# *Citroen Site*
# *Capital Interchange Way, Brentford*

**Environmental Statement Addendum**

**Submission to the Greater London Authority**

14th May 2018 v8

# *Contents*



## Appendices

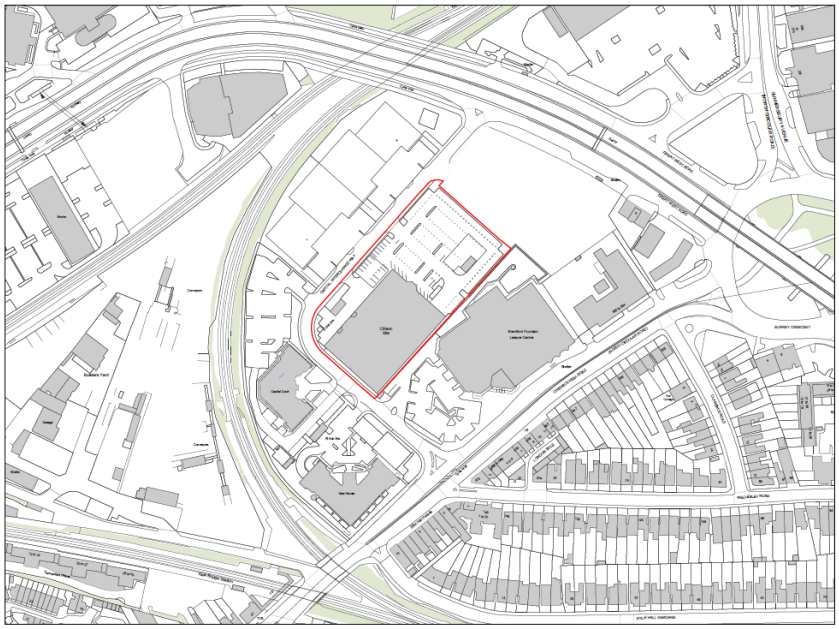
# 1. Introduction

1.1.1 This Addendum supports the Environmental Statement (ES) submitted alongside the Planning Application (Ref. 01508/A/P6) for the comprehensive redevelopment of the former Citroen site, Capital Interchange Way, Brentford.

1.1.2 The 'Description(s) of Development' which have been the subject of Environmental Assessment are summarised as:

*"Redevelopment of the site to provide a mixed use scheme of 427 residential units (Class C3) including 40% affordable housing with ancillary facilities, flexible uses (within Classes A1, A2, A3 and B1) and a nursery (Class D1). Comprising buildings of 12, 13, 15, 16 and 18 storeys in height, with associated cycle and car parking, playspace, landscaping and public realm improvements."*

1.1.3 'The Site' Citroen Garage located off Capital Interchange Way, Brentford. It currently comprises car showroom and associated car parking (3,287 sqm). The site is approximately 0.96 hectares in size. The planning application 'red line' boundary within which the development is proposed is provided below as Figure 3.1.



ES Figure 3.1: Site Location Plan

1.1.4 The London Borough of Hounslow resolved to refuse permission for this application on 16 February 2018.

1.1.5 On 26 February 2018, having considered a report on the case, the Mayor of London notified Hounslow that he would act as the Local Planning Authority for the purposes of determining the planning applications under article 7 of the Mayor of London Order and the powers conferred by Section 2A of the 1990 Town and Country Planning Act. Setting out that:

"*Having now considered a report on this case, reference GLA/4279/02, I hereby direct (under the powers conferred by Section 2A of the 1990 Act) that I will act as the local planning authority for the purposes of determining the above planning application.*
*My reasons are as follows:*

- *The proposed development would have a significant impact on the implementation of the London Plan and draft London Plan – as set out within the above mentioned report; and*
- *There are sound planning reasons for my intervention – as set out within the above mentioned report.*"

1.1.6 Further to this decision and as a result of recent discussions with the Greater London Authority (GLA) the Applicant proposes to make scheme amendments to the proposed development prior to the determination of the planning application by the Mayor of London. These modifications are to ensure that the maximum reasonable amount of affordable housing is provided on this site.

1.1.7 This Addendum to the original Environmental Statement (ES) has been prepared to consider whether the amendments to the 'Proposed Development' alter the findings of the Environmental Impact Assessment (EIA) undertaken in regards to the likely significant effects on the environment.

1.1.8 This report must be read in conjunction with the original ES. The addendum covers:

- Heritage, Townscape and Visual Impact Assessment prepared by JLL Heritage as an addendum to the original Volume II Townscape, Visual and Built Heritage Assessment November 2017 ;
- Sunlight, Daylight and Overshadowing prepared by Point 2 Surveyors which provides a full update to ES Chapter 8: Sunlight, Daylight and Overshadowing;
- Transport prepared by PBA which provides a full update to ES Chapter 9: Transport;
- Air Quality prepared by REC which provides a full update to ES Chapter 10: Microclimate – Air Quality;
- Wind prepared by RWDI have provided a qualitative addendum to the Technical Report on Microclimate – Wind which is include in Appendix 6.
- Socio-Economic prepared by JLL which provides a full update to ES Chapter 15: Socio-Economic.

1.1.9 The revised description of development and proposed development for which is the subject of this ES Addendum report is the following:

*Redevelopment of the site to provide a mixed use scheme of 441 residential units (Class C3) including 50% affordable housing with ancillary facilities, flexible uses (within Classes A1, A2, A3 and B1) and a nursery (Class D1). Comprising buildings of 12, 13, 16, 17 and 18 storeys in height, with associated cycle parking, car parking, playspace, landscaping and public realm improvements."*

1.1.10 This Report has been prepared in response to a request from the GLA for further assessment of the environmental effects of the Proposed Development and for updates responding to amendment to the scheme.

# 2. Requirement for Environmental Assessment

2.1.1 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 came into force on the 16th May 2017. This legislation formally revoked the EIA Regulations 2011.

2.1.2 The EIA technical team has undertaken a review of the design changes to establish whether these would affect the results of the assessment previously undertaken and presented within the ES.

2.1.3 The adjustments to the proposed development have the potential to alter the finding of some of the detailed assessments set out in the ES. This report sets out, where necessary, revisions and updates to the technical assessments, and provides clarification as to whether any new or different effects identified within the ES would arise as a result of the amendments, or whether the significance of any previously identified effects would be altered.

2.1.4 The results of these technical reviews are presented within this ES addendum report. This ES addendum report has been prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, and should be read in conjunction with the ES and the revised planning application plans and documents.

2.1.5 This addendum report set out the results of the EIA technical team's review of the amendments to the proposed development, and analyse these in relation to the ES. This addendum report is structured similarly to the ES, and each technical specialism is considered individually within the subsequent sections.

2.1.6 An updated Non-Technical Summary (NTS) document has also been produced, which reflects the scheme amendments and content of this ES addendum report.

**Availability of Environmental Statement and ES Addendum**

2.1.7 The ES, ES Addendum and supporting documents are available for public inspection at the London Borough of Hounslow, Civic Centre, Lampton Road, Hounslow, TW3 4DN.

2.1.8 Copies of the Environmental Statement are available at a cost of £175. Individual copies of the Non-Technical Summary are available free of charge. Requests for copies of the Environmental Statement should, in the first instance, be addressed to JLL Planning & Development (Ref: TB) 30 Warwick Street, London W1B 5NH.

# 3. *Amendments to the Description of Development*

3.1.1 The Applicant proposes to make scheme amendments to the proposed development prior to the determination of the planning application by the Mayor of London. These modifications are to ensure that the maximum reasonable amount of affordable housing is provided on this site.

3.1.2 The Applicant has sought to address these concerns through amendments to the scheme. The following provides a summary of the scheme amendments submitted to address GLA's comments:

**Affordable Housing**

3.1.3 Paragraph 40 of the Stage II response stated that GLA will ensure the application delivers the maximum level of affordable housing and that the viability will be robustly reviewed as appropriate.

3.1.4 The applicant has explored various options of further increasing the proportion of on-site affordable housing. In direct response to the comments received the proposed level of affordable housing has been increased to 50% on a habitable room basis by:

9.1 Increasing the number of proposed residential units to 441 (uplift of 14 units) by increasing the height of Core 3 from 15 to 17 storeys (increase of 2 storeys).
9.2 Increasing the number of intermediate units in Core 3 from 94 units to 108 units (uplift of 28 intermediate units).
9.3 Changing the 5 houses in Core 5 from intermediate tenure to affordable rented tenure. Increasing these units in size from 2 bedroom houses (2 bed, 4 person) to 3 bedroom family-sized houses (3 bed, 5 person).
9.4 Increasing the number of intermediate units in Core 5 from 12 to 44 units (increase of 32 units), and a resultant decrease in the number of private units from 81 units to 54 units (decrease of 27 units).

3.1.5 The following tables summarise the key amendments to the scheme:

Table 3.1: Proposed Land Uses

| Land Use | Description | Previous GEA (sqm) | Previous GIA (sqm) | Proposed GEA (sqm) | Proposed GIA (sqm) |
|---|---|---|---|---|---|
| Residential (Class C3) | 441 new residential dwellings, of which 50% will be affordable * | 43,322 | 40,053 | 44,525 | 41,187 |
| Range of Uses | Class A1 and/or A2 and/or A3 and/or B1 | 588 | 510 | 588 | 510 |
| Nursery (Class D1) | Nursery | 288 | 250 | 288 | 250 |
| | **Sub Total** | **44,198** | **40,813** | **45,401** | 41,947 |
| **Includes ancillary residents gym (153 sqm GEA) (147 sqm GIA)* | | | | | |

Table 3.2: Maximum Heights of Proposed Buildings

| Building | Previous Proposed No of Storeys | Previous Maximum Height metres (AOD) | Proposed No of Storeys | Proposed Maximum Height metres (AOD) |
|---|---|---|---|---|
| Core 01 | 16 | 65.78 | 16 | 65.78 |
| Core 02 | 12 | 53.18 | 12 | 53.18 |
| Core 03 | 15 | 62.63 | 17 | 68.93 |
| Core 04 | 13 | 56.33 | 13 | 56.33 |
| Core 05 | 18 | 72.08 | 18 | 72.08 |

Table 3.3: Residential Breakdown (Private)

| Private Units | Previous Number of Units | Proposed Number of Units |
|---|---|---|
| Studio Flat | 14 | 14 |
| 1 Bedroom Flat | 98 | 80 |
| 2 Bedroom Flat | 136 | 118 |
| 3 Bedroom Flat | 11 | 11 |
| **Total** | **259** | **223** |

Table 3.4: Residential Breakdown (Affordable)

| Affordable Units | Previous Number of Units | Proposed Number of Units |
|---|---|---|
| Studio Flat | 0 | 0 |
| 1 Bedroom Flat | 70 | 96 |
| 2 Bedroom Flat | 87 | 106 |
| 3 Bedroom Flat | 11 | 16 |
| **Total** | **168** | **218** |

**Layout**

3.1.6 At paragraph 41 of the Stage II response the GLA commented that the level of active frontage on the north-eastern elevation could be improved. In response, the resident's gym has been relocated to the eastern part

of the site, to the previous location of the CHP. This has been designed to further activate this part of the site and help respond to the new route between Capital Interchange Way and the adjacent Fountain Leisure Centre site.

3.1.7 A new flue for the new CHP has been incorporated into Core 1, exiting at roof level. The previous flue for the old CHP has been converted to a cleaners cupboard (in Core 5). Core 3 bin store has increased in size slightly to accommodate the increase in storage requirements due to the extra two storeys.

### Cycle Parking

3.1.8 The proposed development will provide cycle parking above the requirements of the Draft New London Plan with a total of 881 cycle parking spaces consisting of 816 long stay spaces and 65 short stay spaces. This is broken down by the following land uses in Table 3.5.

Table 3.5: Long and Short Stay Cycle Parking

| Use | Long Stay | Short Stay | Total |
|---|---|---|---|
| C3 Residential | 806 | 29 | 835 |
| A1, A2, A3 Retail / B1 office | 8 | 12 | 20 |
| D1 Nursery | 2 | 20 | 22 |
| D1 Nursery (large bike/ trailer) | 0 | 4 | 4 |
| **Total** | **816** | **65** | **881** |

### Play Space

3.1.9 The revised development provides an increase in playspace to a total of 969 sqm. This exceeds the GLA's Child Playspace SPG requirement for playspace based on child yield (963 sqm). Play Space is provided in the public realm and on the courtyard podium. The intention is that the podium play areas will provide a more intimate 'door step' play experience for the resident children, where the two podium courtyards will provide a very natural play experience. The undercroft area which joins the east and west courtyards will benefit from feature lighting, a 'playful' soffit treatment, rubber safety surfacing and padding to the structural columns to ensure safe fall zones.

3.1.10 The podium play spaces will also benefit from the natural surveillance provided by overlooking from the surrounding residential buildings, with the added security derived from access control to buildings. Furthermore, the significant link route between the courtyards also provides sheltered play space for all weather use.

3.1.11 The development is also well located for access to significant parks which including playing fields, more suited to older age groups. This includes Gunnersbury Park.

### Construction Programme and Methodology

3.1.12 The information and assumptions as set out for the Construction Programme and Methodology in the ES for the demolition and construction phases are considered to remain valid. There will be some minor, non-material changes as a result of the amendments which would be unlikely to give rise to significant environmental effects. The proposed development will still be built out broadly in line with the indicative programme.

# 4. *ES Chapter 6: Planning Policy*

4.4.1 The planning application for the Citroen Site was submitted in November 2017. The adopted development plan remains in force. The section below provides an overview of additional draft planning policies that have been released for consultation since submission. The changes below are emerging policies and policy documents which are material considerations in the determination of the planning application but carry limited weight.

**Draft National Planning Policy Framework (NPPF, 2018)**

4.4.2 The draft revised NPPF (NPPF, 2018) was released for consultation on 5th March 2018, ending 10th May 2018.

4.4.3 The "presumption in favour of sustainable development" remains a key element of the NPPF.

4.4.4 The proposed deletion of current paragraph 19 and alternate wording changes proposed continue to support the mixed use nature of the scheme. The NPPF draft states that "Planning Policies and decisions should help create the conditions in which businesses can invest, expand and adapt."

4.4.5 Paragraph 65 of the draft NPPF states that at least 10% of homes should be available for low cost home ownership. This definition includes shared ownership.

4.4.6 Section 11 considers how the planning system should make the most effective use of land. Substantial weight should be given for using suitable brownfield land within settlements and support the use of under-utilised land – especially if this would help to meet identified needs for housing and where land supply is constrained and available sites could be used more effectively (Paragraph 118).

4.4.7 The draft NPPF also considers the issue of achieving appropriate densities (Paragraph 122). Reference is made to promoting regeneration and change. Furthermore, paragraph 123 states that

4.4.8 "Where there is an existing or anticipated shortage of land for meeting identified housing needs, it is especially important that planning policies and decisions avoid homes being built at low densities, and ensure that developments make optimal use of the potential of each site".

4.4.9 The draft document continues to emphasise the importance of good design. "Great Weight" should be given to outstanding or innovative designs that "help raise the standard of design more generally in an area". (Paragraph 130).

4.4.10 The draft NPPF continues to place great weight on the significance of heritage assets, and the use of "substantial" and "less than substantial" tests established in the courts (paragraph 189). Where a development leads to less than substantial harm, the harm should be weighed against the public benefits of the proposal (paragraph 192).

**Draft New London Plan (2017)**

4.4.11 The Draft New London Plan sets out the proposed development strategy for London from 2019 to 2041. It was consulted on from 29th November 2017 until 2nd March 2018.

4.4.12 The policies which are of particular relevance to the Citroen Site Application include:

Increased Housing Target for Hounslow

4.4.13 Table 4.4 which accompanies draft Policy H1 (Increasing Housing Supply) increases the annual housing target in London from 42,389 in the current London Plan to 64,935 new homes. Turning specifically to Hounslow, the Draft New London Plan seeks to increase the annual housing target from 1,264 to 2,182 new homes.

Great West Corridor Opportunity Area

4.4.14 Figure 2.10 identifies a new Great West Corridor Opportunity Area which is identified as having the capacity to provide 7,500 new homes and 14,000 new jobs. The Application Site falls within the Opportunity Area.

4.4.15 Draft Policy SD1: Opportunity Areas – provide support and leadership for the collaborative preparation and implementation of planning frameworks to ensure Opportunity Areas realise their growth and regeneration potential by bringing together the range of investment and intervention needed to deliver the vision and ambition for the area.

4.4.16 Draft Policy GG2 states that to create high density, mixed use place that make the best of land, development must prioritise the development of Opportunities and brownfield land.

4.4.17 Draft Policy GG1: Building a strong and inclusive economy – ensuring that London continues to generate a wide range of economic and other opportunities, and that everyone is able to benefit from these by providing good access to good quality goods and services and amenities that accommodate and strengthen communities. Also, to ensure streets and public places, as well as buildings and the spaces they create are well designed and well planned while promoting the crucial role of town centres to support the creation of a city for all Londoners where everyone can move around with ease and enjoy the opportunities provided.

4.4.18 Draft Policy GG5: Growing a good economy - ensuring London diversifies and shares the economic benefits. Supplying sufficient employment and industrial sites in the right locations. Providing physical and social infrastructure to support growth as London continues to provide leadership in innovation, research and policy whilst promoting and protecting London's heritage and culture and maximising existing and future public transport and sustainable modes of travel.

4.4.19 Draft Policy S2: Health and social care facilities – Boroughs should work with Clinical Commissioning Groups (CCGs) and other NHS community organisations to identify and address local health and social care needs whilst understanding the impact and implications of service transformation plans and new models of care on current and future health infrastructure.

4.4.20 Draft Policy S3: Education and childcare facilities – ensure there is a sufficient supply of good quality education and childcare facilities to meet demand and offer educations choices by identifying local needs and any shortages in supply, identifying sites for future provision through the Local Plan process and ensuring development proposals incorporate suitable education and childcare facilities.

4.4.21 Policy S4: Play and informal recreation facilities – Boroughs should assess existing play and informal recession provision and opportunities while development proposals should increase opportunities for play and informal recreation including the incorporation of good quality, accessible play provision for residential developments.

# 5. *ES Volume II: Heritage, Townscape and Visual Impact Assessment*

5.1.1 A Heritage, Townscape and Visual Impact Assessment (HTVIA) Addendum has been prepared by JLL Heritage on behalf of L&Q in respect of the proposed amendments to the submitted proposals for the Citroen site, Brentford. This Addendum also sets out the significance of a number of grade II listed buildings located between 500m and 750m distant from the site which were included as part of the ES Scoping Report, as agreed with the London Borough of Hounslow. A full HTVIA Addendum is included in Appendix 2.

### Assessment of Effects

### Demolition and Construction

5.1.2 The submitted HTVIA highlighted that the effects during construction and demolition arise from the presence of tower cranes, site hoardings, construction compound and the activity associated with the demolition of the existing building and construction of the Proposed Development. These demolition and construction works would be temporary and would lessen as the construction programme progresses. Such effects are also inevitable and expected in urban environments which undergo change and redevelopment. Accordingly, the demolition and construction effects of the Proposed Development would be temporary, indirect and in the short term. The effect would be a minor magnitude of effect on assets of medium significance. As a result, the overall effect would be minor adverse.

### Once the Development is Fully Operational

Listed Buildings

5.1.3 The following assessments of significance are based on the methodology set out in the submitted HTVIA and the assessments of significance undertaken in Appendix 2 of this document. The following section provides an assessment of the Proposed Development for the purposes of the Environmental Statement but also the Heritage Statement.

- Group 1: Kew Green West

5.1.4 Listed building Group 1: Kew Green West, is situated within the western extent of Kew Green and forms an important collection of buildings which form an enclosure to its north side. The significance of the listed buildings is in part derived from their principal frontages which collectively form a good quality townscape composition. The extended setting of the listed buildings is formed of Kew Green which contributes to their special interest as best appreciated in views from the various footpaths looking northwards towards the buildings. View 22 of the HTVIA illustrates the degree of visibility of the Proposed Development from Kew Green and illustrates that only a small element of the new development will be visible above the roofline of two of the listed buildings. The Proposed Development will read as a subservient background element in views towards the heritage assets and its brick appearance will fit with the residential character and materiality of the listed buildings. The Proposed Development will read as part of the wider extended urban environment to the north of the listed buildings with other taller consented and constructed buildings

breaking the roofline of the listed buildings, as illustrated within the cumulative view 22. Importantly, due to the distance between the listed buildings and the Proposed Development, the visual dominance of the group will remain within these key views and will not affect one's appreciation of the 18th and 19th century appearance and form of the buildings.

5.1.5 For the purposes of the **Heritage Statement**, the application proposals will, in accordance with the statutory duty, preserve the significance of the listed buildings in group 1: Kew Green West, both in terms of their individual special interest and group value, in accordance with the statutory duty of the Planning (Listed Buildings and Conservation Areas) Act 1990, national and local policy.

5.1.6 For the purposes of the **Environmental Statement**, the Proposed Development will have a minor change to the medium significance of the listed buildings. These heritage assets have a medium sensitivity to change and the effect of the Proposed Development at completion stage will be indirect and permanent. Accordingly, the magnitude of the impact of the Proposed Development on the designated heritage assets will be minor. The significance of the listed buildings will be preserved and thus the overall effect will be neutral. Taking consideration of all mitigation measures, in overall terms, the residual effect of the Proposed Development would be minor neutral.

- Group 3: Kew Green East

5.1.7 This group of listed buildings sits on the north side of Kew Green and the buildings are listed, in part, for their group value. View 20 of the HTVIA illustrates the degree of visibility of the Proposed Development from Kew Green and illustrates that only the uppermost part of the tallest building is visible above the ridge line of the listed buildings on the northern side of Kew Green. The building is of a brick appearance which fits within the materiality of the other buildings in the view and reinforces the residential nature of the proposals. The Proposed Development will only be visible from the extended setting where there is a high degree of interposing mature vegetation. The distance between the listed building and the Proposed Development form Kew Green will ensure that the listed buildings will remain dominant in the view and their significance will not be affected.

5.1.8 For the purposes of the **Heritage Statement**, the application proposals will, in accordance with the statutory duty, preserve the significance of the listed buildings that form part Group 3: Kew Green East.

5.1.9 For the purposes of the **Environmental Statement**, the Proposed Development will have a minor change on assets of a medium level of significance. These assets have a medium sensitivity to change. The effect of the Proposed Development upon Completion of the Development will be indirect and permanent. Accordingly, the magnitude of effect of the Proposed Development on the heritage assets will be minor. As the significance of the listed buildings will be preserved, the overall effect will be neutral. Overall, the residual effect will be minor neutral.

- Group 4: Strand on the Green

5.1.10 This group of grade II statutory listed buildings are located between c.500-750m to the south-west of the study site within the Strand-On-The-Green Conservation Area. The immediate and wider setting of these

statutory listed buildings contributes to their significance and is best experienced from the towpath on the northern bank of the river. From here, their historic association with the river and their group value with surrounding historic structures and features is best appreciated. Notably, the proposals will remain unappreciable from here, ensuring that the proposals will preserve the significance of the listed buildings.

5.1.11 As shown in view 23 of the HTVIA, the proposals will be appreciable in views across Strand-On-The-Green Conservation Area from the south side of the Thames (which includes the group of grade II statutory listed buildings fronting the north side of the river). The proposals will form the eastern edge of a group of existing and approved tall buildings to the north of the conservation area - all of which fall within the vicinity of the Site. The proposals will sit comfortably within this existing and emerging tall building context, which currently forms part of the extended setting of the statutory listed buildings running along the northern edge of the river. As part of the extended setting, the proposal will have an indirect impact on the statutory listed buildings, largely by compounding the existing and emerging tall buildings context evident in the background of views across the river from the south.

5.1.12 The existing tall building context visible in panoramic views across this section of the river includes: Rivers House (c.9 storey mid-20th century office block converted for residential use, located on Kew Bridge Road); Vantage London (c.12 storeys on the north side of the Great West Road); and the BSI Building (c.18 storeys/60m high located directly north of Gunnersbury Station and forming No.389 Chiswick High Road).

5.1.13 Tall buildings are a prominent feature within the extended setting of the group of grade II statutory listed buildings fronting the north side of the river (see view 23 of the HTVIA). The proposals and their surrounding tall building context will continue to provide a juxtaposition in scale when experienced in tandem with those historic buildings of a more human scale within Strand-On-The-Green Conservation Area, of which the group of grade II statutory listed buildings are examples. This type of composite and layered view is not an uncommon feature of the area/or that of Greater London – it is typical of the way in which small scale historic areas of high architectural quality are experienced, often as part of the foreground of wider cityscape views, increasingly including taller buildings. This is also an area which has been identified as an Opportunity Area where there is expected to be an increase in height with an intensification of development.

5.1.14 The significance, character and appearance of the group of grade II statutory listed buildings will remain appreciable in this view as a result of the proposal. The proposal will be visible within the existing and emerging tall building context, forming part of the extended setting of these statutory listed buildings. For the purposes of the Heritage Statement, the significance of the heritage assets will be preserved.

5.1.15 For the purposes of the Environmental Statement, the Proposed Development will have a minor change on assets of a medium level of significance. These assets have a medium sensitivity to change. The effect of the Proposed Development upon Completion of the Development will be indirect and permanent. Accordingly, the overall effect of the Proposed Development on the heritage assets will be minor. As the significance of the listed buildings will be preserved, the effect will be neutral. Overall, the residual effect will be minor neutral.

**Locally Listed Buildings**

5.1.16 The application site is located c.575m to the west of the locally listed building (The Gunnersbury PH). The building sits at the south-eastern edge of the Thorney Hedge Conservation Area. Due to its location and the presence of intervening deciduous tree cover/development, the latter of which includes the elevated section of the M4, the site remains physically and visually dislocated from the building in all but the winter months. During the winter periods the intervening deciduous tree cover dissipates, unveiling very limited glimpses towards the vicinity of the study site. These seasonal glimpses form part of the extended setting of the building, although offer no contribution to its significance. As shown by view 8 of the HTVIA, the proposals will not be visible during leaf bearing months, however, may become visible within the context of existing tall buildings as the seasons progress. For the purposes of the **Heritage Statement**, the localised significance of the building will be preserved.

5.1.17 For the purposes of the **Environmental Statement**, the Proposed Development will have a minor change on assets of a low level of significance. These assets have a medium sensitivity to change. The effect of the Proposed Development upon Completion of the Development will be indirect and permanent. Accordingly, the overall effect of the Proposed Development on the heritage assets will be minor. As the significance of the listed buildings will be preserved, the effect will be neutral. Overall, the residual effect will be minor neutral.

**Cumulative Effects**

5.1.18 When the Development is considered alongside the identified cumulative schemes, the assessment of effects would remain unchanged from that within the submitted HTVIA.

**Conclusion**

5.1.19 The changes to the building are minor and, as the revised accurate visual representations illustrate, there will be no perceptible change to views from heritage assets, nor will there be any change in the effects of the Proposed Development on the conclusions reached as part of the submitted HTVIA. The conclusions of the submitted HTVIA – for the demolition and construction effects, once completed and fully operational and also as cumulative effects – therefore remain valid for the revised scheme.

# 6. *ES Chapter 8: Sunlight, Daylight and Overshadowing*

## 6.1 Introduction

6.1.1 This chapter assesses the potential significant effects of the proposed Development in terms of:

- Daylight and sunlight amenity to the existing residential properties which surround the Site;
- Daylight and sunlight to proposed future residential, which may surround the site;
- Overshadowing to existing amenity areas and open space around the Site;
- Daylight and sunlight amenity within the residential elements of the Proposed Development; and
- Overshadowing to proposed amenity areas within the scheme.

6.1.2 This ES chapter prepared by Point 2 Surveyors provides a full update to ES Chapter 8: Sunlight, Daylight and Overshadowing. The chapter outlines the relevant policy context, describes the methodologies applied, the existing baseline conditions in and around the site and identifies the potential effects associated with the Proposed Development. Mitigation is set out as necessary and the resulting likely residual effects are identified.

6.1.3 This chapter is supplemented with the following:

- Appendix 3.1: Drawings of the existing and proposed situations;
- Appendix 3.2: Daylight and sunlight analysis results for external residential properties;
- Appendix 3.3: Overshadowing analysis results for Kew House School;
- Appendix 3.4: Daylight and Sunlight Analysis results for cumulative developments;
- Appendix 3.5: Daylight and sunlight analysis results for internal residential properties;
- Appendix 3.6: Overshadowing Analysis results for proposed amenity space.

