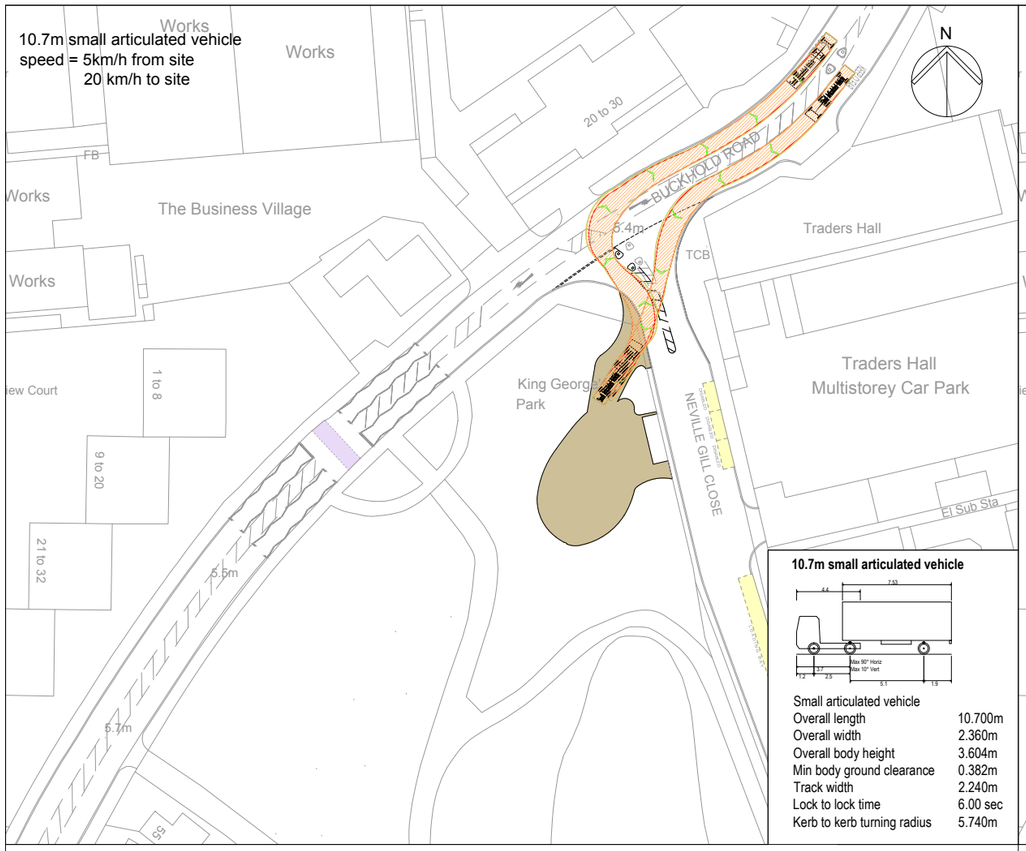
Document Information
Application for Development Consent

