Stag Brewery, Mortlake

Transport and Access EIA Report

For Reselton Properties

February 2018

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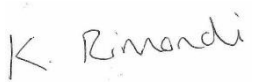

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1. Introduction

This Transport and Access EIA report has been prepared by Peter Brett Associates LLP (PBA) on behalf of Reselton Properties Limited ('the Applicant') in relation to three linked planning applications for the comprehensive redevelopment of the former Stag Brewery site in Mortlake and land at Chalkers Corner ('the Site') within the London Borough of Richmond Upon Thames ('LBRuT').

This report presents the assessment of the likely significant transport and access effects associated with the proposed demolition, alteration, refurbishment and construction works ('the Works'), and once the Development is completed and operational (see below for a definition of the Development). This report comprises the Environmental Statement (ES) Chapter and associated figures and appendices.

1.1 Report Context and Approach

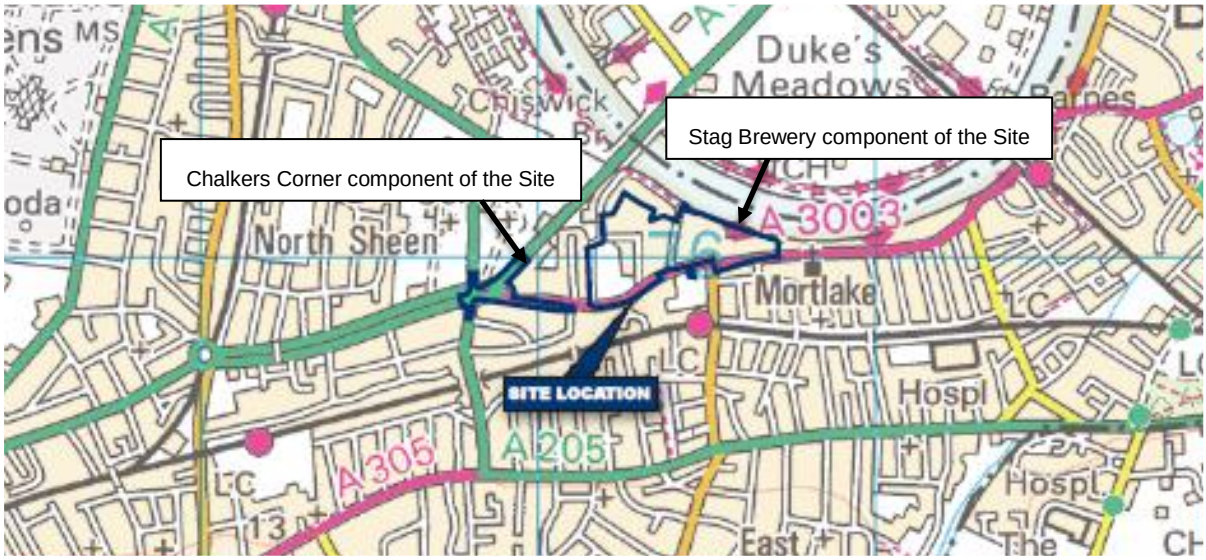
The Development is considered as EIA Development under Schedule 2, Category 10(b) (urban development projects) of the Town and Country Planning (Environmental Impact Assessment) Regulations, 2011 (as amended 2015)[1].

The ES reports the key findings of the EIA process undertaken for the Development and accompanies all three Planning Applications (as described below). At the request of the LBRuT, standalone reports have been provided, but do not differ from those contained within the ES. Justification as to the scope of the ES is summarised in ES Chapter 2: EIA Methodology. Further information on the description of the existing Site and surrounds, the proposed Development, the Works, alternatives and design evolution, and cumulative effects are provided in the ES.

1.2 Site Context and Development Proposals

The location of the Site is shown in Figure 1 below and comprises two components referred to as the 'Stag Brewery component of the Site' and the 'Chalkers Corner component of the Site'.

Figure 1: Site Location



The Stag Brewery component of the Site is bounded by Lower Richmond Road to the south, the river Thames and the Thames Bank to the north, Williams Lane to the east and Bulls Alley (off Mortlake High Street) to the west. The Stag Brewery component of the Site is bisected by Ship Lane. The Stag Brewery

[1] HMSO (2015) Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (as amended 2015).

component of the Site currently comprises a mixture of large scale industrial brewing structures, large areas of hardstanding and playing fields. The Chalkers Corner component of the Site comprises highway and associated landscaping referred to as Chalkers Corner junction which includes the junction with the A316 (Clifford Avenue, A3003 (Lower Richmond Road) and A205 (South Circular). Refer to ES Chapter 3: Existing Site and land uses for further information.

The redevelopment will provide homes (including affordable homes), accommodation for an older population, complementary commercial uses, community facilities, a new secondary school alongside new open and green spaces throughout. Associated highway improvements are also proposed, which include works at Chalkers Corner junction. The proposed floorspace of the Development (made up of the three planning applications) is provided in Table 1 below. Refer to ES Chapter 5: The Proposed Development for further information on the Development. The Works would be carried out over a period of approximately 8 years, anticipated to commence in June 2019 and complete in September 2027 (as set out in ES Chapter 6: Development Programme, Demolition, Alteration, Refurbishment and Construction).

Table 1: Proposed Floorspace of the Development

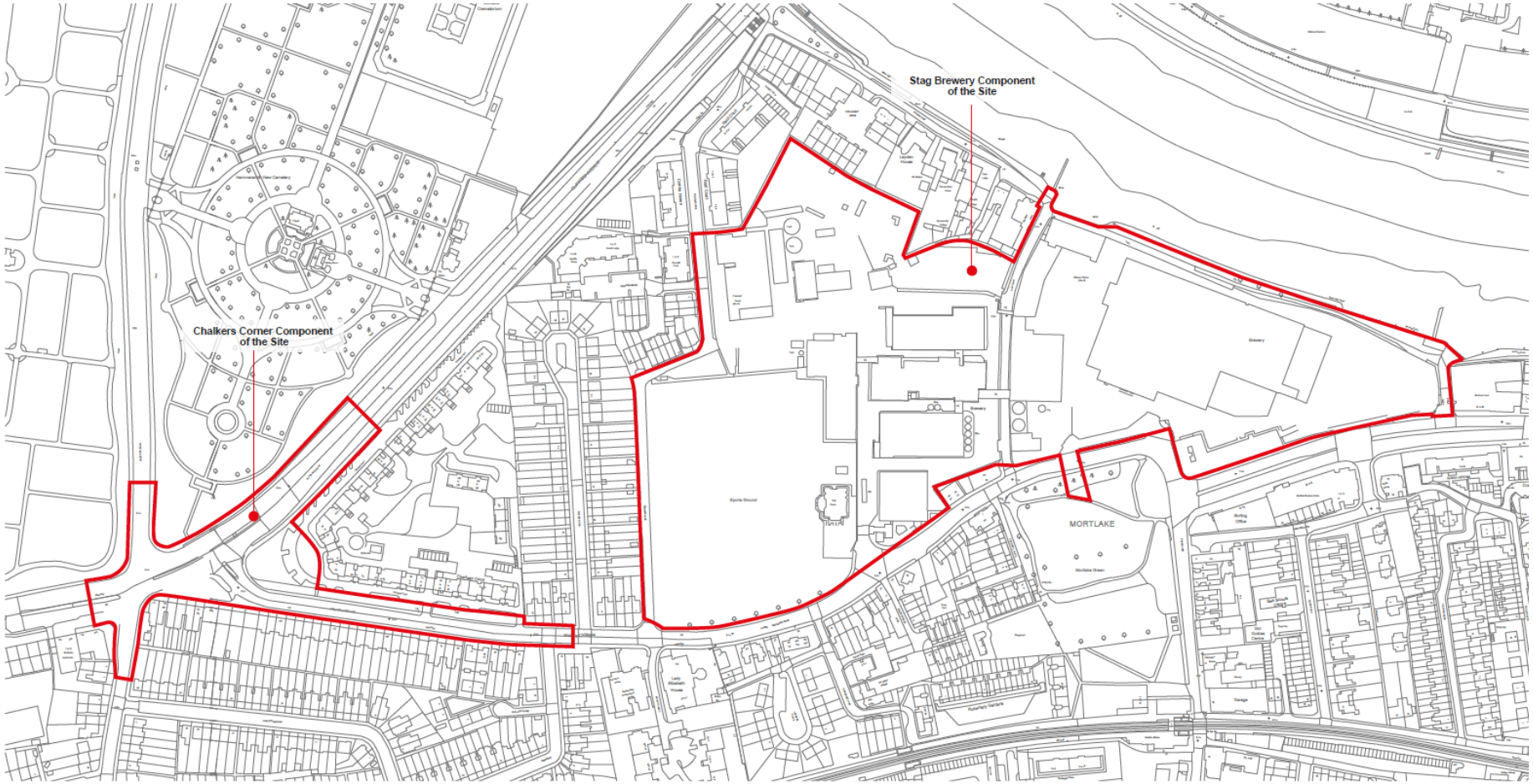
Land Use and Class	Floorspace Area (m^2)	
	Gross External Area (GEA)	Gross Internal Area (GIA)
Residential (Use Class C3, excluding assisted living)	Up to 84,639 (Up to 667 units)	Up to 75,119 (Up to 667 units)
Office (Use Class B1) (including Site management office)	2,674	2,457
Cinema (Use Class D2)	2,565	2,120
Gym (Use Class D2)	912	740
Flexible Uses - Restaurant / bar / retail / community / boathouse (Use Classes A1 / A2 / A3 / A4 / B1 / D1 / Boathouse)	5,308*	4,664*
Hotel (Use Class C1)	1,858	1,668
Assisted Living (Flexible Use Class C2 / C3)	Up to 16,246	Up to 14,738
Nursing and Care Home (Use Class C2)	Up to 10,293	Up to 9,472
School (Use Class D1)	11,430	9,319
Plant and storage.	Up to 4,536 (+ Plant and storage included in school)	Up to 4,244 (+ 249 included in school)
Car parking spaces.	Up to 708 spaces	Up to 708 spaces
Cycle parking spaces.	Up to 1,611 spaces	Up to 1,611 spaces
Basement residential access / circulation	1,868	1,810
Private amenity space.	Up to 5,912	Not applicable
Public amenity space (including external and internal play space for residents and school play space).	Up to 38,943	Not applicable
Play space (including external and internal play space for residents and school play space).	Up to 14,353	Not applicable

The three planning applications are as follows:

- Application A – hybrid planning application for comprehensive mixed use redevelopment of the Stag Brewery component of the Site consisting of:
  - Land to the east of Ship Lane applied for in detail (referred to as 'Development Area 1' throughout); and
  - Land to the west of Ship Lane (excluding the school) applied for in outline detail (referred to as 'Development Area 2' throughout).
- Application B – detailed planning application for the school (on land to the west of Ship Lane within the Stag Brewery component of the Site).
- Application C – detailed planning application for highways and landscape works at Chalkers Corner.

The three Planning Applications are separate applications, but will be linked through a S106 agreement to ensure that the Application B (school) land is handed over at an appropriate time and that the Application C (Chalkers Corner) works are carried out at an appropriate stage in conjunction with either Application A or B. For the purposes of assessment, all three Planning applications are therefore considered together as one comprehensive redevelopment proposal. As such, for the purposes of the EIA and ES, the proposals defined by the Planning Applications are collectively referred to as the 'Development'. Similarly, the collective parcels of land associated with the Planning Applications are referred to as the 'Site', as shown on Figure 2.

Figure 2: The Site for the Purposes of the EIA



2. Assessment

8. Transport and Access

Introduction

8.1 This Chapter, prepared by Peter Brett Associates LLP (PBA), presents an assessment of the likely significant effects of the Development on the existing transport and access conditions within the area local to the Site and the wider surrounding area.

8.2 The Chapter provides a description of the methods used in the transport and access assessment, a description of the relevant baseline conditions of the Site and surrounding area, and an assessment of the likely significant environmental effects relating to transport and access of the Development during the demolition, alteration, refurbishment and construction works (the Works) and once the Development is completed and operational (the Completed Development).

8.3 Mitigation measures are identified, where appropriate, to avoid, reduce or offset any adverse effects. The Chapter concludes by examining the nature and significance of likely residual effects taking account of the mitigation measures.

8.4 A Transport Assessment (TA) has been submitted in support of the Planning Applications for the Development. This Chapter has been prepared on the basis of the detailed assessment within the TA and refers to the TA, supporting appendices and transport documents where further information is required. The TA can be found in **Appendix 8.1** to this ES.

Assessment Methodology and Significance Criteria

8.5 This Chapter has been prepared in accordance with the requirements set out in the 2011 EIA Regulations and has taken account of the guidance presented within the following:

- Guidelines for Environmental Impact Assessment (Institute of Environmental Management and Assessment (IEMA), 2004)[1];
- Guidelines for the Environmental Assessment of Road Traffic (Institute of Environmental Assessment (now IEMA), 1993[2]) (the 'IEMA Guidelines'); and
- Volume 11 of the Design Manual for Roads and Bridges (DMRB) – Environmental Assessment (Highways Agency et al., 2007 / 2008 / 2009 / 2011[3]).

8.6 The above listed 'Guidelines for the Environmental Assessment of Road Traffic' refer to the 'Manual of Environment Appraisal' (MEA) published by the (then) Department of Transport in 1983, which has been superseded. Reference has therefore been made to the relevant sections of the DMRB - specifically Volume 11 entitled 'Environmental Assessment'.

8.7 The IEMA Guidelines identify that the main transport effects that could arise from the construction and operation of new developments relate to the following:

- severance;
- driver delay;
- pedestrian delay;
- pedestrian and cycle amenity;
- fear and intimidation;
- accidents and road safety;
- dust and dirt; and
- hazardous Loads.