## 6.2 Legislation and Planning Policy

National Policy

### National Planning Policy Framework (NPPF), 2012

6.2.1 There are no national planning policies directly relating to daylight, sunlight and overshadowing. However, the NPPF stipulates that:

*"…planning policies and decisions should always seek to secure a good standard of amenity for existing and future occupants of land and buildings."*

### National Planning Practice Guidance, 2016

6.2.2 The National Planning Practice Guidance (NPPG) is an online resource for planning practitioners. In respect to daylight and sunlight, the document states at paragraph 25 (Reference ID 26-025-20140306) in respect to building form that: -

*"Some forms pose specific design challenges, for example how taller buildings meet the ground and how they affect local wind and sunlight patterns should be carefully considered."*

6.2.3 In respect to building scale it states at paragraph 26 (Reference ID 26-026-20140306) that: -

*"Account should be taken of local climatic conditions, including daylight and sunlight, wind, temperature and frost pockets."*

6.2.4 Paragraph 003 (Reference ID: 31-003-2010306) states that: -

*"Light intrusion occurs when the light 'spills' beyond the boundary of the area being lit. For example, light spill can impair sleeping, cause annoyance to people, compromise an existing dark landscape and/or affect natural systems (e.g. plants, animals, insects, aquatic life). It can usually be completely avoided with careful lamp design selection and positioning:"*

### Historic England Guidance on Tall Buildings – Historic England Advice Note 4, 2015

6.2.5 The Historic England Advice Note 4 sets out guidance on dealing with tall buildings in the planning process. It supersedes the 'Guidance on Tall Buildings' issued by English Heritage and CABE in 2007. The Introduction notes that:

*"Alternative approaches may be equally acceptable, provided they are demonstrably compliant with legislation and national policy objectives." It notes that what might be considered a tall building will vary from area to area and "A ten storey building in a mainly two-storey neighbourhood will be thought of as a tall building by those affected, whereas in the centre of a large city it may not."*

6.2.6 The note states that it would be important to assess social and environmental effects associated with tall buildings. Amongst others, consideration should be given of the impact on the local environment, including microclimate, overshadowing, night-time appearance, light pollution, vehicle movements, the environment and amenity of those in the vicinity of the building, and the impact on the pedestrian experience.

## Regional Policy

### The Spatial Development Strategy for Greater London (The London Plan), 2016

6.2.7 The key policies from the London Plan of relevance to this assessment are detailed below:

6.2.8 Policy 7.6 states: *"…buildings and structures should…not cause unacceptable harm to the amenity of surrounding land and buildings, particularly residential buildings, in relation to privacy, overshadowing, wind and micro-climate.";*

6.2.9 Policy 7.7 notes that large buildings should not adversely affect their surroundings in terms of overshadowing and solar reflected glare: *"Location and design of tall buildings should not affect their surroundings adversely in terms of microclimate, wind turbulence, overshadowing, noise, reflected glare, aviation, navigation and telecommunication interference."*

Local Policy

LBH Local Plan (2015)

6.2.10 The LBH's Local Plan 2015 forms part of the development plan for the London Borough of Hounslow and provides the planning framework for the Borough until 2030.

6.2.11 Policy SC4 – Scale and Density of New Housing Development states:

*"We will expect development proposal to (d) Meet the design standards set out in Building Regulations and the Local Plan and expanded upon within detailed supplementary guidance documents, including but not limited to, demonstrating compliance with prevailing daylighting standards (BRE Guidance 2011) and habitable room window separation guidance; and (e) Respond to the Urban Context and Character Study, Conservation Area Appraisals, planning briefs, Neighbourhood Plan and other guidance prepared."*

6.2.12 Policy SC6 – Managing Building Conversions and Sub-Division of the Existing Housing states:

*"(i) Provide a good standard of living conditions and amenity for future occupiers in terms of privacy, daylight and outlook"*

6.2.13 Policy SC7 – Residential Extensions and Alterations states:

*"(f) Minimise harm to neighbouring residents (such as avoiding an unacceptable loss of daylight/sunlight, outlook or by creating an unacceptable sense of enclosure) and future occupants through high quality design"*

6.2.14 Policy CC2 – Urban Design and Architecture states:

*"(t) Provide adequate outlook, minimise overbearingness and overshadowing, and ensure sufficient sunlight and daylight to proposed and adjoining/adjacent dwellings; reduce reliance on single aspect dwellings, particularly if north facing, within noise bands C and D (as defined in the Noise Supplementary Planning Document) or containing 3 bedrooms or more; provide adequate levels of privacy and minimise direct overlooking through the careful layout, design and orientation of buildings and spaces; and"*

Guidance and Industry Standards

### Building Research Establishment Guidelines: Site Layout Planning for Daylight and Sunlight 2011, A Guide to Good Practice, Second Edition

6.2.15 The Building Research Establishment (BRE) Guidelines provides advice on site layout planning to achieve good sunlighting and daylighting within buildings, and in the open spaces between them. It is intended for building designers, developers, consultants and Local Planning Authorities (LPAs). It is intended to be used in conjunction with the interior daylight recommendations in the British Standard BS8206 Part II and the Applications Manual Window Design of the Chartered Institute of Building Services Engineers (CIBSE).

6.2.16 The advice it gives is not mandatory and should not be used as an instrument of planning policy. Of particular relevance, it states:

*"'This guide is a comprehensive revision of the 1991 edition of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice. It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location*

6.2.17 In addition, paragraph 1.6 states:

*"…the aim of the document is to help rather than constrain the designer. Though it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of many factors in site layout design. In special circumstances, the developer or the planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings."*

### British Standard (BS) 8206 Part 2; Lighting for buildings. Code of Practice for Daylighting, 2008

6.2.18 The British Standard describes good practice in daylighting design and presents criteria intended to enhance the wellbeing of people in buildings. The standard recognises that lighting is one of many matters that influence fenestration.

## 6.3 Existing Baseline Conditions

6.3.1 3D models of the existing and cumulative baseline scenarios were constructed.

6.3.2 Detailed drawings of these scenario assessment models can be found at Appendix 3.1. The drawings in Appendix 3.1 indicate the position of the surrounding properties in relation to the Site. The models were analysed in order to ascertain the baseline levels of daylight and sunlight amenity within the surrounding residential properties.

6.3.3 The baseline VSC, NSL and APSH conditions were assessed. Full detailed results can be found in Appendix 3.2. The results for VSC and NSL are summarised in Tables 8.2 and 8.3 respectively. The results for APSH are discussed in paragraph 8.3.5.

Table 8.2: Summary of Baseline VSC Results.

| Address | Total No of Windows that meet VSC Criteria (>27%) Existing Baseline | Total No of Windows | Total No of Windows that meet VSC Criteria (>27%) Cumulative Baseline |
|---|---|---|---|
| 525 Chiswick High Road | 0 | 6 | 1 |
| 527 Chiswick High Road | 0 | 6 | 1 |
| 529 Chiswick High Road | 0 | 6 | 1 |
| 531 Chiswick High Road | 1 | 6 | 1 |
| 533 Chiswick High Road | 1 | 3 | 1 |
| 535 Chiswick High Road | 2 | 3 | 1 |
| 537 Chiswick High Road | 2 | 3 | 1 |
| 539 Chiswick High Road | 2 | 3 | 2 |
| 541 Chiswick High Road | 2 | 3 | 2 |
| 543 Chiswick High Road | 2 | 3 | 1 |
| 545 Chiswick High Road | 2 | 6 | 2 |
| 547 Chiswick High Road | 3 | 6 | 3 |
| 549 Chiswick High Road | 2 | 6 | 2 |
| 551 Chiswick High Road | 2 | 6 | 2 |
| 553 Chiswick High Road | 3 | 4 | 3 |
| 555 Chiswick High Road | 3 | 3 | 3 |
| 557 Chiswick High Road | 3 | 3 | 3 |
| 559 Chiswick High Road | 3 | 3 | 3 |
| 561 Chiswick High Road | 3 | 3 | 3 |
| 563 Chiswick High Road | 3 | 3 | 3 |
| 565-569 Chiswick High Road | 9 | 9 | 9 |
| **Total** | **48** | 94 | 48 |

Table 8.3: Summary of Baseline NSL Results.

| Address | Total No. of Rooms that Receive NSL in Excess of 80% Existing Baseline | Total No. of Rooms | Total No. of Rooms that Receive NSL in Excess of 80% Cumulative Baseline |
|---|---|---|---|
| 525 Chiswick High Road | 1 | 2 | 1 |
| 527 Chiswick High Road | 1 | 2 | 1 |
| 529 Chiswick High Road | 1 | 2 | 1 |
| 531 Chiswick High Road | 1 | 2 | 1 |
| 533 Chiswick High Road | 1 | 1 | 1 |
| 535 Chiswick High Road | 1 | 1 | 1 |
| 537 Chiswick High Road | 1 | 1 | 1 |
| 539 Chiswick High Road | 1 | 1 | 1 |
| 541 Chiswick High Road | 1 | 1 | 1 |
| 543 Chiswick High Road | 1 | 1 | 1 |
| 545 Chiswick High Road | 2 | 2 | 2 |
| 547 Chiswick High Road | 2 | 2 | 2 |
| 549 Chiswick High Road | 2 | 2 | 2 |
| 551 Chiswick High Road | 2 | 2 | 2 |
| 553 Chiswick High Road | 1 | 1 | 1 |
| 555 Chiswick High Road | 1 | 1 | 1 |
| 557 Chiswick High Road | 1 | 1 | 1 |
| 559 Chiswick High Road | 1 | 1 | 1 |
| 561 Chiswick High Road | 1 | 1 | 1 |
| 563 Chiswick High Road | 1 | 1 | 1 |
| 565-569 Chiswick High Road | 3 | 3 | 3 |
| **Total** | 27 | 31 | 27 |

6.3.4 There are no windows/rooms in the existing Baseline that require consideration in terms of APSH as all existing properties only have windows orientated within 90 degrees due north and therefore not material for assessment in terms of sunlight amenity.

Baseline Sun-on-Ground (Overshadowing)

6.3.5 The baseline Sun on the Ground condition was assessed at the Kew School Play Area. This demonstrates that 74.3% received more than 2 hours of direct sunlight on 21st March.

## 6.4 Methodology

### Assessment Methodology

6.4.1 The technical analysis has been undertaken via the creation of a digital three-dimensional model of the Site and surroundings. This 3D computer model is based on land survey information for the site and surrounding buildings, which captured the location and size of the surrounding windows. The internal arrangements of the surrounding buildings are unknown but assumptions following a site visit and research have been undertaken.

6.4.2 Residential receptors/properties are usually most sensitive to daylight and sunlight availability. This assessment therefore deals with the effects to residential properties that surround the Site. Commercial properties are generally deemed to have a greater reliance upon supplementary electric lighting and have therefore not been included within the assessment.

### Daylight

6.4.3 The BRE Guidelines provide different methods for assessing daylight for existing and proposed residential accommodation. These are, however, based upon the same fundamental principles. The methods relevant in this assessment are the Vertical Sky Component (VSC) method, the No Sky Line (NSL) method and Average Daylight Factor (ADF). These methods are described in detail below.

### Vertical Sky Component Method (VSC)

6.4.4 VSC is a quantified measurement of the amount of skylight falling on a vertical wall or window. This is the ratio of the direct sky luminance falling on a vertical wall at the reference point for the simultaneous horizontal luminance under an unobstructed sky. The Commission International de l'Eclairage (CIE) 'standard' overcast sky is used, the ratio is then expressed as a percentage. The maximum value achievable is approximately 40% for a completely unobstructed vertical window.

6.4.5 VSC may be calculated by using the sky light indicator or Waldram Diagram. For calculation purposes, trees may be ignored unless they form dense continuous belts. The computer model created for the daylight assessments presented within the chapter will use Waldram Diagrams to calculate the VSC.

### No Sky Line Method (NSL)

6.4.6 The NSL method is a measure of the distribution of daylight at the 'working plane' within a room. In houses, the 'working plane' means a horizontal 'desktop' plane of 0.85 metres (m) in height. The NSL divides those areas of working plane in a room which receive direct sky light through the windows from those areas of the working plane which cannot. If a significant area of the working plane lies beyond the NSL (i.e. it receives no direct sky light) then the distribution of daylight in the room would be poor and supplementary electric lighting may be required.

6.4.7 The potential effect of the daylighting distribution in the surrounding existing buildings is established by plotting the NSL in each of the main rooms. For houses, this includes living rooms, dining rooms and kitchens. Bedrooms are also analysed although they are less important in terms of the amount of daylight received.

### Average Daylight Factor

6.4.8 The ADF method, assessed using the guidelines set out in the BRE Guidelines, is derived from BS 8026 and is a more complex and representative calculation to determine the natural internal luminance (daylight).

6.4.9 The ADF is defined in the BRE Guidelines as: *"A ratio of total daylight flux incident on a reference area to the total area of the reference area, expressed as a percentage of outdoor luminance on a horizontal plane, due to an unobstructed sky of assumed or known luminance distribution".*

6.4.10 This daylight assessment method considers the diffuse visible transmittance of the glazing to the room in question (i.e. how much light gets through the window glass); the net glazed area of the window in question; the total area of the room surfaces (ceiling, walls, floor and windows); and the angle of visible sky reaching the window/windows in question. It also makes allowance for the average reflectance of the internal surfaces of the room and of external obstruction. The BRE Guidelines and British Standard BS8206 recommend that for a fairly light-coloured room an internal reflectance value of 0.5 can be assumed. The ADF assessments in this chapter are used predominantly for the assessment of proposed new dwellings that have not yet been built.

6.4.11 The BRE Guidelines and BS 8026 provide for minimum levels of average daylight factor (ADF) being:

- Bedroom - 1%
- Living room - 1.5%
- Kitchen 2%

6.4.12 Where a room serves more than one purpose the minimum ADF should be for the room type with the highest value.

### Sunlight

6.4.13 The BRE Guidelines provide two methods for assessing sunlight, depending on whether the assessment is for an existing neighbouring property or a proposed property/building. However, the methods are similar and relate to methods of assessing the Annual Probable Sunlight Hours (APSH) at a reference point.

6.4.14 For existing residential properties, the BRE Guidelines state in Section 3.2.3 that: "all main living rooms of dwellings…should be checked if they have a window facing within 90° of due south, kitchens and bedrooms are less important, although care should be taken not to block too much sun."

6.4.15 Section 3.2.4 continues: *"If the main living room to a dwelling has a main window facing within 90° of due north, but a secondary window facing within 90° of due south, sunlight to the secondary window should be checked."*

6.4.16 The BRE Guidelines suggest that when assessing sunlight for existing neighbouring buildings, the point at the centre of the window on the outside window face can be used. Section 3.2.5 states: *"If this window point can receive at least one quarter of APSH, including at least 5% of APSH in the winter months between 21 September and 21 March, then the room should still receive enough sunlight."*

6.4.17 All windows facing within 90° of due south and serving habitable residential rooms within properties surrounding the Site have been assessed for sunlight.

6.4.18 Where an existing surrounding room is served by additional windows to those facing within $90^0$ of due south, all windows will be assessed, even any additional window serving the room is facing within $90^0$ of due north. This is done in order to understand the true level of sunlight amenity to the room in question.

6.4.19 This methodology is in accordance with the BRE Guidelines for the assessment and establishing impact significance (Appendix I paragraph I6). It does not duplicate sunlight values. It measures the total sunlight availability to all windows.

### Overshadowing

6.4.20 The BRE Guidelines acknowledge that sunlight in the space between buildings has an important effect on the overall appearance and ambience of a development. It states:

*"…good site layout planning for daylight and sunlight should not limit itself to providing good natural light inside buildings. Sunlight in the space between buildings has an important effect on the overall appearance and ambience of a development."*

### Sun on the Ground

6.4.21 The method for assessing sun on the ground is the 'sun-on-ground indicator'. The BRE Guidelines suggest that the Spring Equinox (March 21st) is a suitable date for the assessment.

6.4.22 Using specialist software, the path of the sun is tracked to determine when/where the sun would reach the ground and when/where it would not. This assessment reviews the total percentage of an area that receives at least two hours of direct sunlight on the March 21st.

6.4.23 The BRE Guidelines suggest that for a garden or amenity area to appear adequately sunlit throughout the year, no more than half (50%) of the area should be prevented by buildings from receiving two hours of sunlight on March 21st.

### Three-Dimensional Model

6.4.24 Each of the daylight, sunlight and shadow methods described above have been implemented using specialist computer software applied to a three-dimensional AutoCAD model. This 3D computer model is

based on indicative information for the site and surrounding buildings, which have been assumed using Ordnance Survey data and site photography to best assume window locations and sizes. The internal arrangements of the surrounding buildings are unknown but assumptions following a site visit and research have been undertaken.

6.4.25 Any floor plan information found has been worked into the three-dimensional computer model to provide NSL calculations to a higher degree of accuracy which can, therefore, provide accurate representations of the light conditions within the rooms of many of the surrounding buildings.

6.4.26 The model, which is orientated to the north, enables the path of the sun to be tracked throughout the year to establish a shadow cast by the existing buildings and the Proposed Development and thus to calculate the permanent shadow cast on open spaces.

### Significance Criteria

6.4.27 The results of each assessment are compared against the criteria set out in the 2011 BRE Guidelines.

6.4.28 The BRE Guidelines are predicated upon a suburban environment. Therefore, a degree of flexibility can be applied when assessing the significance of daylight and sunlight effects in urban locations.

6.4.29 The 2011 BRE Guidelines state: *"Adverse effects occur when there is a significant decrease in the amount of skylight and sunlight reaching an existing building where it is required, or in the amount of sunlight reaching an open space… The assessment of effect will depend on a combination of factors, and there is no simple rule of thumb that can be applied."*

6.4.30 In view of the above, the interpretation of the daylight and sunlight results must be assessed in terms of the quantum of light lost or gained, not purely on the percentage of change. The percentage value may well be misleading, particularly where the baseline values are small. In these situations, a small change in the quantum of light could represent a high percentage change in the overall figure, implying that there would be a significant change in daylight and sunlight whereas in reality the difference would be negligible.

6.4.31 The numerical criteria provided within the 2011 BRE Guidelines are presented in Table 8.4.

Table 8.4: 2011 BRE Criteria

| Issue | 2011 BRE Criteria |
|---|---|
| Vertical Sky Component | A window may be adversely affected if the VSC measured at the centre of the window is less than 27% and less than 0.8 times its former value. |
| No Sky Line | A room may be adversely affected if the daylight distribution (no sky line) is reduced beyond 0.8 times its existing area. |
| Average Daylight Factor | A room may be adversely affected if the ADF is less than 1% for a bedroom, 1.5% for a living room or 2% for a kitchen (used for proposed residential accommodation). |
| Annual Probable Sunlight Hours | A window may be adversely affected if a point at the centre of the window receives for the whole year, less than 25% of |

| | |
|---|---|
| | the APSH including at least 5% of the APSH during the winter months (21 September to 21 March) and less than 0.8 times its former sunlight hours during either period, and (for existing neighbouring buildings), if there is a reduction in total APSH which is greater than 4%. |
| Vertical Sky Component | A window may be adversely affected if the VSC measured at the centre of the window is less than 27% and less than 0.8 times its former value. |

6.4.32 The assessment criteria specified within the BRE Guidelines only suggests where a change in daylight may be noticeable to the occupants. It does not further define effects beyond this. As such, for the purposes of this assessment, effects beyond the levels suggested by the BRE Guidelines have been defined as adverse or beneficial depending upon whether the property's amenity would be more or less favourable than the existing baseline situation. These effects have also been described as negligible, minor, moderate or major using professional judgement, and by reference to the criteria summarised within Table 8.5

Table 8.5: 2011 Daylight and Sunlight Significance Criteria

| Significance | Description |
|---|---|
| **Negligible** | No alteration or a small alteration from the existing scenario which is within the numerical levels suggested in the BRE Guidelines. |
| **Minor Adverse** | Marginal infringements (20-29.9%) of the numerical values suggested in the BRE Guidelines, which should be viewed in context. |
| **Moderate Adverse** | Moderate infringements (30-39.9%) of the numerical values suggested in the BRE Guidelines, which should be viewed in context. |
| **Major Adverse** | Major infringements (40%+) of the numerical values suggested within the BRE Guidelines, which should be viewed in context. |

### Sensitive Receptors:

6.4.33 The following surrounding properties are understood to be in residential use and therefore relevant to this assessment:

- 525 Chiswick High Road
- 527 Chiswick High Road
- 529 Chiswick High Road
- 531 Chiswick High Road
- 533 Chiswick High Road
- 535 Chiswick High Road
- 537 Chiswick High Road
- 539 Chiswick High Road
- 541 Chiswick High Road
- 543 Chiswick High Road
- 545 Chiswick High Road
- 547 Chiswick High Road
- 549 Chiswick High Road
- 551 Chiswick High Road

- 553 Chiswick High Road
- 555 Chiswick High Road
- 557 Chiswick High Road
- 559 Chiswick High Road
- 561 Chiswick High Road
- 563 Chiswick High Road
- 565-569 Chiswick High Road
- Wheatstone House

Scenarios Assessed

Existing Baseline v. Proposed Development

6.4.34 This scenario assesses the daylight, sunlight and overshadowing impact of the completed Development against the levels achieved in the current situation.

Cumulative Baseline v. Proposed Development

6.4.35 This scenario assesses the daylight, sunlight and overshadowing impact of the Proposed Development against the levels achieved should the following developments, which are either consented or the subject of a live application, have already been built:

- Wheatstone House

## 6.5 Identification and Evaluation of Key Effects

6.5.1 Effects in relation to daylight, sunlight and overshadowing will vary throughout the demolition and construction phase. They will, however, certainly be less than the effects of the completed Proposed Development. Those effects, which may be perceptible during construction, would be similar to those of the completed Development set out below.

## 6.6 Evaluation of Significance

Completed Development

6.6.1 Summary results of the assessments of effects on daylight and sunlight are given in Tables 8.6A, 8.6B, 8.6C and 8.6D.

Daylight to Surrounding Properties

6.6.2 There are 94 windows serving 31 residential rooms surrounding the Site. These have all been assessed in terms of both VSC and NSL. Full detailed results can be found at Appendix 3.2. These are summarised in Table 8.6A and Table 8.6B below.

6.6.3 BRE Guidance states that *"…the diffuse daylighting of the existing building may be adversely affected if either the VSC measured at the centre of an existing main window is less than 27% and less than 0.8 times its former value [or] the area of the working plane in a room which can receive direct skylight is reduced to less than 0.8 times its former value."*

6.6.4 In situations where the completed Development will result in fully BRE compliant VSC and NSL alterations to the windows and rooms within a property, the effect of the completed Development upon the daylight amenity to that property is considered to be **negligible**.

Table 8.6A: VSC Summary with the Completed Development – Existing v. Proposed

| Address | Total that Meet BRE Guidelines | Below BRE Guidelines | | | | Total No. of Windows | Gains |
|---|---|---|---|---|---|---|---|
| | | 20-29% Loss | 30-39.9% Loss | >=40% Loss | Total | | |
| 525 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 527 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 529 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 531 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 533 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 535 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 537 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 539 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 541 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 543 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 545 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 547 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 549 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 551 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 553 CHISWICK HIGH ROAD | 4 | 0 | 0 | 0 | 0 | 4 | 0 |
| 555 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 557 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 559 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 561 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 563 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 565-569 CHISWICK HIGH ROAD | 9 | 0 | 0 | 0 | 0 | 9 | 0 |
| **Total** | **94** | **0** | **0** | **0** | **0** | **94** | **0** |

Table 8.6B: NSL Summary with the Completed Development – Existing v. Proposed

| Address | Total that Meet BRE Guidelines | Below BRE Guidelines | | | | Total No. of Rooms | Gains |
|---|---|---|---|---|---|---|---|
| | | 20-29% Loss | 30-39.9% Loss | >=40% Loss | Total | | |
| 525 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| 527 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| 529 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| 531 CHISWICK HIGH ROAD | 1 | 1 | 0 | 0 | 0 | 2 | 0 |
| 533 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 535 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 537 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 539 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 541 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 543 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 545 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| 547 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| 549 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 551 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| 553 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 555 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 557 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 559 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 561 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 563 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 565-569 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| **Total** | **30** | **1** | **0** | **0** | **0** | **31** | **0** |

6.6.5 The effect on the daylight amenity of all existing surrounding residential properties is **negligible**.

Sunlight to Surrounding Properties

6.6.6 Effects in relation to sunlight amenity has not been tabulated as there are no existing surrounding properties have site facing windows orientated within 90 degrees due south and therefore not material for assessment. The effects on the sunlight amenity of all surrounding residential properties is, therefore, **negligible**.

Sun-on-Ground (Overshadowing) – Kew House School

6.6.7 The drawings in Appendix 3.3 show the sun-on-ground comparison between the existing baseline and with the completed development in place on the 21st March (Spring Equinox). The proposed scheme causes no additional level of overshadowing the play area of the school. The effect is, therefore, **negligible.**

Sun-on-Ground (Overshadowing) – Fountain Leisure Centre

6.6.8 We have not assessed the Fountain Leisure Centre in terms of overshadowing as it is located to the south of the site. The sun travels from east to west on a southern axis and therefore cannot be overshadowed by the scheme. The effect is **negligible.**

## 6.7 Scope for Mitigation

Daylight and Sunlight to Surrounding Properties

6.7.1 The overall effects to daylight and sunlight amenity of surrounding properties are considered negligible in nature. Mitigation measures are not, therefore, considered necessary for either the Development considered in isolation or in the context of cumulative development.

Overshadowing

6.7.2 The effects on daylight and sunlight amenity are considered negligible. Mitigation measures are not, therefore, considered necessary.

Residual Effects and Summary

6.7.3 Since no mitigation measures have been suggested as this has been dealt with throughout the design evolution stage, the residual effects of the Development remain the same as the potential effects as described above.

## 6.8 Cumulative Effects

Daylight to Surrounding Properties – Cumulative Developments

6.8.1 As earlier noted there is one nearby scheme, Wheatstone House that has also been assessed to understand what cumulative effects these have upon the existing residential properties. We have also analysed the daylight conditions of the schemes themselves to understand the level of daylight that will be received within habitable rooms of Wheatstone House if all schemes were implemented.

6.8.2 The VSC and NSL results following the construction of the proposed scheme in the cumulative scenario are detailed in the tables 8.6C and 8.6D below:

Table 8.6C: VSC Summary with the Completed Development – Cumulative v. Proposed

| Address | Total that Meet BRE Guidelines | Below BRE Guidelines | | | | Total No. of Windows | Gains |
|---|---|---|---|---|---|---|---|
| | | 20-29% Loss | 30-39.9% Loss | >=40% Loss | Total | | |
| 525 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 527 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 529 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 531 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 533 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 535 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 537 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 539 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 541 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 543 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 545 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 547 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 549 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 551 CHISWICK HIGH ROAD | 6 | 0 | 0 | 0 | 0 | 6 | 0 |
| 553 CHISWICK HIGH ROAD | 4 | 0 | 0 | 0 | 0 | 4 | 0 |
| 555 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 557 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 559 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 561 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 563 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| 565-569 CHISWICK HIGH ROAD | 9 | 0 | 0 | 0 | 0 | 9 | 0 |
| **Total** | **94** | **0** | **0** | **0** | **0** | **94** | **0** |

Table 8.6D: NSL Summary with the Completed Development – Cumulative v. Proposed

| Address | Total that Meet BRE Guidelines | Below BRE Guidelines | | | | Total No. of Rooms | Gains |
|---|---|---|---|---|---|---|---|
| | | 20-29% Loss | 30-39.9% Loss | >=40% Loss | Total | | |
| 525 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| 527 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| 529 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| 531 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| 533 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 535 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 537 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 539 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 541 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 543 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 545 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| 547 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| 549 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| 551 CHISWICK HIGH ROAD | 2 | 0 | 0 | 0 | 0 | 2 | 0 |
| 553 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 555 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 557 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 559 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 561 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 563 CHISWICK HIGH ROAD | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 565-569 CHISWICK HIGH ROAD | 3 | 0 | 0 | 0 | 0 | 3 | 0 |
| **Total** | **31** | **0** | **0** | **0** | **0** | **31** | **0** |

6.8.3 There is **negligible** difference in terms of daylight to the existing residential properties when these schemes are included as part of the existing context.

6.8.4 In terms of the daylight amenity within the cumulative schemes themselves the assessment will report upon the ADF achieved against BRE target values (i.e 1% for bedrooms, 1.5% for Living Rooms and 2% for Kitchens). This is because there are no existing occupants within the cumulative developments and therefore no one to 'notice' a change in daylight. Where a Living/Kitchen/Dining Room appears, an ADF target value of 1.5% has been applied in consideration of the Kitchen element of the room being located at the back of the room where direct skylight is difficult to achieve. This approach has in contemplation BRE Guidance noting in circumstances where kitchens do not have access to daylight, they *"…should be directly linked to a well daylit living room".* Given we are in receipt of planning drawings for the property, it is appropriate to consider whether the proposed accommodation will still receive the BRE recommended levels of daylight amenity once all cumulative schemes are constructed.

6.8.5 The detailed ADF analysis can be found within Appendix 3.4. The results show that all rooms assessed within the proposed cumulative schemes will retain a level of ADF which are BRE and British Standard compliant against their observed room use. The effects are, therefore, **negligible**.

Sunlight to Surrounding Properties – Cumulative Developments

6.8.6 In terms of the level of APSH to the existing surrounding residential properties, as earlier mentioned all windows are orientated within 90 degrees due north and therefore not material for assessment in accordance with BRE Guidance. The effects of the Cumulative Developments upon the existing residential properties is, therefore, negligible.

6.8.7 BRE Guidance states that "*In housing, the main requirement for sunlight is in living rooms*" (paragraph 3.1.2). We have assessed the level of APSH received within the Living Rooms of the Cumulative Developments. The results of our assessment are detailed within the technical analysis within Appendix 3.4. The results demonstrate that, of the 22 rooms material for assessment 8 retain fully BRE compliant levels of APSH. The remaining 14 rooms retain total APSH levels between 18 and 24 but all compliant in Winter. In consideration of the statement within British Standard BS 8206-2:2008 states at Section 5.3, Sunlight Duration, that:

*"If a room…is in a densely-built urban area, the absence of sunlight is more acceptable than when its exclusion seems arbitrary."* The effect of the proposed development upon the level of sunlight amenity within the cumulative schemes is considered to be of no greater than **minor adverse** significance.