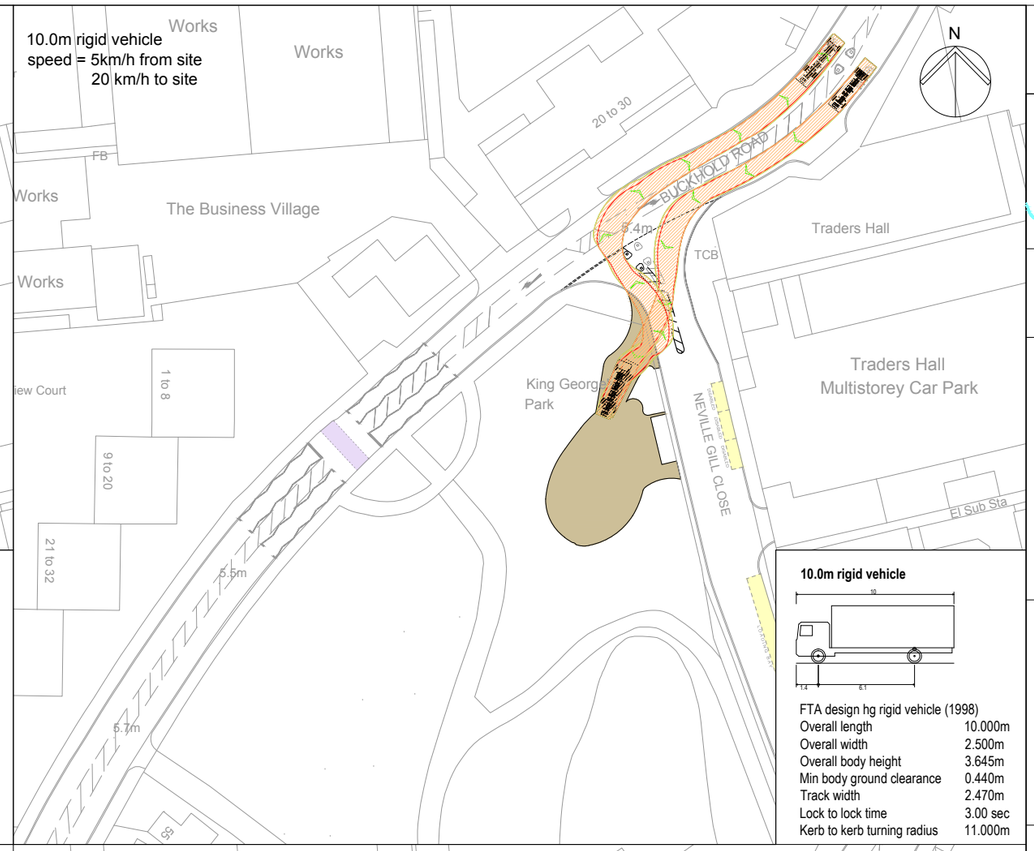
Highway layout during construction
Vehicle swept path analysis

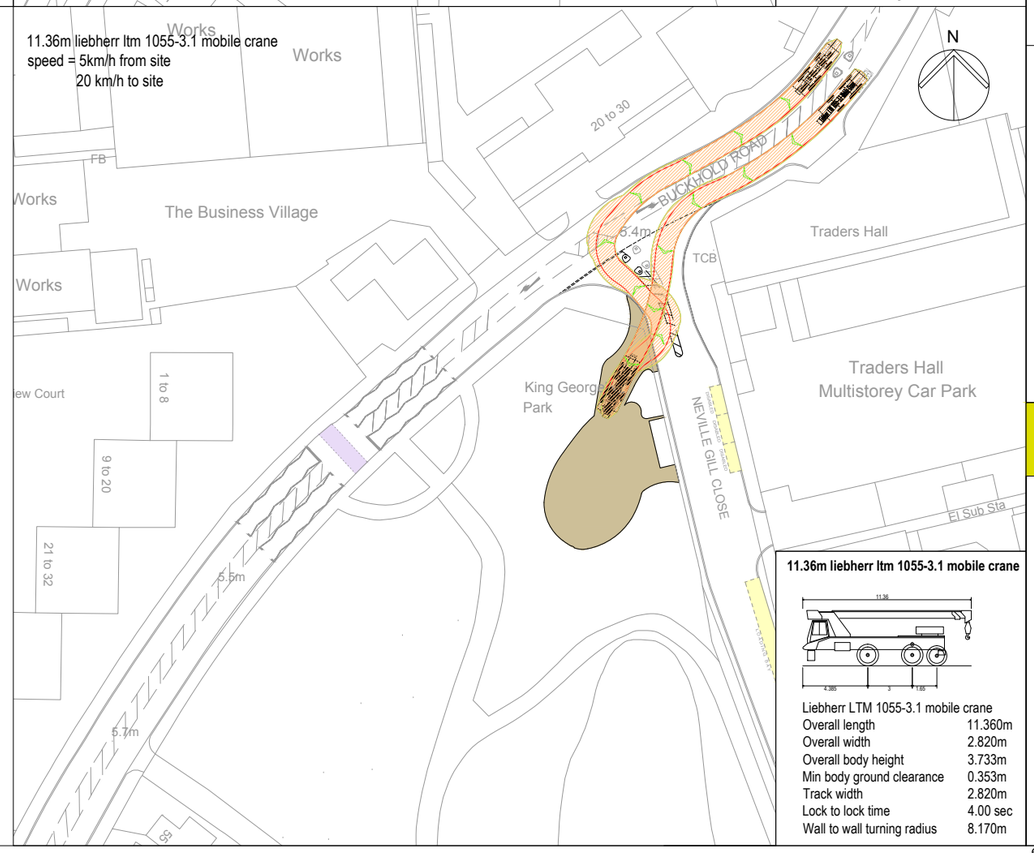
DCO-PP-09X-KNGGP-110021
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water







Keyplan:

Coordinates are to be Ordnance Survey Datum OSGB36. All levels are in metres and relate to the Tunnel Datum which is 100 metres below Ordnance Datum Newlyn.