8.8 The ‘dust and dirt’ criterion has not been considered within this assessment as this topic is covered within **Chapter 10: Air Quality**.

8.9 The ‘Hazardous Loads’ criterion has also not been considered in this assessment, as at this stage as it is deemed unlikely that the Development Works or operation of the Development will require the transportation of hazardous loads.

8.10 Therefore, in accordance with IEMA guidance, this Chapter considers the likely effects of the Development in terms of changes in traffic flow volume and composition in relation to the above listed criteria.

8.11 In addition, although the IEMA guidance does not identify a requirement to assess the effect of public transport changes, due to the specific request from LBRuT, a public transport assessment has been included in this Chapter. A full assessment of the Development on surrounding public transport facilities is included within the TA in **Appendix 8.1**.

Assessment Methodology

Assessment of the Works

8.12 The assessment of the indicative peak daily construction two-way flows arising from the Development has been completed in advance of appointing a contractor. As a result of the range of construction activities and processes occurring on any one day, there will be some variation in the flows anticipated once a contractor is appointed. Nevertheless, a reasonable worst-case assessment of the likely extent of construction-related activities occurring at any one time has been undertaken for the purpose of assessing environmental effects.

8.13 The additional public transport assessment presented in this Chapter relating to the Works considers the morning (08:00-09:00) and evening (17:00-18:00) peak hours exclusively, as those times are considered the busiest throughout the day and thus any adverse effects identified during the peak hours would present a worst case. It should be noted that the number of construction staff expected to work on Site during the peak construction period is currently unknown. However, as part of the socio-economics assessment presented in **Chapter 7: Socio-Economics**, it has been estimated that an average of up to 1,140 full time equivalent jobs per annum over the period of the Works could be supported by the Works. The precise number of construction staff required for the Works would be confirmed post planning approval and once a construction contractor has been appointed prior to any works commencing on Site.

Completed and Operational Development Assessment

8.14 In order to identify the likely significant environmental effects relating to transport and access of the operational Development a trip generation assessment has been undertaken. The trip generation methodology, including trip rates, have been agreed with LBRuT and TfL during pre-application discussions.

8.15 It should be noted that the trip generation assessment presented within the TA, and considered in this Chapter, is not based on the final development schedule, as the Development proposals for the Site have been amended post completion of the TA work. It is not anticipated that the changes to the development schedule will make any material difference to the significance of the environmental effects set out in this Chapter. shows the assessed and final development quantum as well as the change between them.

Assessed Land Use Quanta

8.16 Within the detailed component of Application A, the ground floor of a number of proposed buildings, particularly along the new 'high street' have been identified as flexible use in order to provide the necessary flexibility to respond to market demand.

8.17 **Chapter 5: The Proposed Development** provides the maximum floorspace per land use within the overall flexible use space which should not be exceeded. For the purposes of this assessment, the following mix of flexible uses has been assumed, as set out in **Table 8.1**.

8.18 As outlined above, the below is not based on the final development schedule. However, as also shown above the changes in development schedule have minimal impact on the daily trip generation forecast of the Stag Brewery component of the Site.

Table 8.1: Flexible Use Assumptions

Use	Floor Area sqm (GIA)	Comment
Retail – Local Shops	691	The combined retail area (1,259) is the minimum retail required as part of the mix. The area for local shops has been minimised as this use will mainly generate local / linked trips. The food store is the floor area for the identified unit fronting Mortlake High Street (Building 5).
Retail – Food Store	568	
Office and Financial / Professional Services	1,353	Highest AM peak vehicle generator plus significant PM peak generator.
Community	848	Combined ground floor of the Maltings (Building 4) and Boathouse (Building 9). Buildings which are both identified for this use.
Cafés, Restaurants and Bars	1,353	Highest vehicle generator during PM peak.
Total	4,819	-

8.19 It is considered that this mix of flexible uses will provide a likely worst case assessment of highway effects. **Table 8.2** provides the final floor areas for the detailed component of Application A that have been used in this assessment.

Table 8.2: Detailed Component of Application A - Non-Residential Units used within Trip Generation Assessment

Land Use	Architects Schedule (GIA)	Floor Area (GIA)		Units used for Trip Generation
Unspecified Flexible Floor Area inc. Retail / Restaurant / Office	3,965 m^2	Food Store	568 m^2	568 m^2*
		Local Retail	691 m^2	Included in food store assessment
		Restaurant	1,353 m^2	1,353 m^2
		Office	1,353 m^2	-
Hotel	1,266 m^2	1,266 m^2		16 rooms

Land Use	Architects Schedule (GIA)	Floor Area (GIA)	Units used for Trip Generation
Community	854 m^2	854 m^2	854 m^2
Office	2,424 m^2	2,424 m^2	3,777 m^2**
Cinema	1,899 m^2	1,899 m^2	370 seats
Gym	757 m^2	757 m^2	757 m^2
Total	11,165 m^2	11,165 m^2	-

** 568 m^2 represents the size of the convenience store (Building 5) which the retail trip generation is based on.*

*** Including Flexible Use Office.*

8.20 For the outline component of Application A, there are no flexible uses proposed. **Table 8.3** shows the quanta by land use that have been applied for the trip generation assessment for the outline component of Application A.

Table 8.3: Outline Component of Application A - Trip Generation Units

Land Use	Floor Area (GIA)	Units used for Trip Generation
Residential	26,547 m^2	232 units
Extra Care	12,324 m^2	150 Assisted Living Units
Care Home	8,450 m^2	70 Care Home beds
Health Care	748 m^2	4 Consulting Rooms

8.21 The trip generation for the proposed school (Application B) has been based on the requirements to cater for up to 1,260 pupils and 60 staff.

Trip Generation

8.22 A detailed multi-modal trip generation assessment for each proposed land use on the Stag Brewery component of the Site has been undertaken as part of the TA, contained within **Appendix 8.1**.

8.23 Generally, the person trip generation for each of the proposed land uses has been based upon data of comparable development sites derived from the Trip Rate Information Computer System (TRICS) database, with appropriate comparable sites selected for each proposed individual use in accordance with the TRICS guidance. The one exception to this has been for the cinema use where a first principles approach has been agreed with LBRuT and TfL which relates to the number of seats and the likely arrival and departure patterns based on a three screen operation.

Vehicular Trip Distribution

8.24 The distribution of trips to / from the Stag Brewery component of the Site has been estimated using the SoLHAM forecast traffic distribution to / from three 'donor' zones in the SoLHAM model. The development trips have then been distributed accordingly based on these three zones. A more detailed description of the distribution is included in a Technical Note produced by PBA and attached at Appendix L of the TA in **Appendix 8.1**.

Public Transport Trip Distribution

8.25 The distribution of public transport trips, namely bus and rail trips, have been distributed using the census data for journeys to work. These trips were then distributed across the relevant services they related to dependent upon the destination. For example, if someone was recorded as taking the bus to Richmond they would be allocated onto the 419 as this is the most appropriate service for them to use.

8.26 **Table 8.4** and **Table 8.5** show the predicted distribution of public transport users onto the different bus services that can be accessed from the Site.

Table 8.4: Bus Distribution - Residential

Bus Route	Proportion by Route	Proportion by Direction	
		Bus Route Destination	Proportion
419	58%	Hammersmith	41%
		Richmond	17%
190	36%	West Brompton Station	36%
209	3%	Hammersmith	3%
R68	3%	Kew	2%
		Hampton Court	1%

Table 8.5: Bus Distribution – Non-Residential

Bus Route	Proportion by Route	Proportion by Direction	
		Bus Route Destination	Proportion
419	76%	Hammersmith	55%
		Richmond	21%
190	18%	West Brompton Station	18%
209	4%	Hammersmith	4%
R68	3%	Kew	3%

Peak Hour Assessments

8.27 The public transport assessment relating to the operational Development as well as the driver delay assessment relating to the Works and operational Development presented in this Chapter focus on the morning (08:00-09:00) and evening (17:00-18:00) peak hours to present a worst case scenario.

Establishment of Baseline Conditions

8.28 An independent survey company was commissioned to undertake a variety of surveys in order to gain an understanding of the existing transport conditions in the surrounding area of the Site. The following surveys were undertaken in June 2016:

- vehicle turning counts and queue length surveys at:
  - A31 Lower Richmond Road / Clifford Road / South Circular Road / A3003 Lower Richmond Road Staggered Signalised Junction;
  - Upper Richmond Road West (South Circular) / Sheen Lane Signalised Junction; and

- A3003 Lower Richmond Road / Mortlake High Street / Sheen Lane Roundabout.

- Mortlake Station pedestrian counts at:
  - Mortlake Station at all four access points.
- level crossing timings and queues at:
  - Mortlake Station level crossing on Sheen Lane.
- 7-day automatic traffic counts (ATC) on:
  - Mortlake High Street, to the east of the Lower Richmond Road / Mortlake High Street / Sheen Lane roundabout.

8.29 Further surveys were undertaken in November 2016. These surveys comprised:

- on-street parking surveys extending:
  - To the east up to Ashleigh Road;
  - To the west up to Clifford Avenue;
  - To the south of the railway between Bexhill Road / Elm Road to the west; and
  - Alexandra Road to the east.
- turning counts at:
  - Vineyard Path / Mortlake High Street Junction.
- pedestrian and cycle counts as well as vehicle entry and exit counts at the following comparable residential developments:
  - Kew Riverside Park, Strand Drive;
  - Kew Riverside, Melliss Avenue; and
  - Kew Bridge, A315 Kew Bridge Road.

8.30 The following further surveys were undertaken in June 2017:

- video survey at:
  - Mortlake station at all four access points.
- 7 day ATCs at:
  - Sheen Lane to the south of South Circular Road;
  - South Circular Road to the west of Sheen Lane;
  - A3003 Lower Richmond Road adjacent to Watney's Sports Ground;
  - A3003 Lower Richmond Road adjacent to Mortlake Green;
  - Williams Lane;
  - Clifford Avenue to the south of Chiswick Bridge;
  - The Terrace to the west of Barnes Bridge station; and
  - White Hart Lane to the south of Mortlake High Street.

8.31 In addition to the above surveys, accident data have been obtained from TfL for a study area around the Site comprising Mortlake High Street, the A3003 Lower Richmond Road, Chalkers Corner including Clifford Avenue up to Chiswick Bridge, and the South Circular Road between Chalkers Corner, Upper Richmond Road W and White Hart Lane. The data covers a five-year period up to 31 January 2016. Detailed accident data records can be found in the TA, **Appendix 8.1**.

Extent of Assessment Area

8.32 The IEMA Guidelines suggest two broad rules to identify the appropriate extent of the highways assessment area, as follows:

- road links with all vehicle or Heavy Vehicles traffic flow increases in any assessment year of +30%; and
- road links with Medium or High sensitivity receptors with flow increases greater than 10%.

8.33 Based on these rules, the highway assessment area includes all links of the Site's surrounding local and strategic road network that are included in the TfL South London Highway Assignment Model (SoLHAM) used to assess the impact of the Development and that are subject to any daily traffic flow changes as a result of the Development's construction or operation. Links that are forecast to be subject of traffic flow changes of less than 10% have also been included to present a robust assessment.

8.34 The study area is bound in the west by all arms of the Chalkers Corner junction, in the north by the river Thames, in the east by The Terrace and White Hart Lane and in the south by the South Circular Road and Sheen Lane to the south of the South Circular Road.

Assessment Scenarios

8.35 The assessment of environmental effects relating to transport and access have considered the following scenarios:

- 2017 Do Nothing (Baseline);
- 2022 Do Minimum (peak construction year);
- 2022 Do Something (peak construction year);
- 2027 Do Minimum (operational Development year);
- 2027 Do Something (operational Development year);
- 2031 Do Something with Highway Improvements (operational Development);
- 2042 Do Minimum (15 years' after operational Development); and
- 2042 Do Something (15 years' after operational Development).

8.36 The Do Minimum scenarios include background traffic growth only, which is added to the baseline traffic flows. In these scenarios, no account has been taken of trips associated with the Development. Development trips have been taken account of in the Do Something scenarios, which also take account of background traffic growth.

8.37 The Do Something (operational Development) scenarios constitute Do Minimum plus the completed and operational Development (i.e. all three Planning Applications), taking account of the vehicular trip generation of the Stag Brewery component of the Development as well as the existing traffic re-assignment as a result of the re-configured junction layout which forms part of the Chalkers Corner component of the Development.

8.38 It should be noted that the driver delay assessment presented in this Chapter is based on outcomes of the strategic traffic model which considers the year 2031 rather than 2027 and 2042. The strategic modelling undertaken for the development utilises TfL's SoLHAM, which is set up for the modelling year of 2031. It is considered that the different assessment year would not affect the outcomes as:

- the Development's trip generation would be the same in 2027, 2031 and 2042;

- background traffic growth is greater in 2031 compared to 2027, hence presenting a worst-case scenario compared to 2027, but a better-case scenario compared to 2042.

8.39 The highway improvement measures included within the 2031 Do Something with Highway Improvements scenario comprise highway improvements along Lower Richmond Road, Mortlake High Street, Williams Lane and Ship Lane. The highway improvements are outlined below and described in detail within the TA in **Appendix 8.1**.

Significance Criteria

8.40 The significance of the environmental effect of the Development on the above listed IEMA criteria has been determined based on the magnitude of the effect, the sensitivity of the receptor, and whether the effect is beneficial or adverse and temporary or permanent.

Magnitude of Effect

8.41 For each of the considered assessment criteria, a scale of magnitude has been identified. The magnitude of effects has been assessed against a scale divided into negligible, small, medium and large magnitude.

8.42 The assessment criteria, as well as their scale of magnitude, are described as follows.

Severance

8.43 The IEMA Guidelines states that: "*severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery.*" Further, "*Changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively*". However, the guidance acknowledges that the measurement and prediction of severance is extremely difficult. The assessment of severance pays full regard to specific local conditions, in particular the location of pedestrian routes to key local facilities and whether or not crossing facilities are provided.