Internal Daylight Amenity

6.8.8 The daylight amenity to the residential units within the completed Development has been analysed as if Wheatstone House has already been built. This will, therefore, present a worst case scenario. It is initially highlighted that where a Living/Kitchen/Dining Room appears, an ADF target value of 1.5% has been applied in consideration of the Kitchen element of the room being located at the back of the room where direct skylight is difficult to achieve. This approach has in BRE Guidance noted in circumstances where kitchens do not have access to daylight, they *"…should be directly linked to a well daylit living room".* Furthermore, where a room (or rooms) is/are served by a winter garden, which is effectively an extension of the room itself if the glass doors are open, we have incorporated the area into the room to understand the average daylight factor of the holistic, usable space. External balconies have not been omitted for the purposes of the analysis.

6.8.9 Full and detailed analysis can be found at Appendix 3.5. Annotated floor layout plans are provided to show both the locations and configuration of the rooms which have been analysed.

6.8.10 There are 1146 habitable rooms across all floors within the Proposed Development. In order to establish the approximate level of overall daylight compliance throughout, 628 rooms have been assessed. This amounts to 55% of the total number of habitable rooms within the proposed scheme.

6.8.11 Based upon the results of the above assessments 553 (88%) of the 628 rooms are considered BRE compliant, in that they achieve at least the minimum ADF levels recommended for their observed room usage. Many of the rooms actually achieve substantially in excess of the required levels. Reviewing these lowest analysed rooms and applying the practice that daylight will improve the higher up the room is within the building

(naturally granting greater access to direct skylight), the level of compliance based on 1146 habitable rooms would be at least 95%.

6.8.12 The remaining 75 rooms that do not meet BRE guidelines, is because the rooms are positioned under balconies and/or within more constrained elements of the site. This is not unexpected within urban developments where there will always be some rooms that architecturally (and unavoidably) will be located in more constrained positions. Overall, the level of daylight amenity within the residential elements of the Proposed Development is considered good based on the number of lower-floor rooms which are BRE compliant.

6.8.13 The overall level of daylight amenity within the residential elements of the Proposed Development is, therefore, considered to be adequate based on the number of lower floor rooms which are fully BRE and British Standard compliant.

Internal Sunlight Amenity

6.8.14 181 Rooms have been assessed for internal sunlight detail. This includes all primary living rooms which have a window orientated within 90 degrees due south, following the BRE statement that "In housing, the main requirement for sunlight is in living rooms" (paragraph 3.1.2). Of these 181 rooms, 78 achieve the BRE recommended levels of total APSH. Of the remaining 105 rooms, 47 achieve between 20-24 total APSH, 39 achieve between 11 and 19 total APSH and 17 rooms achieve 10 APSH or less. It is reminded that British Standard Document BS 8206-2:2008 states at Section 5.3, Sunlight Duration, that

6.8.15 "If a room is in a densely-built urban area, the absence of sunlight is more acceptable than when its exclusion seems arbitrary." The proposed habitable rooms will receive levels of internal sunlight commensurate with a dense built environment.

Sun-on-Ground (Overshadowing) to Proposed Outdoor Amenity Spaces

6.8.16 The drawing in Appendix 3.6 shows the sun-on-ground to the proposed amenity spaces on the 21st March (Spring Equinox). The proposed amenity areas in accordance with BRE Guidance will be adequately sunlit throughout the year.

Table 8.7A: Summary of Assessment

| Impact Category | Nature of Effect | Effect Significance |
|---|---|---|
| **Demolition and Construction** | | |
| Daylight, sunlight and overshadowing to existing adjacent residential occupants and areas of open space | Negligible to Adverse | **Negligible** |

| Impact Category | Nature of Effect | Effect Significance |
|---|---|---|
| **Completed Development** | | |
| Daylight to existing adjacent residential occupants | Negligible to Adverse | **Negligible** |
| Sunlight to existing adjacent residential occupants | Negligible to Adverse | **Negligible** |
| Overshadowing | Negligible to Adverse | **Negligible** |
| **Completed Development with Cumulative Schemes** | | |
| Daylight to existing adjacent residential occupants | Negligible to Adverse | **Negligible** |
| Sunlight to existing adjacent residential occupants | Negligible to Adverse | **Negligible** to **Minor Adverse** |
| Overshadowing | Negligible to Adverse | **Negligible** |
| Daylight and Sunlight Amenity within the proposed development | Compliance with BRE Guidance and British Standard | **Based upon the analysis results of the lowest 8 floors the overall level of compliance is 88% in terms of ADF; based upon professional judgement of all rooms within the proposed scheme overall compliance will be in the region of 95%.** |

# 7. ES Chapter 9: Transport

## 7.1 Introduction

7.1.1 This ES chapter prepared by PBA which provides a full update to ES Chapter 9: Transport and assesses the significant transport and movement environmental effects of the proposed development.

7.1.2 A Transport Statement (TS) and Residential Travel Plan (RTP) have been submitted as supporting documents to the ES. This ES chapter is supported:

- Appendix 4.1 Delivering and Servicing Strategy;
- Appendix 4.2 Transport Statement;
- Appendix 4.3 Travel Plan; and
- Appendix 4.4 Transport Statement (November 2017).

7.1.3 A scoping EIA report has previously been submitted by JLL to LBH regarding this scheme. Additionally, a scoping meeting was held on Thursday 17th August 2017 with LBH.

## 7.2 Legislation and Planning Policy

### National Policy

7.2.1 The National Planning Policy Framework (NPPF), Department for Communities and Local Government, 2012 (Ref 9.1) sets out the Government's economic, environmental and social planning policies for England. These policies articulate the Government's vision of sustainable development, which should be interpreted and applied to meet local aspirations.

7.2.2 The NPPF recognises the importance transport policies have in facilitating development, but also in contributing to wider sustainability and health objectives. The Framework identifies at paragraph 32, that all developments that generate significant amounts of movement should be supported by a Transport Statement or Transport Assessment. Plans and decisions should take account of whether:

*"The opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;*

*Safe and suitable access to the site can be achieved for all people; and*

*Improvements can be undertaken within the transport network that (cost) effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe".*

7.2.3 NPPF paragraphs 34 to 36, identifies that Local Authority plans and decisions should ensure developments that generate significant movements are located where the need to travel will be minimised and the use of

sustainable transport modes can be maximised. Plans should protect and exploit opportunities for the use of sustainable transport modes for the movement of goods and people. Therefore, developments should be located and designed where practical to:

3.1 Accommodate the efficient delivery of goods and supplies;

3.2 Give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;

3.3 Create safe and secure layouts which minimise the conflicts between traffic and cyclists or pedestrians, avoiding street clutter and where appropriate establishing home zones;

3.4 Incorporate facilities for charging plug-in and other ultra-low emission vehicles; and

3.5 Consider the needs of people with disabilities by all modes of transport.

7.2.4 NPPF recognises that a key tool to facilitate this will be a Travel Plan such that all developments which generate significant amounts of movement should be required to provide a Travel Plan.

7.2.5 The provision of a mixture of land uses within larger scale residential developments to provide opportunities to undertake day-to-day activities including work is encouraged by NPPF specifically stating at paragraph 38 that "where practical, particularly within large scale developments, key facilities such as primary schools and local shops should be located within walking distance of most properties."

7.2.6 In respect of setting local parking standards for development, NPPF (at paragraph 39) encourages local planning authorities to take the following into account:

*"The accessibility of the development;*

*The type, mix and use of development;*

*The availability of and opportunities for public transport;*

*Local car ownership levels; and*

*An overall need to reduce the use of high-emission vehicles."*

7.2.7 DCLG published the National Planning Practice Guidance (NPPG) in March 2014 (DCLG, 2014) (Ref 9.2).

7.2.8 The NPPF and NPPG identify that Travel Plans and Transport Assessments are ways of assessing and mitigating the negative transport impacts of development to support sustainable development and are required for all developments that generate significant amounts of movement. They should be proportionate to the size and scope of the proposed development, established at the earliest practicable stage of a development proposal, be tailored to particular local circumstances and be brought forward through collaborative ongoing working between statutory authorities, transport operators and, where relevant, Highways England.

7.2.9 Travel plans are promoted as an effective way of encouraging sustainable travel. Paragraph 28 states that *"the preparation and implementation of a robust travel plan that promotes use of sustainable transport modes such as walking, cycling and public transport is an effective means of managing the impact of development on the road network, and reducing the need for major transport infrastructure".*

7.2.10 A Residential Travel Plan (RTP) has been submitted in support of the planning application, in order to provide guidance for new residents and for future occupiers for producing tenant-specific travel plans.

Regional Policy – London Plan

7.2.11 The London Plan was published in 2016 (Ref 9.3). Since then three sets of alterations have been made. A key objective of the Plan states London should be:

*"A city where it is easy, safe and convenient for everyone to access jobs, opportunities and facilities with an efficient and effective transport system which actively encourages more walking and cycling".*

7.2.12 Chapter 6 of the Plan identifies policies to support integration of transport and development, connecting London and ensuring better streets. It also sets out car and cycle parking standards. The relevant policies are outlined below:

7.2.13 Policy 6.1 Strategic Approach

The Mayor will work with key parties to encourage integrated transport systems. This will be achieved by:

- Encouraging patterns and nodes of development that reduce the need to travel, especially by car;
- Supporting development with a high trip generation at locations where there is good public transport accessibility and capacity;
- Supporting measures that encourage shifts to more sustainable modes and appropriate demand management;
- Promoting greater use of low-carbon technology to reduce carbon dioxide emissions and global warming contributions; and
- Promoting walking by ensuring an improved public realm.

7.2.14 Policy 6.3 Assessing Transport Capacity

Development proposals should ensure that the impacts of the transport capacity and the transport network are considered and that Transport Assessments will be required in accordance with TfL's Transport Assessment Best Practice guidelines.

7.2.15 Policy 6.9 and Policy 6.10 Cycling and Walking

The Mayor will work to increase cycling and walking in London. Developments should:

- Provide secure, integrated and accessible cycle parking facilities in line with London Plan standards;
- Provide onsite showering and changing facilities;

- Integrate the Cycle Superhighways and facilitate the central London Cycle Hire scheme;
- Ensure high quality pedestrian environments in and around new developments that give emphasis to pedestrian and street space; and
- Promote simplified streetscapes that are de-cluttered and provide access for all.

Local Policy – Hounslow Local Plan

7.2.16 The Hounslow local plan was adopted in September 2015 (Ref 9.4). The plan includes policy EC2 - Developing a sustainable local transport network, an extract of which is provided below. This sets out that LBH will expect development proposals to:

*"(f) Demonstrate they are located appropriately with regard to public transport accessibility and capacity, road capacity and access to good quality walking and cycling networks. Developments should provide a minimum number of cycle parking spaces and an appropriate maximum number of car parking spaces consistent with the standards in the London Plan;*

*(g) Demonstrate that adverse impacts on the transport network are avoided, including preparation of Transport Assessments for all major schemes, and providing contributions or improvements to transport networks"*

Relevant Guidance

7.2.17 As a matter of best practice, this assessment has generally been undertaken based on the relevant guidance set out in the Guidelines for the Environmental Assessment of Road Traffic published by the Institute of Environmental Assessment (now the Institute of Environmental Management and Assessment (IEMA)) (IEA, 1993) (Ref 9.5). These guidelines have been used, together with professional judgement, to gauge the significance of the changes in environmental conditions caused by traffic and transport including consideration of the effects of severance, driver delay, pedestrian delay, pedestrian amenity, accidents and safety, and hazardous loads.

7.2.18 This assessment also refers to the Highways Agency Assessment and Management of Environmental Effects, DMRB Volume 11 HA 205/08 (Ref 9.6).

## 7.3 Existing Baseline Conditions

Walking and Cycling

7.3.1 Footways are located on both sides of Capital Interchange Way. These provides access south towards Brentford Fountain Leisure Centre and to a selection of shops to the south of the A205 Chiswick High Road via a signalised pedestrian crossing at the junction with Capital Interchange Way.

7.3.2 Kew Bridge Rail Station is located approximately 270 metres to the south west of the site and is accessed on foot via Capital Interchange Way and the A205 Chiswick High Road. The signalised crossing described above provides a safe crossing facility on this route and is the only road that is required to be crossed.

7.3.3 Pedestrian access towards Gunnersbury Park Overground and Underground Station approximately 930 metres to the west of the centre of the site via a series of controlled signalised toucan crossings at Chiswick Roundabout and along the A315 Chiswick High Road.

7.3.4 Transport for London (TfL) Local Cycling Guide 6 covers the area surrounding the site and indicates routes that are recommended for cycling with Capital Interchange Way highlighted as such a route. This provides access from the site north towards an off-carriageway designated cycle lane on the A4 Great West Road towards Gunnersbury Park.

7.3.5 Chiswick High Road contains a shared bus and cycle lane northbound towards Chiswick Roundabout. On the approach to the roundabout the cycle route leaves the bus lane and becomes a shared foot and cycleway. At Chiswick Roundabout the cycle route continues through the junction via the toucan crossing described above.

7.3.6 To the south of the site a shared foot and cycleway is located on both sides of Kew Bridge heading towards Kew Gardens. The A315 Kew Bridge Road contains an eastbound shared bus and cycle lane towards the junction with the A205 South Circular Road and westbound on-carriageway cycle lane. These both assist cycling to and from the centre of Brentford, which is less than 2 kilometres to the south west of the site.

Local Bus Services

7.3.7 The site benefits from six bus services surrounding the site. These are set out in Table 9.1 together with their frequency.

Table 9.1: Bus Services Summary

| Bus No. | Route | Frequency (min) Weekday (0700-1900) | Saturday (0700-1900) | Sunday (0700-1900) |
|---|---|---|---|---|
| 65 | Ealing Broadway – Richmond – Kingston – Chessington South | 4-8 | 5-15 | 8-19 |
| 237 | Hounslow Heath – Brentford – Stamford Brook – Shepherd's Bush | 5-9 | 8-16 | 8-15 |
| 267 | Fulwell – Brentford – Ravenscourt Park – Hammersmith | 8-12 | 15-30 | 15-30 |
| 391 | Richmond – North Sheen – Hammersmith – Sands End | 8-12 | 9-16 | 10-30 |
| 440 | Stonebridge Park – West Acton – Chiswick Park | 12-14 | 15-20 | 20-30 |
| H91 | Hounslow West – Osterley - Hammersmith | 7-12 | 9-21 | 14-30 |

7.3.8 Service 65 operates the highest frequency service of the nearby bus routes and provides a connection from the site to key locations such as Ealing Broadway, Richmond and Kingston.

7.3.9 Service 237 operates between Hounslow Heath and Shepherd's Bush and Service 391 operates between Richmond and Sands End. Bus stops for each of these services are located on the Chiswick High Road adjacent to Brentford Fountain Leisure Centre.

7.3.10 Service 267 operates on Chiswick High Road with a stop adjacent to Brentford Fountain Leisure Centre. This service operates between Fulwell and Hammersmith via Brentford.

7.3.11 Service 440 operates between Power Road to Stonebridge Park Station in Brent. The terminal and first bus stops for this services are located on Power Road, which is to the north east side of Chiswick Roundabout.

7.3.12 Service H91 operates along the A4 Great West Road to the north of the site, providing convenient connections to Hounslow West, Osterley and Hammersmith.

Rail and Underground Network

7.3.13 The site is situated 4 minutes' walk to Kew Bridge Rail Station. From Kew Bridge, direct trains are available to London Waterloo, Weybridge and Hounslow.

7.3.14 The site is also situated 12 minutes' walk to Gunnersbury Overground and London Underground Station. This station is situated on the District Line, which has services between Richmond and Upminster as well as between Richmond and Edgware Road.

7.3.15 The line also provides connection with central London (Westminster and Embankment) in approximately 30 minutes, with Paddington and Victoria Rail Stations reached in 30 minutes.

7.3.16 The site is also located within walking and cycling distance to other London Underground, Overground and National Rail stations, which can also be easily reached by cycle and local bus services. These include;

7.3.17 Acton Town Station which is on the Piccadilly Line and is 24 minutes on foot or 7 minutes by bike. Brentford Station (National Rail) is 26 minutes walk from the site or 8 minutes by bike.

7.3.18 The site is very well connected by the London Underground and London Overground to Central London and key rail termini such as Victoria, King's Cross St Pancras and Paddington.

Existing Public Transport Accessibility Level

7.3.19 Public Transport Accessibility Levels (PTALs) provide a measure of a site's proximity to public transport services and indicate a relative rating. It takes into account walk access times and service availability, frequency and reliability. A PTAL can range from 0 to 6b, where a score of 0 indicates no accessibility and 6b indicates "excellent" provision.

7.3.20 The PTAL analysis methodology has prescribed maximum walk distances to bus stops (640 metres) and rail/ underground stations (960 metres). A 2021 PTAL forecast map covering the site has been prepared via the TfL website. This highlights that the site has a PTAL score of 3 (moderate) for the west of the site and 4 (Good) for the eastern part of the site.

7.3.21 It is however noted that the PTAL methodology does not take account of public transport services just beyond bus stop and rail/ underground station thresholds, or indeed the ability to make multi-modal journeys such as catching a bus to a nearby station or riding a bike to a station that is beyond 640 metre

walk distance. The site in reality is therefore considered to be a lot more accessible by sustainable modes than the PTAL results reveal.

Highway Network

7.3.22 The principle vehicular access is located to the north east of the site on Capital Interchange Way, which is used for all vehicle movements. There is a second vehicular access approximately 30 metres to the west of this access, although this is used significantly less and contains drop down bollards that are raised when no vehicles are using this access.

7.3.23 In addition to the two vehicle accesses, there is also separate pedestrian access in the northwest corner of the site, on the bend of Capital Interchange Way.

7.3.24 Capital Interchange Way is a single carriageway road with limited Pay and Display wrapping round the site frontage between 07:00-19:00 Monday to Friday.

7.3.25 The north eastern end of the Capital Interchange Way connects to the A4 Great West Road via a left in/left out junction. This primarily provides access from Chiswick Roundabout, which is the main vehicle route to the site from the north and east. The junction also provide access westbound on the A4 Great West Road towards the M4.

7.3.26 The southern junction of Capital Interchange Way is with the A205 Chiswick High Road. This junction is signalled controlled with vehicle movements restricted to a left in/ left out arrangement. Consequently, only local traffic approaching from the direction of Brentford Town Centre and from the south via Kew Bridge would turn left into Capital Interchange Way from Chiswick High Road.

Existing Traffic

7.3.27 The existing traffic flow on Capital Interchange Way was recorded during an automatic traffic counters (ATC) survey carried out for the seven day period from 18th to 24th July 2017. To supplement the July ATC survey, a further ATC was undertaken on Capital Interchange Way for the week commencing Saturday 9th September 2017 to account for the recent opening of Kew School. This identified that the surveyed flows for the week were higher in September. To ensure a robust assessment within this chapter, the lower July ATC flows have been used, as the percentage increases from the development will be higher.

7.3.28 The existing flows on A205 Chiswick High Road and A4 Great West Road were taken from the Department for Transport Traffic Counts database. The existing traffic flow rates are provided in Table 9.2.

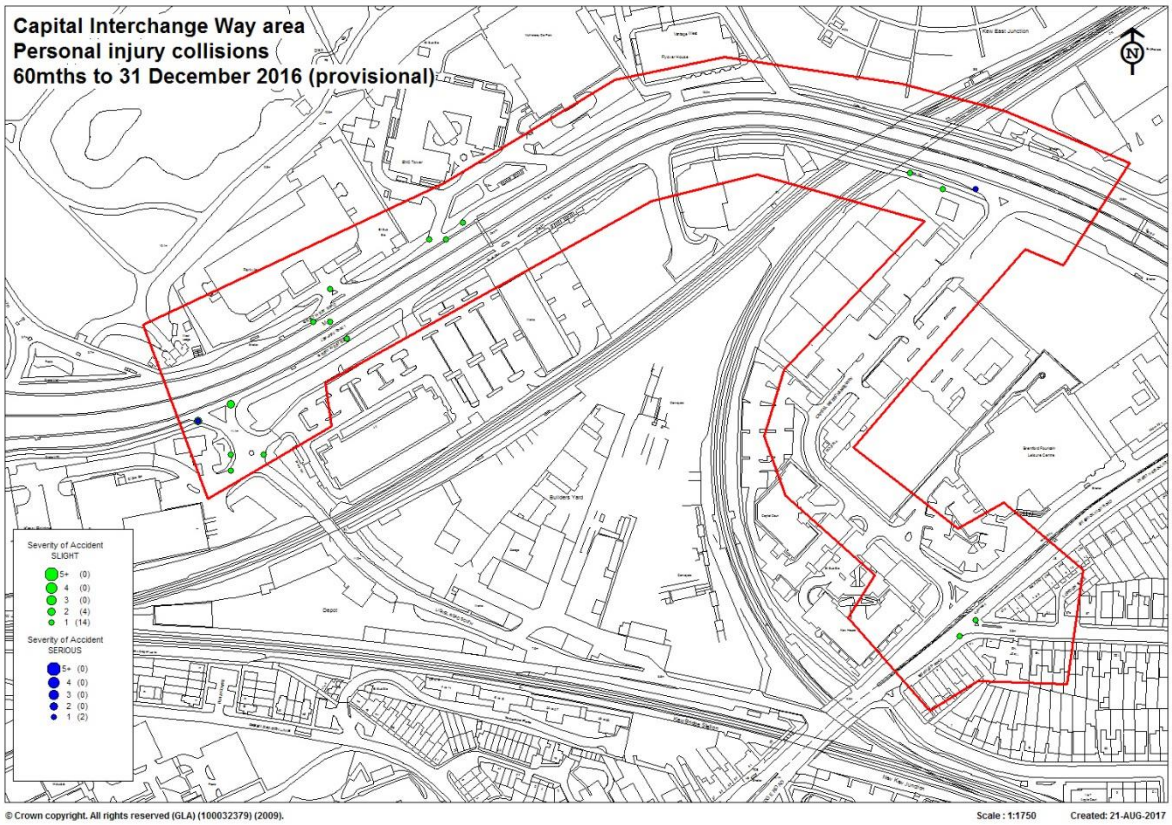
Table 9.2: Existing Traffic Flows

| Location | | AM Peak | | PM Peak | | 24 Hour | |
|---|---|---|---|---|---|---|---|
| | Year | Total | HGV | Total | HGV | Total | HGV |
| A205 Chiswick High Road | 2016 | 1,538 | 67 | 2,490 | 109 | 26,311 | 1,150 |
| A4 Great West Road | 2016 | 2,438 | 88 | 3.971 | 143 | 41,958 | 1,513 |
| Capital Interchange Way | 2017 | 396 | 51 | 676 | 59 | 1,367 | 163 |

Personal Injury Collision Review

7.3.29 The Personal Injury Collision (PIC) data was obtained from the Transport of London for the latest 5 years (60 months prior to 31/12/2016) for the area highlighted in Figure 9.1.

ES Figure 9.1: Personal Injury Review Study Area




7.3.30 During the scoping process with LBH it was agreed that Capital Interchange Way and its junctions with Chiswick High Road and Wellesley Road to the south and the A4 Great West Road to the north together with the junction between the A4 Great West Road and Lionel Road would be reviewed. It was not possible to remove the A4 eastbound PICs from the data, but these have not been included within the analysis.

7.3.31 The PIC review in the geographical criteria set out above is included within the TS attached in Appendix 4.4 and has identified 11 PICs. A summary of the severity of these is set out in Table 9.3.

Table 9.3: Annual Collision Statistics

| Severity / Months To | 12/01/2013 | 12/01/2014 | 12/01/2015 | 12/01/2016 | 08/09/2016 | Total |
|---|---|---|---|---|---|---|
| Fatal | 0 | 0 | 0 | 0 | 0 | 0 |
| Serious | 0 | 1 | 1 | 0 | 0 | 2 |
| Slight | 2 | 1 | 0 | 1 | 5 | 9 |
| Total | 2 | 2 | 1 | 1 | 5 | 11 |

Source: TfL

7.3.32 There were no accidents recorded on Capital Interchange Way, at the junction of Capital Interchange Way with Chiswick Road and at the junction of Capital Interchange Way with the A4.

7.3.33 There was one PIC recorded involving a pedestrian. A driver exited a broken down vehicle and was hit by another vehicle, causing a slight injury.

7.3.34 At the junction of Lionel Road South with the A4 Great West Road two PICs were recorded involving cyclists, one with a serious severity and the other with a slight injury. The serious PIC was caused when the car driver failed to look properly when he turned left and hit the cyclist. The road was dry with daylight. The slight PIC was caused when a lorry changed lanes into the path of a motorcycle causing a collision. The road was wet and dark.

7.3.35 The other serious PIC recorded occurred near the junction of the Capital Interchange Way with the A4, when a car driver lost consciousness.

7.3.36 A further two slight PIC's recorded at this junction involving vehicles only. One PIC involved a vehicle braking suddenly causing the following vehicle to collide with the rear. The road was wet (raining) and dark. In the second PIC, a vehicle collided with a LGV stopped at a red light. The road was dry and daylight.

7.3.37 At the junction of the Chiswick High Road with Stile Hall Gardens there was a PIC recorded where a vehicle made a u-turn and collided with another vehicle, resulting in a slightly injury. The road was wet (raining) and daylight.

7.3.38 A further PIC was recorded 52 metres northwest of the junction of the Great West Road with Lionel Road South involving four vehicles where vehicle 1 shunted vehicle 3 into vehicle 2 into vehicle 4. The driver of vehicle 1 was slightly injured. The road was wet (raining) and dark.

7.3.39 At the junction of the Chiswick High Road (South Circular) with Wellesley Road vehicle failed to give way at the junction and collided with a passing vehicle. The driver was slightly injured. The road was dry and dark.

7.3.40 At the junction of the Great West Road with the M4 slip road there was on PIC recorded, where a vehicle braked suddenly due to another car in front and was hit from the rear by the following vehicle. The road was dry and daylight, and the PIC was recorded as slight severity.

7.3.41 Analysis of the collision records provided by TfL, has not identified any specific concern with regards to the geometric design and/or road layout of the local network. There are no reoccurring patterns in regards to the frequency of the severity of collision noted. The data does not highlight any specific concern with regards to cluster collisions at single junctions within the study area.

7.3.42 It is therefore not considered to be an existing highway safety concern which could be exacerbated by the proposed development.

7.3.43 The full PIC data is provided within the appendix of the Transport Statement, which is included in Appendix 4.4.

Future Traffic Flows

7.3.44 The development is expected to be fully occupied in 2023, which is the year of assessment for the operation. The baseline traffic flows have been derived by applying TEMPRO growth factors to the 2016 and 2017 baseline traffic flows to allow for future background traffic growth between the surveyed year and the future assessment year. There are no future highway improvements that will impact on this assessment.

7.3.45 TEMPRO is produced by the Department for Transport and uses a wide range of data so that accurate localised traffic growth projections can be predicted. As such, the use of TEMPRO for predicting the growth in existing traffic flows for future year baseline traffic assessment years for the project is considered to provide the most accurate prediction of baseline traffic flows for the construction and operational appraisal years.

7.3.46 The growth factors are based on Hounslow area Office for National Statistics (ONS) data set for urban, all roads, as previously agreed by LBH for the Curve development, and are summarised in Table 9.4.

Table 9.4: Forecast traffic flow growth rates

| Time Period | Growth Rate |
|---|---|
| 2016 to 2023 Growth Rate | 1.0956 |
| 2017 to 2023 Growth Rate | 1.0810 |

7.3.47 The growth rates calculated by TEMPRO have been applied to the baseline flows and Table 9.5 shows the resultant 2023 traffic flows on A205 Chiswick High Road, A4 Great West Road and Capital Interchange Way.

Table 9.5: 2023 Forecast Traffic Flows

| Location | AM Peak | | PM Peak | | 24 Hour | |
|---|---|---|---|---|---|---|
| | Total | HGV | Total | HGV | Total | HGV |
| A205 Chiswick High Road | 1,685 | 67 | 2,728 | 109 | 28,826 | 1,260 |
| A4 Great West Road | 2,688 | 10 | 4,350 | 17 | 45,969 | 1,658 |
| Capital Interchange Way | 396 | 51 | 676 | 59 | 1,478 | 176 |

## 7.4 Methodology

7.4.1 As a matter of best practice, this assessment has been undertaken based on relevant guidance set out in The Guidelines for the Environmental Assessment of Road Traffic published by The Institute of Environmental Assessment in 1993 (now the Institute of Environmental Management and Assessment –the IEMA Guidelines). Definitions of each of the potential effects identified are set out below along with explanatory text relating to assessment criteria. It is on this basis that the assessment in this chapter has been undertaken.

Study Area

7.4.2 The site is located on the northern side of Chiswick High Road (South Circular) close to the junction with the Great West Road/ elevated M4 motorway. Capital Interchange Way curves around the site on its north-western and south-western boundary.

7.4.3 The following links are assessed as part of the study:

- Capital Interchange Way;
- A205 Chiswick High Road between the junction of Capital Interchange Way and Chiswick Roundabout; and
- A4 Great West Road between the junction of Chiswick Roundabout and Capital Interchange Way.

7.4.4 The Guidelines for the Environmental Assessment of Road Traffic provides a general rule that can be used to be used as a screening process to establish the extent of the assessment. The rules are as follows:

- 'Rule 1 - Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and
- Rule 2 - Include any other specifically sensitive areas where traffic flows have increased by 10% or more'.