Key

Existing
- Parking restrictions
- On street parking
- Pedestrian crossing

Revised
- Illustrative on-site manoeuvring zone

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

Standards
- Design Manual For Roads And Bridges, Dft, 1992
- Traffic Signs Regulations & General Directions, Tso, 2002
- Traffic Signs Manual, Dft, 2006
- Manual For Streets, Dft, 2007
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- Designing For Deliveries, Fta, 1998
- Cycle Infrastructure Design Ltn 2/08, Dft, 2008
- Design Of Pedestrian Crossings Ltn 2/95, Dft, 1995
- Guidance For The Use Of Tactile Paving, Dft, 1998
- Accessible Bus Stop Design Guidance, Tfl, 2006

Stage
Permanent phase

10m 0 40m

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

ILLUSTRATIVE

Location
King George's Park
London Borough of Wandsworth

Document Information
Application for Development Consent

Permanent highway layout
Vehicle swept path analysis

DCO-PP-09X-KNGGP-110022
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

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Transport assessment figures

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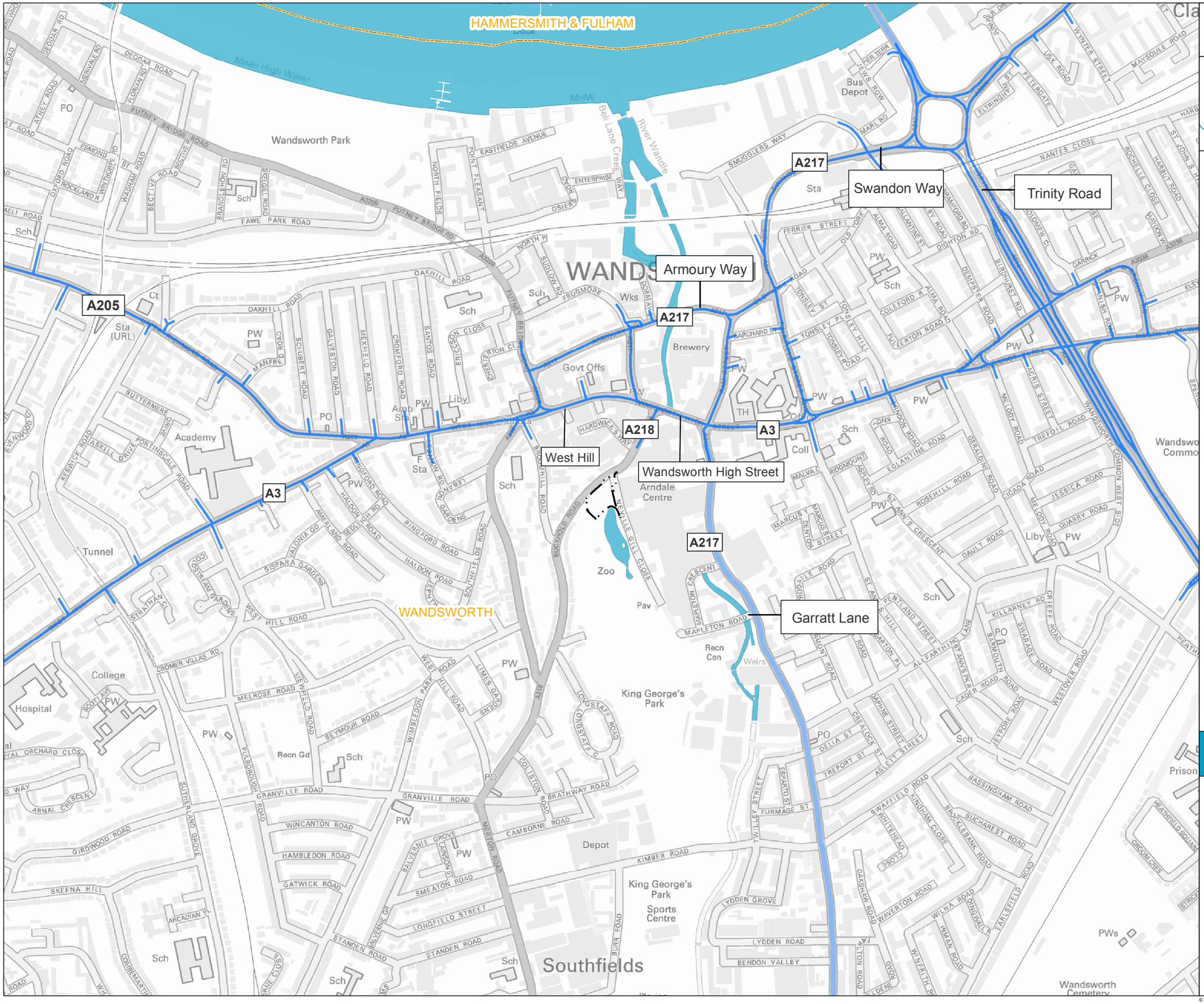