8.44 Volume 11, Section 3, Part 8, Chapter 6 of the Design Manual for Roads and Bridges entitled 'Pedestrians and Others and Community Effects' provides further guidance on the aspect of New Severance within a community in terms of the 2-way Annual Average Daily Traffic flow (AADT) on a link. It states that new severance should be described in terms of "Slight", "Moderate" or "Severe" and that these categories: "… *should be coupled with an estimate of the numbers of people affected, their location and the community facilities from which they are severed.*"

8.45 The potential effects as set out later in this Chapter are based on an assessment, which takes into account the IEMA's thresholds. **Table 8.6** summarises these thresholds.

Table 8.6: Severance Thresholds (based on IEMA Guidance)

Magnitude	Definition
Large	Over 90% change in AADT flows as a result of the Development
Medium	Between 60 – 90% change in AADT flows as a result of the Development
Small	Between 30 – 60% change in AADT flows as a result of the Development
Negligible	Less than 30% change in AADT flows as a result of the Development

Driver Delay

8.46 Delay to drivers can be predicted through capacity assessments at key points on the local and strategic highway network. The addition of new development generated traffic could result in an increase in the number of vehicles using key routes and junctions. This may lead to additional delays depending on the existing operation, levels of background traffic and development generated traffic.

8.47 Assessment of junction capacity and delay is undertaken through the use of standard practice analytical tools and junction analysis programs. Driver delay is only likely to be an issue requiring consideration of mitigation (improvements) where junctions are operating beyond capacity.

8.48 **Table 8.7** below shows the magnitude-scale applied to the category 'driver delay' along road corridors for the purpose of this assessment.

Table 8.7: Driver Delay – Magnitude of Effect

Magnitude	Definition
Large	Average vehicle delay changes of more than 180 seconds per mile as a result of the Development during the peak hour periods
Medium	Average vehicle delay changes are between 120 to 180 seconds per mile as a result of the Development during the peak hour periods
Small	Average vehicle delay changes are between 60 and 120 seconds per mile as a result of the Development during the peak hour periods
Negligible	Average vehicle delay changes are less than 60 seconds per mile as a result of the Development during the peak hour periods

Pedestrian Delay

8.49 Pedestrian delays for a particular walking journey can be increased by changes to traffic flows, and can affect the ability of pedestrians to cross roads. This, therefore, will affect an individual's desire to make a particular walking journey. Changes in the volume, speed or composition of traffic are most likely to affect pedestrian delay, with the level of severity dependent on the general level of pedestrian activity and the physical condition of crossing points.

8.50 The determination of what constitutes a material impact on pedestrian delay is generally left to the judgement of the assessor and knowledge of local factors and conditions. However, the IEMA Guidelines suggest: "*a lower threshold of 10 seconds delay and an upper threshold of 40 seconds delay, for a link with no crossing facilities*". It further advises that the lower threshold equates to a two-way flow of approximately 1,400 vehicles per hour.

8.51 **Table 8.8** below shows the magnitude-scale applied to links with insufficient or no pedestrian facilities at desired lines and links subject to significant volumes of pedestrian footfall.

Table 8.8: Pedestrian Delay – Magnitude of Effect

Magnitude	Definition
Large	Link subject to a two-way traffic flow of more than 5,600 vehicles per hour
Medium	Link subject to a two-way flow of 3,500-5,600 vehicles per hour
Small	Link subject to a two-way flow of 1,400-3,500 vehicles per hour
Negligible	Link subject to a two-way flow of less than 1,400 vehicles per hour

Pedestrian and Cycle Amenity

8.52 Pedestrian and cycle amenity is broadly defined as the relative pleasantness of a journey, which is affected by traffic flow, traffic composition and pavement width / separation from traffic. This potentially significant effect is considered to be a broad assessment category which also encompasses fear, intimidation and exposure to noise and air pollution.

8.53 A tentative threshold for judging the significance of changes in pedestrian and cyclist amenity is described by the IEMA guidance as instances "*where traffic flow (or its lorry component) is halved or doubled*".

Fear and Intimidation

8.54 A further effect of traffic flows on pedestrian and cycle movements is the issue of fear and intimidation individual travellers will experience with respect to vehicular movements. The impact of this factor is dependent on the volume of traffic, the HGV content, the width of footpath and closeness of the footpath to the carriageway edge. As is the case with pedestrian delay, there are no commonly agreed thresholds for the measurement of this impact, with appraisal based on the judgement of the assessor.

8.55 The IEMA Guidelines does nevertheless suggest some thresholds, based on previous research, which could be used and these are shown in **Table 8.9**.

Table 8.9: Suggested IEMA Threshold Guidelines for Pedestrian Fear and Intimidation

Degree of Hazard	Change in Average Traffic Flow over 18 Hours day (vehicles/hour)	Average 18 Hour HGV Flow	Change in Average Speed over 18 Hours (mph)
Extreme	1800+	3000+	20+
Moderate	1200-1800	2000-3000	15-20
Slight	600-1200	1000-2000	10-15

8.56 Notwithstanding the thresholds set out above, the IEMA Guidelines suggests that they should be approached with a certain level of caution as the individual factors could be weighted by local circumstances to decide on the overall value of intimidation. For example, a road may show higher speeds but lower flows making crossing easier or high flows but congested and constant traffic, therefore reducing total fear of passing vehicles but increasing crossing difficulties.

8.57 **Table 8.10** below shows the magnitude-scale applied to the category 'fear and intimidation' for the purpose of this assessment.

Table 8.10: Fear and Intimidation – Magnitude of Effect

Magnitude	Definition
Large	Change in average traffic flow over 18 hours of 1500 + vehicles/hr as a result of the Development; An average 18-hour HGV flow of 3000 +; or Change in average speed over 18 hours of 17 + mph as a result of the Development.

Magnitude	Definition
Medium	Change in average traffic flow over 18 hours of 1200-1500 vehicles /hr as a result of the Development; An average 18-hour HGV flow of 2000-3000; or Change in average speed over 18 hours of 15-17 mph as a result of the Development.
Small	Changes in average traffic flow over 18 hours of 600-1200 vehicles/hr as a result of the Development; An average 18-hour HGV flow of 1000-2000; or Changes in average speed over 18 hours of 10-15mph as a result of the Development.
Negligible	Increase in average traffic flow over 18 hours of less than 600 vehicles/hr as a result of the Development; An average 18-hour HGV flow of less than 1000; or Increase in average speed over 18 hours of less than 10mph as a result of the Development.

Accidents and Road Safety

8.58 The assessment of accident risk and highway safety is based upon existing accident rates and specific local circumstances to identify accident clusters. For example, should a particular link or junction be found to have a high existing accident rate, the addition of substantial traffic volumes generally would be expected to have a detrimental effect on highway safety due to further increased opportunities for conflict. Mitigation measures may therefore be required.

8.59 A further assessment of highway safety may also include the comparison of accident rates at those locations identified for highway improvements, which are related to capacity issues. An assessment of expected accident rates for a new junction design compared to the existing layout will identify any future accident risk related to development traffic movements.

8.60 The IEMA Guidelines suggests that: "*Professional judgement will be needed to assess the implications of local circumstances, or factors, which may elevate or lessen risks of accidents, e.g. junction conflicts*".

8.61 **Table 8.11** below shows the magnitude scale applied to the category 'accidents and road safety' for the purpose of this assessment.

Table 8.11: Accident Risk and Road Safety – Magnitude of Effect

Magnitude	Definition
Large	Expected change in accident risk of 15 + % at the location of existing accident cluster as a result of the Development.
Medium	Expected change in accident risk of 10%-15% at the location of existing accident cluster as a result of the Development.
Small	Expected change in accident risk of 5%-10% at the location of existing accident cluster as a result of the Development.
Negligible	Expected change in accident risk of less than 5% at the location of existing accident cluster as a result of the Development.

Public Transport

8.62 As outlined above, the IEMA guidance does not identify a need to include a public transport assessment. Therefore, the magnitude of public transport effects has been based on professional judgement, the quantitative analysis of public transport trips of the Development as identified within the TA in **Appendix 8.1** and public transport service capacities.

Receptors and Receptor Sensitivity

8.63 The IEMA Guidelines identify groups and special interests which should be considered in the assessment. Categories of receptor sensitivity have been defined from the principles set out in the IEMA Guidelines and these have been used to outline in broad terms the sensitivity of receptors to traffic for the categories of effect assessed in this Chapter, although in detail, each receptor assessed has a different sensitivity to each specific effect. The sensitive receptors and their sensitivity to traffic are shown in **Table 8.12**.

Table 8.12: Sensitive Receptors to Traffic

High Sensitivity Receptors	Medium Sensitivity Receptors	Low Sensitivity Receptors
Schools, colleges and other educational institutions (Nurseries have been assumed to be included in this category).	Hospitals, surgeries and clinics.	Open space.
Retirement / care homes for the elderly or infirm.	Parks and recreation areas.	Tourist / visitor attractions.
Roads used by pedestrians with no footways.	Shopping areas.	Historical buildings.
Road safety black-spots.	Roads used by pedestrians with narrow footways.	Places of Worship.

8.64 Based on the sensitive receptors to traffic defined by the IEMA Guidelines, **Table 8.13** outlines the identified sensitivity receptors for this assessment together with their sensitivity rating and description.

8.65 It should be recognised that most of significant criteria apply to 'link' receptors, with the exception of driver delay, which is only relevant for 'junction' receptors. Therefore, 'link' receptors are assessed in terms of severance, pedestrian delay and amenity, and fear and intimidation; whilst 'junction' receptors are assessed against driver delay significance criteria. For accidents and road safety, both types of receptors are relevant, since what matters is the existence of accident clusters.

Table 8.13: Transport and Access Sensitivity Receptors

Sensitivity	Receptor	Definition
Severance / Pedestrian Delay/ Pedestrian and Cycle Amenity / Fear and Intimidation / Driver Delay		
High	Sheen Lane (north of Level Crossing).	Link comprises pedestrian crossing, access to schools.
	Sheen Lane (south of Level Crossing).	Link comprises pedestrian crossing and public transport facilities, active frontage of shops, cafes and restaurants, health centre and library.

Sensitivity	Receptor	Definition
	Sheen Lane (to the south of the South Circular Road).	Link provides access to Richmond Park and Tower House School.
Medium	A3003 Lower Richmond Road.	Link currently provides access to park and recreational areas, would provide access to proposed school on Site. Link comprises bus stops and crossing facilities.
	White Hart Lane.	Link provides access to retail and dinning outlets, as well as hospital via South Worple Way.
	South Circular Road (to the west of Sheen Lane).	Link comprises pedestrian crossing and public transport facilities, active frontage of shops, cafes and restaurants.
Low	Mortlake High Street.	Link provides access to place of worship, post office, restaurants and shops, comprises pedestrian crossing and bus stops.
	A316 Lower Richmond Road.	Link provides access to Richmond, limited active frontage, comprises bus stops.
	A316 Clifford Avenue.	Link provides access across the River Thames, limited active frontage, comprises bus stops.
	South Circular Road (to the north of the A316).	Link provides access to Kew, Royal Botanic Gardens, comprises bus stops.
	South Circular Road (to the south of the A316).	Link provides an alternative route to Richmond and provides access to the A3 and A306, both of which form part of the TLRN.
	Williams Lane.	Link provides access to residential dwellings, partially adjoined by back gardens of residential dwellings.
	The Terrace.	Link provides access to residential dwellings and Barnes Bridge station, comprises bus stops.
Accidents and Road Safety		
Medium	Chalkers Corner Junction.	Key junction on strategic network and existing accident cluster location with 11% of accidents recorded as severe.
	South Circular Road / Sheen Lane Junction.	Existing accident cluster location with 42% of accidents recorded as severe.

Evaluation of Significance

8.66 **Table 8.14** demonstrates how the proposed significance of potential effects is justified against the magnitude of effects and the sensitivity of the receptor.

Table 8.14: Transport and Access Significance Criteria

Sensitivity of Receptor	Magnitude of Effect			
	Large	Medium	Small	Negligible
High	Major	Major	Moderate	Insignificant

Sensitivity of Receptor	Magnitude of Effect			
	Large	Medium	Small	Negligible
Medium	Major	Moderate	Minor	Insignificant
Low	Moderate	Minor	Insignificant	Insignificant

Baseline Conditions

Existing Highway Network and Traffic Flows

Road Network

8.67 There are four vehicular access points to the Main Stag Brewery Site, one of which takes access off the A3003 Lower Richmond Road, one off Mortlake High Street, one off Ship Lane and one off Williams Lane.

8.68 Vehicular access to the wider Mortlake area is limited to four points of access / egress due to the impact of the River Thames and the railway line. These access / egress points are:

- the traffic light controlled junction of the A3003 Lower Richmond Road onto the A316 Clifford Road within the Chalkers Corner component of the Site. This is part of a wider signal junction, which also includes the closely associated South Circular junction. This can be regarded as the main vehicular access route into and out of the area from the east. The junction provides for all movements;
- Sheen Lane across the Mortlake Station level crossing. This in turn accesses onto the A205 Upper Richmond Road (South Circular) by way of a signal controlled junction;
- White Hart Lane across the second level crossing. This again provides access / egress to the A205 South Circular via Priests Bridge, a one-way loop road with separate priority junctions for traffic leaving and entering the South Circular. Together these junctions provide for all movements; and
- A3003 under Barnes Bridge.

8.69 The A3003 runs in an east-west direction, connecting to the A306 in Barnes in the east to the A316 in the west. It is subject to a 30 mph speed limit and is used by bus services operating through the Mortlake area.