7.4.5 The above guidance is based upon knowledge and experience of environmental effects of traffic and also acknowledges that traffic forecasting is not an exact science. The 30% threshold is based upon research and experience of the environmental effects of traffic, with less than a 30% increase generally resulting in imperceptible changes in the environmental effects of traffic apart from within sensitive locations.

7.4.6 The guidance considers that projected changes in traffic flow of less than 10% create no discernible environmental effect. In such instances, detailed appraisal of the various effects is not required.

7.4.7 Paragraph 3.20 of the IEA guidelines defines sensitive areas as being locations where specific environmental problems may occur, such as accident blackspots, conservation areas, hospitals and links with high pedestrian flows (e.g. near to schools).

7.4.8 From this guidance, the Capital Interchange Way (north of A205) link will be assessed against the Rule 2 threshold, as a sensitive link where the Kew House School is located. The Capital Interchange Way (west of A4), A205 Chiswick High Road, and A4 Great West Road will be assessed against the Rule 1 threshold, as these are less sensitive links, and the PIC assessment has demonstrated that there are no accident blackspots identified on these.

### 7.5 Identification and Evaluation of Key Effects

7.5.1 Column 3 in Table 2.1 of the IEA guidelines sets out a list of environmental effects that should be assessed for their significance. Each of these potential effects is listed below. It is on this basis that the assessment in this chapter has been undertaken. It is acknowledged at paragraph 2.4 of the IEA guidelines that not all the effects listed in the guidance (and reproduced below) would be applicable to every development.

7.5.2 Driver Delay - delay to drivers generally occurs at junctions where opposing vehicle manoeuvres are undertaken with vehicles having to give or receive priority depending upon the type of junction arrangement. The IEA guidance states that computer modelling programmes can be used to assess the changes in driver delay on the network as a result of the Proposed Development. The guidelines do not state

specific thresholds to calculate the magnitude of the effect, however, it does advise that delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system.

7.5.3 Table 9.7 below shows the magnitude-scale applied to the category 'driver delay' for the purpose of this assessment.

Table 9.7: Driver Delay – Scale of Magnitude

| Magnitude | Description |
|---|---|
| Large | Average vehicle delay changes of more than 1 minute as a result of the proposed development during the peak hour periods |
| Medium | Average vehicle delay changes are between 30 and 60 seconds as a result of the proposed development during the peak hour periods |
| Small | Average vehicle delay changes are between 20 and 30 seconds as a result of the proposed development during the peak hour periods |
| Negligible | Average vehicle delay changes are less than 20 seconds as a result of the proposed development during the peak hour periods |

7.5.4 Severance - is the perceived division that can occur within a community when it becomes severed by a major traffic artery. This may result from the difficulty in crossing of a heavily trafficked road or a physical barrier. Severance is difficult to measure and by its subjective nature is likely to vary between different groups within a single community. In addition to the volume, composition and speed of traffic, severance is also likely to be influenced by the geometric characteristics of a road, the demand for movement across a road and the variety of land uses and extent of community located on either side of a road. All these factors are considered when determining the likely severance effect.

7.5.5 The main indicators for the assessment of separation have been formulated from studies of changes in traffic flow on observed links and are discussed in the 'Guidelines for the Environmental Assessment of Road Traffic'. It must be recognised that these are guidelines only, and are highly dependent on existing ambient traffic levels. They are in no way definitive measures of separation. Indicators for this assessment are presented in Table 9.7 below.

Table 9.7: Severance – Scale of Magnitude

| Magnitude | Description |
|---|---|
| Large | Links subject to a 60+% traffic flow increase per day |
| Medium | Links subject to a 40% - 60% traffic flow increase per day |
| Small | Links subject to a 30% - 40% traffic flow increase per day |
| Negligible | Links with daily traffic flow increases below 30% |

7.5.6 Pedestrian Delay and Amenity - pedestrian delay and amenity for a particular walking journey are related to traffic flows through the impact of changes in vehicular demand on the ability of pedestrians to cross

individual routes. This will therefore 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.

7.5.7 The determination of what constitutes a material impact on pedestrian delay and amenity is generally left to the judgement of the assessor and knowledge of local factors and conditions. However, the 'Guidelines for the Environmental Assessment of Road Traffic' suggest that pedestrian delay, the time a pedestrian has to wait before crossing a road, at an individual link should not exceed 40 seconds where no crossing facilities are available. It further advises that the lower threshold equates to a two-way flow of approximately 1,400 vehicles per hour.

7.5.8 Pedestrian amenity can be materially affected where traffic flow is halved or doubled. It can also be improved by the provision of new dedicated facilities or segregated routes.

7.5.9 Table 9.8 shows the magnitude-scale applied to the category 'pedestrian delay and pedestrian amenity' for the purpose of this assessment.

Table 9.8: Pedestrian Delay – Scale of Magnitude

| Magnitude | Description |
|---|---|
| Large | Change in traffic flow of >50% |
| Medium | Change in traffic flow of 40%-50% |
| Small | Change in traffic flow of 30%-40% |
| Negligible | Change in traffic flow of <30%<br>or<br>Traffic flow less than 800 vehicles per hour* |

*Note: This threshold is based upon the Manual for Streets (2007) threshold of 10,000 vehicles per day for traffic flow and road safety for streets with direct frontage access. Peak hour flow is estimated at approximately 8.5% of daily flow (850 vehicles), although this has been reduced to 8% (800 vehicles) in order to provide a robust assessment threshold.

7.5.10 Fear and Intimidation - is broadly defined as the relative pleasantness of a journey, it is affected by traffic flow, traffic composition and pavement width / separation from traffic. It encompasses the overall relationship between pedestrians and traffic, including fear and intimidation which is the most emotive and difficult effect to quantify and assess. There are no commonly agreed thresholds for quantifying the significance of changes in pedestrian amenity, although the IEA guidelines suggest a useful study which could be referenced when considering any effect. These thresholds are replicated in Table 9.9.

Table 9.9: Fear and Intimidation – Threshold Guidelines

| Degree of Hazard | Average traffic flow over 18hr day (vehicles/hour) | Total 18hr HGV flow | Average vehicle speed over 18hr day (mph) |
|---|---|---|---|
| Extreme | 1,800 | >3,000 | >20 |
| Moderate | 1,200-1,800 | 2,000-3,000 | 15-20 |
| Slight | 600-1,200 | 1,200-2,000 | 10-15 |

7.5.11 Notwithstanding the thresholds set out above, the guidance 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.

7.5.12 Table 9.10 shows the magnitude-scale applied to the category 'fear and intimidation' for the purpose of this assessment.

Table 9.10: Fear and Intimidation – Scale of Magnitude

| Magnitude | Description |
|---|---|
| Large | Change in average traffic flow over 18 hours of >1500 vehicles/hr;<br>An average 18 hour HGV flow of >2500; or<br>Change in average speed over 18 hours of >17 mph |
| Medium | Change in average traffic flow over 18 hours of 1200-1500 vehicles/hr;<br>An average 18 hour HGV flow of 2000-2500; or<br>Change in average speed over 18 hours of 15-17 mph |
| Small | Change in average traffic flow over 18 hours of 600-1200 vehicles/hr;<br>An average 18 hour HGV flow of 1000-2000; or<br>Change in average speed over 18 hours of 10-15 mph |
| Negligible | Change in average traffic flow over 18 hours of <600 vehicles/hr;<br>An average 18 hour HGV flow of <1000;<br>Change in average speed over 18 hours of <10 mph |

7.5.13 Accidents and Safety - the guidance states that overall changes in vehicle kilometres on account of the proposed development may be used to assess the magnitude of impact on accidents and safety. However, the guidance does not prescribe specific criteria, which can be applied to the changes in vehicle kilometres to identify impact magnitude dependent on local circumstances such as traffic speed, flow and composition as well as vehicle conflict and pedestrian activity. The guidelines state that it is this combination that enables a professional judgement to be made regarding the significance of the effect.

7.5.14 Dust and Dirt - the impact of dust and dirt has been assessed in relation to the nature of development. This has been considered as part of the Chapter 10 on Air Quality.

7.5.15 Noise and Vibration - The potential effects relating to noise and vibration as a result of project related traffic are set out in Chapter 14 of this ES, where relevant.

7.5.16 Hazardous Loads - the impact of hazardous loads on the highway has not been assessed, as the development is not expected to generate any hazardous loads in either the construction or operational stage.

7.5.17 The significance of the effect on these topics has been determined on the magnitude of the effect, the sensitivity of the receptor and whether the impact is temporary or permanent.

7.5.18 Further to the level of significance, environmental effects will also be determined by whether effects are temporary or permanent, and whether they are beneficial or adverse.

Significance Criteria

7.5.19 The two principal criteria for determining the significance of an environmental effect are the sensitivity of the receptor and magnitude of effect.

7.5.20 Table 9.11 shows the significance matrix used to determine the significance of environmental transport effects.

Table 9.11: Transport and Access – Significance Criteria

| Magnitude of Effect | Sensitivity of Receptor | | | |
|---|---|---|---|---|
| | High | Medium | Low | Negligible |
| Large | Severe | Major | Minor | Minor / No Significance |
| Medium | Major | Minor | Minor | No Significance |
| Small | Minor | Minor | No Significance | No Significance |
| Negligible | Minor/No significance* | No Significance | No Significance | No Significance |

*Note: The choice between 'Minor' and 'Not significant' will depend on the specifics of the impact and will be down to professional judgement and reasoning.

7.5.21 Further to the level of significance, environmental effects will also be determined by whether effects are temporary or permanent, and whether they are beneficial or adverse.

7.5.22 A description of criteria for each level of significance (severe, major, moderate, minor and not significant) can be found in Table 9.12.

Table 9.12: Significance Criteria

| Significance Level | Criteria |
|---|---|
| Severe | Only adverse effects are assigned this level of importance as they represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites and features of international, national or regional importance. A change at a regional or borough scale site or feature may also enter this category. |
| Major | These effects are likely to be important considerations at a local or borough scale but, if adverse, are potential concerns to the project and may become key factors in the decision-making process. |
| Moderate | These effects, if adverse, while important at a local scale, are not likely to be key decision-making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource. |
| Minor | These effects may be raised as local issues but are unlikely to be of importance in the decision-making process. |

| | |
|---|---|
| No Significance | No effect or effect which is beneath the level of perception, within normal bounds of variation or within the margin of forecasting error. |

## 7.6 Effects During Construction

7.6.1 The construction programme has been produced by Real PM which has identified that the peak period of construction will be in November 2019 with 65 HGV movements to site daily (130 two way trips). There will be no staff parking permitted on site, with construction workers expected to travel to site by sustainable means. The construction will be completed in 2023, and therefore the effects of construction traffic will be temporary.

7.6.2 The HGV routes will be agreed with LBH and TfL, but for this assessment it is considered that HGV movements will be the same as for the operational flows, set out in the section on Operational traffic below, and within the Transport Assessment included as Appendix 4.4.

7.6.3 This assessment considers the peak construction period in November 2019, which will provide a robust assessment as being the highest HGV movements with a lower baseline link flow. The daily HGV trips are predicted to be 130 in total throughout the working day of 0800-1800. As a robust prediction of peak time construction traffic, the developer has indicated a peak of 14 HGV arrivals and 14 departures per hour, with a maximum of 65 HGV arrivals and 65 HGV departures per day (130 two way 24 hour flows).

7.6.4 The peak construction period for workers will be in August to November 2020 when approximately 115 staff will be on site, although the HGV numbers will be lower, between approximately 60 – 80 two way flows. As there will be no staff parking on site, and the HGV numbers are less than during the 2019 peak, it is considered that the November 2019 scenario will be the biggest impact on the highway and ensures a robust assessment.

7.6.5 The 2019 flows and construction impact is provided in Tables 9.13 – 9.15.

Table 9.13: 2019 Traffic Flows (AM Peak Hour)

| Link Location | Baseline | | Construction Flows | | Baseline with Development | | | |
|---|---|---|---|---|---|---|---|---|
| | Light | HGV | Light | HGV | Light | % Change | HGV | % Change |
| A205 Chiswick High Road | 1,685 | 68 | 0 | 9 | 1,685 | 0% | 76 | 12.7% |
| A4 Great West Road | 2,688 | 97 | 0 | 19 | 2,688 | 01% | 111 | 21.1% |
| Capital Interchange Way (north of A205) | 396 | 51 | 0 | 9 | 396 | 0% | 60 | 16.7% |
| Capital Interchange Way (west of A4) | 396 | 51 | 0 | 19 | 396 | 0% | 70 | 38.2% |

Table 9.14: 2019 Traffic Flows (PM Peak Hour)

| Link Location | Baseline | | Construction Flows | | Baseline with Development | | | |
|---|---|---|---|---|---|---|---|---|
| | Light | HGV | Light | HGV | Light | % Change | HGV | % Change |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| A205 Chiswick High Road | 2,728 | 109 | 0 | 9 | 2,728 | 0% | 117 | 7.8% |
| A4 Great West Road | 4,350 | 157 | 0 | 19 | 4,350 | 0% | 168 | 13.1% |
| Capital Interchange Way (north of A205) | 676 | 59 | 0 | 9 | 676 | 0% | 68 | 14.5% |
| Capital Interchange Way (west of A4) | 676 | 59 | 0 | 19 | 676 | 0% | 78 | 33.0% |

Table 9.15: 2019 Traffic Flows (24 hour)

| Link Location | Baseline | | Construction Flows | | Baseline with Development | | | |
|---|---|---|---|---|---|---|---|---|
| | Light | HGV | Light | HGV | Light | % Change | HGV | % Change |
| A205 Chiswick High Road | 28,826 | 1,150 | 0 | 40 | 28,826 | 0% | 1,190 | 3.4% |
| A4 Great West Road | 45,969 | 1,658 | 0 | 90 | 45,969 | 0% | 1,664 | 5.7% |
| Capital Interchange Way (north of A205) | 1,478 | 176 | 0 | 40 | 1,478 | 0% | 207 | 23.7% |
| Capital Interchange Way (west of A4) | 1,478 | 176 | 0 | 90 | 1,478 | 0% | 258 | 54.0% |

7.6.6 As noted in paragraph 9.4.5, only Capital Interchange Way north of the A205 is a sensitive location subject to the 10% threshold as set out in Rule 2 of the EIA guidelines. The remaining links are subject to the 30% increase in traffic threshold, as set out in Rule 1 of the IEA guidelines.

7.6.7 From Tables 9.13 to 9.14 the increases in HGV movements on Capital Interchange Way (west of the A4) as a result of construction traffic flows are predicted to exceed the Rule 2 thresholds of an increase of daily traffic by more than. On this basis, and in accordance with the IEA guidance, a detailed assessment of the environmental effects of traffic has been undertaken along this road link to determine the significance of effect of construction traffic flows.

Driver Delay

7.6.8 It can be seen from Tables 9.13 and 9.14 that the increase on the Capital Interchange Way (west of the M4) will be a maximum of 19 HGV's. This equates as approximately 1 HGV per three minutes, which is less than will be generated by the operation of the development. For the sensitive link on Capital Interchange Way (north of A205) the increase will be 9 HGV's, or less than 1 per 6 minutes. As such, it is considered that the magnitude of impact on driver delay would be negligible, including on a sensitive receptor. The significance of the driver delay as a result of the construction traffic is assessed as not significant in terms of the EIA Regulations.

Severance

7.6.9 Severance is only likely to occur on highly trafficked roads and would result from the perceived division that the road and traffic creates. As set out in Table 9.7 of this report, severance impacts are considered to be of 'large', 'medium', 'small' or 'negligible' magnitude with changes in traffic flows of +60%, 40%, 30% and below 30%. Notwithstanding this, it is noted that the IEA guidance advises that the assessment of severance

should pay full regard to specific local conditions, such as whether crossing facilities are provided, the availability of traffic signal settings etc.

7.6.10 Capital Interchange Way is not considered to be a highly trafficked road, even with the addition of the proposed construction traffic. As such, the existing traffic flows and local conditions are such that severance would not occur, especially with a signal controlled pedestrian crossing at the A205 Chiswick High Road junction. Severance effects are therefore negligible and assessed as not significant in terms of the EIA Regulations.

Pedestrian Delay and Amenity

7.6.11 The IEA guidelines set out that pedestrian delay is perceptible beyond a lower delay threshold of 10 seconds, for a link with no crossing facilities. A 10 second pedestrian delay in crossing a road broadly equates to a two-way link flow of approximately 1,400 vehicles per hour, and delay should not exceed 40 seconds. The maximum hourly 2019 weekday traffic flows with construction traffic is 396 which is considerably below this figure, and therefore the effects on pedestrian delay are negligible and assessed as not significant in terms of the EIA Regulations.

7.6.12 There are no commonly agreed thresholds for quantifying the significance of changes in pedestrian amenity, although the IEA guidelines refer to the same figures set out in Tables 9.9 and 9.10.

7.6.13 These set out that moderate fear and intimidation (the lowest category), could occur when the average hourly traffic flow over an 18-hour day is between 600 and 1,200 vehicle movements per hour, the total HGV flow over an 18 hour period is between 1,000 and 2,000 movements or when average vehicle speeds over an 18 hour day are between 10 and 15 mph.

7.6.14 The maximum hourly flow on Capital Interchange Way is less than 400 with 51 HGV's, therefore the construction impact is considered to be negligible in terms of the EIA Regulations.

Accidents and Safety

7.6.15 Personal Injury Collision (PIC) data has been obtained for the surrounding highway network for the latest 5 years (60 months prior to 31/12/2016), an analysis of which is set out above, with further details provided within the Transport Assessment (see Appendix 4.4).

7.6.16 The PIC data demonstrates that there were a total of 11 accidents recorded during this period. From analysis of this data it is concluded that there is not an existing highway safety concern which could be exacerbated by the proposed development.

7.6.17 There would be an increase in traffic on Capital Interchange Way during the construction phase. However, the link would still be lightly trafficked and the arrival and departure of construction traffic would be managed in a controlled manner. Therefore, it is considered that the impact of construction traffic would result in a negligible impact in terms of safety on Capital Interchange Way and not significant in terms of the EIA regulations.

**Effects During Operation**

Trip generation & distribution

7.6.18 The trip rates for the AM and PM peak hours were calculated as part of the Transport Statement provided in Appendix 4.4. Based on these peak hour trip rates the daily trip rates for the proposed development are calculated.

7.6.19 Trip generation over a 24 hour period is calculated for the residential, office, café/restaurant, retail and nursery uses. The TRICS database provides trip rates per person between 0700-1900 which are used to calculate trip generation within this time period. The remaining trips are distributed across the rest of the day based on the profile of TRICS data collected for residential developments between 1998-2000, this is considered to be the best trip data available for the remainder of the day.

7.6.20 The mode of travel to and from site is calculated based on the Table 5.3 of the Transport Statement in Appendix 4.4. The 24 hour trip generation profile is provided in Table 9.16 and corrects the daily profile presented in the original assessment submitted in November 2017.

Table 9.16: 24 hour trips for the proposed development

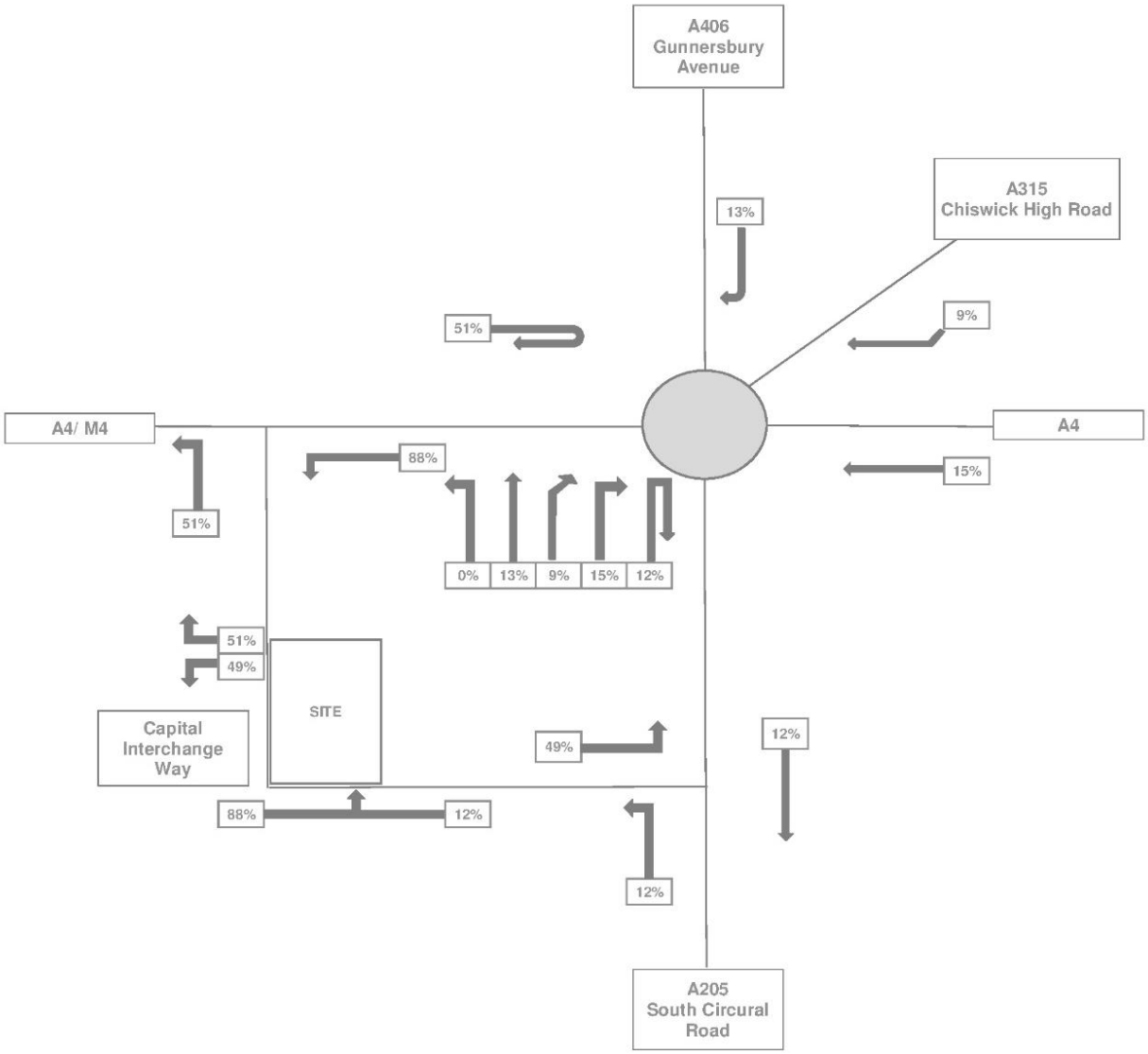
| Mode of transport | 24hour trips |
|---|---|
| Underground, Metro, Light Rail, Tram | 756 |
| Train | 146 |
| Bus, Minibus or Coach | 188 |
| Taxi/Other | 22 |
| Motorcycle | 22 |
| Driving a Car or Van | 495 |
| Passenger in a Car or Van | 29 |
| Bicycle | 120 |
| On Foot | 363 |

Note: Figures presented in Table 9.14 reflect the increase in units to 441 and corrected 24 hour trips

Vehicle Trip Distribution

7.6.21 The proposed vehicle trip distribution is set out in the Transport Statement in Appendix 4.4 and summarised in Figure 9.2. The vehicle arrivals and departures from the site are largely shaped by the left in left out turning restrictions at either end of Capital Interchange Way.

ES Figure 9.2: Trip Distribution




7.6.22 The trip distribution turning percentage for the Chiswick Roundabout are presented in the TA by CEC for 'The Curve' development proposals which are based on the Travel To Work data from the 2011 Census for the Hounslow 029 MSOA and were considered to be acceptable to LBH and TfL.

7.6.23 The AM, PM and 24 hour weekday traffic flows in 2023, together with the impact of the operational traffic on background traffic flows, are shown in Tables 9.17 to 9.19.

Table 9.17: 2023 Traffic Flows (AM Peak Hour)

| Link Location | Baseline | | Development Flows | | Baseline with Development | | | |
|---|---|---|---|---|---|---|---|---|
| | Light | HGV | Light | HGV | Light | % Change | HGV | % Change |
| A205 Chiswick High Road | 1,685 | 68 | 17 | 0 | 1,702 | 1.0% | 68 | 0.0% |
| A4 Great West Road | 2,688 | 97 | 13 | 0 | 2,701 | 1.0% | 97 | 0.0% |
| Capital Interchange Way (north of A205) | 396 | 51 | 17 | 0 | 413 | 4.3% | 51 | 0.0% |
| Capital Interchange Way (west of A4) | 396 | 51 | 13 | 0 | 409 | 3.4% | 51 | 0.0% |

Table 9.18: 2023 Traffic Flows (PM Peak Hour)

| Link Location | Baseline | | Development Flows | | Baseline with Development | | | |
|---|---|---|---|---|---|---|---|---|
| | Light | HGV | Light | HGV | Light | % Change | HGV | % Change |
| A205 Chiswick High Road | 2,728 | 109 | 5 | 0 | 2,733 | 0.2% | 109 | 0.0% |
| A4 Great West Road | 4,350 | 157 | 33 | 0 | 4,384 | 0.8% | 157 | 0.0% |
| Capital Interchange Way (north of A205) | 676 | 59 | 5 | 0 | 681 | 0.8% | 59 | 0.0% |
| Capital Interchange Way (west of A4) | 676 | 59 | 33 | 0 | 709 | 4.9% | 59 | 0.0% |

Table 9.19: 2023 Traffic Flows (24 hour)

| Link Location | Baseline | | Development Flows | | Baseline with Development | | | |
|---|---|---|---|---|---|---|---|---|
| | Light | HGV | Light | HGV | Light | % Change | HGV | % Change |
| A205 Chiswick High Road | 28,826 | 1,150 | 37 | 0 | 28,863 | 0.1% | 1,150 | 0.0% |
| A4 Great West Road | 45,969 | 1,658 | 86 | 0 | 46,056 | 0.3% | 1,658 | 0.0% |
| Capital Interchange Way (north of A205) | 1,478 | 176 | 37 | 0 | 1,515 | 2.5% | 176 | 0.0% |
| Capital Interchange Way (west of A4) | 1,478 | 176 | 86 | 0 | 1,564 | 5.8% | 176 | 0.0% |

7.6.24 The Tables 9.15 to 9.17 demonstrate that the proposed development will have an impact on the baseline 2023 flows of less than the 10% threshold for the sensitive link on Capital Interchange Way (north of A205) under Rule 2. The impact on the remaining links are below the 30% threshold under Rule 1. The development will therefore will result in negligible change in the environment effects of traffic and no further assessment is required for the operation of the development.

## 7.7 Scope for Mitigation

7.7.1 The construction of the development will be subject to a Construction Management Plan (CMP) which will set out measures to reduce the impact of the construction on the local highway network.

7.7.2 The CMP would form the basis of more detailed plans to be prepared during the pre-construction period once a Principal Contractor has been appointed. A Construction Travel Plan will be included within the CMP and will be produced prior to the construction phase. The Construction Travel Plan will set out how

construction traffic will be managed and identify how construction workers will be encouraged to use alternative modes to travelling alone by car.

7.7.3 Construction working hours would be 07:00-18:00 hours Monday to Friday and 08:00-13:00 hours on a Saturday. No construction would take place on Sundays or on public/bank holidays. These hours would be subject to agreement with the statutory authorities. In exceptional circumstances, whereby works are required to be undertaken outside of these hours, this would be agreed with the relevant statutory authorities prior to commencement of the activity.

7.7.4 Routing for construction vehicles would be agreed with the Local Highway Authority (LBH and TfL) prior to construction. However, where feasible, construction HGVs would be restricted to the M4/A4 and A205 Chiswick High Road corridors. Although it is not expected that the project would generate any abnormal loads, if this was required the routing and nature of such loads would be agreed with LBH and TfL prior to delivery. However, it is envisaged that abnormal loads would follow the same route as construction HGVs.

7.7.5 Every effort would be taken to minimise the effects of traffic associated with the construction phase of the project. Materials and resources would be sourced locally where possible and it is proposed that construction management would aim to avoid such deliveries during commuter peaks. In addition, the number of construction HGVs accessing and exiting the site would be minimised by:

- Balancing the earthworks as far as possible to minimise the import and export of spoil material;
- Investigating opportunities to 'backload' vehicles and utilise delivery vehicles for removing material; and
- Where practical, re-using any aggregates and recycling materials on site.

7.7.6 For the operation, the development will be subject to a Residential Travel Plan (RTP) which sets out how a range of measures would be introduced at the development to actively encourage the new residents to use sustainable modes of travel. The RTP is included as Appendix 4.3 of this report. The overarching objectives which underpin the Travel Plan are to:

- Reduce the traffic generated by the development to a lower level than would normally be predicted without the implementation of a Travel Plan, in order to further increase the benefits along the local highway network;
- Encourage those travelling to and from the development to use public transport, cycle or walk in a safe and secure manner; and
- Promote healthy lifestyles and sustainable, vibrant local communities.

7.7.7 The approach and measures set out in the Travel Plan accord with national, regional and local Government objectives and seek to:

- Achieve further reductions in traffic on surrounding roads;

- Promote equal opportunities to residents by offering wider travel choices;
- Develop places for people that encourage community interaction and avoid a car-dominated environment;
- Reduce the cost of personal travel and saving household's money through promoting opportunities for cost savings such as car-sharing;
- Improve personal and wider community health; and
- Reduce air and noise pollution.