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Keyplan:

Key

- TFL road network
- Strategic road network
- 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

King George's Park
London Borough of Wandsworth

Document Information

Transport Assessment

Transport - site location plan

Figure 9.2.1

1PL03-TT-50615
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

King George's Park
London Borough of Wandsworth

Document Information

Transport Assessment

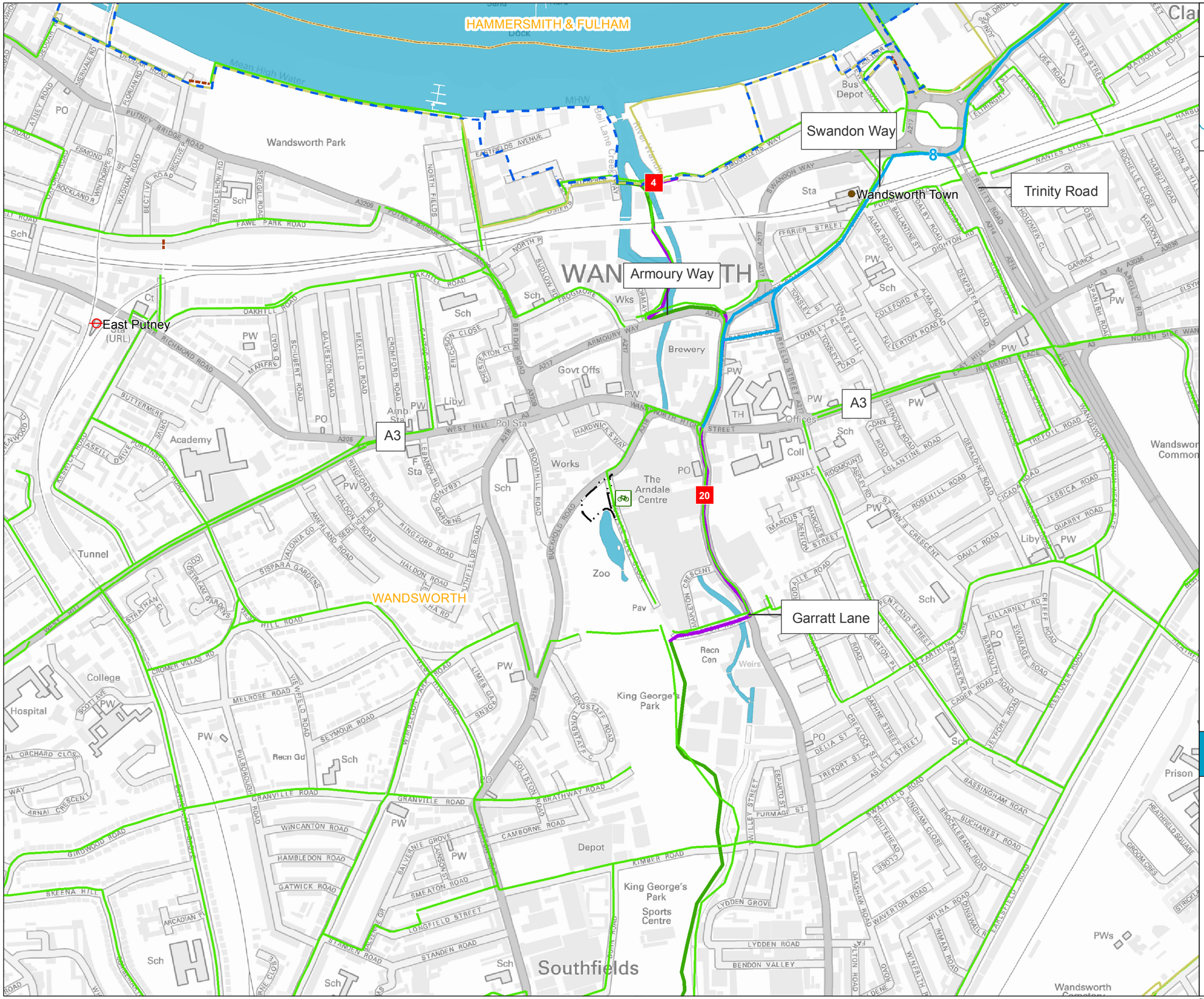
Transport - construction traffic routes

Figure 9.2.2

1PL03-TT-50607
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water



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Keyplan:

Key

- National Rail stations with cycle parking
- Underground stations with cycle parking
- Cycle parking