8.70 The A306 has a north-south alignment and provides access to the South Circular Road at its junction with the A306 Roehampton Lane in the south and the A4 Great West Road in Hammersmith via Hammersmith Bridge in the north.

8.71 The A316 and A205, to the west of the Site, form part of Transport for London Road Network (TLRN). Both are subject to a 30 mph speed limit, however the speed limit along the A316, over Chiswick Bridge, increases to 40 mph. The A316 has a north-east to south-west alignment providing access to the A4, which in turn provides access to the M4 motorway, in the north-east and to the M3 motorway via Richmond in the south-west.

Baseline Traffic Flows on Highway Network Surrounding the Site

8.72 **Table 8.15** shows the baseline traffic flows for 2017, presented as Annual Average Daily Traffic (AADT) flows and its HGV percentage, for links in proximity of the Site.

Table 8.15: 2016 Baseline Traffic Flows

Link	AADT Flow	HGV Percentage
A316 Clifford Ave	29791	10.25%
A316 Lower Richmond Road	36741	5.45%
South Circular (north of A316)	14863	5.85%
South Circular (south of A316)	21164	3.75%
A3003 Lower Richmond Road (Watney's Sports Ground)	16940	8.73%
A3003 Lower Richmond Road (Mortlake Green)	17098	9.77%
Williams Lane	609	7.07%
Mortlake High Street	18049	10.94%
The Terrace (west of Barnes Bridge Station)	17223	8.68%
White Hart Lane (south of Mortlake High Street)	4825	7.90%
Sheen Lane (north of Level Crossing)	5834	3.46%
Sheen Lane (south of Level Crossing)	5559	2.48%
Sheen Lane (south of South Circular)	4817	4.19%
South Circular Road (west of Sheen Lane)	18054	8.42%

Road Safety

8.73 A detailed analysis of the personal injury collision data for the set study area surrounding the Site as outlined above, can be found in Chapter 2 of the TA (refer to **Appendix 8.1**), while the location plan and summary details of the collisions recorded during the period are appended to the TA.

8.74 In summary, no collisions that occurred in the study area were identified as having contributory factors linked to the road layout, which suggests that there are no integral highway safety issues within the study area.

8.75 The data, however, shows two locations where clustering of collisions (concentration of more than 10 collisions) occurred during the five-year period. These accident cluster locations are outlined in **Table 8.16**.

Table 8.16: Accident Cluster Locations

	Accidents over the Five-Year Period up to 31 January 2016			
Accident Cluster Location	Total Number of Accidents	Percentage of Slight Accidents	Percentage of Severe Accidents	Percentage of Fatal Accidents
Chalkers Corner junction	19	89%	11%	0%
South Circular Road / Sheen Lane Junction	12	58%	42%	0%

8.76 The detailed assessment undertaken as part of the TA has shown that none of the accidents within the cluster locations are due to the highway layout. All of the accidents recorded in these locations are due to road user errors.

Pedestrian Facilities

8.77 Footways are provided on both sides of the carriageway for the majority of roads in the surrounding area of the Site, with the exception of Ship Lane, Thames Bank, Williams Lane, The Terrace and parts of Lower Richmond Road where a footway is only present on one side of the carriageway. The majority of footways within the area are over 2 m in width and are well lit and well maintained.

8.78 Additionally, there are several footpaths through Mortlake Green, to the south of the Stag brewery component of the Site, which are approximately 2 m in width. These footpaths are well maintained and provide a connection between the A3003 Lower Richmond Road and Mortlake Station. Some lighting is provided within Mortlake Green although to a lesser standard than provided on footways adjacent to the carriageways.

8.79 The Thames path is located to the north of the Stag Brewery component of the Site adjacent to the River Thames. This link provides an unlit path along the south bank of the River Thames leading towards Kew to the west and Barnes to the east. The path consists of a mixture of unpaved and cobbled surfaces.

8.80 Several pedestrian crossings are present in the area. Two zebra crossings are located on Sheen Lane, approximately 70-100 m either side of the railway level crossing, whilst another is located on Lower Richmond Road. A further one is located on Mortlake High Street, approximately 300 m to the east of Sheen Lane. A signalised crossing is located on Lower Richmond Road in proximity to the Ship Lane junction and the northern entrance to Mortlake Green. Additional signalised crossings are located at the Chalkers Corner junction as well as the Sheen Lane / South Circular Road junction.

8.81 A Pedestrian Environment Review System (PERS) audit has been undertaken by PBA, in November 2016, in support of the planning applications for the Development. The PERS audit assesses the quality of an environment in terms of how it meets the needs of a pedestrians, in accordance with guidance set out by TfL in the PERS handbook. The PERS report, which presents the findings of the PERS audit, can be found appended to the TA, **Appendix 8.1**.

8.82 The PERS audit comprised pedestrian links to the main trip generators of the local area surrounding the Site as well as the pedestrian crossing points, public transport waiting areas and the nearby public spaces.

8.83 In summary, the PERS found:

- in total 41 links, 25 crossings, 21 public transport waiting areas and one public space were audited. The majority of these achieved ‘Green’ and ‘Amber’ scores indicating a good or acceptable standard of provision for pedestrians, respectively;
- in general, all links, crossings, public transport waiting areas and the public spaces are of a good standard. Most of the links, particularly the residential links were found to be very similar in terms of design and provision of facilities;
- one public transport waiting area scored ‘Red’ which was due to its narrow boarding points and waiting area discomfort;
- issues that have arisen throughout the audit include, the lack of crossing facilities on Lower Richmond Road and Mortlake High Street, the width of the footway in places on The Terrace, the route through the Timber Yard at Mortlake station and the quality of Barnes Bridge bus stop; and

- whilst the footway is narrow in places along The Terrace, there is still reasonable amounts of width and the Thames Path provides an alternative route on the northern side of The Terrace.

8.84 The following suggestions have been made as part of the PERS findings:

- to improve the route across the timber yard at Mortlake station, it is suggested to increase signage on the approach to make pedestrians more aware of moving vehicles; and
- several new crossing points have been suggested in order to combat the lack of permeability across Lower Richmond Road and Mortlake High Street.

Cycle Facilities

8.85 In terms of strategic access there is an existing cycle route along the A316 providing an important link between the Site and Richmond town centre to the south west and towards Hammersmith in the north east. This comprises of a mix of shared footway facility, for example across Chiswick Bridge, and segregated off road facility, to the west of the South Circular Road.

8.86 Within the immediate vicinity of the Site the provision of formal cycle facilities comprises:

- an advisory route along Mortlake High Street from the east of the Site towards Barnes Bridge;
- a further advisory route along North Worple Way, along the north side of the railway line, providing a connection to Mortlake Station from the east;
- a signed on street route connecting the cycle facilities on Chiswick Bridge with the A3003 Lower Richmond Road; and
- a further signed on street route providing access to the station from the south west.

Existing Public Transport Network

Public Transport Accessibility Level

8.87 The Public Transport Accessibility Level (PTAL) is a measure of the accessibility of a specified point to the public transport network, taking into account walk access times and service availability. The method is essentially a way of measuring the density of the public transport network at a particular point. A PTAL can range from 1a to 6b, where a score of 1 indicates a “very poor” and score of 6 an “excellent” level of accessibility.

8.88 The Site at present has a PTAL rating of predominantly 2 with a PTAL rating of 1 at the western corner of the Stag Brewery component of the Site, which represents a ‘poor’ and ‘very poor’ level of accessibility to public transport services, respectively. However, PTAL does tend to underestimate the accessibility of the Site by public transport since the nearby Mortlake Rail station provides access to the wider strategic public transport network serving London and the South East Region. It should be noted that TfL has acknowledged a PTAL rating of 2 for the Stag Brewery component of the Site.

National Rail

8.89 The closest National Rail station to the Site is Mortlake, which is situated approximately 400 m (5 minutes) to the south of the Stag Brewery component of the Site. The station is served by South West Trains services between London Waterloo and Twickenham, continuing either via Hounslow and Chiswick on the Hounslow Loop or Kingston and Wimbledon on the Kingston Loop, back to Waterloo.

8.90 **Table 8.17** shows the peak hour rail service frequencies of services departing Mortlake station.

Table 8.17: Rail Services Peak Hour Frequencies

	Service Frequency (Services per Hour)	
Direction (towards)	**AM Peak Hour**	**PM Peak Hour**
Waterloo (Fast)	4	4
Waterloo (via Hounslow)	2	2
Waterloo (via Kingston)	2	2
Total	8	8

8.91 **Table 8.18** shows the journey times from Mortlake Station to selected destinations.

Table 8.18: Journey Times from Mortlake Rail Station

Direction	Destination	Journey Time (minutes)
Eastbound	Barnes	3
	Wandsworth Town	9
	Clapham Junction	11
	Vauxhall	18
	Waterloo	28
Westbound	North Sheen	2
	Richmond	4
	St Margarets	7
	Twickenham	9
	Strawberry Hill	13
	Teddington	17
	Hampton Wick	22
	Kingston upon Thames	24
	Hounslow	21

8.92 Mortlake station is served by the new South Western Railway franchise. By 2020, there will be line upgrades to allow 4 extra trains per hour on the “Windsor Lines”, however, none of these will be via Richmond as this section of track is physically constrained by several level crossings. Whilst the number of trains calling at Mortlake will not change the passenger capacity on the line will be increased through the provision of longer trains increasing from 8 to 10 cars. Further capacity increases will occur from 2020 through the provision of a new homogeneous fleet of rolling stock that will serve all stations on the Windsor Lines. The new rolling stock have increased loading capacity and will increase the current peak hour capacity of around 8,624 (3,304 seats) to around 11,800 (4,547 seats). The actual increase will depend on the final seat configuration which is yet to be announced.

8.93 It is not foreseen that there will be any investment to increase line capacity via Richmond (as opposed to train or station capacities) until at least the 2030s. At this point there is potential that either Crossrail 2 or the Heathrow Southern Railway will be constructed -both of which will have different direct and indirect impacts on the Windsor Lines capacity.

London Underground and Overground

8.94 The closest London Underground station to the Site is Richmond, which lies approximately 2.6 km to the south-west of the Site and can be accessed via a 34-minute walk, 10-minute cycle ride, 12-minute bus ride on bus route 419, or 9-minute train ride from Mortlake Station.

8.95 Richmond Station provides access to District line services. A total of 7 District line services depart from Richmond in the morning peak hour and 6 in the evening peak hour.

8.96 **Table 8.19** shows journey times into Central London from Richmond via District Line services.

Table 8.19: District Line Journey Times by Selected Destinations

Destination	Time (minutes)
Hammersmith	00:17
Earl's Court	00:24
Paddington	00:35
Edgware Road	00:38
Victoria	00:34
Westminster	00:38
Embankment	00:40
Blackfriars	00:44

8.97 Richmond station, furthermore, provides access to London Overground services between Richmond and Stratford. A total of 4 services depart from Richmond in the morning and 4 in the evening peak hour.

Local Bus Services

8.98 The closest bus stops to the Site are situated to the south of the Site along Lower Richmond Road to the east (Stop Z) and west of Ship Lane (Stop N).

8.99 **Table 8.20** shows the bus routes available within an 850 m walking distance of the Site. It should be noted, however, that TfL recommends a maximum walking distance of 640 m to bus stops.

Table 8.20: Bus Routes and Peak Hour Frequencies

Bus Route No.	Route (towards)	Nearest Bus Stop to Site	Location of Bus Stop	Approx. Walking Distance to Centre of Site	Approximate Frequency (Services per Hour)	
					AM Peak Hour	PM Peak Hour
419	George Street (Richmond)	Ship Lane Stag Brewery (Stop Z)	Lower Richmond Road	160 m (2 mins)	4	4
	Hammersmith Bus Station	Ship Lane Stag Brewery (Stop N)		170 m (2 mins)	4	4
190	George Street (Richmond)	Thames Bank (Stop R)	Clifford Avenue	450 m (6 mins)	3	4

Bus Route No.	Route (towards)	Nearest Bus Stop to Site	Location of Bus Stop	Approx. Walking Distance to Centre of Site	Approximate Frequency (Services per Hour)	
					AM Peak Hour	PM Peak Hour
	Empress State Building / W Brompton Station	Thames Bank (Stop J)		400 m (5 mins)	4	4
209*	Hammersmith Bus Station	Avondale Road Mortlake (Stop S)	Mortlake High Street	850 m (11 mins)	14	14

**route starts / finishes in Mortlake.*

Likely Significant Effects

The Works

Construction Trip Generation during Peak Construction Traffic Period

8.100 The vehicle trip generation assessment relating to the Works considers the busiest year of construction activities in terms of vehicle movements. Based on the current construction programme, it is anticipated that the busiest year of construction vehicle movements will be 2022. During this period, it is forecast that 82 one-way vehicle trips would access the Site per day, of which 57 one-way trips are likely to be undertaken by Heavy Goods Vehicles (HGVs) and 25 one-way trips by Light Goods Vehicles (LGVs).

8.101 It is currently proposed that no parking would be provided on Site for the construction workforce. It is anticipated that construction staff would access the Site via public transport. Therefore, it is considered that construction staff would generate a negligible amount of vehicle trips along the local highway network.

Construction Site Access and Assumed Routes

8.102 During the peak construction period, access to the Site for construction vehicles would be taken via two access points off Lower Richmond Road via Ship Lane, and Mortlake High Street, adjacent to Bulls Alley.

8.103 Although the final construction vehicle routes will be agreed and confirmed as part of the final Construction Logistics Plan (CLP) post submission of the planning application and once a contractor has been appointed, for the purposes of this assessment it has been assumed that all construction HGVs would access the Site from the west via Chalkers Corner – Lower Richmond Road. As access from the east is constrained by 17 and 18 tonne weight restrictions along The Terrace, it has been assumed that only LGV trips would access the Site from the east.