7.7.8 The developer will fund the requirements of the Travel Plan throughout the development period as well as funding the initiatives and the monitoring of the Travel Plan. The developer will also fund the implementation of further measures if targets are not being met. These commitments can be secured within the S106 Agreement which will accompany the development.

7.7.9 The TP target is to reduce single occupancy travel by 3% within five years from the first occupation of the project. Using the modal split for the 2011 Census data as a baseline, the initial derived target modal split is set out below in Table 9.20.

Table 9.20: Travel Plan Targets

| Mode | Percentage Baseline | 'Interim' | 3rd Year Target | 5th Year Target |
|---|---|---|---|---|
| Public Transport | 54% | | 52% | 55% |
| Car Driver | 23% | | 21% | 20% |
| Car Passenger | 1% | | 1% | 1% |
| Bicycle | 6% | | 8% | 10% |
| Foot | 14% | | 17% | 20% |
| Other | 2% | | 2% | 1% |
| Total | 100% | | 100% | 100% |

7.7.10 The development is supported by a revised Delivery and Servicing Plan contained in Appendix 4.3 that seeks to reduce the impact of delivery and servicing at the site and on the local highway network and is attached to this ES Addendum.

## 7.8 Evaluation of Significance of Residual Effects

7.8.1 The residual impacts from the construction phase of the development will be reduced by the provision of the Construction Management Plan (CMP). The flows on the local links are identified as having no significance impacts in terms of driver delay, severance, pedestrian delay and amenity and accidents and safety. Any effects would be temporary in nature.

7.8.2 For the operation of the development, the assessment has demonstrated that the development will not exceed the thresholds set out in Rule 1 or Rule 2 of the Guidelines for the Environmental Assessment of Road Traffic, whereby the development will result in imperceptible changes in the environmental effects of traffic. As such, the operation of the development will have no significant impacts in terms of the EIA Regulations.

## 7.9 Monitoring

7.9.1 A Construction Management Plan has been prepared that sets out details of how the construction phase would be managed through implementation of appropriate mitigation measures.

7.9.2 A Construction Travel Plan would be implemented during the construction phase. The Construction Travel Plan will set out how construction traffic will be managed and identify how construction workers would be encouraged to use alternative modes to travelling alone by car.

7.9.3 A Residential Travel Plan would be implemented during the operation phase which will set out how residents would be encouraged to use alternative modes to travelling alone by car. A travel survey will be conducted within six months of first occupation.

7.9.4 Based upon the findings of the assessment set out above, there would be no likely significant effects and there is no requirement for any further mitigation or future monitoring. Accordingly, no further mitigation is proposed beyond that presented in the 'Mitigation' section of this chapter.

## 7.10 Cumulative Effects

7.10.1 There are a number of planning applications and committed developments in the area surrounding the proposed development identified in the ES scoping report. Table 9.21 shows the effect that the surrounding developments have on the network around the site.

Table 9.21: Other Local Developments

| Development | Impact on local highway network |
|---|---|
| Brentford Football Club Land at Lionel Road | The development will affect network around the site and is considered further in this Chapter |
| Brentford Football Club<br>Griffin Park, Braemar Road TW8 0NT | Impact of development does not affect network around the site |
| Former Thames Water Land Kew Bridge Road TW8 0EF | Impact of development does not affect network around the site |
| Land Adjacent to Kew Bridge Kew Bridge Road TW8 0ED | Impact of development does not affect network around the site |
| 250 Gunnersbury Avenue Chiswick W4 5QB | Impact of development does not affect network around the site |
| Alfa Laval TW8 9DF | Impact of development does not affect network around the site |
| St George's Church and St Trimmer Hall TW8 0BD | Impact of development does not affect network around the site |
| Wheatstone House<br>650 Chiswick High Road W4 5SA | Impact of development does not affect network around the site |
| Kew Bridge Station Yard<br>Kew Bridge Road<br>TW8 0EW | Impact of development does not affect network around the site |
| 408-430 Chiswick High Road W4 5TF | Impact of development does not affect network around the site |
| 500 Chiswick High Road W4 5RG | Impact of development does not affect network around the site |
| Layton Road Car Park<br>TW8 0QJ | Impact of development does not affect network around the site |

| | |
|---|---|
| 100 Bollo Lane Chiswick<br>W4 5LX | Impact of development does not affect network around the site |
| Land at Chiswick Roundabout Great West Road | Impact of development does not affect network around the site |

7.10.2 From the above list of planning applications only the Brentford Football Club Land at Lionel Road development has been considered within this Chapter. The remaining developments are considered to be sufficiently small or remote to have minimal impact on the assessment, and these developments are considered to be included within the TEMPRO growth factors applied to the observed baseline traffic flows, or have since been constructed and are therefore included within the observed flows.

Brentford FC Lionel Road (LBH Ref P/2016/0880)

7.10.3 This is for a new 20,000 capacity Community Stadium, with up to 910 dwellings, a hotel (up to 160 bed) and ancillary retail facilities. This application was approved in December 2016.

Demolition and Construction Phase

7.10.4 To determine the cumulative impacts effects of the scheme the Environmental Statement for the Brentford FC scheme produced by Greengate, has been reviewed.

7.10.5 The Brentford FC scheme is expected to result in a peak construction trip generation of 60 vehicles on Capital Interchange Way (30 arrivals, 30 departures).

7.10.6 Although the peak construction years for both development are unlikely to overlap, to determine a robust assessment, these flows are considered together and result in a total two-way daily movement of 190 construction vehicles (60 two way trips for the Brentford FC development). This will result in large increases in HGVs on the Capital Interchange Way links due to all construction traffic using these links, which have low baseline HGV flows. It is, however, considered that as these combined flows will be higher than what will be experienced during the Citroen site peak construction periods, and will be spread across the hours of construction, the cumulative significant effects for the construction phase of the proposed development are the same as set out for the development construction effects set out earlier in this report.

Operation Phase

7.10.7 The inclusion of the Brentford FC has been considered within this ES. These only included the highway peak hours (0800-0900 and 1700-1800), so the 24 hour flows have been obtained from the Transport Assessments, with a factor applied to the Brentford FC peak hour flows on Capital Interchange Way to determine the 24 hour flows. The cumulative development flows are summarised in Table 9.22.

Table 9.22: 2023 Cumulative Traffic Flows (24 hour)

| Link Location | Baseline | | Development Flows | | Baseline with Development | | | |
|---|---|---|---|---|---|---|---|---|
| | Light | HGV | Light | HGV | Light | % Change | HGV | % Change |
| A205 Chiswick High Road | 28,826 | 1,150 | 1,223 | 0 | 30,049 | 4.2% | 1,150 | 0.0% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| A4 Great West Road | 45,969 | 1,658 | 596 | 0 | 46,565 | 1.3% | 1,658 | 0.0% |
| Capital Interchange Way (north of A205) | 1,478 | 176 | 1,223 | 0 | 2,701 | 82.8% | 176 | 0.0% |
| Capital Interchange Way (west of A4) | 1,478 | 176 | 748 | 0 | 2,226 | 50.6% | 176 | 0.0% |

7.10.8 Table 9.18 demonstrates that the proposed cumulative developments will have an impact on the baseline 2023 flows of over 30% on both Capital Interchange Way links. The impact on the A4 Great West Road and A205 Chiswick High Road are both below the 30% threshold. On this basis further assessment of the environmental effects of traffic has been undertaken on these links.

7.10.9 The large increases on Capital Interchange Way are due to the low baseline flows, which accommodates all the cumulative development.

### Driver Delay

7.10.10 The Transport Assessment for the Capital Interchange Way development included detailed junction capacity assessments of the junctions with the A205 Chiswick High Road and the A4 Great West Road which demonstrated that these operate in 2025 with development. As set out in Tables 9.15 and 9.16 the increase on the Capital Interchange Way links will be a maximum of 17 vehicles, or approximately 1 vehicle per three minutes in the AM peak.

7.10.11 In the PM peak the development will generate 5 vehicles on the Capital Interchange way (north of A205) link, and 33 on the west of A4 links, or approximately 1 vehicle every 2 minutes. As such, it is considered that the magnitude of impact on driver delay would be negligible. The significance of the driver delay as a result of the construction traffic is assessed as not significant in terms of the EIA Regulations.

### Severance

7.10.12 Capital Interchange Way is not considered to be a highly trafficked road, even with the addition of the proposed construction traffic. As such, the existing traffic flows and local conditions are such that severance would not occur, with a signal controlled pedestrian crossing at the A205 Chiswick High Road junction. Severance effects are considered as negligible, and therefore of no significance.

### Pedestrian Delay and Amenity

7.10.13 The maximum daily flow on Capital Interchange Way is 1, 223 west of A4 junction, with 176 HGV's and therefore the average hourly flow over an 18 hour day will be below 600 with HGV's of less than 1,000. The impact is therefore negligible in terms of the EIA Regulations.

### Accidents and Safety

7.10.14 Whilst there would be an increase in traffic on Capital Interchange Way with the cumulative development, the link would still be lightly trafficked. Therefore, it is considered that development would not significantly alter the personal injury accident rate on Capital Interchange Way.

7.10.15 It is therefore considered that the magnitude of impact on accidents and safety would be negligible, with the significance of effect on road safety as a result of construction as negligible on all road links.

### References

Ref 9.1: Department for Local Government and Communities (DCLG) (2012) National Planning Policy Framework (NPPF), March 2012

Ref 9.2: Department for Local Government and Communities (DCLG) (2014) National Planning Practice Guidance (NPPG), March 2014

Ref 9.3: Mayors London Plan (2016)

Ref 9.4: London Borough of Hounslow Local Plan (September 2015)

Ref 9.5: Institute of Environmental Assessment (IEA) (now the Institute of Environmental Management and Assessment (IEMA)) (1993) Guidelines for the Environmental Assessment of Road Traffic (Guidance Note No. 1)

Ref 9.6: Highways Agency, Transport Scotland, Welsh Assembly Government and the Department for Regional Development Northern Ireland (2008) Assessment and Management of Environmental Effects. Design Manual for Roads and Bridges, Volume 11, Section 2, Part 5. HA 205/08

# 8. ES Chapter 10: Microclimate - Air Quality

## 8.1 Introduction

8.1.1 This Chapter addresses the likely significant effects of the proposed development with respect to Air Quality. This Chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the application site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.

8.1.2 This Air Quality Chapter has been completed with due regard to the requirements of The London Borough of Hounslow's (LBH) Environmental Health Department.

## 8.2 Legislation and Planning Policy

### European Legislation

8.2.1 European Union (EU) air quality legislation is provided within Directive 2008/50/EC, which came into force on 11th June 2008. This Directive consolidated previous legislation which was designed to deal with specific pollutants in a consistent manner and provided new air quality objectives for particulate matter with an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$). The consolidated Directives include:

- Directive 99/30/EC - the First Air Quality "Daughter" Directive - sets ambient Air Quality Limit Values (AQLVs) for nitrogen dioxide (NO2), oxides of nitrogen (NOx), sulphur dioxide, lead and particulate matter with an aerodynamic diameter of less than 10µm (PM10);
- Directive 2000/69/EC - the Second Air Quality "Daughter" Directive - sets ambient AQLVs for benzene and carbon monoxide; and
- Directive 2002/3/EC - the Third Air Quality "Daughter" Directive - seeks to establish long-term objectives, target values, an alert threshold and an information threshold for concentrations of ozone in ambient air.

8.2.2 The fourth daughter Directive was not included within the consolidation and is described as:

- Directive 2004/107/EC - sets health-based limits on polycyclic aromatic hydrocarbons, cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable.

### UK Legislation

8.2.3 The Air Quality Standards (Amendment) Regulations (2016) came into force on 31st December 2016. These Regulations amend the Air Quality Standards Regulations 2010 and transpose the EU Directive 2008/50/EC into UK law. AQLVs were published in these regulations for 7 pollutants, as well as Target Values for an additional 6 pollutants.

8.2.4 Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007[1]. The AQS sets out Air Quality Objectives (AQOs) that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale. These are generally in line with the AQLVs, although the requirements for compliance vary slightly

8.2.5 Table 10.1 presents the AQOs for pollutants considered within this assessment.

Table 10.1 Air Quality Objectives

| Pollutant | Air Quality Objective Concentration (µg/m$^3$) | Averaging Period |
|---|---|---|
| $NO_2$ | 40 | Annual mean |
| | 200 | 1-hour mean; not to be exceeded more than 18 times a year |
| $PM_{10}$ | 40 | Annual mean |
| CO | 10,000 | Maximum daily running 8-hour mean |

15.1 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2007

8.2.6 Table 10.2 summarises the advice provided in Greater London Authority (GLA) guidance LLAQM (TG16)**2** on where the AQOs for pollutants considered within this report apply.

Table 10.2 Examples of Where the Air Quality Objectives Apply

| Averaging Period | Air Quality Objective Concentration (µg/m$^3$) | Averaging Period |
|---|---|---|
| Annual mean | All locations where members of the public might be regularly exposed<br>Building façades of residential properties, schools, hospitals, care homes etc | Building façades of offices or other places of work where members of the public do not have regular access<br>Hotels, unless people live there as their permanent residence<br>Gardens of residential properties<br>Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term |
| 24-hour and 8-hour mean | All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties | Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term |

1 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2007.

2 London Local Air Quality Management Technical Guidance 2016 LLAQM.TG (16), GLA, 2016.

| Averaging Period | Air Quality Objective Concentration (µg/m³) | Averaging Period |
|---|---|---|
| 1-hour mean | All locations where the annual mean and 24-hour mean and 8-hour objectives apply. Kerbside sites (for example, pavements of busy shopping streets)<br>Those parts of car parks, bus stations and railway stations etc which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more<br>Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer | Kerbside sites where the public would not be expected to have regular access |

15.2 Local Air Quality Management Technical Guidance 2016 LAQM (TG16), DEFRA, 2016.

### Local Air Quality Management

8.2.7 Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of administration under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves considering present and likely future air quality against the AQOs. If it is predicted that levels at sensitive locations where members of the public are regularly present for the relevant averaging period are likely to be exceeded, the LA is required to declare an AQMA. For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

### Dust

8.2.8 The main requirements with respect to dust control from industrial or trade premises not regulated under the Environmental Permitting (England and Wales) Regulations (2016) and subsequent amendments, such as construction sites, is that provided in section 79 of Part III of the Environmental Protection Act (1990). The Act defines nuisance as:

*"any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance."*

8.2.9 Enforcement of the Act, in regard to nuisance, is currently under the administration of the local Environmental Health Department, whose officers are deemed to provide an independent evaluation of nuisance. If the LA is satisfied that a statutory nuisance exists, or is likely to occur or happen again, it must serve an Abatement Notice under Part III of the Environmental Protection Act (1990). Enforcement can insist that there be no dust beyond the boundary of the works. The only defence is to show that the process to which the nuisance has been attributed and its operation are being controlled according to best practice measures.

## National Planning Policy

### National Planning Policy Framework

8.2.10 The National Planning Policy Framework[3] (NPPF) was published on 27th March 2012 and sets out the Government's core policies and principles with respect to land use planning, including air quality. The document includes the following considerations which are relevant to this assessment:

*"The planning system should contribute to and enhance the natural and local environment by:*

*Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability*

*Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan."*

8.2.11 In March 2018 a draft revised NPPF was issued for consultation. The document contains the following paragraph which is relevant to this assessment:

*"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."*

8.2.12 The implications of the current NPPF and draft NPPF have been considered throughout this assessment.

8.2.13 The draft revised NPPF (NPPF, 2018) was released for consultation on 5th March 2018, ending 10th May 2018. The draft NPPF carries limited weight in the determination of this application.

3 National Planning Policy Framework, Department for Communities and Local Government, 2012.

### National Planning Practice Guidance

8.2.14 The National Planning Practice Guidance[4] (NPPG) web-based resource was launched by the Department for Communities' and Local Government on 6th March 2014 to support the NPPF and make it more accessible. The air quality pages are summarised under the following headings:

Paragraph 001 states that: *"Defra carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with EU Limit Values" and "It is important that the potential impact of new development on air quality is taken into account, where the national assessment indicates that relevant limits have been exceeded or are near the limit". The role of Local Authorities under LAQM are stated and that Air Quality Action Plans should "identify measures that will be introduced in pursuit of the objectives"*

Paragraph 005 states that *"Whether or not air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to generate air quality impact in an area where air quality is known to be poor. They could also arise where the development is likely to adversely impact upon the implementation of air quality strategies and action plans and/or, in particular, lead to a breach of EU legislation*

Paragraph 007 states that *"Assessments should be proportional to the nature and scale of development proposed and the level of concern about air quality". In terms of mitigation, it states that "Mitigation options where necessary will be location specific, will depend on the proposed development and should be proportionate to the likely impact".*

Paragraph 009 shows a flow chart highlighting how the assessment of air quality impacts should fit into the development management process. It makes it clear that air quality impact risks, AQLVs and AQOs should be considered in the decision-making process.

8.2.15 These were reviewed and the relevant guidance considered as necessary throughout the undertaking of this assessment.

## Local Planning Policy

### London Planning Policy

8.2.16 The Minor Alterations to The London Plan[5] was published in March 2016 and sets out a fully integrated economic, environmental, transport and social framework for the development of the capital until 2031.

4 http://planningguidance.planningportal.gov.uk/.

5 The London Plan, Minor Alterations to the London Plan, Greater London Authority, March 2016.

London boroughs' local plans need to be in general conformity with the London Plan, and its policies guide decisions on planning applications by councils and the Mayor.

8.2.17 The London Plan policies relating to air quality are outlined below:

"Policy 3.2 Improving health and addressing health inequalities

Strategic

- The Mayor will take account of the potential impact of development proposals on health and health inequalities within London. The Mayor will work in partnership with the NHS in London, boroughs and the voluntary and community sector as appropriate to reduce health inequalities and improve the health of all Londoners, supporting the spatial implications of the Mayor's Health Inequalities Strategy.
- The Mayor will promote London as a healthy place for all – from homes to neighbourhoods and across the city as a whole – by:
- Coordinating planning and action on the environment, climate change and public health to maximise benefits and engage a wider range of partners in action

  […]
- The impacts of major development proposals on the health and wellbeing of communities should be considered, for example through the use of Health Impact Assessments (HIA).

Planning decisions

- New developments should be designed, constructed and managed in ways that improve health and promote healthy lifestyles to help to reduce health inequalities.

Policy 5.3 - Sustainable design and construction

Strategic

- The highest standards of sustainable design and construction should be achieved in London to improve the environmental performance of new developments and to adapt to the effects of climate change over their lifetime.

Planning decisions

- Development proposals should demonstrate that sustainable design standards are integral to the proposal, including its construction and operation, and ensure that they are considered at the beginning of the design process.
- Major development proposals should meet the minimum standards outlined in the Mayor's supplementary planning guidance and this should be clearly demonstrated within a design and access

statement. The standards include measures to achieve other policies in this Plan and the following sustainable design principles:

[…]

- Minimising pollution (including noise, air and urban run-off)

[…]"

**Policy 7.14 - Improving air quality**

**Strategic**

- The Mayor recognises the importance of tackling air pollution and improving air quality to London's development and the health and well-being of its people. He will work with strategic partners to ensure that the spatial, climate change, transport and design policies of this plan support implementation of his Air Quality and Transport strategies to achieve reductions in pollutant emissions and minimise public exposure to pollution.

**Planning decisions**

8.2.18 Development proposals should:

- Minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within Air Quality Management Areas (AQMAs) and where development is likely to be used by large numbers of those particularly vulnerable to poor air quality, such as children or older people) such as by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plans (see Policy 6.3).
- Promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practice guidance in the GLA and London Council's 'The control of dust and emissions from construction and demolition'.
- Be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as Air Quality Management Areas (AQMAs).
- Ensure that where provision needs to be made to reduce emissions from a development, this is usually made on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, and that it is possible to put in place measures having clearly demonstrated equivalent air quality benefits, planning obligations or planning conditions should be used as appropriate to ensure this, whether on a scheme by scheme basis or through joint area-based approaches."

8.2.19 These policies have been considered throughout the completion of this Air Quality Assessment.

### Draft New London Plan (2017)

8.2.20 The Draft New London Plan sets out the proposed development strategy for London from 2019 to 2041. It was consulted on from 29th November 2017 until 2nd March 2018.

**Draft Policy SI1 Improving air quality**

*London's air quality should be significantly improved and exposure to poor air quality, especially for vulnerable people, should be reduced:*

*Development proposals should not:*

*a) lead to further deterioration of existing poor air quality*

*b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits*

*c) reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality*

*d) create unacceptable risk of high levels of exposure to poor air quality.*

- *Development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality. Particular care should be taken with developments that are in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people.*

- *The development of large-scale redevelopment areas, such as Opportunity Areas and those subject to an Environmental Impact Assessment should propose methods of achieving an Air Quality Positive approach through the new development. All other developments should be at least Air Quality Neutral.*

- *Development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance*

- *Air Quality Assessments (AQAs) should be submitted with all major developments, unless they can demonstrate that transport and building emissions will be less than the previous or existing use.*

- *Development proposals should ensure that where emissions need to be reduced, this is done on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated.*

8.2.21 This policy has been considered throughout the undertaking of this Air Quality Assessment. However, it should be noted that the plan carries limited weight in the determination of this application.

### London Borough of Hounslow Local Plan

8.2.22 The Local Plan[6] was adopted by LBH in September 2015 and provides a framework for development within the borough until 2030. It includes a number of planning policies and strategic site allocations and supersedes the Employment Development Plan Document, the Brentford Area Action Plan and the Unitary Development Plan. As such, it provides the current basis for the determination of planning applications within LBH.

8.2.23 A review of the Local Plan indicated the following policy in relation to air quality:

**"Policy EQ 4 - Air Quality**

*We will seek to reduce the potential air quality impacts of development and promote improved air quality conditions across the borough, in line with the Air Quality Action Plan.*

*We will achieve this by*
*(a) Assessing the potential air quality impacts of development proposals;*

*(b) Encouraging air quality-sensitive development to be located in the most appropriate places, and requiring mitigation measures to minimise adverse impacts on end users through planning conditions; and*

*(c) Ensuring that development does not exacerbate existing air quality, by promoting development that reduces and limits exposure to emissions through on-site mitigation and is 'air quality neutral', and through promoting sustainable design and seeking developer contributions where appropriate, consistent with the London Plan, the Mayor's Air Quality Strategy and the National Air Quality Strategy.*

*i. We will expect development proposals to*

*(d) Carry out air quality assessments where major development or change of use to air quality sensitive uses are proposed, considering the potential impacts of air pollution from the development on the site and neighbouring areas, and the potential for end users to be exposed to air pollution, consistent with requirements established in the Air Quality SPD, the London Plan and in government and European policy are met; and*

(e) Incorporate mitigation measures where air quality assessments show that developments could cause or exacerbate air pollution, or where end users could be exposed to air pollution."

ii. Consideration has been given to this policy during the undertaking of this Air Quality Assessment.

6 The Hounslow Local Plan, London Borough of Hounslow, 2015.

## 8.3 Existing Baseline Conditions

8.3.1 Existing air quality conditions in the vicinity of the proposed development site were identified in order to provide a baseline for assessment.

### Local Air Quality Management

8.3.2 As required by the Environment Act (1995), LBH has undertaken Review and Assessment of air quality within their area of administration. This process has indicated that annual mean concentrations of NO2 are above the AQOs within the borough. As such, an AQMA has been declared, described as:

*"Hounslow AQMA – An area encompassing the entire borough of Hounslow."*

8.3.3 The proposed development site is located within the Hounslow AQMA. As such, there is the potential for future residents to be exposed to elevated pollutant concentrations, as well as the potential to cause adverse impacts to air quality within this area. This has been considered within this report.

8.3.4 LBH has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs and as such no further AQMAs have been designated.

### Air Quality Monitoring

8.3.5 Monitoring of pollutant concentrations is undertaken by LBH using continuous and periodic methods throughout their area of administration. A review of the most recent Air Quality Report7 indicates that there are two continuous monitors located within the assessment extents. Recent monitoring results of NO2 from these locations are shown in Table 10.3. Exceedances are shown in **bold**.

Table 10.3 Automatic $NO_2$ Monitoring Results

| Site Name | | Type | NGR (m) | | Annual Mean $NO_2$ Concentration ($\mu g/m^3$) | |
|---|---|---|---|---|---|---|
| | | | X | Y | 2015 | 2016 |
| HS5 | Brentford | Roadside | 517425 | 178074 | **53.3** | **56.9** |
| HS8 | Gunnersbury | Roadside | 519184 | 179369 | **53.0** | **59.1** |

8.3.6 As indicated in Table 10.3 there were exceedances of the annual mean AQO for NO2 at both sites in recent years. This is to be expected due to their roadside locations within an AQMA.

8.3.7 Both of these sites also monitor PM10 and recent results are shown in Table 10.4.

7 Air Quality Annual Status Report, London Borough of Hounslow, 2016

Table 10.4 Automatic $PM_{10}$ Monitoring Results

| Site Name | | Type | NGR (m) | | Annual Mean $PM_{10}$ Concentration ($\mu g/m^3$) | |
|---|---|---|---|---|---|---|
| | | | X | Y | 2015 | 2016 |
| HS5 | Brentford | Roadside | 517425 | 178074 | 31.1 | 30.7 |
| HS8 | Gunnersbury | Roadside | 519184 | 179369 | 25.6 | 27.0 |

8.3.8 As indicated Table 10.4 in there were no exceedances of the annual mean AQO for PM10 at both sites in recent years.

8.3.9 LBH also utilise passive diffusion tubes to monitor NO2 concentrations throughout the borough. A review of the most recent monitoring data available indicated that there are eleven diffusion tubes within the assessment extents. Recent results are shown in Table 10.5 . Exceedances of the AQO are shown in **bold.**

Table 10.5 Diffusion Tube Monitoring Results

| Site Name | | Type | NGR (m) | | Annual Mean $NO_2$ Concentration ($\mu g/m^3$) | |
|---|---|---|---|---|---|---|
| | | | X | Y | 2015 | 2016 |
| HS32 | 24 Adelaide Terrace | Roadside | 517592 | 178210 | **58.8** | **59.4** |
| HS33 | 30 Surrey Crescent | Roadside | 519452 | 178314 | **59.4** | **57.6** |
| HS34 | Chiswick Community School | Intermediate | 521028 | 177321 | 32.8 | 34.0 |
| HS35 | Hogarth Primary School | Intermediate | 521174 | 178069 | 34.6 | 37.2 |
| HS69 | Kew Bridge | Roadside | 519005 | 178040 | **60.1** | **55.4** |
| HS71 | Gunnersbury Avenue | Roadside | 519184 | 179369 | **57.3** | **54.1** |
| BREN A,B,C | Brentford, Glenhurst Road | Roadside | 517425 | 178071 | **62.1** | **64.7** |
| CHIS A,B,C | Chiswick High Road | Roadside | 521085 | 178499 | **58.1** | **55.5** |
| 20[a] | Mortlake Rd, Kew (nr. Kent Rd) | Kerbside | 519205 | 177221 | **48.0** | **47.0** |
| 54[a] | Mortlake Road, adjacent to West Hall Road, Kew | Kerbside | 519585 | 176492 | **51.0** | **49.0** |
| 66[a] | South Circular, Kew Green | Kerbside | 519060 | 177428 | -[b] | **49.0** |

[a]Diffusion tubes are operated under the administration of the London Borough of Richmond upon Thames
[b]Diffusion tube was not operational in 2015

8.3.10 As indicated in Table 10.5 the annual mean AQO for NO2 was exceeded at nine diffusion tube locations in recent years. This is to be expected due to their roadside and kerbside locations within an AQMA.

### Background Pollutant Concentrations

8.3.11 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The proposed development site is located in grid square NGR: 519500, 178500. Data for this location was downloaded from the DEFRA website for the purpose of this assessment and is summarised in Table 10.6

Table 10.6 Predicted Background Pollutant Concentrations

| Pollutant | Predicted 2016 Background Concentration (µg/m³) |
|---|---|
| $NO_x$ | 50.67 |
| $NO_2$ | 31.83 |
| $PM_{10}$ | 18.87 |
| CO | 506.00 |

8.3.12 As shown in Table 10.6, background concentrations do not exceed the relevant AQOs. Comparison with the NO2 monitoring results indicates the impact that vehicle exhaust emissions from the highway network have on pollutant concentrations at roadside locations.

8.3.13 It should be noted that the background concentrations of CO were predicted for 2001. These were the most recent predictions available from DEFRA and are therefore considered to provide a reasonable representation of background concentrations in the vicinity of the site.

### Sensitive Receptors

8.3.14 A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a development. These have been defined for construction dust impacts in the following Sections.

#### Construction Phase Sensitive Receptors

8.3.15 Receptors sensitive to potential dust impacts during earthworks and construction were identified from a desk-top study of the area up to 350m from the development boundary. These are summarised in Table 10.7.

Table 10.7 Demolition, Earthworks and Construction Dust Sensitive Receptors

| Distance from Site Boundary (m) | Approximate Number of Human Receptors | Approximate Number of Ecological Receptors |
|---|---|---|
| Less than 20 | 10 - 100 | 0 |
| 20 - 50 | 10 - 100 | 0 |
| 50 - 100 | More than 100 | Not Applicable |
| 100 - 350 | More than 100 | Not Applicable |

8.3.16 Reference should be made to Figure 3 within Appendix I for a graphical representation of earthworks and construction dust buffer zones.