- Cycle superhighway (open)
- TFL Pedestrian Routes
- Thames path
- London strategic walk network
- London cycle routes

National cycle network

Route Type

- Open Traffic Free
- Open on-road
- Limits of Land to be Acquired or Used
- Local authority boundary

110 55 0 110 m

Scale 1 : 7,500 at A3

FOR INFORMATION

Location

King George's Park
London Borough of Wandsworth

Document Information

Transport Assessment

Transport - pedestrian and cycle network

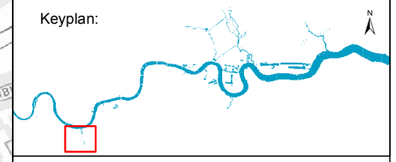
Figure 9.4.1

1PL03-TT-50623
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Keyplan:



Key

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

110 55 0 110 m

Scale 1 : 7,500 at A3

FOR INFORMATION

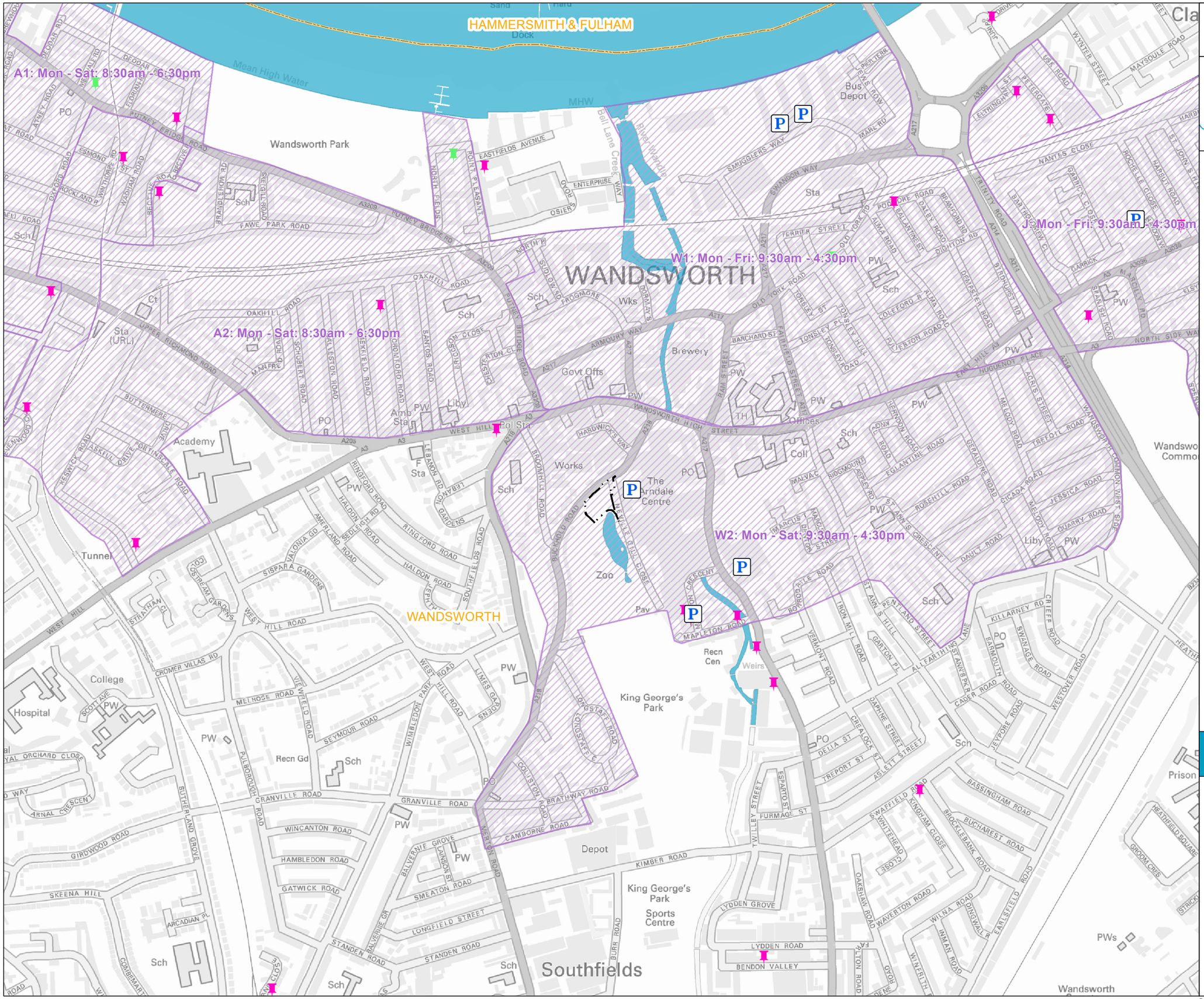
Location
King George's Park
London Borough of Wandsworth