8.104 **Table 8.21** shows the assumed distribution of construction vehicle trips by assumed vehicle type and **Table 8.22** shows the vehicle trips distributed along the highway network.

Table 8.21: Assumed Construction Traffic by Direction and Vehicle Type

Total One-Way Daily Construction Trips during Peak Construction Traffic Period (2021)	One-Way Trips by Assumed Vehicle Type		Assumed Construction Traffic Distribution by Direction and Vehicle Type		
			From the West		From the East
	HGV	LGV	HGV	LGV	LGV
82	57	25	57	8	17

Table 8.22: Assumed Construction Traffic by Link

Link	Daily Two-Way Constriction Trips during Peak Construction Traffic Period (2021)
A316 Clifford Ave	52
A316 Lower Richmond Road	33
South Circular (north of A316)	13
South Circular (south of A316)	33
A3003 Lower Richmond Road (Watney's Sports Ground)	130
Mortlake High Street	34
The Terrace (west of Barnes Bridge Station)	34
South Circular Road (west of Sheen Lane)	33

8.105 Further and more detailed information regarding the construction of the Development can be found within **Chapter 6: Development Programme, Demolition, Alteration, Refurbishment and Construction** and within the Framework Construction Management Statement provided / submitted to support the Planning Applications.

8.106 Consideration was given, by the Applicant, to the use of the River Thames for removal of demolition and excavation waste and the delivery of construction materials. However, this was discounted for the reasons outlined in **Chapter 4: Alternatives and Design Evolution** and therefore, the assessment of the effects of the Works does not include the use of the River Thames, which from a ES transport assessment point of view represents a worst case assessment as no discount in vehicle trips has been taken account of.

Effects Assessment

Severance

8.107 **Table 8.23** shows the percentage increase in average daily traffic flows on links in proximity of the Site. It compares traffic flows of the 2022 future baseline plus the Works (Do Something) scenario with the 2022 future baseline (Do Minimum) scenario.

Table 8.23: Peak Construction of Development – Severance Assessment

Link	Increase in Daily Traffic Flows in 2022 as a result of Traffic associated with the Works
A316 Clifford Ave	0.2%
A316 Lower Richmond Road	0.1%

Link	Increase in Daily Traffic Flows in 2022 as a result of Traffic associated with the Works
South Circular (north of A316)	0.1%
South Circular (south of A316)	0.1%
A3003 Lower Richmond Road (Watney's Sports Ground)	0.7%
Mortlake High Street	0.2%
The Terrace (west of Barnes Bridge Station)	0.2%
South Circular Road (west of Sheen Lane)	0.2%

8.108 The assessment has shown that the largest increase in daily traffic flows as a result of the Works would occur along Lower Richmond Road. It is forecast that traffic along this link would temporarily increase by less than 1%, which falls well below the IEMA Guideline threshold of a 30% increase that would produce a slight change in severance. Therefore, the addition of construction traffic will not result in a significant increase in severance along this link.

8.109 As a result, it is considered that the Works would not contribute to any significant increase in severance, thus is deemed to have an **insignificant** effect in relation to pedestrian and cycle severance on links in the proximity to the Site.

Driver Delay

8.110 HGV movements associated with the Works would be spread over the working day and would generally be timed to avoid busy periods on the local and strategic highway network surrounding the Site.

8.111 Therefore, it is not expected that the Works related vehicle movements would result in any significant increase in driver delay during peak hours. Thus, it is considered that the Works would cause an **insignificant** effect in relation to driver delay on links in the proximity to the Site.

Pedestrian Delay

8.112 As outlined within the methodology section of this Chapter, pedestrian delay is related to traffic flows, which influence the ability of pedestrians to cross individual links.

8.113 The assessment of pedestrian delay on links that form part of the assumed construction routes has shown that no assessed link would be subject to a significant increase in pedestrian delay as a result of the additional traffic movements associated with the Works.

8.114 Furthermore, it needs to be recognised that since all links that form part of the assumed construction routes to and from the Site provide pedestrian crossing facilities, pedestrians journey times would not be affected by a change in traffic volumes as these crossing facilities provide convenient opportunities for pedestrians to cross links.

8.115 As outlined above, a PERS audit has been undertaken in the surrounding area of the Site. As part of the PERS audit, crossing points on links that form part of the assumed construction routes have been assessed, all of which were found to be of a good standard, achieving a ‘Green’ rating.

8.116 Therefore, it is considered that the Works would cause an **insignificant** effect on pedestrian delay along links that form part of the assumed construction routes.

Pedestrian and Cycle Amenity

8.117 Pedestrian and cycle amenity, as outlined above, is affected by factors including traffic flow, traffic composition and pavement width / separation from traffic. A tentative threshold for judging the significance of changes in pedestrian and cyclist amenity is described by the IEMA guidance as instances *"where traffic flow (or its lorry component) is halved or doubled"*.

8.118 The additional traffic generated by the Works would not result in a doubling of traffic flows along any link assumed to be part of the construction routes. As a result, it is considered that the Works would result in an **insignificant** effect on pedestrian and cycle amenity.

Fear and Intimidation

8.119 As outlined above, an increase in the proportion of HGV movements can cause adverse effects on pedestrian fear and intimidation. The suggested IEMA threshold guidance for pedestrian fear and intimidation, as shown in **Table 8.9**, suggests a small adverse effect if average 18-hour HGV flows are in the region of 1,000 to 2,000.

8.120 The Works of the Development are forecast to generate approximately 114 two-way HGV trips per day in the peak construction period.

8.121 **Table 8.24** shows 18-hour two-way HGV flows for the 2022 Do Minimum and Do Something scenarios.

Table 8.24: Fear and Intimidation Assessment – 2022 Do Minimum and Do Something

Link on Assumed Construction HGV Route	18-Hour 2-Way HGV Flow			18-Hour 2-Way Traffic Flow per Hour		
	2022 Do Minimum	2022 Do Something	Change	2022 Do Minimum	2022 Do Something	Change
A316 Clifford Ave	3535	3581	46	1955	1958	3
A316 Lower Richmond Road	2314	2342	29	2143	2145	2
South Circular (north of A316)	1005	1016	11	867	868	1
South Circular (south of A316)	918	947	29	1234	1236	2
A3003 Lower Richmond Road (Watney's Sports Ground)	1739	1853	114	1080	1087	7
Mortlake High Street	2228	2227	0	1148	1150	2
The Terrace (west of Barnes Bridge Station)	1774	1774	0	1102	1104	2
South Circular Road (west of Sheen Lane)	1891	1919	29	1215	1217	2

8.122 As can be seen, the 18-hour HGV flow on Clifford Avenue in the 2022 future baseline without Development (Do Minimum) scenario is likely to be in excess of 3000, which would result in a

moderate effect on pedestrian fear and intimidation. The 18-hour HGV flow on Lower Richmond Road in the 2022 future baseline without Development (Do Minimum) scenario is likely to be less than 2000, which would result minor adverse effect on pedestrian fear and intimidation. These effects are a result of the forecast future traffic growth within the area and are not a result of the additional traffic generated by the Works.

8.123 The additional HGV movements associated with the Works of the Development are not considered to change pedestrian fear and intimidation compared to the 2022 Do Minimum scenario.

8.124 Apart from a change in the proportion of HGVs, increased fear and intimidation can also be caused by an increase in average traffic flows over 18 hours per day of 600 and more vehicles per hour. The assessment of fear and intimidation considering all traffic over 18 hours has shown that no link that forms part of the assumed construction route would experience an increase in traffic of more than 7 vehicles per hour (Lower Richmond Road) as a result of the Works associated with the Development.

8.125 As outlined above, pedestrian fear and intimidation can furthermore be influenced by vehicle speeds. However, it is considered unlikely that the Works associated with the Development would result in a change in vehicle speeds compared to the 2022 Do Minimum scenario.

8.126 Given the above, it is considered that the Works would result in an **insignificant** effect on pedestrian fear and intimidation.

Accidents and Road Safety

8.127 As outlined above, continued growth in traffic volumes is expected to increase the likelihood of a proportional rise in accident risk. This is especially true for locations where there are existing highway safety issues.

8.128 The accident data analysis, the findings of which are summarised in **Table 8.16** above, has identified two junctions where more than 10 collisions were recorded during the five-year period up to 31 January 2016 within the study area. The analysis has shown that the Chalkers Corner junction was subject to a total of 19 accidents and the Sheen Lane / Upper Richmond Road West (South Circular Road) junction was subject to a total of 12 accidents over the five-year period.

8.129 Nonetheless the Works associated with the Development will result in an extremely slight increase in accident risk at the existing accident cluster locations. As can be seen in **Table 8.25**, the increase will be significantly less than 1%.

Table 8.25: Increase in Accident Risk during Peak Works Phase

Junction / Link	Number of Accidents		Increase in Accident Risk DM – DS 2022
	2022 Do Minimum (DM)	2022 Do Something (DS)	
Chalkers Corner junction	20	20	0.2%
South Circular Road / Sheen Lane Junction	13	13	0.1%

8.130 The Works associated with the Development are therefore considered to cause no significant increase in accident risk. Thus, it is considered that the Works would have an **insignificant** effect on accident risk at existing accident cluster locations.

Public Transport

8.131 There will be an increased number of contractors in the local area who will use the public transport network. However, construction workers:

- generally start early and leave early resulting in the majority of the contractors travelling outside the morning and evening peak hour periods;
- public transport trips would be split between rail and bus services available in proximity of the Site; and
- arrivals in and departures from the local area around the Site would be counter-directional to the majority of existing residential public transport trips.

8.132 Furthermore, the use of the existing bus stops in the vicinity of the Site will be maintained at all times.

8.133 Therefore, it is considered that the magnitude of effects on the capacity of existing bus and rail services during the peak hours would be negligible. Thus, it is considered that the Works would result in an **insignificant** effect on public transport services available in the local area of the Site during the peak hours.

Completed Development

Transport-Related Development Proposals - Stag Brewery component of the Site

8.134 The strategy for movement across and through the Stag Brewery component of the Site revolves around reducing the number of vehicle trips required at ground floor level and to prioritise walking and cycling to, from and within the Development. Vehicular movement across the Stag Brewery component of the Site would mainly take place in the basement car parks. These are accessible via ramps from Mortlake High Street and Ship Lane. By keeping vehicular movements below ground it increases the area available for pedestrians and cyclists and reduces potential conflicts between these modes and motorised traffic.

8.135 The number of car parking spaces proposed aims to achieve a balance between over provision of spaces and therefore attracting more vehicles than necessary to the Development and providing too little and thus causing a negative impact on existing parking conditions within the local area around the Site.

8.136 The only provision of parking at ground floor level is proposed to be 24 spaces for the proposed town houses on the north-western part of the Stag Brewery component of the Site and 15 spaces for the proposed six-form entry secondary school. An agreement for a lower residential parking ratio of approximately 0.7 spaces per residential unit has been agreed with TfL officers during pre-application discussions as an appropriate level of parking based on similar sites.

8.137 It is proposed to provide car parking spaces on Stag Brewery component of the Site as outlined in **Table 8.26**.

Table 8.26: Proposed Car Parking Provision on the Stag Brewery component of the Site

Parking Area	Residential Spaces	Non-Residential Spaces
At Grade – on Ship Lane	-	5
At Grade – Residential Houses	24	-

Parking Area	Residential Spaces	Non-Residential Spaces
At Grade - School	-	15*
Eastern Basement	331	77
Western Basement	148	108
Sub-Total	503	205
Total	**708**	

**As requested by LBRuT*

8.138 Regarding at grade parking, the Stag Brewery component of the Development would provide new car club spaces, with three potential spaces identified on Ship Lane. The amount of Electric Vehicle Charging Points on the Stag Brewery component of the Site, both active and passive, is still to be agreed but would as a minimum be provided in accordance with London Plan standards.

8.139 The Development is envisaged to focus on pedestrian and cycle accessibility. The Development would comprise numerous access points for pedestrians and cyclists. Throughout the Development, particularly in the western section, there are shared spaces where pedestrians and cycles can move around without the presence of traffic. Cycle routes would connect the Site to the existing cycle network with the primary route through the Site formed by the Green Link, which would link Mortlake Green with the Thames Path.

8.140 Cycle parking for the Site would be provided in both the underground car parks and at street level in accordance with the London Cycling Design Standards. The underground cycle storage facilities are to provide for long stay parking for residents of the Site, whilst more short stay spaces would be provided at street level to cater for employees and visitors using the non-residential facilities on Site. Provision is also made for non-standard bikes in accordance with the standards. The level of cycle parking is to be provided in line with the London Plan.

Transport-Related Development Proposals – Chalkers Corner component of the Site

8.141 The Chalkers Corner junction to the west of the Stag Brewery component of Site has been identified for improvements in order to both alleviate the transport and traffic implications associated with the operation of the Development within the Stag Brewery component of the Site and to improve the pedestrian and cycle environment. The details of the Chalkers Corner improvements are outlined in **Chapter 5: The Proposed Development** and in the TA, **Appendix 8.1**, and summarised below:

- Junction of A205 South Circular Road / A316 Clifford Avenue / A3003 Lower Richmond Road and A306 Lower Richmond Road (Chalkers Corner)
  - The Chalkers Corner proposals are designed in order to provide a balanced scheme to enhance facilities for pedestrians and cycles as well as improving capacity in order to facilitate the additional demand of the Development without worsening the existing highway access to Mortlake.

Trip Generation from the Completed and Operational Development

8.142 It is forecast that the operational Development will generate 2,892 two-way vehicle trips per day, of which 122 two-way trips are likely to be undertaken by HGVs. These HGV trips are associated with deliveries and servicing of the Development. As outlined above, it should be noted that the vehicular trip generation forecast is not based on the final development schedule.