8.3.17 Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 500m of the site access route. These are summarised in Table 10.8. The exact construction vehicle access routes were not available for the purpose of this assessment as they will depend on sourcing of materials. This is likely to be decided by the contractor. However, it was assumed construction traffic would access the site from Capital Interchange Way, utilising either the A205 (South Circular Road) or the A4 (Great West Road).

Table 10.8 Trackout Dust Sensitive Receptors

| Distance from Site Access Route (m) | Approximate Number of Human Receptors | Approximate Number of Ecological Receptors |
|---|---|---|
| Less than 20 | 10 - 100 | 0 |
| 20 - 50 | More than 100 | 0 |

8.3.18 Reference should be made to Figure 4 within Appendix I for a graphical representation of trackout dust buffer zones.

8.3.19 Sensitive receptors in the study area were identified as a mixture of industrial, commercial and residential premises and would be classified as of medium and high sensitivity respectively.

8.3.20 There are no ecological receptors within 50m of the site or trackout boundary. As such, ecological impacts have not been assessed further within this report.

8.3.21 A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in Table 10.9

Table 10.9 Additional Area Sensitivity Factors

| Guidance | Comment |
|---|---|
| Whether there is any history of dust generating activities in the area | The site is located in a mixed Industrial and residential location. As such, history of dust generation is minimal |
| The likelihood of concurrent dust generating activity on nearby sites | A review of the LBH planning portal indicated that there are 6 major planning applications within 500m of the proposed development. As such, there is the potential for concurrent dust generation due to overlapping construction phases |
| Pre-existing screening between the source and the receptors | The proposed site has no vegetation along the boundary. |
| Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place | The wind direction is predominantly from the south-west and west of the development, as shown in Figure 5 within Appendix I. As such, properties to the north-east and east of the site would be most affected by dust emissions |
| Conclusions drawn from local topography | The topography of the area appears to be predominantly flat. As such, there are no constraints to dust dispersion |
| Duration of the potential impact, as a receptor may become more sensitive over time | The development opening year of 2023 suggests the duration of the construction phase is likely to extend over one years. As such potential impact to receptors is low |
| Any known specific receptor sensitivities which go beyond the classifications given in the document. | No specific receptor sensitivities identified during the baseline |

8.3.22 Based on the criteria shown in Table 10.13, the sensitivity of the receiving environment to potential dust impacts was considered to be high. This was because users would expect to enjoy a reasonable level of amenity, aesthetics or value of their property could be diminished by soiling and people would be expected to be present for extended periods of time e.g. residential properties.

8.3.23 The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria shown in Section 10.4, is shown in Table 10.10

Table 10.10 Sensitivity of the Surrounding Area

| Potential Impact | Sensitivity of the Surrounding Area | | | |
|---|---|---|---|---|
| | Demolition | Earthworks | Construction | Trackout |
| Dust Soiling | High | High | High | High |
| Human Health | Low | Low | Low | Low |

Operational Phase Sensitive Receptors

8.3.24 Receptors sensitive to potential operational phase road vehicle exhaust emission impacts and on-site energy generating activities were identified from a desk-top study and are summarised in Table 10.11. Respective heights were model to reflect a worse case exposure from road vehicle emissions (1.5m) and worst case exposure from energy emissions, which is equivalent to the highest habitable floor level of each receptor building considered.

Table 10.11 Sensitivity of the Surrounding Area

| Receptors | | NRG | | Height (m) |
|---|---|---|---|---|
| | | X | Y | |
| R1 | Block K, Capital Court Site | 519051.0 | 178257.9 | 1.5 |
| R1a | Block K, Capital Court Site | 519051.0 | 178257.9 | 36 |
| R2 | Block J, Capital Court Site | 519032.3 | 178265.6 | 1.5 |
| R2a | Block J, Capital Court Site | 519032.3 | 178265.6 | 51 |
| R3 | Block J, Capital Court Site | 519024.4 | 178281.5 | 1.5 |
| R3a | Block J, Capital Court Site | 519024.4 | 178281.5 | 51 |
| R4 | Block I, Capital Court Site | 519027.0 | 178311.6 | 1.5 |
| R4a | Block I, Capital Court Site | 519027.0 | 178311.6 | 48 |
| R5 | Block H, Central Eastern Site | 518999.0 | 178385.7 | 1.5 |
| R5a | Block H, Central Eastern Site | 518999.0 | 178385.7 | 55.5 |
| R6 | Block G, Central Eastern Site | 518972.4 | 178359.5 | 1.5 |
| R6a | Block G, Central Eastern Site | 518972.4 | 178359.5 | 58 |
| R7 | Wheatstone House | 519214.3 | 178324.3 | 26.5 |
| R8 | Wheatstone House | 519213.9 | 178335.2 | 26.5 |
| R9 | Wheatstone House | 519224.0 | 178344.0 | 26.5 |
| R10 | Kew House School | 519092.7 | 178204.8 | 1.5 |
| R10a | Kew House School | 519092.7 | 178204.8 | 15.4 |

| Receptors | | NRG | | Height (m) |
|---|---|---|---|---|
| | | X | Y | |
| R11 | Kew House School | 519071.5 | 178163.8 | 1.5 |
| R12 | 55 Kew Bridge Road | 518952.0 | 178065.0 | 1.5 |
| R13 | Stile Hall Mansions, Wellesley Road | 519135.0 | 178176.0 | 4.5 |
| R14 | 551 Chiswick High Road | 519209.0 | 178236.0 | 1.5 |
| R15 | Wheatstone House | 519269.0 | 178319.0 | 1.5 |
| R16 | 6 Stonehill Road | 519366.0 | 178283.0 | 1.5 |
| R17 | 30 Surrey Crescent | 519452.0 | 178314.0 | 1.5 |
| R18 | 463 Chiswick High Road | 519461.0 | 178384.0 | 1.5 |
| R19 | 447 Chiswick High Road | 519536.0 | 178395.0 | 1.5 |
| R20 | International School of London | 519318.9 | 178798.1 | 1.5 |
| R21 | 406 High Street | 518662.5 | 177939.9 | 1.5 |

8.3.25 The sensitive receptors identified in Table 10.11.represent worst-case locations. However, this is not an exhaustive list and there may be other locations within the vicinity of the application site that may experience air quality impacts as a result of the proposed development that have not been individually identified above. Reference should be made to Figure 6 within Appendix I for a graphical representation of road vehicle exhaust emission sensitive receptor locations.

## 8.4 Methodology

8.4.1 The proposed development has the potential to cause air quality impacts during the construction and operational phases in addition to exposing future site users to elevated pollution levels. These issues have been assessed in accordance with the following methodology. This methodology has been approved by Surinderpal Suri, Team Leader (interim) - Environmental Strategy, on 15/08/2017.

### Construction Phase assessment

8.4.2 There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the GLA document 'Guidance on the Assessment of Dust from Demolition and Construction'8

8.4.3 Activities on the proposed construction site have been divided into four types to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and,

8 The Control of Dust and Emissions During Construction And Demolition Supplementary Planning Guidance, GLA, 2016.

- Trackout.

8.4.4 The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to a significant increase in exposure to $PM_{10}$.

8.4.5 The assessment steps are detailed below.

### Step 1

8.4.6 Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the site boundary or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment should proceed to Step 2.

8.4.7 Should sensitive receptors not be present within the relevant distances then negligible impacts would be expected and further assessment is not necessary.

### Step 2

8.4.8 Step 2 assesses the risk of potential dust impacts. A site is allocated to a risk category based on two factors:

- The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large (Step 2A); and
- The sensitivity of the area to dust impacts, which can defined as low, medium or high sensitivity (Step 2B).

8.4.9 The two factors are combined in Step 2C to determine the risk of dust impacts without mitigation applied.

8.4.10 Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table 10.12.

Table 10.12 Construction Dust - Magnitude of Emission

| Magnitude | Activity | Criteria |
|---|---|---|
| Large | Demolition | • Total building volume greater than 50,000$m^3$<br>• Potentially dusty construction material (e.g. concrete)<br>• On-site crushing and screening<br>• Demolition activities greater than 20m above ground level |

| Magnitude | Activity | Criteria |
|---|---|---|
| | Earthworks | • Total site area greater than 10,000m$^2$<br>• Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size)<br>• More than 10 heavy earth moving vehicles active at any one time<br>• Formation of bunds greater than 8m in height<br>• More than 100,000 tonnes of material moved |
| | Construction | • Total building volume greater than 100,000m$^3$<br>• On site concrete batching<br>• Sandblasting |
| | Trackout | • More than 50 Heavy Duty Vehicle (HDV) trips per day<br>• Potentially dusty surface material (e.g. high clay content)<br>• Unpaved road length greater than 100m |
| Medium | Demolition | • Total building volume 20,000m$^3$ to 50,000m$^3$<br>• Potentially dusty construction material<br>• Demolition activities 10m to 20m above ground level |
| | Earthworks | • Total site area 2,500m$^2$ to 10,000m$^2$<br>• Moderately dusty soil type (e.g. silt)<br>• 5 to 10 heavy earth moving vehicles active at any one time<br>• Formation of bunds 4m to 8m in height<br>• Total material moved 20,000 tonnes to 100,000 tonnes |
| | Construction | • Total building volume 25,000m$^3$ to 100,000m$^3$<br>• Potentially dusty construction material (e.g. concrete)<br>• On site concrete batching |
| | Trackout | • 10 to 50 HDV trips per day<br>• Moderately dusty surface material (e.g. high clay content)<br>• Unpaved road length 50m to 100m |
| Small | Demolition | • Total building volume under 20,000m$^3$<br>• Construction material with low potential for dust release (e.g. metal cladding or timber)<br>• Demolition activities less than 10m above ground level<br>• Demolition during wetter months |
| | Earthworks | • Total site area less than 2,500m$^2$<br>• Soil type with large grain size (e.g. sand)<br>• Less than 5 heavy earth moving vehicles active at any one time<br>• Formation of bunds less than 4m in height<br>• Total material moved less than 20,000 tonnes<br>• Earthworks during wetter months |
| | Construction | • Total building volume less than 25,000m$^3$<br>• Construction material with low potential for dust release (e.g. metal cladding or timber) |
| | Trackout | • Less than 10 HDV trips per day<br>• Surface material with low potential for dust release<br>• Unpaved road length less than 50m |

8.4.11 Step 2B defines the sensitivity of the area around the development site for demolition, construction, earthworks and trackout. The factors influencing the sensitivity of the area are shown in Table 10.13.

Table 10.13 Examples of Factors Defining Sensitivity of an Area

| Sensitivity | Examples | |
|---|---|---|
| | Human Receptors | Ecological Receptors |
| High | • Users expect of high levels of amenity<br>• High aesthetic or value property<br>• People expected to be present continuously for extended periods of time<br>• Locations where members of the public are exposed over a time period relevant to the AQO for $PM_{10}$ e.g. residential properties, hospitals, schools and residential care homes | • Internationally or nationally designated site e.g. Special Area of Conservation |
| Medium | • Users would expect to enjoy a reasonable level of amenity<br>• Aesthetics or value of their property could be diminished by soiling<br>• People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g. parks and places of work | • Nationally designated site e.g. Sites of Special Scientific Interest |
| Low | • Enjoyment of amenity would not reasonably be expected<br>• Property would not be expected to be diminished in appearance<br>• Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, playing fields, farmland, footpaths, short term car park and roads | • Locally designated site e.g. Local Nature Reserve |

8.4.12 The guidance also provides the following factors to consider when determining the sensitivity of an area to potential dust impacts during the construction phase:

- Any history of dust generating activities in the area;
- The likelihood of concurrent dust generating activity on nearby sites;
- Any pre-existing screening between the source and the receptors;
- Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which works will take place;
- Any conclusions drawn from local topography;
- Duration of the potential impact, as a receptor may become more sensitive over time; and
- Any known specific receptor sensitivities which go beyond the classifications given in the document.

8.4.13 These factors were considered in the undertaking of this assessment.

8.4.14 The sensitivity of the area to dust soiling effects on people and property is shown in Table 10.14.

Table 10.14 Sensitivity of the Area to Dust Soiling Effects on People and Property

| Receptor Sensitivity | Number of Receptors | Distance from the Source (m) | | | |
|---|---|---|---|---|---|
| | | Less than 20 | Less than 50 | Less than 100 | Less than 350 |
| High | More than 100 | High | High | Medium | Low |
| | 10 - 100 | High | Medium | Low | Low |
| | 1 - 10 | Medium | Low | Low | Low |
| Medium | More than 1 | Medium | Low | Low | Low |
| Low | More than 1 | Low | Low | Low | Low |

8.4.15 Table 10.15 outlines the sensitivity of the area to human health impacts.

Table 10.15 Sensitivity of the Area to Human Health Impacts

| Receptor Sensitivity | Annual Mean $PM_{10}$ Concentration | Number of Receptors | Distance from the Source (m) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Less than 20 | Less than 50 | Less than 100 | Less than 200 | Less than 350 |
| High | Greater than 32µg/m³ | More than 100 | High | High | High | Medium | Low |
| | | 10 - 100 | High | High | Medium | Low | Low |
| | | 1 - 10 | High | Medium | Low | Low | Low |
| | 28 - 32µg/m³ | More than 100 | High | High | Medium | Low | Low |
| | | 10 - 100 | High | Medium | Low | Low | Low |
| | | 1 - 10 | High | Medium | Low | Low | Low |
| | 24 - 28µg/m³ | More than 100 | High | Medium | Low | Low | Low |
| | | 10 - 100 | High | Medium | Low | Low | Low |
| | | 1 - 10 | Medium | Low | Low | Low | Low |
| | Less than 24µg/m³ | More than 100 | Medium | Low | Low | Low | Low |
| | | 10 - 100 | Low | Low | Low | Low | Low |
| | | 1 - 10 | Low | Low | Low | Low | Low |
| Medium | Greater than 32µg/m³ | More than 10 | High | Medium | Low | Low | Low |
| | | 1 - 10 | Medium | Low | Low | Low | Low |
| | 28 - 32µg/m³ | More than 10 | Medium | Low | Low | Low | Low |
| | | 1 - 10 | Low | Low | Low | Low | Low |
| | 24 - 28µg/m³ | More than 10 | Low | Low | Low | Low | Low |
| | | 1 - 10 | Low | Low | Low | Low | Low |
| | Less than 24µg/m³ | More than 10 | Low | Low | Low | Low | Low |
| | | 1 - 10 | Low | Low | Low | Low | Low |
| Low | - | More than 1 | Low | Low | Low | Low | Low |

8.4.16 Table 10.16 outlines the risk category from demolition activities.

Table 10.16 Dust Risk Category from Demolition

| Sensitivity of Area | Dust Emission Magnitude | | |
|---|---|---|---|
| | Large | Medium | Small |
| High | High | Medium | Medium |
| Medium | High | Medium | Low |
| Low | Medium | Low | Negligible |

8.4.17 Step 2C combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts.

8.4.18 Table 10.17 outlines the risk category from earthworks and construction activities.

Table 10.17 Dust Risk Category from Earthworks and Construction

| Sensitivity of Area | Dust Emission Magnitude | | |
|---|---|---|---|
| | Large | Medium | Small |
| High | High | Medium | Low |
| Medium | Medium | Medium | Low |
| Low | Low | Low | Negligible |

8.4.19 Table 10.18 outlines the risk category from trackout.

Table 10.18 Dust Risk Category from Trackout

| Sensitivity of Area | Dust Emission Magnitude | | |
|---|---|---|---|
| | Large | Medium | Small |
| High | High | Medium | Low |
| Medium | Medium | Low | Negligible |
| Low | Low | Low | Negligible |

Step 3

8.4.20 Step 3 requires the identification of site specific mitigation measures within the GLA guidance to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with negligible risk, mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

Step 4

8.4.21 Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. For almost all construction activity, the aim should be to control effects through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'.

8.4.22 The determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

## Operational Phase Assessment

### Future Exposure

8.4.23 The proposed development includes sensitive land use and is located within an AQMA, within close proximity to the local highway network. As such, the proposals have the potential to introduce new receptors into an area of existing poor air quality. Detailed dispersion modelling was therefore undertaken to quantify NO2, PM10 and CO concentrations across the site and determine suitability for the proposed use. Reference should be made to Appendix II for details of the assessment inputs.

8.4.24 The results of the dispersion modelling assessment were compared against the Air Pollution Exposure Criteria (APEC) contained within the London Councils Air Quality and Planning Guidance[9] from the London Air Pollution Planning and the Local Environment (APPLE) working group. These are outlined in Table 10.19.

Table 10.19 Air Pollution Exposure Criteria

| Category | Applicable Range | Recommendation |
|---|---|---|
| APEC A | Below 5% of the annual mean AQO | No air quality grounds for refusal; however mitigation of any emissions should be considered |
| APEC - B | Between 5% below or above the annual mean AQO | May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered e.g. maximise distance from pollutant source, proven ventilation systems, parking considerations, winter gardens, internal layout considered and internal pollutant emissions minimised. |
| APEC - C | Above 5% of the annual mean AQO | Refusal on air quality grounds should be anticipated, unless the LA has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated. Worker exposure in commercial/industrial land uses should be considered further. Mitigation measures must be presented with air quality assessment, detailing anticipated outcomes of mitigation measures |

8.4.25 It should be noted that a significant area of London would fall under APEC - C due to high NO2 concentrations throughout the city. As such, a presumption against planning consent in these locations may result in large areas of land becoming undevelopable and prevent urban regeneration. The inclusion of suitable mitigation measures to protect future users is therefore considered a suitable way to progress sustainable schemes in these locations and has been considered within this assessment.

Road Vehicle and On-site Energy Exhaust Emissions

8.4.26 The combination of associated vehicle trips and the energy emissions associated with the proposed CHP and boiler units will generate additional emissions. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site.

8.4.27 The assessment considered the following scenarios:

9 London Councils Air Quality and Planning Guidance, London Councils, 2007.

- 2016 Verification;
- Opening year do-minimum (DM) (predicted traffic flows in 2023 should the proposals not proceed including committed developments); and
- Opening year do-something (DS) (predicted traffic flows in 2023 should the proposed development be completed including committed developments, with the addition of traffic flows generated by the development and emissions associated with on-site energy generating activities)

8.4.28 Reference should be made to the Appendices for assessment input data.

8.4.29 Receptors potentially sensitive to changes in NO2 and PM10 concentrations were identified within 200m of the affected highway network in accordance with the guidance provided within the Design Manual for Roads and Bridges (DMRB)10 on the likely limits of pollutant dispersion from road sources. LLAQM.TG(16)2 provides the following examples of where annual mean and 1-hour AQOs should apply:

- Residential properties;
- Schools;
- Hospitals;
- Care homes; and
- Places of work

8.4.30 The sensitivity impact significance of each receptor was defined in accordance with the criteria shown in Table 10.20. These are based upon the guidance provided within the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance 'Land-Use Planning and Development Control: Planning for Air Quality'[11].

Table 10.20 Operational Traffic Exhaust Emissions - Significance of Impact

| Long Term Average Concentration | Change in Concentration Relative to AQO | | | |
|---|---|---|---|---|
| | 1 | 2-5 | 6-10 | >10 |
| 75% or less of AQO | Negligible | Negligible | Slight | Moderate |
| 76 - 94% of AQO | Negligible | Slight | Moderate | Moderate |
| 95 - 102% of AQO | Slight | Moderate | Moderate | Substantial |
| 103 - 109% of AQO | Moderate | Moderate | Substantial | Substantial |
| 110% or more of AQO | Moderate | Substantial | Substantial | Substantial |
| 75% or less of AQO | Negligible | Negligible | Slight | Moderate |

10 Design Manual for Roads and Bridges Volume 11, Section 3, Part 1, HA207/07, Highways Agency, 2007.

11 Land-Use Planning and Development Control: Planning for Air Quality, Environmental Protection UK and Institute of Air Quality Management, 2015.

8.4.31 The criteria shown in Table 10.20 is adapted from the EPUK and IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality'[11] with sensitivity descriptors included to allow comparisons of various air quality impacts. It should be noted that changes of 0%, i.e. less than 0.5%, will be described as negligible in accordance with the EPUK and IAQM guidance[11].

8.4.32 It is not normal practice to use impact descriptors for short-term (hourly) impacts. However, the EPUK and IAQM guidance[11] suggests the following descriptors based on Environment Agency guidance.

Table 10.21 Short Term Process Contribution - Severity of Impact

| % Change in Hourly Concentration Relative to AQO | | | |
|---|---|---|---|
| <10 | 10-20 | 20-50 | >50 |
| Negligible | Slight | Moderate | Substantial |

8.4.33 Following the prediction of impacts at discrete receptor locations utilising the criteria in Table 10.20 and Table 10.21, the EPUK and IAQM11 document states that this framework is to be used as a starting point to make a judgement on significance of effect but other influences might need to be accounted for. Whilst impacts might be determined as 'slight', 'moderate' or 'substantial' at individual receptors, overall effect might not necessarily be deemed as significant in some circumstances. The following factors may provide some assistance in determining the overall significance of a development:

- Number of properties affected by significant air quality impacts and a judgement on the overall balance;
- Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective will be relevant;
- The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors;
- Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease; and
- The extent to which an objective is exceeded e.g. an annual mean $NO_2$ concentration of 41µg/$m^3$ should attract less significance than an annual mean of 51µg/$m^3$.

8.4.34 These factors were considered and an overall significance determined for the impact of operational phase road traffic emissions. It should be noted that the determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

## Air Quality Neutral

8.4.35 An assessment was undertaken to compare benchmark emissions with the application site use emissions in accordance with the methodology outlined within the GLA 'Air Quality Neutral Planning Support GLA 80371[12]. The methodology is summarised in the following Sections.

Air Quality Neutral Assessment

8.4.36 The following potential scenarios have been considered within the assessment:

- Benchmark; and,
- Development.

8.4.37 The benchmark scenario is representative of annual NOx and PM10 benchmark emissions, which are target emissions as defined by the GLA Guidance12. The development scenario is representative of the annual NOx and PM10 emissions from the operation of the proposed development only.

8.4.38 The following emission source was considered during the assessment:

- Road vehicles travelling to and from the application site.
- On-site energy generation

Road Vehicle Exhaust Emissions

8.4.39 The proposed development has the potential to cause variations in exhaust emissions associated with vehicles travelling to and from the application site. These were assessed by calculating annual emissions based on the anticipated traffic generated by the proposed development and standard emission factors provided in the Air Quality Neutral Planning Support GLA 80371[12], as shown in Table 10.22.

Table 10.22 Air Quality Neutral Road Transport Emission Factors

| Pollutant | g/vehicle-km in Outer London |
|---|---|
| $NO_x$ | 0.353 |
| $PM_{10}$ | 0.0606 |

Energy Emissions

8.4.40 The proposed development has the potential to change NOx emissions as a result of variations in CHP and boiler technology used in the provision of heating and hot water. This was assessed by calculating annual emissions based on the anticipated energy usage of the site and standard release rates provided by the Air Quality Neutral Planning Support GLA 80371[12].

12 Air Quality Neutral Planning Support: GLA 80371, Air Quality Consultants Limited in association with ENVIRON UK Ltd, 2014.

## 8.5 Assessment of potential impacts

8.5.1 There is the potential for air quality impacts as a result of the construction phases, and the combination of vehicle trips and on-site energy generating activates during the operational phase of the proposed development. Consequently, future site users could be exposed to elevated pollution levels; the potential impacts have been assessed in the following Sections

### Construction Phase Assessment

Step 1

8.5.2 The undertaking of activities such as demolition, excavation, ground works, cutting, construction, concrete batching and storage of materials has the potential to result in fugitive dust emissions throughout the construction phase. Vehicle movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul road and highway surfaces.

8.5.3 The potential for impacts at sensitive locations depends significantly on local meteorology during the undertaking of dust generating activities, with the most significant effects likely to occur during dry and windy conditions.

8.5.4 The desk-study undertaken to inform the baseline identified a number of sensitive receptors within 350m of the site boundary. As such, a detailed assessment of potential dust impacts was required.

Step 2

#### Demolition

8.5.5 Demolition will involve the removal of the existing building structures. It is anticipated that the volume of buildings to be demolished is likely to between 20,000 m3 and 50,000 m3. In accordance with the criteria outlined in Table 10.12, the magnitude of potential dust emissions from earthworks is therefore medium.

8.5.6 Table 10.10 indicates the sensitivity of the area to dust soiling effects on people and property is high. In accordance with the criteria outlined in Table 10.16, the development is considered to be a medium risk site for dust soiling as a result of demolition activities.

8.5.7 Table 10.10 indicates the sensitivity of the area to human health is low. In accordance with the criteria outlined in Table 10.16, the development is considered to be a low risk site for human health as a result of demolition activities.

#### Earthworks

8.5.8 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. Information on soil type was not available for the purpose of this assessment. As such, the soil type was considered to be potentially dusty in order to provide a worst-case scenario.

8.5.9 The proposed development site is estimated to cover a total area between 2,500m2 and 10,000 m2. In accordance with the criteria outlined in Table 10.12, the magnitude of potential dust emissions from earthworks is therefore medium.

8.5.10 Table 10.10 indicates the sensitivity of the area to dust soiling effects on people and property is high. In accordance with the criteria outlined in Table 10.17, the development is considered to be a medium risk site for dust soiling as a result of earthworks activities.

8.5.11 Table 10.10 indicates the sensitivity of the area to human health is low. In accordance with the criteria outlined in Table 10.17, the development is considered to be a low risk site for human health as a result of earthwork activities.

### Construction

8.5.12 Due to the size of the development the total building volume is likely to be greater than 100,000m3. In accordance with the criteria outlined in Table 10.12, the magnitude of potential dust emissions from construction is therefore large.

8.5.13 Table 10.10 indicates the sensitivity of the area to dust soiling effects on people and property is high. In accordance with the criteria outlined in Table 10.17, the development is considered to be a high risk site for dust soiling as a result of construction activities.

8.5.14 Table 10.10 indicates the sensitivity of the area to human health is low. In accordance with the criteria outlined in Table 10.17, the development is considered to be a low risk site for human health as a result of construction activities.

### Trackout

8.5.15 Information on the number of HDV trips to be generated during the construction phase of the development provided by Peter Brett Associates LLP indicated that the peak period of construction will be in November 2019 with 65 HGV movements to site across a day (130 two-trips). In accordance with the criteria outlined in Table 10.12, the magnitude of potential dust emissions from trackout is therefore high.

8.5.16 Table 10.10 indicates the sensitivity of the area to dust soiling effects to people and property is high. In accordance with the criteria outlined in Table 10.18, the development is considered to be a high risk site for dust soiling as a result of trackout activities.

8.5.17 Table 10.10 indicates the sensitivity of the area to human health is low. In accordance within the criteria outlined in Table 10.18, the development is considered to be a low risk site for human health as a result of trackout activities.

Summary of the Risk of Dust Effects

8.5.18 A summary of the risk from each dust generating activity is provided in Table 10.23

Table 10.23 Summary of Potential Unmitigated Dust Risks

| Potential Impact | Risk | | | |
|---|---|---|---|---|
| | Demolition | Earthworks | Construction | Trackout |
| Dust Soiling | Medium | Medium | High | High |
| Human Health | Low | Low | Low | Low |

8.5.19 As indicated in Table 10.23, the potential risk of dust soiling is high from construction and trackout activities and medium from demolition and earthworks activities. The potential risk of human health impacts is low for demolition, earthworks construction and trackout activities.

8.5.20 It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location. Risk was predicted based on a worst-case scenario of works being undertaken at the site boundary closest to each sensitive area. Therefore, actual risk is likely to be lower than that predicted during the majority of the construction phase.

Step 3

8.5.21 The GLA guidance8 provides a number of potential mitigation measures to reduce impacts during the construction phase. These measures have been adapted for the development site as summarised in Table 10.24. The mitigation measures outlined in Table 10.24 can be reviewed prior to the commencement of construction works incorporated into the existing the strategies as applicable.

Table 10.24 Fugitive Dust Mitigation Measures

| Issue | Control Measure |
|---|---|
| Communications | • Develop and implement a stakeholder communication plan that includes community engagement before work commences on site<br>• Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary<br>• Display the head or regional office contact information<br>• Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the LA |
| Site Management | • Record all dusty and air quality complaints and make the complaints log available to the LA when asked<br>• Record any exceptional incidents that cause dust/or air emissions, and the action taken to resolve the situation<br>• Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised |
| Monitoring | • Undertake daily on-site and off-site inspection where receptors are nearby to monitor dust<br>• Carry out regular site inspections to monitor compliance with the DMP<br>• Increase frequency of site inspections when activities with a high potential to produce dust are being carried out |

| Issue | Control Measure |
|---|---|
| Preparing and Maintaining the Site | • Plan site layout so that machinery and dust causing activities are located away from receptors<br>• Fully enclose site or specific operations where there is a high potential for dust production and the site as actives for an extensive period<br>• Avoid site runoff of water or mud<br>• Keep site fencing, barriers and scaffolding clean using wet methods<br>• Remove materials that have a potential to produce dust from site as soon as possible<br>• Cover, seed or fence stockpiles to prevent wind whipping Use water as dust suppressant where applicable |
| Operating Vehicle/ Machinery and Sustainable Travel | • Ensure all on-road vehicles comply with the requirements of the London low emission zone and the London NRMM standards, Where applicable<br>• All vehicles to switch off engines - no idling vehicles<br>• Avoid the use of diesel or petrol-powered generators where practicable<br>• Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph in unsurfaced haul roads<br>• Produce a construction logistics plan to manage the sustainable delivery of goods and materials<br>• Implement a travel plan that supports and encourages sustainable travel. |
| Operations | • Cutting equipment to use water as dust suppressant or suitable local extract ventilation<br>• Ensure adequate water supply on the site for effective dust/particulate m atter suppression/mitigation<br>• Use enclosed chutes and covered skips<br>• Minimise drop heights<br>• Ensure equipment is readily available on site to clean any spillages |
| Waste Management | • No bonfires |
| Demolition | • Soft strip inside buildings before demolition<br>• Ensure effective water suppression is used during demolition operations.<br>• Avoid explosive blasting - use appropriate manual alternatives<br>• Bag or remove any debris |
| Earthworks and Construction | • Avoid scabbling (roughening of concrete surfaces)<br>• Ensure bulk cement and other fine powders are stored in bunded area and are not allowed to dry out unless this is required for a particular process<br>• Ensure bulk cement and other fine powder materials are delivered and stored to prevent escape |
| Trackout | • Use water-assisted dust sweeper on the access and local roads<br>• Avoid dry sweeping of large areas<br>• Ensure vehicles entering and leaving sites are covered to prevent escape of materials<br>• Inspect on-site routes for integrity, instigate necessary repairs and record in site log book<br>• Install hard surfaced haul routes which are regularly damped down<br>• Implement a wheel washing system at a suitable location near site exit<br>• Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits<br>• Access gates to be located at least 10m from receptors, where possible |

Step 4

8.5.22 Assuming the relevant mitigation measures outlined in Table 10.24 are implemented, the residual effect from all dust generating activities is predicted to be not significant, in accordance with the GLA guidance8.