Document Information
Transport Assessment
Transport - public transport

Figure 9.4.2
1PL03-TT-50631
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water



Keyplan:

Key

- City Car
- Zip Car
- Private car parking
- Controlled Parking Zones and hours of operation
- Limits of Land to be Acquired or Used
- Local authority boundary

FOR INFORMATION

Location
King George's Park
London Borough of Wandsworth

Document Information
Transport Assessment
Transport - parking

Figure 9.4.3
1PL03-TT-50639
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Keyplan:

Key

- 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

King George's Park
London Borough of Wandsworth

Document Information

Transport Assessment

Transport - survey locations

Figure 9.4.4

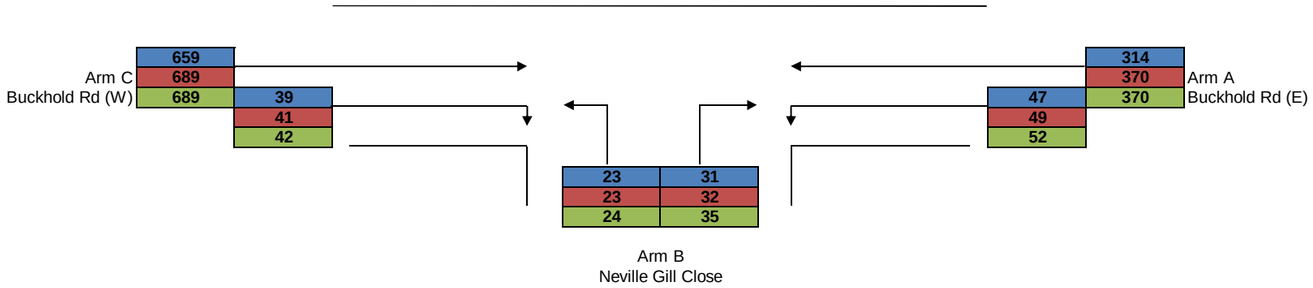
1PL03-TT-50647
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

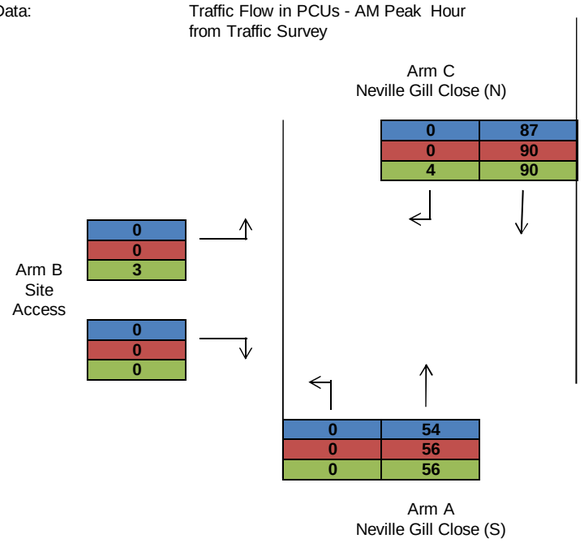
Site: King George's Park
Borough: Wandsworth
Junction: Buckhold Rd/ Neville Gill Close
Junction no.: PBA 14