8.143 Appropriate transport modelling tools have been used to assess the transport implications of the Development, impacts associated with the trip generation of the Development within the Stag Brewery component of the Site and the highway layout changes of the Development proposed within the Chalkers Corner component of the Site. The following models have been utilised for the assessment:

- The SoLHAM has been utilised to assess the effects arising from the Development over a wide area, including all arms of Chalkers Corner and the South Circular Road up to its junction with White Hart Lane to the south east of the Site. SolHAM is TfL's strategic Saturn highway model covering the south east of London and provides a means for assessing the impacts arising from a development on traffic flows and journey times across the wider network covered by the model. It is therefore able to assess the likely changes in vehicle routing that may occur as a result of infrastructure improvements as well as the effects of new development traffic;
- Detailed junction capacity models, LinSig junction models for traffic signals and ARCADY and PICADY (Junctions 8) models for uncontrolled junctions (roundabouts and priority junctions, respectively), have been developed to assess the Development effects on junctions of the local road network. The coverage of these local assessments has been agreed with both LBRuT and TfL, and comprises the following:
  - Chalkers Corner signalised junction;
  - Upper Richmond Road / South Circular Road signalised junction;
  - Upper Richmond Road / Sheen Lane signalised junction;
  - Sheen Lane / Mortlake High Street / Lower Richmond Road roundabout;
  - Lower Richmond Road / Site internal school access road junction;
  - Lower Richmond Road / Ship Lane junction; and
  - Mortlake High Street / Site internal car park access junction.

8.144 In addition, a local VISSIM model was developed for the AM and PM peak hours to better understand the effects of the Development on the local network along Lower Richmond Road, Sheen Lane and Mortlake High Street, including interactions with the nearby railway level crossing and proposed new pedestrian crossings.

8.145 Further details of this local modelling are provided within Chapter 6 of the TA in **Appendix 8.1**.

Operational Traffic Flows on the Surrounding Highway Network

8.146 The existing traffic distribution along the strategic and local highway network in the surrounding area of the Site has been derived from the SoLHAM. This distribution has been used to distribute the Development trips around the highway network. The resultant vehicle trips by road are shown in the **Table 8.27**.

Table 8.27: Vehicular Development Traffic on Assessed Links

Link	Daily Two-Way Development Trips
A316 Clifford Ave	498
A316 Lower Richmond Road	591
South Circular (north of A316)	240
South Circular (south of A316)	96
A3003 Lower Richmond Road (Watney's Sports Ground)	1426

Link	Daily Two-Way Development Trips
A3003 Lower Richmond Road (Mortlake Green)	1466
Williams Lane	709
Mortlake High Street	1011
The Terrace (west of Barnes Bridge Station)	871
White Hart Lane (south of Mortlake High Street)	140
Sheen Lane (north of Level Crossing)	455
Sheen Lane (south of Level Crossing)	455
Sheen Lane (south of South Circular)	277
South Circular Road (west of Sheen Lane)	0

Effects Assessment

Severance

8.147 **Table 8.28** shows the percentage increase in average daily traffic flows on links in proximity of the Site. It compares traffic flows of the 2027 and 2042 future baseline plus Development (Do Something) scenarios with the 2027 and 2042 future baseline (Do Minimum) scenarios.

Table 8.28: Operational Development – Severance Assessment

Link	Increase in Daily Traffic Flows in 2027 as a result of Development Traffic	Increase in Daily Traffic Flows in 2042 as a result of Development Traffic
A316 Clifford Ave	1.5%	1.4%
A316 Lower Richmond Road	1.4%	1.3%
South Circular (north of A316)	1.4%	1.3%
South Circular (south of A316)	0.4%	0.4%
A3003 Lower Richmond Road (Watney's Sports Ground)	7.6%	7.0%
A3003 Lower Richmond Road (Mortlake Green)	7.7%	7.2%
Williams Lane	105.2%	97.4%
Mortlake High Street	5.1%	4.7%
The Terrace (west of Barnes Bridge Station)	4.6%	4.2%
White Hart Lane (south of Mortlake High Street)	2.6%	2.4%
Sheen Lane (north of Level Crossing)	7.0%	6.5%
Sheen Lane (south of Level Crossing)	7.3%	6.8%
Sheen Lane (south of South Circular)	5.1%	4.8%

8.148 As can be seen, the largest increase in daily traffic flows as a result of the Development would occur along Williams Lane. It is forecast that traffic flows on Williams Lane would increase by 105.2% in 2027 and by 97.4% in 2042.

8.149 It should be noted that baseline traffic flows on Williams Lane are very low and thus even a small increase in vehicle trips on Williams Lane presents a large percentage change. In real terms, the traffic flow on Williams Lane is forecast to increase from 674 (future baseline) to 1383 (future baseline plus Development traffic) vehicles per day in 2027 and from 728 (future baseline) to 1437 (future baseline plus Development) vehicles per day in 2042. The traffic flows for the future baseline plus Development traffic scenario in 2027 and 2042 equates to less than 1 vehicle per minute and 1 vehicle per minute, respectively. This is considered to be a low volume of traffic when compared to all other assessed links and thus it is considered that the traffic flows on Williams Lane in 2027 and 2042 with the Development in place would not cause any significant severance effects on pedestrians.

8.150 The remaining assessed links are forecast to be subject to traffic flow increases of less than 8% in both 2027 and 2042 as a result of the Development when compared to the 2027 and 2042 future baseline scenarios. As shown in the methodology section above, an increase of less than 30% is considered a negligible magnitude, according to IEMA guidance. Therefore, the operational Development is deemed to have an **insignificant** effect on severance in 2027 and 2042.

Driver Delay

8.151 Delay to drivers can be predicted through capacity assessments at key points on the local highway network. The TA (**Appendix 8.1**) includes detailed junction capacity assessments results for junctions along the local and strategic highway network surrounding the Site.

8.152 The local and strategic highway network surrounding the Site is subject to congestion at peak times, including the weekday mornings (08:00-09:00) and evenings (17:00-18:00). The TA has considered in detail driver delay and congestion during both the peak hour periods, since these are the periods when the combined effect of existing traffic and additional traffic generated by the Development has the greatest impacts.

8.153 The finding of capacity assessments, presented in detail within the TA, include the identification of changes to driver delays during the peak hours, expressed in terms of maximum delay in seconds per vehicle along key routes.

8.154 **Table 8.29** and **Table 8.30** show the change in driver delay times between Do Minimum and Do Something scenarios for the morning and evening peak hour, respectively.

8.155 It should be noted, that the journey times presented are not based on the final development schedule. The trip generation used as part of the strategic modelling potentially underestimates development trips by 14 two-way vehicle trips in the morning peak hour and 9 two-way vehicle trips in the evening peak hour, which equates to approximately 1 two-way trip every 4 minutes and 1 two-way trip every 7 minutes, respectively. An increase of this magnitude is considered unlikely to change the outcomes of the assessment undertaken. However, as part of the TA, local junction modelling has been repeated taking account of the increase peak hour trip generation resulting from the worst case in terms of vehicle trip generation associated with the flexible use of residential and assisted living units.

Table 8.29: Operational Development – Driver Delay Assessment (AM Peak Hour)

Route Number	Route Description	Direction	Journey Length (miles)	Change in Driver Delay (Do Something – Do Minimum) (Seconds / vehicle mile)
1a	Chalkers Corner -Sheen Lane/South Circular Road junction	EB	0.8	49
1b		WB		-71
2a	Chalkers Corner – White Hart Lane/The Terrace roundabout	EB	0.9	18
2b		WB		-272
3a	Chalkers Corner – A316 Lower Mortlake Road/A307 Kew Road junction	EB	1.0	16
3b		WB		0
4a	Chalkers Corner – Staveley Road	NB	1.5	0
4b		SB		101

Table 8.30: Operational Development – Driver Delay Assessment (PM Peak Hour)

Route Number	Route Description	Direction	Journey Length (miles)	Change in Driver Delay (Do Something – Do Minimum) (Seconds / vehicle mile)
1a	Chalkers Corner -Sheen Lane/South Circular Road junction	EB	0.8	20
1b		WB		-77
2a	Chalkers Corner – White Hart Lane/The Terrace roundabout	EB	0.9	11
2b		WB		-81
3a	Chalkers Corner – A316 Lower Mortlake Road/A307 Kew Road junction	EB	1.0	5
3b		WB		0
4a	Chalkers Corner – Staveley Road	NB	1.5	-1
4b		SB		25

8.156 **Table 8.29** shows that in the morning peak hour driver delay would decrease in the Do Something scenario compared to the Do Minimum scenario along Routes 1b and 2b. These decreases would result in a **long-term, local, beneficial** effect of **minor to moderate significance** on Route 1b and a **long-term, local, beneficial** effect of **moderate to major significance** on Route 2b.

8.157 All remaining Routes presented in **Table 8.29** would be subject to an **insignificant** effect on driver delay during the morning peak hour.

8.158 **Table 8.30** shows that in the evening peak hour driver delay would decrease in the Do Something scenario compared to the Do Minimum scenario along Routes 1b and 2b. These decreases would result in a **long-term, local, beneficial** effect of **minor to moderate significance** on Route 1b and a **long-term, local, beneficial** effect of **insignificant to minor significance** on Route 2b.

8.159 All remaining Routes presented in **Table 8.30** would be subject to an **insignificant** effect on driver delay during the evening peak hour.

8.160 It should be recognised that the Chalkers Corner junction would work considerably better in the future with the Development in place compared to the existing and future scenarios with no Development (including no Chalkers Corner works).

Pedestrian Delay

8.161 As outlined within the methodology section of this Chapter, pedestrian delay is related to traffic flows, which influence the ability of pedestrians to cross individual links.

8.162 Since all, but one, assessed links provide numerous pedestrian crossing facilities, pedestrians journey times would not be affected by a change in traffic volumes. It should be noted that on White Hart Lane, crossing facilities are only provided at either end of the link. Furthermore, Mortlake High Street and Lower Richmond Road have been identified as links that would benefit from additional crossing facilities, which are proposed as part of the mitigation strategy for this Development. The mitigation measures are outlined below.

8.163 As outlined above, a PERS audit has been undertaken in the surrounding area of the Site. As part of the PERS audit, a total of 25 crossing points have been assessed, all of which were found to be of a good standard, achieving a 'Green' rating.

8.164 The location of the crossing points that were assessed as part of the PERS audit are shown on **Figure 8.1**.

8.165 These crossing facilities provide convenient opportunities for pedestrians to cross links in proximity of the Site without being delayed by increases in traffic volumes. As such, the Development is deemed to have an **insignificant** effect on pedestrian delays in 2027 and 2042.

Pedestrian and Cycle Amenity

8.166 Pedestrian and cycle amenity, as outlined above, is affected by factors including traffic flow, traffic composition and pavement width / separation from traffic. A tentative threshold for judging the significance of changes in pedestrian and cyclist amenity is described by the IEMA guidance as instances "*where traffic flow (or its lorry component) is halved or doubled"*.

8.167 The only link that is likely to be subject to an approximate doubling in traffic flows as a result of the operational Development is Williams Lane. As outlined above, it should be noted that baseline traffic flows on Williams Lane are very low and thus even a small increase in vehicle trips on Williams Lane presents a large change. It is forecast that two-way daily traffic flows on Williams Lane are likely to be in the region of 1,400 once the Development is operational. This volume of traffic is considered to be low and within a safe cycling quantity. Although based on traffic flows, when strictly following the IEMA guidance, there would be a long-term, local, adverse effect of minor to moderate significance on cycle amenity along Williams Lane, it is considered that the operation of the Development would cause an **insignificant** effect cycle amenity along Williams Lane given the low traffic volumes along this link.

8.168 Williams Lane, which has been included in the PERS audit undertaken for the Development, achieved an overall 'Green' score, indicating a good provision for pedestrians. The current provision comprises a footway on the western side of the carriageway only. As part of the Development, a footway will be added to the eastern side of the carriageway. This footway is proposed to be 2 meters in width.

8.169 Given the above, it is considered that the increase in traffic flows on Williams Lane will have an **insignificant** effect on pedestrian amenity.

Fear and Intimidation

8.170 As outlined above, an increase in the proportion of HGV movements can cause adverse effects on pedestrian fear and intimidation. The suggested threshold guidance for pedestrian fear and intimidation, as shown in **Table 8.9**, proposes a small adverse effect if average 18-hour HGV flows are in the region of 1,000 to 2,000. It is anticipated that the only HGV movements associated with the operation of the Development will be delivery and servicing trips. The number of servicing trips to and from the Site will be considerably less (61 one-way trips per day) than the suggested threshold shown in **Table 8.9**. As a result, it is anticipated that the operational Development's HGV trip generation would result an **insignificant** effect on pedestrian fear and intimidation in 2027 and 2042 as a result of the traffic composition.

8.171 Apart from a change in the proportion of HGVs, increased fear and intimidation can also be caused by a rise in average speeds over 18 hours. The operation of the Development is considered unlikely to alter the current traffic speed levels on the local road network surrounding the Site. As such, the operation of the Development is anticipated to result in an **insignificant** effect on fear and intimidation of pedestrians as a result of changes in traffic speeds.

8.172 Furthermore, an increase in average traffic flows over 18 hours per day of 600 and more vehicles per hour, as shown in **Table 8.9**, has the potential to raise fear and intimidation levels amongst pedestrians, according to IEMA guidelines. The assessment of fear and intimidation, considering all traffic over 18 hours, has shown that no link will experience an increase in traffic of more than 81 vehicles per hour (Lower Richmond Road adjacent to Mortlake Green) in both 2027 and 2042 as a result of the completed Development. Therefore, it is considered that the operational Development would result an **insignificant** effect on pedestrian fear and intimidation.

Accidents and Road Safety

8.173 As outlined above, continued growth in traffic volumes is expected to increase the likelihood of a proportional rise in accident risk. This is especially true for locations where there are existing highway safety issues.