### Cumulative Effects - Construction Phase Assessment

8.5.23 There are a number of large scale committed developments located within 500m of the proposed development, as listed below:

- Brentford Football Club Land at Lionel Road (LBH Ref: P/2013/1811);
- Former Thames Water Land, Kew Bridge Road (LBH Ref: P/2011/2757, P/2014/5228, and P/2016/4495);
- Land Adjacent to Kew Bridge Road (LBH Ref: P/2011/0747);
- 250 Gunnersbury Avenue, Chiswick (LBH Ref: P/2015/4187);
- Wheatstone House, 650 Chiswick High Road (LBH Ref: P/2013/2757); and
- Kew Bridge Station Yard, Kew Bridge Road (LBH Ref: P/2014/1736)

8.5.24 Due to the size and nature of the above planning applications there is a likelihood for cumulative effects as a result of concurrent dust generating activity should the construction phases overlap. However, the implementation of the following mitigation measures suggested in Table 10.24 will ensure that any cumulative effects at the development site will be minimized.

### Cumulative Effects - Operational Phase Assessment – Future Exposure

8.5.25 Cumulative effects are defined as those that occur as a result of combined past, current and future activities that may impact collectively over time. Cumulative effects on air quality at the Proposed Development are outlined in the following Sections. These sections consider the effect of the Proposed Development in conjunction with traffic and highway works associated with the identified committed developments, as listed below:

- Brentford Football Club Land at Lionel Road (LBH Ref: P/2013/1811)

8.5.26 For the assessment of the impacts of onsite energy emissions, the building geometry of the committed developments within the near vicinity of the proposed development were considered to assess the likely building effects on the dispersion of pollutants around the site. The considered committed developments for the energy impacts are listed below:

- Brentford Football Club Land at Lionel Road (LBH Ref: P/2013/1811); and
- Wheatstone House ,650 Chiswick High Road (LBH Ref: P/2013/2757)

Nitrogen Dioxide – Annual Mean

8.5.27 Annual mean NO2 concentrations were predicted across the entire development site for the DM and DS scenarios at the following building heights of 2.25m, 6.10m, 9.20m, 12.40m, 15.50m and 56.50m to represent exposure across the ground, first, second, third, fourth and seventeenth floor of the proposed development, respectively. Reference should be made to Figures 7 to 13 within Appendix I. It should be noted that the ground level of the proposed development represents worst-case locations from road vehicle exhaust emissions and the seventeenth floor represents worst-case locations from the energy emissions.

8.5.28 Predicted annual mean NO2 concentrations across the proposed sensitive uses (residential units and nursery) from ground floor to fourth floor level for the DS scenario are summarised in Table 10.25.

Table 10.25 Predicted Annual Mean $NO_2$ Concentrations

| Elevation (m) | Predicted 2023 Annual Mean $NO_2$ Concentration Range ($\mu g/m^3$) | APEC Category |
|---|---|---|
| Ground Floor (2.25m) | 38.13 - 38.81 | B |
| First Floor (6.10m) | 37.84 - 39.04 | A - B |
| Second Floor (9.20m) | 37.04 - 38.93 | A - B |
| Third Floor (12.40m) | 36.49 - 38.17 | A - B |
| Fourth Floor (15.50m) | 36.09 - 37.38 | A |

8.5.29 Table 10.25 indicates that predicted NO2 concentrations did not exceeded the annual mean AQO across all levels at proposed sensitive locations. However, there were exceedances of the annual mean AQO for NO2 across the development site boundary on the ground and first floor levels, as shown in Figure 8 and 9 within Appendix I.

8.5.30 As indicated in Table 10.25 all sensitive locations on the ground floor levels are classified as APEC - B in accordance with the London Councils Air Quality and Planning Guidance9. Additionally, concentrations at the sensitive uses on the first, second and third floor levels were predicted to range between APEC - A and APEC - B. It is important to note that levels between fourth and seventeenth floor were predicted to be APEC - A.

8.5.31 Based on the dispersion modelling results the implementation of mitigation measures is required to protect future residents from poor air quality at ground, first, second and third floor level. Further details on required mitigation techniques are detailed in Section 8.6 It should be noted that the annual mean AQO does not apply at commercial areas and therefore mitigation measures are not required at these building uses on the ground and first floor level.

Nitrogen Dioxide – 1-Hour Mean

8.5.32 Predicted 99.79th percentile of hourly mean NO2 concentrations were modelled across the development site at ground floor level (2.25m) for the DM and DS scenarios and the seventeenth floor level (56.50m) for the DS scenario, as shown in Figures 14 to 16 within Appendix I. The predicted concentrations for the DS scenarios across the development site are summarised in Table 10.26 for the development opening year.

Table 10.26 Predicted 1-Hour Mean $NO_2$ Concentrations

| Elevation (m) | Predicted 2023 1-Hour Mean $NO_2$ Concentration Range (µg/m³) |
|---|---|
| Ground Floor (2.25m) | 68.34 - 70.61 |
| Seventeenth Floor (56.50m) | 64.50 - 92.34 |

8.5.33 As indicated in Table 10.26, there are no predicted exceedances of the hourly AQO across the development site.

**Particulate Matter – $PM_{10}$ Annual Mean**

8.5.34 Annual Mean PM10 concentrations were modelled across the development site at ground floor level (2.25m) for the DM and DS scenarios, as shown in Figures 17 to 18 within Appendix I. The predicted concentrations for the DS scenario across the development site are summarised in Table 10.27 for the development opening year.

Table 10.27 Predicted Annual Mean $PM_{10}$ Concentrations

| Elevation (m) | Predicted 2023 Annual Mean $PM_{10}$ Concentration Range (µg/m³) | APEC Category |
|---|---|---|
| Ground Floor (2.25m) | 28.78 - 29.13 | A |

8.5.35 As indicated in Table 10.27 there were no predicted exceedances of the annual mean AQO for PM10 across the proposed development. It should be noted that Figures showing predicted annual mean PM10 concentrations at heights above the ground floor were not included as concentrations reduce at increased heights and therefore the relevant AQO will not be exceeded at other levels.

Carbon Monoxide – 8-Hour Rolling Mean

8.5.36 Predicted 8-hour rolling mean CO concentrations as a result of the CHP and boiler units were modelled across the seventeenth-floor level (56.50m) of the proposed development during the DM and DS scenarios as shown in Figure 19 within Appendix I. The predicted concentrations for the DS scenario across the development site are summarised in Table 10.28 or the development opening year.

Table 10.28 Predicted 8-Hour Rolling Mean CO Concentration

| Elevation (m) | Predicted 2023 8-Hour Rolling Mean CO Concentration Range (µg/m³) |
|---|---|
| Seventeenth Floor (56.50m) | 1012.66 - 1040.22 |

8.5.37 As indicated in Table 10.28 there were no predicted exceedances of the 8-hour rolling mean AQO for CO across the proposed development.

Cumulative Effects - Operational Phase Assessment – Sensitive Receptors

8.5.38 The development has the potential to impact on existing air quality as a result of on-site energy generating activities, as well as exposing future users to elevated pollutant levels. An assessment was therefore undertaken using dispersion modelling in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site.

8.5.39 The assessment considered the following scenarios:

- 2016 Verification;
- 2023 DM; and
- 2023 DS.

8.5.40 The DM (i.e. without development) scenario is representative of anticipated traffic data for 2023. The DS (i.e. with development) scenarios are representative of anticipated traffic data for 2023 in addition to vehicle trips associated with the proposals and emissions from the proposed CHP and boiler units.

8.5.41 For the purpose of this assessment traffic data was supplied for 2023, the development opening year. Emission factors for the assessment were calculated using the Calculator Using Realistic Emissions for Diesels (CURED, version V3A), development by Air Quality Consultants Ltd. This calculator gives realistic, worst case emission factors for diesels for future years which utilise recent real-world emissions test data. It should be noted that PM10 emission factors were calculated using the Emission Factor Toolkit (version 8.0.1) for the 2016 Verification scenario and the 2023 Opening Year scenario.

8.5.42 The use of 2023 traffic data and emission factors calculated using the CURED approach is considered to provide a robust scenario and therefore a sufficient level of confidence can be placed within the predicted pollution concentrations.

8.5.43 Reference should be made to the Appendices for full assessment input details.

Nitrogen Dioxide – Annual Mean

8.5.44 Annual mean NO2 concentrations were predicted for the DM and DS scenarios and are summarised in Table 10.29. Exceedances of the relevant AQO are highlighted in bold.

Table 10.29 Predicted Annual Mean $NO_2$ Concentrations at Sensitive Receptor Locations

| Sensitive Receptors | | Height (m) | Predicted Annual Mean $NO_2$ Concentration (µg/m³) | | |
|---|---|---|---|---|---|
| | | | DM | DS | Change |
| R1 | Block K, Capital Court Site | 1.5 | 37.68 | 37.73 | 0.05 |
| R1a | Block K, Capital Court Site | 36 | 33.71 | 33.75 | 0.04 |
| R2 | Block J, Capital Court Site | 1.5 | 37.25 | 37.30 | 0.05 |
| R2a | Block J, Capital Court Site | 51 | 32.82 | 33.05 | 0.23 |
| R3 | Block J, Capital Court Site | 1.5 | 37.24 | 37.29 | 0.05 |
| R3a | Block J, Capital Court Site | 51 | 32.81 | 32.95 | 0.14 |
| R4 | Block I, Capital Court Site | 1.5 | 37.47 | 37.51 | 0.04 |
| R4a | Block I, Capital Court Site | 48 | 32.94 | 32.99 | 0.05 |
| R5 | Block H, Central Eastern Site | 1.5 | 37.82 | 37.83 | 0.01 |
| R5a | Block H, Central Eastern Site | 55.5 | 31.72 | 31.80 | 0.08 |

| Sensitive Receptors | | Height (m) | Predicted Annual Mean $NO_2$ Concentration (µg/m³) | | |
|---|---|---|---|---|---|
| | | | DM | DS | Change |
| R6 | Block G, Central Eastern Site | 1.5 | 37.22 | 37.23 | 0.01 |
| R6a | Block G, Central Eastern Site | 58 | 31.66 | 31.71 | 0.05 |
| R7 | Wheatstone House | 26.5 | 34.94 | 34.97 | 0.03 |
| R8 | Wheatstone House | 26.5 | 34.95 | 34.98 | 0.03 |
| R9 | Wheatstone House | 26.5 | 34.95 | 34.99 | 0.04 |
| R10 | Kew House School | 1.5 | 39.81 | 39.82 | 0.01 |
| R10a | Kew House School | 15.4 | 36.21 | 36.22 | 0.01 |
| R11 | Kew House School | 1.5 | **43.03** | **43.06** | 0.03 |
| R12 | 55 Kew Bridge Road | 1.5 | **41.51** | **41.53** | 0.02 |
| R13 | Stile Hall Mansions, Wellesley Road | 4.5 | **46.15** | **46.18** | 0.03 |
| R14 | 551 Chiswick High Road | 1.5 | **47.39** | **47.42** | 0.03 |
| R15 | Wheatstone House | 1.5 | **45.96** | **45.99** | 0.03 |
| R16 | 6 Stonehill Road | 1.5 | **48.02** | **48.06** | 0.04 |
| R17 | 30 Surrey Crescent | 1.5 | **46.51** | **46.54** | 0.03 |
| R18 | 463 Chiswick High Road | 1.5 | **49.52** | **49.55** | 0.03 |
| R19 | 447 Chiswick High Road | 1.5 | **41.68** | **41.69** | 0.01 |
| R20 | International School of London | 1.5 | **40.60** | **40.61** | 0.01 |
| R21 | 406 High Street | 1.5 | 33.60 | 33.62 | 0.02 |

8.5.45 As indicated in Table 10.29, predicted annual mean NO2 concentrations did exceeded the AQO at ten sensitive receptor locations in both the DM and DS scenarios. More critically, no new exceedances of the annual mean AQO for NO2 are predicted to occur as a result of the proposed development.

8.5.46 Predicted impacts on annual mean NO2 concentrations at the sensitive receptor locations are summarised in Table 10.30.

Table 10.30 Predicted Annual Mean $NO_2$ Impacts

| Sensitive Receptor | | % Change in Concentration Relative to AQO | Long Term Average Concentration | Impact |
|---|---|---|---|---|
| R1 | Block K, Capital Court Site | 0.12 | 95-102% of AQO | Negligible |
| R1a | Block K, Capital Court Site | 0.10 | 76-94% of AQO | Negligible |
| R2 | Block J, Capital Court Site | 0.12 | 76-94% of AQO | Negligible |
| R2a | Block J, Capital Court Site | 0.57 | 76-94% of AQO | Negligible |
| R3 | Block J, Capital Court Site | 0.12 | 76-94% of AQO | Negligible |
| R3a | Block J, Capital Court Site | 0.35 | 76-94% of AQO | Negligible |
| R4 | Block I, Capital Court Site | 0.10 | 76-94% of AQO | Negligible |
| R4a | Block I, Capital Court Site | 0.13 | 76-94% of AQO | Negligible |
| R5 | Block H, Central Eastern Site | 0.02 | 95-102% of AQO | Negligible |
| R5a | Block H, Central Eastern Site | 0.20 | 76-94% of AQO | Negligible |
| R6 | Block G, Central Eastern Site | 0.02 | 76-94% of AQO | Negligible |

| Sensitive Receptor | | % Change in Concentration Relative to AQO | Long Term Average Concentration | Impact |
|---|---|---|---|---|
| R6a | Block G, Central Eastern Site | 0.13 | 76-94% of AQO | Negligible |
| R7 | Wheatstone House | 0.08 | 76-94% of AQO | Negligible |
| R8 | Wheatstone House | 0.07 | 76-94% of AQO | Negligible |
| R9 | Wheatstone House | 0.10 | 76-94% of AQO | Negligible |
| R10 | Kew House School | 0.02 | 95-102% of AQO | Negligible |
| R10a | Kew House School | 0.02 | 76-94% of AQO | Negligible |
| R11 | Kew House School | 0.08 | 103-109% of AQO | Negligible |
| R12 | 55 Kew Bridge Road | 0.05 | 103-109% of AQO | Negligible |
| R13 | Stile Hall Mansions, Wellesley Road | 0.08 | 110+ of AQO | Negligible |
| R14 | 551 Chiswick High Road | 0.08 | 110+ of AQO | Negligible |
| R15 | Wheatstone House | 0.08 | 110+ of AQO | Negligible |
| R16 | 6 Stonehill Road | 0.10 | 110+ of AQO | Negligible |
| R17 | 30 Surrey Crescent | 0.08 | 110+ of AQO | Negligible |
| R18 | 463 Chiswick High Road | 0.07 | 110+ of AQO | Negligible |
| R19 | 447 Chiswick High Road | 0.02 | 103-109% of AQO | Negligible |
| R20 | International School of London | 0.02 | 95-102% of AQO | Negligible |
| R21 | 406 High Street | 0.05 | 76-94% of AQO | Negligible |

8.5.47 As indicated in Table 10.30, the impacts on annual mean NO2 concentrations as a result of road vehicle exhaust and energy emissions associated with the proposed development were predicted to be negligible at all sensitive receptor locations. It is therefore considered that the overall impacts as a result of the proposed development are not significant.

Nitrogen Dioxide - 1 Hour Mean

8.5.48 In order to predict the 1-hour mean background NO2 concentration, the advice provided within the EA guidance**13** was followed, which advises that an estimate of the maximum combined pollutant concentration can be obtained by adding the maximum predicted short-term concentration due to emissions from the source to twice the annual mean baseline concentration. The 1-hour mean background NO2 concentration was therefore assumed to be twice the annual mean background NO2 concentration.

8.5.49 1-hour mean NO2 concentrations were predicted for the DM and DS scenarios and are summarised in Table 10. 31.

13 https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit.

Table 10. 31 Predicted 1-Hour Mean NO2 Concentrations

| Sensitive Receptors | | Height (m) | Predicted 1-Hour Mean $NO_2$ Concentration (µg/m³) | | |
|---|---|---|---|---|---|
| | | | DM | DS | Change |
| R1 | Block K, Capital Court Site | 1.5 | 68.45 | 68.90 | 0.45 |
| R1a | Block K, Capital Court Site | 36 | 65.32 | 65.76 | 0.44 |
| R2 | Block J, Capital Court Site | 1.5 | 68.01 | 68.47 | 0.46 |
| R2a | Block J, Capital Court Site | 51 | 64.76 | 70.89 | 6.13 |
| R3 | Block J, Capital Court Site | 1.5 | 67.99 | 68.44 | 0.45 |
| R3a | Block J, Capital Court Site | 51 | 64.77 | 66.68 | 1.91 |
| R4 | Block I, Capital Court Site | 1.5 | 68.00 | 68.44 | 0.44 |
| R4a | Block I, Capital Court Site | 48 | 64.95 | 65.89 | 0.94 |
| R5 | Block H, Central Eastern Site | 1.5 | 67.35 | 67.50 | 0.15 |
| R5a | Block H, Central Eastern Site | 55.5 | 62.98 | 65.26 | 2.28 |
| R6 | Block G, Central Eastern Site | 1.5 | 67.27 | 67.39 | 0.12 |
| R6a | Block G, Central Eastern Site | 58 | 62.88 | 64.39 | 1.51 |
| R7 | Wheatstone House | 26.5 | 66.04 | 66.33 | 0.29 |
| R8 | Wheatstone House | 26.5 | 66.17 | 66.51 | 0.34 |
| R9 | Wheatstone House | 26.5 | 66.19 | 66.49 | 0.30 |
| R10 | Kew House School | 1.5 | 71.17 | 71.35 | 0.18 |
| R10a | Kew House School | 15.4 | 67.35 | 67.56 | 0.21 |
| R11 | Kew House School | 1.5 | 73.37 | 73.59 | 0.22 |
| R12 | 55 Kew Bridge Road | 1.5 | 73.01 | 73.20 | 0.19 |
| R13 | Stile Hall Mansions, Wellesley Road | 4.5 | 75.16 | 75.39 | 0.23 |
| R14 | 551 Chiswick High Road | 1.5 | 74.84 | 75.10 | 0.26 |
| R15 | Wheatstone House | 1.5 | 76.21 | 76.41 | 0.20 |
| R16 | 6 Stonehill Road | 1.5 | 78.56 | 78.70 | 0.14 |
| R17 | 30 Surrey Crescent | 1.5 | 78.41 | 78.54 | 0.13 |
| R18 | 463 Chiswick High Road | 1.5 | 80.15 | 80.28 | 0.13 |
| R19 | 447 Chiswick High Road | 1.5 | 73.61 | 73.73 | 0.12 |
| R20 | International School of London | 1.5 | 72.60 | 72.69 | 0.09 |
| R21 | 406 High Street | 1.5 | 56.18 | 56.37 | 0.19 |

8.5.50 As indicated in Table 10. 31, predicted 1-hour mean NO2 concentrations did not exceeded the 1-hour mean AQO for NO2 at any sensitive receptor locations in both the DM and DS scenarios.

8.5.51 Predicted impacts on 1-hour mean NO2 concentrations at the sensitive receptor locations are summarised in Table 10.32.

Table 10.32 Predicted 1-Hour Mean NO2 Impacts

| Sensitive Receptor | | % Change in Concentration Relative to AQO | Impact |
|---|---|---|---|
| R1 | Block K, Capital Court Site | 0.23 | Negligible |
| R1a | Block K, Capital Court Site | 0.22 | Negligible |

| | | | |
|---|---|---|---|
| R2 | Block J, Capital Court Site | 0.23 | Negligible |
| R2a | Block J, Capital Court Site | 3.07 | Negligible |
| R3 | Block J, Capital Court Site | 0.23 | Negligible |
| R3a | Block J, Capital Court Site | 0.96 | Negligible |
| R4 | Block I, Capital Court Site | 0.22 | Negligible |
| R4a | Block I, Capital Court Site | 0.47 | Negligible |
| R5 | Block H, Central Eastern Site | 0.08 | Negligible |
| R5a | Block H, Central Eastern Site | 1.14 | Negligible |
| R6 | Block G, Central Eastern Site | 0.06 | Negligible |
| R6a | Block G, Central Eastern Site | 0.75 | Negligible |
| R7 | Wheatstone House | 0.14 | Negligible |
| R8 | Wheatstone House | 0.17 | Negligible |
| R9 | Wheatstone House | 0.15 | Negligible |
| R10 | Kew House School | 0.09 | Negligible |
| R10a | Kew House School | 0.11 | Negligible |
| R11 | Kew House School | 0.11 | Negligible |
| R12 | 55 Kew Bridge Road | 0.09 | Negligible |
| R13 | Stile Hall Mansions, Wellesley Road | 0.12 | Negligible |
| R14 | 551 Chiswick High Road | 0.13 | Negligible |
| R15 | Wheatstone House | 0.10 | Negligible |
| R16 | 6 Stonehill Road | 0.07 | Negligible |
| R17 | 30 Surrey Crescent | 0.07 | Negligible |
| R18 | 463 Chiswick High Road | 0.06 | Negligible |
| R19 | 447 Chiswick High Road | 0.06 | Negligible |
| R20 | International School of London | 0.05 | Negligible |
| R21 | 406 High Street | 0.09 | Negligible |
| R1 | Block K, Capital Court Site | 0.23 | Negligible |
| R1a | Block K, Capital Court Site | 0.22 | Negligible |

8.5.52 As indicated in Table 10.32, the impacts on 1-hour mean NO2 concentrations as a result of road vehicle exhaust and energy emissions associated with the proposed development were predicted to be negligible at all sensitive receptor locations. It is therefore considered that the overall impacts as a result of the proposed development are not significant.

Particulate Matter ($PM_{10}$) – Annual-Hour Mean

8.5.53 Annual mean PM10 concentrations were predicted for the DM and DS scenarios and are summarised in Table 10.33.

Table 10.33 Predicted Annual Mean $PM_{10}$ Concentrations at Sensitive Receptor Locations

| Sensitive Receptors | | Height (m) | Predicted Annual Mean $PM_{10}$ Concentration (µg/m³) | | |
|---|---|---|---|---|---|
| | | | DM | DS | Change |
| R1 | Block K, Capital Court Site | 1.5 | 19.913 | 19.916 | 0.003 |
| R1a | Block K, Capital Court Site | 36 | 19.193 | 19.193 | 0.000 |
| R2 | Block J, Capital Court Site | 1.5 | 19.828 | 19.831 | 0.003 |

| Sensitive Receptors | | Height (m) | Predicted Annual Mean $PM_{10}$ Concentration ($\mu g/m^3$) | | |
|---|---|---|---|---|---|
| | | | DM | DS | Change |
| R2a | Block J, Capital Court Site | 51 | 19.041 | 19.041 | 0.000 |
| R3 | Block J, Capital Court Site | 1.5 | 19.826 | 19.829 | 0.003 |
| R3a | Block J, Capital Court Site | 51 | 19.040 | 19.040 | 0.000 |
| R4 | Block I, Capital Court Site | 1.5 | 19.868 | 19.872 | 0.004 |
| R4a | Block I, Capital Court Site | 48 | 19.061 | 19.061 | 0.000 |
| R5 | Block H, Central Eastern Site | 1.5 | 19.317 | 19.319 | 0.002 |
| R5a | Block H, Central Eastern Site | 55.5 | 18.233 | 18.233 | 0.000 |
| R6 | Block G, Central Eastern Site | 1.5 | 19.205 | 19.207 | 0.002 |
| R6a | Block G, Central Eastern Site | 58 | 18.223 | 18.223 | 0.000 |
| R7 | Wheatstone House | 26.5 | 19.395 | 19.396 | 0.001 |
| R8 | Wheatstone House | 26.5 | 19.398 | 19.398 | 0.000 |
| R9 | Wheatstone House | 26.5 | 19.398 | 19.398 | 0.000 |
| R10 | Kew House School | 1.5 | 20.272 | 20.274 | 0.002 |
| R10a | Kew House School | 15.4 | 19.626 | 19.627 | 0.001 |
| R11 | Kew House School | 1.5 | 20.931 | 20.933 | 0.002 |
| R12 | 55 Kew Bridge Road | 1.5 | 19.855 | 19.856 | 0.001 |
| R13 | Stile Hall Mansions, Wellesley Road | 4.5 | 21.444 | 21.447 | 0.003 |
| R14 | 551 Chiswick High Road | 1.5 | 21.819 | 21.823 | 0.004 |
| R15 | Wheatstone House | 1.5 | 21.374 | 21.378 | 0.004 |
| R16 | 6 Stonehill Road | 1.5 | 21.614 | 21.617 | 0.003 |
| R17 | 30 Surrey Crescent | 1.5 | 21.311 | 21.314 | 0.003 |
| R18 | 463 Chiswick High Road | 1.5 | 21.816 | 21.818 | 0.002 |
| R19 | 447 Chiswick High Road | 1.5 | 20.616 | 20.617 | 0.001 |
| R20 | International School of London | 1.5 | 20.672 | 20.673 | 0.001 |
| R21 | 406 High Street | 1.5 | 17.851 | 17.852 | 0.001 |

8.5.54 As indicated in Table 10.33, predicted annual mean PM10 concentrations were below the relevant AQO at all sensitive receptor locations for both the DM and DS scenarios considered.

8.5.55 Predicted impacts on annual mean PM10 concentrations at the sensitive receptor locations are summarised in Table 10.34.

Table 10.34 Predicted Annual Mean $PM_{10}$ Impacts

| Sensitive Receptor | | % Change in Concentration Relative to AQO | Long Term Average Concentration | Impact |
|---|---|---|---|---|
| R1 | Block K, Capital Court Site | 0.008 | 75% or Less of AQO | Negligible |
| R1a | Block K, Capital Court Site | 0.000 | 75% or Less of AQO | Negligible |
| R2 | Block J, Capital Court Site | 0.008 | 75% or Less of AQO | Negligible |
| R2a | Block J, Capital Court Site | 0.000 | 75% or Less of AQO | Negligible |

| Sensitive Receptor | | % Change in Concentration Relative to AQO | Long Term Average Concentration | Impact |
|---|---|---|---|---|
| R3 | Block J, Capital Court Site | 0.008 | 75% or Less of AQO | Negligible |
| R3a | Block J, Capital Court Site | 0.000 | 75% or Less of AQO | Negligible |
| R4 | Block I, Capital Court Site | 0.010 | 75% or Less of AQO | Negligible |
| R4a | Block I, Capital Court Site | 0.000 | 75% or Less of AQO | Negligible |
| R5 | Block H, Central Eastern Site | 0.005 | 75% or Less of AQO | Negligible |
| R5a | Block H, Central Eastern Site | 0.000 | 75% or Less of AQO | Negligible |
| R6 | Block G, Central Eastern Site | 0.005 | 75% or Less of AQO | Negligible |
| R6a | Block G, Central Eastern Site | 0.000 | 75% or Less of AQO | Negligible |
| R7 | Wheatstone House | 0.003 | 75% or Less of AQO | Negligible |
| R8 | Wheatstone House | 0.000 | 75% or Less of AQO | Negligible |
| R9 | Wheatstone House | 0.000 | 75% or Less of AQO | Negligible |
| R10 | Kew House School | 0.005 | 75% or Less of AQO | Negligible |
| R10a | Kew House School | 0.002 | 75% or Less of AQO | Negligible |
| R11 | Kew House School | 0.005 | 75% or Less of AQO | Negligible |
| R12 | 55 Kew Bridge Road | 0.003 | 75% or Less of AQO | Negligible |
| R13 | Stile Hall Mansions, Wellesley Road | 0.008 | 75% or Less of AQO | Negligible |
| R14 | 551 Chiswick High Road | 0.010 | 75% or Less of AQO | Negligible |
| R15 | Wheatstone House | 0.010 | 75% or Less of AQO | Negligible |
| R16 | 6 Stonehill Road | 0.008 | 75% or Less of AQO | Negligible |
| R17 | 30 Surrey Crescent | 0.008 | 75% or Less of AQO | Negligible |
| R18 | 463 Chiswick High Road | 0.005 | 75% or Less of AQO | Negligible |
| R19 | 447 Chiswick High Road | 0.003 | 75% or Less of AQO | Negligible |
| R20 | International School of London | 0.002 | 75% or Less of AQO | Negligible |
| R21 | 406 High Street | 0.003 | 75% or Less of AQO | Negligible |

8.5.56 As indicated in Table 10.34, impacts on annual mean PM10 concentrations as a result of road vehicle exhaust emissions and energy emissions associated with the development were predicted to be negligible at all sensitive receptor locations considered. It is therefore considered that the overall impacts as a result of the proposed development are not significant.