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



Site: King George's Park
Borough: Wandsworth
Junction: Neville Gill Close/ Site Access
Junction no.: PBA 15

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



Key

	Baseline
	Construction Base
	Development Case

FOR INFORMATION

Location
King George's Park
London Borough of Wandsworth

Document Information
Transport Assessment

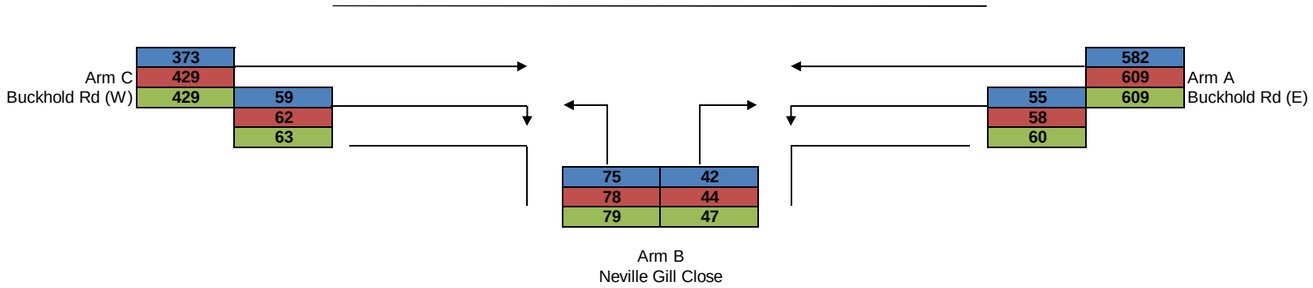
Baseline, Construction and Development case traffic flow (AM peak hour)

Figure 9.4.5
1PL03-TT-50906
January 2013

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

Site: King George's Park
Borough: Wandsworth
Junction: Buckhold Rd/ Neville Gill Close
Junction no.: PBA 14

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

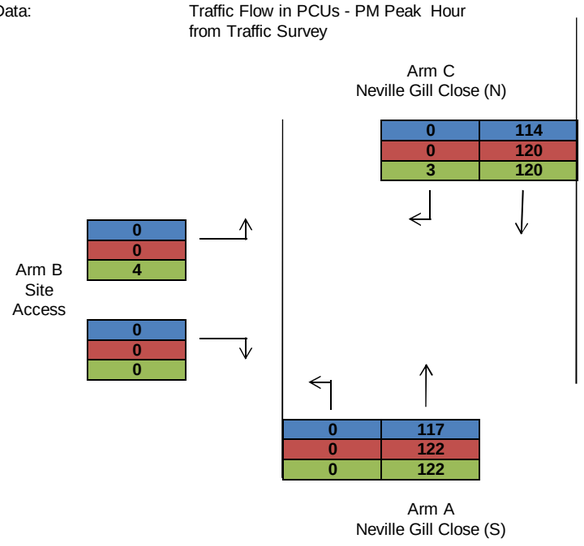


Key

	Baseline
	Construction Base
	Development Case

Site: King George's Park
Borough: Wandsworth
Junction: Neville Gill Close/ Site Access
Junction no.: PBA 15