8.174 The accident data analysis, as presented in **Table 8.16**, has identified two locations where more than 10 accidents were recorded over the five-year period within the study area. The analysis has shown that the two junctions (Chalkers Corner and South Circular Road / Sheen Lane junctions) were subject to 10 or more accidents over the five-year period up to 31st January 2016.

8.175 The completed Development will result in a slight increase in accident risk at the accident cluster locations. However, as can be seen in **Table 8.31**, the increase will be less than 3%. In addition, the development proposals for the Chalkers Corner component of the Site will improve crossing facilities for both pedestrians and cycles and help to improve cycle access and safety through the junction.

Table 8.31: Increase in Accident Risk during Operational Phase

Junction / Link	Number of Accidents		Increase in Accident Risk DM – DS 2027	Number of Accidents		Increase in Accident Risk DM – DS 2042
	2027 Do Minimum (DM)	2027 Do Something (DS)		2042 Do Minimum	2042 Do Something	
Chalkers Corner junction	21	21	2.1%	23	23	2.0%
South Circular Road / Sheen Lane Junction	13	13	1.5%	14	14	1.4%

8.176 The completed Development is therefore considered to cause no significant increase in accident risk. Thus, it is considered that the operational Development would have an **insignificant** effect on accident risk at existing accident cluster locations.

Public Transport

8.177 As outlined above, a multi-modal trip generation assessment has been undertaken as part of the TA in **Appendix 8.1** as well as public transport impact assessments.

8.178 **Table 8.32** shows the forecast peak hour public transport trips of the operational Development.

Table 8.32: Operational Development – Public Transport Peak Hour Trips

Mode of Transport	AM Peak Hour			PM Peak Hour		
	Arr	Dep	2-Way	Arr	Dep	2-Way
Bus	571	113	684	106	152	258
Rail	44	46	90	80	102	182
Underground	10	45	54	28	16	44
Total	625	204	828	214	270	484

Public Transport - Rail

8.179 For the purpose of this assessment it has been assumed that all underground trips would use rail services from Mortlake Station to access underground services. The combined rail and underground trips have then been distributed based on local Census 2011 origin – destination data.

8.180 **Table 8.33** shows the increase in rail usage at Mortlake Station during the peak hours as a result of the operational Development.

Table 8.33: Operational Development – Peak Hour Rail Trip Distribution

	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
Forecast Development rail and underground trips	54	91	108	118
Number of rail services per peak hour in both directions	8	8	8	8
Increase in rail patronage per service	7	11	14	15

	AM Peak Hour		PM Peak Hour	
	Arrival	Departure	Arrival	Departure
Estimated 10-car service capacity (seating and standing)	1,475	1,475	1,475	1,475
Increase in rail patronage per service as proportion of service capacity	0.5%	0.8%	0.9%	1.0%

8.181 As can be seen, the largest increase in rail trips as a result of the Development is forecast to occur in the evening peak hour. It is estimated that an additional 15 passengers would board a service stopping at Mortlake Station, which equates to an approximate increase in rail ridership of 1.0% of the service capacity.

8.182 This increase in rail ridership as a result of the Development is considered to fall within the daily fluctuation of peak hour rail ridership and thus is considered to cause an **insignificant** effect on rail services.

Public Transport – Bus Service Delay

8.183 The environmental effect on bus services travelling along Lower Richmond Road, Mortlake High Street, Sheen Lane, Clifford Avenue and A316 Lower Richmond Road are included within the assessment of driver delay, presented above.

Public Transport – Bus Service Capacity

8.184 As shown in **Table 8.32**, the Development is forecast to generate 684 two-way bus trips in the morning and 258 two-way bus trips in the evening peak hour. **Table 8.32** shows the likely peak hour bus trips of the Development by land use.

Table 8.34: Operational Development – Peak Hour Bus Trips by Land Use

Land Use	AM Peak Hour			PM Peak Hour		
	Arr	Dep	2-Way	Arr	Dep	2-Way
Residential	9	42	51	27	15	42
Non-Residential	39	28	67	57	70	127
Sub-Total	*48*	*70*	*118*	*84*	*85*	*169*
Education (School Application)	523	43	566	22	67	89
Total	571	113	684	106	152	258

8.185 As shown in **Table 8.34**, the vast amount of likely morning peak hour bus trips of the Development would be generated by the proposed Secondary School on Site. Application B (the school) is forecast to generate 566 two-way bus trips in the morning peak hour while the remaining land uses on Site are likely to generate 118 two-way bus trips in the morning peak hour.

8.186 Discussions are currently on-going with TfL regarding the most appropriate bus improvements that could be implemented to serve the Development. It is anticipated that the non-school demand generated by the Development would be largely absorbed within the existing bus services available in proximity of the Site. However, it is considered that, at most, two additional single decker bus services could be required to cover the non-school demand of the Development. The demand likely to be generated by the school is considered to be met by the take up of spare capacity on existing bus services or dedicated school bus services. The need for school bus services will be determined once the school's catchment is better understood.

8.187 The effects of a failure to provide buses have not been modelled because the scenario is unrealistic and any bus subsidy required will be secured via planning conditions once planning consent has been granted.

Mitigation Measures and Likely Residual Effects

The Works

8.188 No mitigation measures would be required during the Works, as the above assessment of effect relating to the Works has shown that the Works would result in insignificant effects on severance, driver delay, pedestrian delay and amenity, fear and intimidation as well as accidents and road safety. However, the following measures will be implemented for the Works in order to avoid adverse effects arising during the Works:

Framework Construction Management Statement

8.189 A Framework Construction Management Statement (FCMS), which includes a draft Construction Logistics Plan (CLP), has been submitted as part of a suite of documents for the planning applications of the Development.

8.190 The CLP aims to reduce the impact of construction vehicle trips to and from the Site. It sets out the following measures to reduce adverse effects generated by construction activities:

- construction vehicle routes to site would be agreed with LBRuT and TfL and would seek to minimise impact on the local road network and community;
- commitment to use a Delivery Management System (DMS) to ensure contractors and suppliers forward plan and pre-book deliveries. This would enable site managers to control deliveries and vehicle flow to site including avoiding peak network times where possible;
- investigate the use of construction consolidation centre to help maximise vehicle load efficiency and reduce vehicle trips;
- commitment to use contractors and suppliers that are members of best practice schemes such as Considerate Constructors Scheme (CCS); and
- ensure a sufficiently robust CLP management, monitoring and compliance regime is in place so that the CLP is implemented correctly and remedial actions are taken when necessary.

Construction Environmental Management Plan

8.191 It is proposed that a detailed Construction Environmental Management Plan (CEMP) would be prepared for the Development and secured through planning condition attached to the planning permission, based on the FCMS provided with the planning application. The CEMP would include details of relevant environmental management controls necessary for environmental protection during the Works, as detailed in **Chapter 6: Development Programme, Demolition, Alteration, Refurbishment and Construction**, and would be implemented by the construction contractor for the Development.

8.192 The CEMP is likely to include a detailed CLP to be prepared when a main contractor has been appointed in the post planning consent phase. In addition to measures outlined in the draft CLP, the detailed CLP would include a full management, monitoring and compliance regime.

8.193 Likely residual effects associated with the Works would remain **insignificant**.

Completed Development

Mitigation Measures

8.194 The mitigation measures, proposed to avoid or minimise adverse effects on cycle amenity and driver delay as a result of the Development, are described in full detail within the TA, **Appendix 8.1**. The following summarises the measures:

Delivery and Servicing Plan

8.195 A Delivery and Servicing Plan (DSP) has been prepared and is appended to the TA in **Appendix 8.1**. The DSP will be introduced for the Development's operational stage. The DSP will set out how all types of freight vehicle movements to and from the Development will be managed.

Travel Plans

8.196 A Framework, School as well as Residential Travel Plans (TPs) have been prepared for the Development. These TPs, which are appended to the TA in **Appendix 8.1**, set out how all Site users can access the Development by sustainable forms of transport. The TPs would address, amongst others, the following:

- staff, visitor and residential cycle parking provision;
- health benefits of active travel;
- incentives for using sustainable modes of transport;
- targets to achieve modal shift from private car to more sustainable modes, in particular walking and cycling; and
- Action Plan to achieve the desired modal shift and a monitoring and review process.

Public Transport Enhancements

8.197 Discussions are currently ongoing with TfL to enhance bus services that would serve the completed Development in the future. TfL are unable to commit to a preferred strategy at this time since they envisage that these would form part of a wider re-planning of bus services in the area following the repair works to Hammersmith Bridge. Based on the current service pattern, an increased frequency for the 419 service would be the preferred solution together with provision of special buses to meet the peak demands associated with the school.

8.198 Adverse impacts on the bus service capacity in the area caused by the demand of the school could not be identified at the time of writing this Chapter due to the uncertainties relating to the schools' catchment area. Thus, as stated above, any adverse effects on bus service capacity in the area that might arise from the school will be mitigated to prevent residual adverse effects. The commitment to mitigate adverse effects on bus service capacity in the area will be secured by planning conditions / S106 obligations.

Highway Improvements

8.199 In addition to the improvement works proposed for the Chalkers Corner component of the Site, two further areas have been identified for improvements. These are detailed within the TA in **Appendix 8.1**, and summarised below:

- Lower Richmond Road Corridor including Mortlake High Street – between Williams Lane and Bulls Alley, including the north eastern corner of Mortlake Green and Sheen Lane up to the level crossing (delivered through S.278 works).

- the proposals for the Lower Richmond Road Corridor including Mortlake High Street focus on enhancing the pedestrian and cycle environment by slowing speeds and improving pedestrian and cycle crossing facilities, in particular to provide a high quality route between Mortlake Green and the station and the riverside and to take account of the new secondary school.

- Widening of Williams Lane and Ship Lane (delivered via S.278 works).
  - the proposals for Williams Lane and Ship Lane have been set out in order to integrate the public highway into the Development. This is to ensure that the pedestrian and cycle environment promoted in the Development is present on the surrounding public highway and that there is no segregation between Mortlake and the Development.

8.200 These highway improvements have been agreed in principle with LBRuT and will be secured by planning condition following planning approval.

8.201 A summary of the mitigation measures (including inherent mitigation measures is provided in **Table 8.35**.

Table 8.35: Summary of mitigation measures (including inherent mitigation)

	Mitigation Measures
1.Demolition and Construction Phase	• Environmental management controls developed and set out in the Framework Construction Management Plan and subsequent Construction Environmental Management Plans this would include dust suppression, hoarding, monitoring etc. • Avoidance, or limited use, of traffic routes in proximity to sensitive routes (i.e. residential roads etc.). All construction traffic logistics would be agreed with LBRuT. • Avoidance, or limited use, of roads during peak hours, where practicable. • Provision of a Construction Worker Travel Plan and a Construction Transport Management Plan.
2. Inherent – Measures included in the design of the Development	• Reduction of the ratio indicated by the Planning Brief of 1 car parking space per residential unit to 0.74 of a space per residential unit. • Preparation and implementation of a Delivery and Servicing Plan that will set out how all types of freight vehicle movements to and from the Development will be managed; • Framework, School and Residential Travel Plan setting out how all Site users can access the Development by sustainable forms of transport. • Provision of new car club spaces as part of the Residential Travel Plan; • Provision of a minimum of 1,611 spaces cycle spaces in accordance with London Plan requirements. • Provision of new pedestrian and cycle paths aimed to promote walking, cycling and the use of public transport • Provision of Electric Vehicle Charging Points at least in accordance with London Plan standards. • Reconfiguration to the Chalkers Corner junction to alleviate the transport and traffic implications associated with the operation of the Development including the alignment of the Lower Richmond Road arm to be moved approximately 12 m to the north east to allow: – the provision of a short additional left turn lane (flare) from Lower Richmond Road into the junction (26 m long or about 5 car lengths); – provision of an extended queuing reservoir between the main junction of Lower Richmond Road (this would accommodate about 9 extra cars south

	Mitigation Measures
	westbound), which would also provide extra storage for north east bound vehicles including those waiting to turn right into Lower Richmond Road; – provision of a wider pedestrian island within the Lower Richmond Road arm to 4 m wide to sufficiently cater for cyclists crossing as well as pedestrians; – an extended, dedicated lane for traffic turning left from Clifford Avenue into Lower Richmond Road; – retaining 28 trees and the removal of 22 trees along Lower Richmond Road, Clifford Avenue and within Chertsey Gardens. It is proposed to add a total of 33 new trees, resulting in an overall increase in 10 trees at Chalkers Corner to assist in air pollution. A new 2 m high wall would also replace the existing wall and fence to screen the vehicles at the junction; – A new cycle lane would be provided as part of Application C (Chalkers Corner). The highway improvements at Chalkers Corner would benefit cyclists and help Transport for London (TfL) to achieve their "Quietway" proposals for the A316 corridor by creating: • advance cycle stop lines at the main junction; • wider islands to make them suitable for cycle use; and • improved cycle links into Lower Richmond Road.
	• Other highways works, secured by S278 works: – Improvements to Ship Lane, which would continue as a public highway but would be enhanced as a pedestrian route through the provision of a wider footway on the west side and a new footway (3 m) on the east side; – A new pelican crossing at the southern end of the Green Link along Lower Richmond Road directly north of Mortlake Green. The existing signalised crossing point adjacent to Ship Lane would be relocated to align better with the Green Link; and – A new crossing provided just to the west of the new access road to the school to improve access for pupils needing to cross Lower Richmond Road. This is currently shown as a zebra crossing but could potentially be upgraded to a pelican crossing. – Provision of a new zebra crossing to serve a desire line to the eastern portion of the development
3.Additional future measures that could be included / to be secured through S106 / s278 agreement.	• Enhancement of existing bus services. Based on the current service pattern, an increased frequency for the 419 service would be the preferred solution together with provision of special buses to meet the peak demands associated with the school. • Safeguarding of land at the corner of Lower Richmond Road/Williams Lane to allow TfL to provide in the future bus stands, driver facilities and a bus turn facility, • Safeguarding of land close to the Green Link to allow the future provision of a cycle hire facility. • A New 20mph speed limit enforced between Williams Lane and Bulls Alley including Sheen Lane, between the Mortlake High Street / Lower Richmond Road junction and the Sheen Lane level crossing. A number of physical measures are proposed to help manage speeds including junction entry treatments, carriageway narrowing and provision of a textured tarmac resin to differentiate the area of speed restraint. Potentially, table tops to comply with TfL requirements for buses could be installed at pedestrian crossing points by the school and on the Green Link. • Potential funding for a new controlled parking zone and/or modifications to existing parking zones to help manage potential overspill parking associated with the proposed development onto surrounding roads

Likely Residual Effects

8.202 The residual effects for severance, pedestrian delay, pedestrian and cycle amenity, fear and intimidation, and accident and road safety are considered to be **insignificant**.