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



FOR INFORMATION

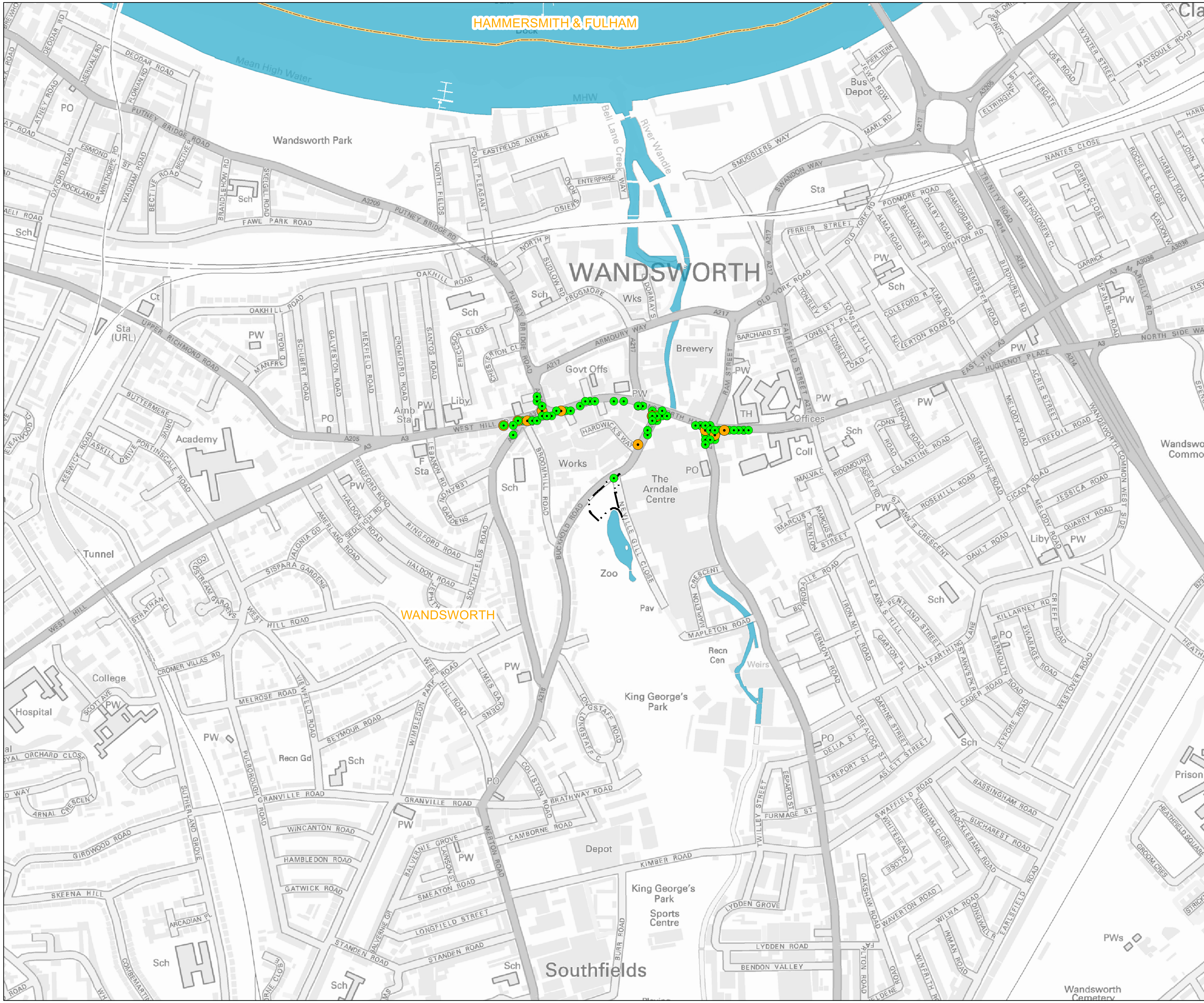
Location
King George's Park
London Borough of Wandsworth

Document Information
Transport Assessment

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

Figure 9.4.6
1PL03-TT-50930
January 2013

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



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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

King George's Park

London Borough of Wandsworth

Document Information

Transport Assessment

Transport - accident locations

Figure 9.4.7

1PL03-TT-50751

January 2013

Thames Tideway Tunnel

Creating a cleaner, healthier River Thames

Thames Water

Keyplan:

Key

Accidents

(Severity, Mode of travel)

- Slight, Pedestrian
- Slight, Pedal Cycle
- Serious, Pedestrian
- Serious, Pedal Cycle
- 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

King George's Park
London Borough of Wandsworth

Document Information

Transport Assessment

Transport - pedestrian and cyclist accidents by severity
Figure 9.4.8

1PL03-TT-50835
January 2013

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

Carnwath Road Riverside

Hanson Wandsworth

Putney Bridge Road

A217

Dormay Street

Armoury Way

Fairfield Street

Ram Street

A3

Wandsworth High Street

A3

King George's Park

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

King George's Park
London Borough of Wandsworth

Document Information

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

Figure 19.5.1

1PL03-TT-50876

Thames Tideway Tunnel
Creating a cleaner, healthier River Thames

Thames Water

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

DCO-DT-000-ZZZZZ-071006