8.203 However, although the assessment of driver delay has shown that the completed Development would result in no adverse, but some beneficial, effects on driver delay times, strategic traffic modelling has been undertaken for the Do Something with highway improvements scenario in order to demonstrate the effect of the proposed traffic calming measures.

8.204 However, it needs to be recognised that the traffic calming measures along Lower Richmond Road and Mortlake High Street represent a direct conflict between traffic speeds/driver delay and pedestrian and cycle safety along these links. The traffic calming measures have been introduced in favour of pedestrian and cycle safety, with the aim of managing traffic speeds which consequently results in increased journey times for vehicle drivers. By proposing the highway improvement measures in addition to the Chalkers Corner component of the Development it is sought to strike a balance between the needs of all highway users.

8.205 It should furthermore, be recognised that these measures will have a beneficial effect on severance, pedestrian delay and especially fear and intimidation and accidents and road safety. However, they consequently would have an adverse effect on driver delay times.

8.206 The Chalkers Corner component of the Development is proposed with the aim to create additional capacity at this junction to accommodate the additional vehicle trips generated by the Stag Brewery component, including the proposed secondary school, of the Development. Within the TA (**Appendix 8.1**) detailed junction capacity assessments have been undertaken to show the impact of the Stag Brewery component of the Development with and without the Chalkers Corner component of the Development. These assessments show that the Chalkers Corner component of the Development improves journey times in the surrounding area compared to the Development without the Chalkers Corner component scenario.

8.207 **Table 8.36** and **Table 8.** show the change in driver delay times between Do Something with local highways measures and Do Minimum scenarios for the morning and evening peak hour, respectively.

Table 8.36: Operational Development with Highways Improvements – Driver Delay Assessment (AM Peak Hour)

Route Number	Route Description	Direction	Journey Length (miles)	Change in Driver Delay (Do Something with Highway Works – Do Minimum) (Seconds / vehicle mile)
1a	Chalkers Corner -Sheen Lane/South Circular Road junction	EB	0.8	138
1b		WB		47
2a	Chalkers Corner – White Hart Lane/The Terrace roundabout	EB	0.9	62
2b		WB		-62
3a		EB	1.0	11

Route Number	Route Description	Direction	Journey Length (miles)	Change in Driver Delay (Do Something with Highway Works – Do Minimum) (Seconds / vehicle mile)
3b	Chalkers Corner – A316 Lower Mortlake Road/A307 Kew Road junction	WB		0
4a	Chalkers Corner – Staveley Road	NB	1.5	2
4b		SB		45

Table 8.37: Operational Development with Highways Improvements – Driver Delay Assessment (PM Peak Hour)

Route Number	Route Description	Direction	Journey Length (miles)	Change in Driver Delay (Do Something with Highway Works – Do Minimum) (Seconds / vehicle mile)
1a	Chalkers Corner -Sheen Lane/South Circular Road junction	EB	0.8	28
1b		WB		-20
2a	Chalkers Corner – White Hart Lane/The Terrace roundabout	EB	0.9	61
2b		WB		-21
3a	Chalkers Corner – A316 Lower Mortlake Road/A307 Kew Road junction	EB	1.0	-2
3b		WB		0
4a	Chalkers Corner – Staveley Road	NB	1.5	-1
4b		SB		24

8.208 **Table 8.36** shows that in the morning peak hour driver delay would increase in the Do Something with highway improvements scenario compared to the Do Minimum scenario along Routes 1a and 2a. These increases would result in a **long-term, local, adverse residual** effect of **moderate significance** on Route 1a and a **long-term, local, adverse residual** effect of **insignificant to minor significance** on Route 2a.

8.209 The table furthermore shows that in the morning peak hour driver delay would decrease in the Do Something with highway improvements scenario compared to the Do Minimum scenario along Route 2b. This decrease would result in a **long-term, local, beneficial residual** effect of **insignificant to minor** significance on Route 2b.

8.210 All remaining Routes presented in **Table 8.36** would be subject to an **insignificant** residual effect on driver delay during the morning peak hour.

8.211 **Table 8.37** shows that in the evening peak hour driver delay would increase in the Do Something with highway improvements scenario compared to the Do Minimum scenario along Route 2a. This increase would result in a **long-term, local, adverse residual** effect of **insignificant to minor significance** on Route 2a.

8.212 **Table 8.37** furthermore shows that in the evening peak hour all remaining Routes would be subject to an **insignificant** residual effect on driver delay.

8.213 Once the Development has been implemented, signal timings at the Chalkers Corner junction can be reviewed and adjustments made to improve the operation of the junction as a whole and in particular the delay times on the Lower Richmond Road arm.

8.214 Furthermore, it should be recognised that the effect of the non-highway improvement measures have not been taken account of in the assessment of residual driver delay effects, as the effectiveness of such measures is difficult to quantify.

Summary

8.215 **Table 8.38** summarises the likely significant effects, mitigation measures, and likely residual effects identified within this Chapter.

Table 8.38: Summary of Likely Significant Effects, Mitigation Measures and Likely Residual Effects

Description of Effect	Likely Significant Effect	Mitigation Measures	Likely Residual Effect
The Works			
Severance	**Insignificant**	Not required	**Insignificant**
Driver Delay	**Insignificant**	Not required	**Insignificant**
Pedestrian Delay	**Insignificant**	Not required	**Insignificant**
Pedestrian and Cycle Amenity	**Insignificant**	Not required	**Insignificant**
Fear and Intimidation	**Insignificant**	Not required	**Insignificant**
Accidents and Road Safety	**Insignificant**	Not required	**Insignificant**
Completed Development			
Severance	**Insignificant**	Not required	**Insignificant**

Description of Effect	Likely Significant Effect	Mitigation Measures	Likely Residual Effect
Driver Delay	AM Peak Hour: Chalkers Corner - Sheen Lane / South Circular Road junction: **minor** to **moderate beneficial** (WB) Chalkers Corner – White Hart Lane/The Terrace roundabout: **moderate** to **major beneficial** (WB) PM Peak Hour: Chalkers Corner -Sheen Lane/South Circular Road junction: **minor** to **moderate beneficial** (WB) Chalkers Corner – White Hart Lane/The Terrace roundabout: **insignificant** to **minor beneficial** (WB)	Traffic calming measures along Lower Richmond Road and Mortlake High Street to improve conditions for pedestrians and cyclists at the cost of driver delay effects. However, signal timings at the Chalkers Corner junction could be adjusted post Development implementation to ease driver delay especially along the Lower Richmond Road arm.	AM Peak Hour: Chalkers Corner -Sheen Lane/South Circular Road junction: **moderate adverse** (EB) Chalkers Corner – White Hart Lane / The Terrace roundabout: **insignificant** to **minor adverse** (EB), **insignificant** to **minor beneficial** (WB) PM Peak Hour: Chalkers Corner – White Hart Lane/The Terrace roundabout: **insignificant** to **minor adverse** (EB)
Pedestrian Delay	**Insignificant**	Not required	**Insignificant**
Pedestrian Amenity	**Insignificant**	Not required	**Insignificant**
Cycle Amenity	**Insignificant**	Re-configuration of Williams Lane, resulting in an improved cycle environment	**Insignificant**
Fear and Intimidation	**Insignificant**	Not required	**Insignificant**
Accidents and Road Safety	**Insignificant**	Not required	**Insignificant**

8.216 As outlined above, it should be recognised that the residual adverse driver delay effects, presented in **Table 8.38**, are the results of the proposed traffic calming measures rather than an increase in traffic volumes resulting from the operational Development.

8.217 Regarding the public transport assessment included within this Chapter, during the Works it is not anticipated that the increased number of contractors in the local area who will use the public transport services would cause an adverse effect on existing public transport network, as those trips tend to occur outside of the peak hours, are split between bus and rail modes and would be largely counter-directional to resident trips in the local area.

8.218 Once the Development is operational, bus services would be subject to driver delay times as outlined in the above assessment of driver delay times. The effects of a failure to provide buses have not been modelled because the scenario is unrealistic and any bus subsidy required will be secured via planning conditions once planning consent has been granted.

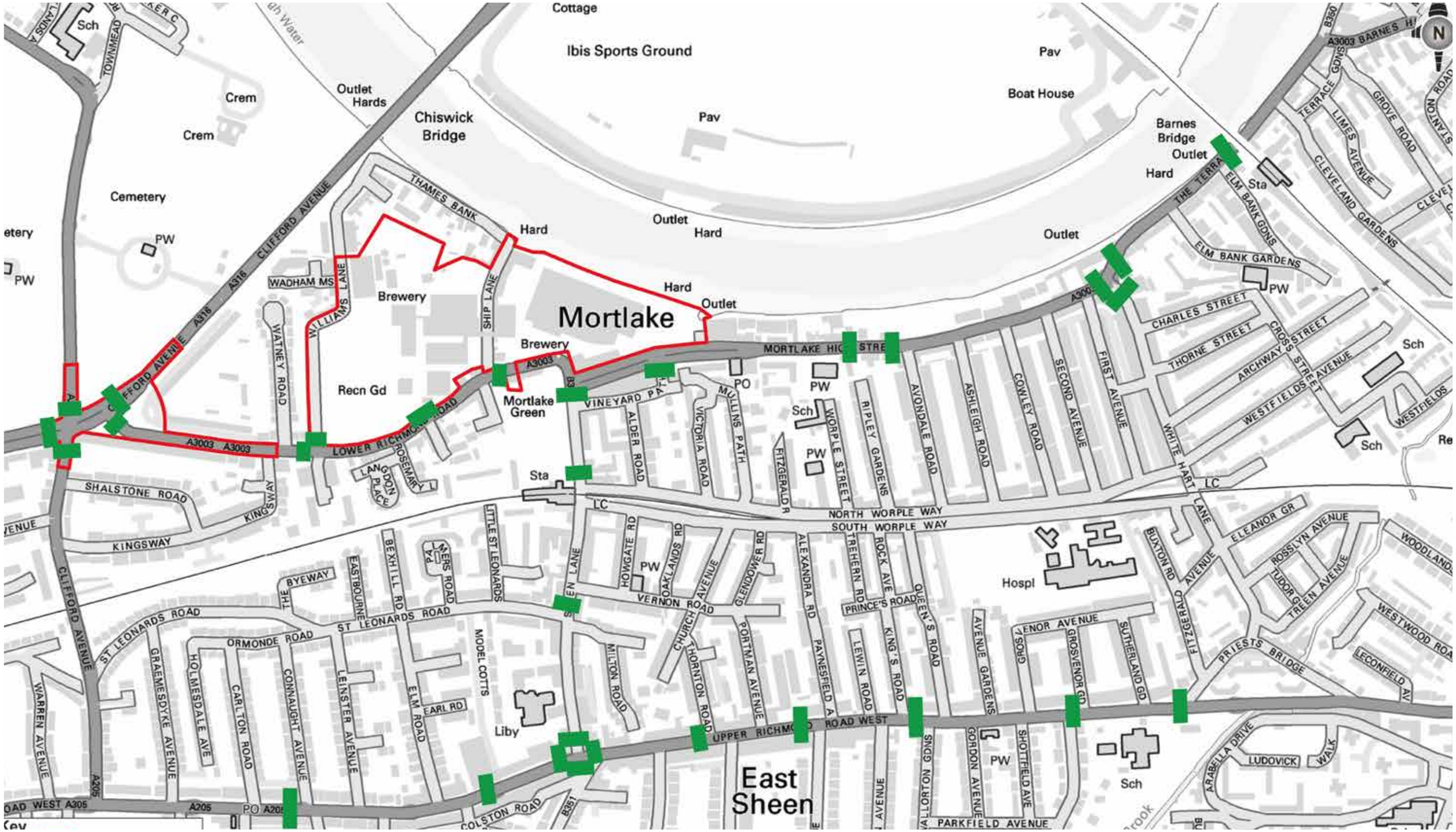
References

1 Institute of Environmental Management and Assessment (2004); 'Guidelines for Environmental Impact Assessment'.

2 Institute of Environmental Assessment (1993); 'Guidelines for the Environmental Assessment of Road Traffic'.

3 Department for Transport (2008); 'Design Manual for Roads and Bridges, Volume 11, Environmental Assessment'.

FIGURES



Site Boundary

Crossings

Railway Station

Source: Peter Brett Associates LLP (PBA)

Project Details	WIE10667-101: Stag Brewery, Mortlake
Figure Title	Figure 8.1: Location of Pedestrian Crossing Points
Figure Ref	WIE10667-101_GR_ES_8.1A
Date	2018
File Location	\\s-lncs\wiel\projects\wie10667\101\graphics\es\issued figures

APPENDICES

A. Appendix 8.1: Transport Assessment

APPENDIX 8.1
TRANSPORT ASSESSMENT (SEE STANDALONE REPORT)

UK and Ireland Office Locations