### Cumulative Effects - Evaluation of Impact Significance

8.5.57 The overall significance of emission impacts associated with operational phase road vehicle exhaust emissions and energy emissions was determined not significant. This was based on the predicted impacts at discrete receptor locations and the considerations outlined in Section 4. Further justification is provided in Table 10.35.

Table 10.35 Overall Road Traffic and Energy Emission Impact Significance

| Guidance | Comment |
|---|---|
| Number of properties affected by slight, moderate or substantial air quality impacts and a judgement on the overall balance | Impacts on annual mean and 1-hour mean $NO_2$ and annual mean $PM_{10}$ concentrations were predicted to be **negligible** at all sensitive receptors<br><br>The sensitive locations represent worst-case locations and therefore it is unlikely that any other receptors would be significantly affected by the proposed development. |
| Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective or limit value will be relevant | Although there were no exceedances of the annual mean AQO for $NO_2$ at sensitive uses across all floors of the proposed development site, sensitive uses on the ground to third floor levels were classified as APEC - B in accordance with the London Councils Air Quality and Planning Guidance[9]. As a result, operational phase mitigation is to be implemented to reduce the significant exposure across the development site at multiple floor levels. Reference should be made to Section 8.6 for further information regarding suggested mitigation techniques.<br><br>Subject to the implementation of the suitable mitigation measures, exposure to elevated $NO_2$ concentration at sensitive locations across the site can be considered as **not significant** and therefore **negligible** |
| The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors | The maximum changes in annual mean and 1-hour mean $NO_2$ and annual mean $PM_{10}$ concentrations relative to their respective AQOs were predicted to be 0.57%, 3.07% and 0.008% respectively. As such, resultant impacts were predicted to be **negligible** at all sensitive receptor locations |
| Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease | There were exceedances of the annual mean AQO for $NO_2$ at sensitive and non-sensitive locations within the modelling extents. The area of exceedance was not predicted to substantially increase or decrease as a result of the development.<br><br>Conversely, there were no exceedances of the 1-hour mean AQO for $NO_2$ and the annual mean AQO for $PM_{10}$ at any location within the modelling extents |
| The extent to which an objective is exceeded e.g. an annual mean $NO_2$ concentration of 41µg/m$^3$ should attract less significance than an annual mean of 51µg/m$^3$ | There were exceedances of the annual mean AQO for $NO_2$ at 10 sensitive locations, of which 6 locations exceeded an annual mean concentration of 45µg/m$^3$. Critically, exceedances of 45µg/m$^3$ were predicted during both the DM and DS scenarios and therefore, they cannot be directly accounted to the operation of the proposed development. Furthermore, the magnitude of change at the most |

| Guidance | Comment |
|---|---|
| | significantly affected receptor locations was considered **not significant** |

## Air Quality Neutral Assessment

8.5.58 The proposals comprise the redevelopment of the site to provide a mixed use scheme of 441 residential units (Class C3) including 50% affordable housing with ancillary facilities, flexible uses (within Classes A1, A2, A3 and B1) and a nursery (Class D1). Comprising buildings of 12, 13, 16, 17 and 18 storeys in height, with associated cycle parking, car parking, playspace, landscaping and public realm improvements.

8.5.59 The development will impact on the total emissions of the site. These are assessed in the following Sections.

### Road Transport

Benchmarks

8.5.60 The Transport Emissions Benchmark (TEB) has been calculated using the GLA Air Quality Neutral Planning Support Guidance document based on the land-use class of the proposed development. The number of dwellings for the residential land use was provided by JLL. Additionally the floor area for the office space and retail was also provided by JLL. The TEBs are those provided in the GLA Air Quality Neutral Planning Support document and are detailed in Table 10.36 below.

8.5.61 It should be noted that the floor area for the proposed A2 and A3 land use category associated with the development have been combined with the A1 (Retail) land use category. This is because there are no TEBs available for the A2 and A3 land use categories and as such, the TEB for the A1 land use category has been utilised, as stated within the GLA Air Quality Neutral Planning Support document.

Table 10.36 Transport Emission Benchmarks

| Land Use | Quantity (units) | $NO_x$ TEB (($NO_x$ (g/m²/year) /(g/dwelling/ year)) | $NO_x$ per Land Use (kg/year) | $PM_{10}$ TEB (($PM_{10}$ (g/m²/year) /(g/dwelling/ year)) | $PM_{10}$ per Land Use (kg/year |
|---|---|---|---|---|---|
| C3 -Residential | 441 | 1553.0 | 684.9 | 267.0 | 117.7 |
| A1- Retail | 340 | 249.0 | 84.7 | 42.9 | 14.6 |
| B1 - Office | 110 | 68.5 | 7.5 | 11.8 | 1.3 |
| **Total** | - | **1870.5** | **777.1** | **321.7** | **133.6** |

8.5.62 As indicated in Table 10.34, the total annual NOx emission TEB is 777.1kg/year and the total annual PM10 emission TEB is 133.6kg/year.

### Development Emissions

8.5.63 Estimated development road transport emissions were calculated using traffic data provided by Peter Brett Associates. The number of daily trips was used to calculate annual NOx and PM10 based on emission factors provided in the GLA Air Quality Neutral Planning Support document, as shown in Table 10.22. A summary of the traffic data used in the assessment is provided in Table 10.37.

Table 10.37 Development Emissions - Traffic Data

| Land Use | 24-hour AADT Flow | Road Type | Average Distance (km/m²/annum) or (km/dwelling/annum) |
|---|---|---|---|
| C3 -Residential | 79 | London - Outer | 11.4 |
| A1- Retail | 44 | London - Outer | 5.4 |
| B1 - Office | 4 | London - Outer | 10.8 |

8.5.64 The inputs outlined in Table 10.36. and Table 10.37 were utilised to calculate proposed development road vehicle exhaust emissions. This is summarised in Table 10.38

Table 10.38 Development Emissions - Road Vehicle Exhaust Emissions

| Land Use | $NO_x$ Emission (kg/year) | $PM_{10}$ Emission (kg/year) |
|---|---|---|
| C3 -Residential | 116.0 | 19.9 |
| A1- Retail | 30.6 | 5.3 |
| B1 - Office | 5.6 | 1.0 |
| **Total** | **152.2** | **26.1** |

8.5.65 The TEB and development road traffic exhaust emissions were calculated using the inputs and methodology outlined in Section 8.4.39. These are summarised in Table 10.39.

Table 10.39 Development Road Vehicle Exhaust Emissions

| Land Use | $NO_x$ Emission (kg/year) | $PM_{10}$ Emission (kg/year) |
|---|---|---|
| TEB | 777.1 | 133.6 |
| Development Emissions | 152.2 | 26.1 |
| **Difference** | **-624.9** | **-107.5** |

8.5.66 As indicated in Table 10.39, annual NOx and PM10 road vehicle exhaust emissions are below the TEB by 732.4kg/year.

## Energy Emissions

8.5.67 Similarly, to the TEB, the Building Emissions Benchmark (BEB) has been calculated using the GLA Air Quality Neutral Planning Support12 guidance document based on the land-use class of the proposed development.

8.5.68 The floor area was provided by JLL. The BEBs are those provided in the GLA Air Quality Neutral Planning Support document. This is detailed in Table 10.40.

Table 10.40 Development Road Vehicle Exhaust Emissions

| Land Use | Quantity ($m^2$) | $NO_x$ BEB (($NO_x$ (g/$m^2$/year) /(g/dwelling/ year)) | $NO_x$ per Land Use (kg/year) |
|---|---|---|---|
| C3 - Residential | 28,873.0 | 26.2 | 756.5 |
| A1 - Retail | 85.0 | 22.6 | 1.9 |
| A3 - Café / Restaurant | 255.0 | 75.2 | 19.2 |
| B1 - Office | 110.0 | 30.8 | 3.4 |
| D1 (b) - Nursery | 250.0 | 75.0 | 18.8 |
| D2 (e) - Gym | 147.0 | 284.0 | 41.7 |
| **Total** | **29,720.0** | **513.8** | **841.5** |

8.5.69 As indicated in Table 10.40, the total annual NOx emission BEB is 841.5kg/year.

**Development Emissions**

8.5.70 Development energy emissions were calculated using emission rates for the proposed gas boilers and CHP. All energy sources were assumed to be operational for the entire year, producing a worst case scenario. As such, a robust assessment was carried out.

8.5.71 The relevant input data is outlined in Table 10.41.

Table 10.41 Development Energy Emissions

| Land Use | $NO_x$ Emission (kg/year) |
|---|---|
| CHP | 492.0 |
| Boiler (combined for 3 units) | 159.9 |
| **Total** | **651.8** |

8.5.72 The BEB and development energy emissions were calculated using the inputs and methodology outlined in Section 8.44. These are summarised in Table 10.42.

Table 10.42 Energy Emissions

| Land Use | $NO_x$ Emission (kg/year) |
|---|---|
| BEB | 841.5 |
| Development Emissions | 651.8 |
| **Difference** | **-189.6** |

8.5.73 As indicated in Table 10.42, annual development NOx emissions from the energy provision are below the BEB by 189.6kg/year.

### Air Quality Neutral Assessment Summary

8.5.74 Overall comparison of the TEB and BEB with the development emissions are summarised in Table 10.43

Table 10.43 Road Vehicle and Energy Emissions

| Scenario | Source | Annual $NO_x$ Emissions (kg/yr) | Annual Total $NO_x$ Emissions (kg/yr) | Annual $PM_{10}$ Emissions (kg/yr) | Annual Total $PM_{10}$ Emissions (kg/yr) |
|---|---|---|---|---|---|
| Benchmark | Road Vehicles | 777.1 | 1618.5 | 133.6 | 133.6 |
| | Energy | 841.5 | | - | |
| Development Emissions | Road Vehicles | 152.2 | 804.1 | 26.1 | 26.1 |
| | Energy | 651.8 | | - | |
| **Difference** | **Road Vehicles** | **-624.9** | **-814.5** | **-107.5** | **-107.5** |
| | **Energy** | **-189.6** | | - | |

8.5.75 As indicated in Table 10.43, annual NOx and PM10 emissions and annual NOx emissions from energy emissions are predicted to be below the TEB and BEB. As such, the development is considered to be Air Quality Neutral.

## 8.6 Scope for Mitigation

8.6.1 There are a number of air quality mitigation options available to reduce potential exposure of future site users to elevated pollutant concentrations.

8.6.2 Detailed dispersion modelling undertaken at heights equivalent to the proposed building floor levels indicated that the sensitive uses including all residential units and the nursery on the ground level were classified as APEC - B for predicted annual mean NO2 concentrations, as shown in Figure 8 within Appendix I. Additionally, Figures 9 to 11 within Appendix I representing predicted concentrations of NO2 across the first, second and third floor levels indicate that there are sensitive uses (including residential units and the nursery) classified as APEC - B. In accordance with the London Councils Air Quality and Planning Guidance9 states that mitigation measures must be considered for areas classified as APEC - B.

8.6.3 It is therefore proposed that the inclusion of appropriate mitigation measures should be implemented to all residential units on the ground floor and first floor levels, as well as specific residential units situated on the second and third floor levels of the proposed development. It should be noted that appropriate mitigation measures should also be include to the ground and first floor nursery.

8.6.4 Whilst it is noted that the development will provide mechanical ventilation within each individual residential unit, there is in some cases a requirement for NOx filtration units to be installed as a number of units are unable to supply clean air. With this in mind, the inclusion of NOx filtration should be included in the building design for all residential units and the nursery on the ground floor and first floor levels (see Figures 8 and 9 within Appendix I) and the residential units located within an area classified as APEC - B on

the second and third floor levels (see Figures 10 and 11 within Appendix I).For the second floor, this comprises all residential units in Cores 4 and 5, as well as the two bedroom plot in the north-eastern corner of Core 3 (plot 3.2.2). For the third floor, this comprises the three bedroom plot to on the northern façade of Core 4 and the two bedroom plot on the eastern façade of Core 4 (plots 4.3.5 and 4.3.1). The inclusion of mechanical ventilation with NOx filtration at these sensitive uses should ensure the supply of clean air for future site users.

8.6.5 Additionally, a high specification of air tightness on the windows and doors should be incorporated at all residential units on the ground and first floor levels, and the specific residential units identified in Section 8.6.4 on the second and third floor level. This ensures that the windows will remain openable at the affected areas and provides freedom of choice over whether natural ventilation is preferable during certain periods. The high specification of air tightness will also ensure that when the windows are shut, the nursery and the aforementioned residential units will be well ventilated by the mechanical ventilation systems. The key to reducing exposure using this method is to ensure occupants are informed over the potential risks associated with prolonged exposure to elevated pollution levels. As such, it may also be possible to provide future users with a welcome pack containing air quality information which will allow them to follow appropriate advice on protection against high concentrations during certain periods.

## 8.7 Conclusion

8.7.1 The site is located within an area identified by the LBH as experiencing elevated pollutant concentrations and as such, there is the potential for the proposed development to cause adverse impacts to existing pollution levels at nearby sensitive locations as well as have the potential to introduce future site users into an area of high pollutant concentrations. As such, an Air Quality Assessment was required in order to determine baseline conditions at the site, assess site suitability for the proposed end-use and assess the potential impacts as a result of the proposed development.

8.7.2 During the construction phase of the development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the GLA methodology. It is considered that the use of good practice control measures would provide suitable mitigation for a development of this size and nature and reduce potential impacts to an acceptable level.

8.7.3 Dispersion modelling was undertaken in order to predict air quality impacts during the operational phase, as a result of the road vehicle exhaust emissions, results were subsequently verified using monitoring results obtained from LBH. Although there were no exceedances of the annual mean AQO for NO2 at any sensitive uses (nursery and residential units) across the proposed development at all floor levels, there were predicted NO2 concentrations that are classified as APEC - B at all sensitive uses on the ground and first floor level and some residential units located on the second and third floor levels. As such specific mitigation techniques will be required to protect future users from elevated concentrations. The 1-hour mean AQO for NO2, annual mean AQO for PM10 and 8-hour rolling mean for CO were also not exceeded at any location across the site.

8.7.4 Predicted impacts on annual mean and 1-hour mean NO2 concentrations as a result of operational phase exhaust emissions and emissions from the on-site CHP and boiler units were predicted to be negligible at

all sensitive receptor locations. Predicted impacts on PM10 concentrations were predicted to be negligible at all sensitive receptor locations considered. The overall significance of potential impacts was determined to be not significant, in accordance with the EPUK and IAQM guidance.

8.7.5 The results of the Air Quality Natural assessment concluded that the combined annual emissions are predicted to be below the combined benchmark level for both NOx and PM10. As such the proposed development is considered Air Quality Neutral.

8.7.6 Based on the assessment results the site is considered suitable for the proposed end use subject to the inclusion of relevant mitigation measures, and complies with the London Plan, the LBH Local Plan and relevant legislation.

# 9. *ES Chapter 11: Microclimate - Wind*

9.1.1 RWDI have provided a qualitative addendum to the Technical Report on Microclimate - Wind. Appendix 6 includes the RWDI Note. The note assessed the proposed alterations to the design of the proposed Citroen Site development. Our summary of the relevant changes and assessment of the potential impact on the wind microclimate is included below. The assessment of the impact of the changes is based on professional experience and judgement, and informed by the previous wind tunnel testing that has been conducted for this development.

**Summary of changes**

9.1.2 Since the October 2017 study, the massing of the proposed Citroen Site has undergone revisions. As per the drawings received on 22nd March 2018, the height of the Core 3 of the proposed development has increased in height by 2 storeys, from 15 storeys to 17 storeys. The massing of the revised scheme can be seen in the image below.

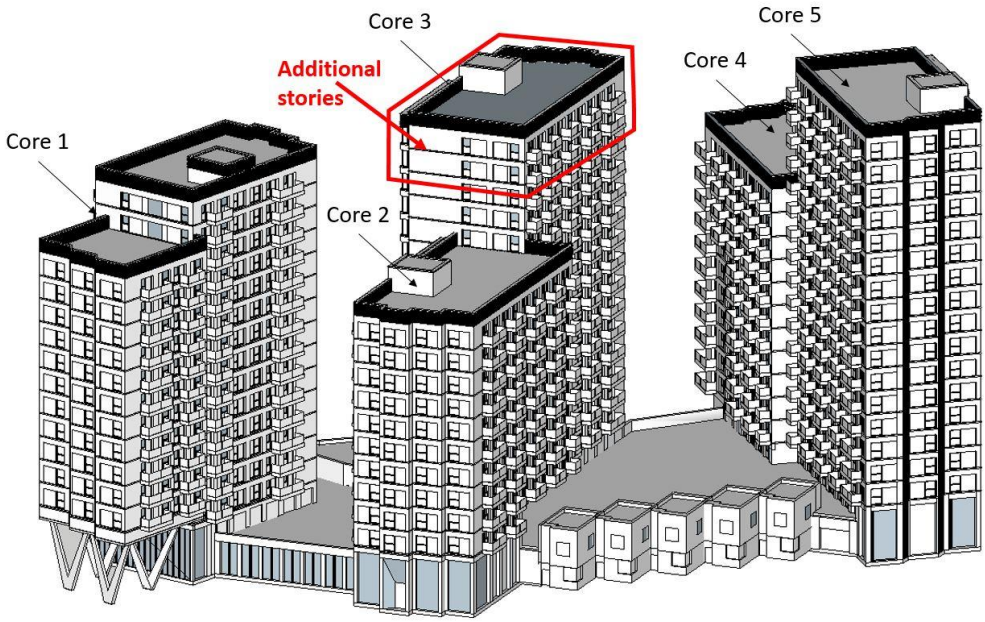



**Figure 1: Revised massing of the Proposed Development**

**Assessment of potential impacts related to wind microclimate**

9.1.3 RWDI note that since the changes to the massing are relatively minor (from a wind engineering point of view), the overall behavior of the wind as it interacts with the development will be similar to the earlier iterations of the scheme which were tested in the wind tunnel. In other words, the wind would be expected to travel through the site in a similar way, and the location of areas that were found to be relatively windier or calmer will remain the same.

9.1.4 The magnitude of the local wind speeds would also be similar at most locations including the ground and podium level pedestrian use areas. However, we would expect there to be a small increase in wind speed locally along the Core 2 terrace to the south of Core 3. This is likely due to an increased downwashing of prevailing winds into this terrace by the now taller southern facade of Core 3. This terrace area (near the Core 3 façade, where the wind effect would likely be significant) however, is used for PV installations and not proposed to be used for any amenity purposes. As such, the increased wind speed is not expected to be a concern and could be considered insignificant.

9.1.5 Overall, the revised massing of the proposed development is not likely to significantly alter the wind environment predicted for the proposed development and that the recommended mitigation measures would still be expected to be beneficial.

# *10. ES Chapter 12: Ground Conditions, Hydrogeology and Contamination*

10.1.1 Assessment of ground conditions, hydrogeology and contamination for the proposed development is set out within Chapter 12 of the ES. No further update is considered to be required for this chapter.

10.1.2 In summary, the conclusions made within Chapter 12 and the recommendations within the appendices of the submitted ES (2017) remain valid and there are no changes to the conclusions as a result of the amended proposals.

# *11. ES Chapter 13: Flood Risk*

11.1.1 Assessment of Flood Risk for the proposed development is set out within Chapter 13 of the ES. No further update is considered to be required for this chapter.

11.1.2 In summary, the conclusions made within Chapter 13 and the recommendations within the appendices of the submitted ES (2017) remain valid and there are no changes to the conclusions as a result of the amended proposals.

11.1.3 A technical note has been prepared by Peter Brett Associates (PBA) in relation to the proposed amendments. This technical note has been prepared to address LBH's reason for refusal with respect to drainage and flood risk (ref: LBH's Delegated Report dated 13th November 2017, Section 13.1) and subsequent comments made by the GLA (ref: GLA Stage 2 Referral Form dated 26th February. Para.45). This is included as Appendix 10.

# *12. ES Chapter 14: Noise and Vibration*

12.1.1 Assessment of noise and vibration for the proposed development is set out within Chapter 14 of the ES. The conclusions made within Chapter 14 and the recommendations within the appendices of the submitted ES remain valid and there are no changes to the conclusions as a result of the amended proposals.

# 13. ES Chapter 15: Socio-Economic

## 13.1 Introduction

13.2.1 Chapter 15 of the Environmental Statement sets out an assessment of the current socio-economic conditions of the former Citroen Garage site, located at Capital Interchange Way, Brentford, the surrounding area and the likely socio-economic effects of the Proposed Development.

13.2.2 Since the planning application was submitted in November 2017 (Application Ref: 01508/A/P6) a number of revisions have been made to the scheme. These include:

- Increase in unit numbers from 427 to 441 residential units;
- Increase of affordable housing provision to 50% (on a habitable room basis);
- Additional playspace provision.

13.2.3 The Applicant proposes to make scheme amendments to the proposed development prior to the determination of the planning application by the Mayor of London. These modifications are to address LBH's grounds for refusal of the previous submission, and to ensure that the maximum reasonable amount of affordable housing is provided on this site.

13.2.4 The provision of affordable housing offered has been amended to provide an increase in the total number of affordable housing units within the development (50% on a habitable room basis). A summary of the amendments is set out below:

| Tenure | Previous Scheme | Revised Scheme |
|---|---|---|
| Market Sales | 259 (662 hab rooms) | 223 units (572 hab rooms) |
| Intermediate Housing | 107 (264 hab rooms) | 152 units (373 hab rooms) |
| Affordable Rent | 61 (181 hab rooms) | 66 units (201 hab rooms) |
| **Total** | **427 units (1107 hab rooms)** | **441 units (1146 hab rooms)** |

13.2.5 Following the updated unit mix for this development, this note sets out the relevant changes to the socio-economic impact assessment.

## 13.2 Identification & Evaluation of Key Effects

### Effects during Operation

*Demand for Housing*

13.2.1 The Proposed Development will provide 441 new homes, including 218 affordable units. The Proposed Development will provide 574 affordable habitable rooms, equating to a provision of just over 50% of the total.

13.2.2 It is considered that the provision of private and affordable housing will have a long term, direct, local, minor beneficial effect on the mix and quantum of private and affordable housing within the Borough.

*Population*

13.2.3 The Proposed Development would provide 441 new residential units in total. The future population of the Proposed Development when completed is estimated to be approximately 902.4 residents based on the GLA Population Yield Calculator. The new residential population will likely be transferring from within Hounslow or the Greater London area and therefore is considered to have a minor beneficial effect on housing at the local level with a negligible effect at the district level.

**ES Table 15.7: Population Yield**

| Age | Previous Application 427 units | Proposed Application 441 units |
|---|---|---|
| 0-3 | 72.0 | 81.4 |
| 4-10 | 71.2 | 81.0 |
| 11-15 | 22.1 | 27.0 |
| 16-17 | 9.3 | 11.4 |
| 18-64 | 670.4 | 685.3 |
| 65+ | 15.9 | 16.3 |
| **Total** | **860.9** | **902.4** |

Source: GLA Population Yield Calculator Version 2

*Healthcare*

13.2.4 With regards to the site's location, there is a good baseline provision of healthcare services in close proximity and all are currently accepting new patients. A maximum of 1,700 patients per GP is a commonly acceptable measure of additional need. Therefore the additional population of 902.4 would not result in the need for an additional GP.

13.2.5 The Existing Baseline Conditions establishes that there is excess capacity available within the locality of LBH (within approximately 1 mile of the site) which could accommodate the 902.4 new patients arising from the development.

13.2.6 Taking into account the proposed population of the development, and the capacity available within the vicinity of the site, there will be a non-significant effect and it will be negligible in the long term on local health care provision.

*Education*

13.2.7 The development will result in an increased demand for educational places in relation to the baseline if any households with children occupy the residential units.

13.2.8 Table 15.8 shows the school yield from the proposed development by applying the population yield rates to the accommodation schedule.

**ES Table 15.8: School Yield from the Proposed Development**

| Scheme | School Yield (Places) | | | |
|---|---|---|---|---|
| | Early Years (0-4) | Primary (5-10) | Secondary (11-15) | Total |
| **427 Units** | 72 | 71.2 | 22.1 | 165.3 (165) |
| **441 Units** | 81.4 | 81.0 | 27.0 | 189.4 (189) |

Reference: GLA Population Yield Calculation (version 2)

13.2.9 The increased residential population on-site would result in increased demand for school places. As established there is existing capacity for school places within the vicinity of the site, for both primary and secondary.

13.2.10 The increased residential population on-site would result in an increased demand for school places. However, it is unlikely that every child who is resident in the new development will require a new school place at local schools. For nursery school children, roughly half of children this age attend a nursery school. For primary school and secondary school aged children, a small proportion will attend private schools. For secondary school aged children who are living in social rented accommodation, these children are likely to already have places at schools in the borough and will continue to attend those schools.

13.2.11 As established, there is existing capacity for school places within the vicinity of the site, for both primary and secondary school ages.

13.2.12 The baseline establishes that there is considerable capacity within the vicinity of the site. The proposed development will give rise to demand for 71 primary and 22 secondary school places. There is deemed to be a negligible effect to both secondary and primary school provision in the local area.

*Employment*

13.2.13 The proposed development will introduce a number of employment generating uses and the direct job numbers expected to be generated by these uses is estimated by applying job density ratios, following Homes and Communities Agency guidance (Ref: 15.18).

13.2.14 Table 15.9 below provides an indication of the number of jobs that could be expected to be generated by the new proposed floorspace. The new floorspace will have capacity to accommodate approximately 42 jobs on site.

Table 15.9: Employment Floorspace

| Use Class | Employment Densities | Floorspace (sqm) | Jobs |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Range of Uses (A1 and/or A2 and/or A3 and/or B1) | Office: 1 per 12 sqm (GIA)<br>Retail: 1 per 17.5 sqm (GIA)<br>Average: 1 per 14.75 sqm | 440.1 | 30 |
| Nursery | 1 member of staff to every 3.5 children | 244 (approx. 40 children) | 12 |
| | | **Employment Total** | **42** |

Ref: HCA Employment Densities Guide 3rd Edition 2015

13.2.15 No further amendments are proposed to the quantum of employment generating uses proposed as part of the Development, however, following on from submission of the application in 2017, further information regarding the existing number of employees at the Citroen Garage site has become apparent.

13.2.16 In terms of the current operation of the existing Citroen Garage site, the site currently employs 30 staff. The Proposed Development would therefore result in a net increase of 12 jobs on site.

*Additional Spending*

13.2.17 The average weekly spend in the area per household on convenience items (comprising food, non-alcoholic and alcoholic drink and tobacco) is £68.20 (Ref: 15.19). Therefore, the provision of 441 new residential units with an expected population of 902.4 is estimated to potentially generate £30,076.20 per week on convenience shopping, or some £1.564 million per annum.

13.2.18 It is widely recognised that convenience shopping is localised and therefore it is appropriate to assume that the vast majority of this expenditure will be undertaken on nearby High Streets and food stores. Town centres are recognised to form the heart of their communities and this proposed development and the residents will clearly lend significant support to their continued viability and vitality.

13.2.19 The average weekly spend in the area per household on comparison goods (clothing and footwear, household goods and services) is £59.00 which equates to approximately £26,019.00 per week or £1.353 million per annum (Ref: 15.19). The expenditure on comparison goods such as clothing and personal items is not generally undertaken locally and will be undertaken in regional centres.

13.2.20 Additional spending could also arise through the provision of new employment space on site. Spending by those working on-site during the operational phase of the development has been calculated at approximately £10 per day per worker on food and drink. Based on a net increase of approximately 12 Full Time employees on site, local spending by employees could be up to £26,400.00 per annum. (Ref: 15.18)

13.2.21 The total indirect effect of the additional spending is considered to be of minor beneficial significance at the local level and negligible significance at the district level.

*Child Play Space*

13.2.22 In order to calculate the estimated number of children aged 0-15 living at the proposed development, the child yield assumptions set out in the GLA's SPG have been applied. As per this document, there is a requirement to provide play space for a child yield of 96 children and therefore some 962.5 sqm, 481.2 sqm of which is required for doorstep play for under 5's.

13.2.23 Play provision is distributed within the two podium courtyards and the undercroft to create a playable landscape containing a variety of play types and areas for children between ages 0-11. A new play area for children aged 12+ is also provided in the new public square.

13.2.24 As part of the Proposed Development amendments, a total of 969 sqm of play space provision will be provided and categorised into the following areas:

| Age Category | Area (sqm) |
|---|---|
| Under 5 years | 533 |
| 5-11 years | 286 |
| 12+ years | 150 |
| **Total** | **969** |

Source: GLA Play and Informal Recreation SPG Calculator

13.2.25 The intention is that the podium play areas will provide a more intimate 'door step' play experience for the resident children, where the two podium courtyards will provide a very natural play experience. The play area below the undercroft will benefit from feature lighting, a 'playful' soffit treatment, rubber safety surfacing and padding to the structural columns to ensure safe fall zones.

13.2.26 The podium play spaces will also benefit from the natural surveillance provided by overlooking from the surrounding residential buildings, with the added security derived from access control to buildings.

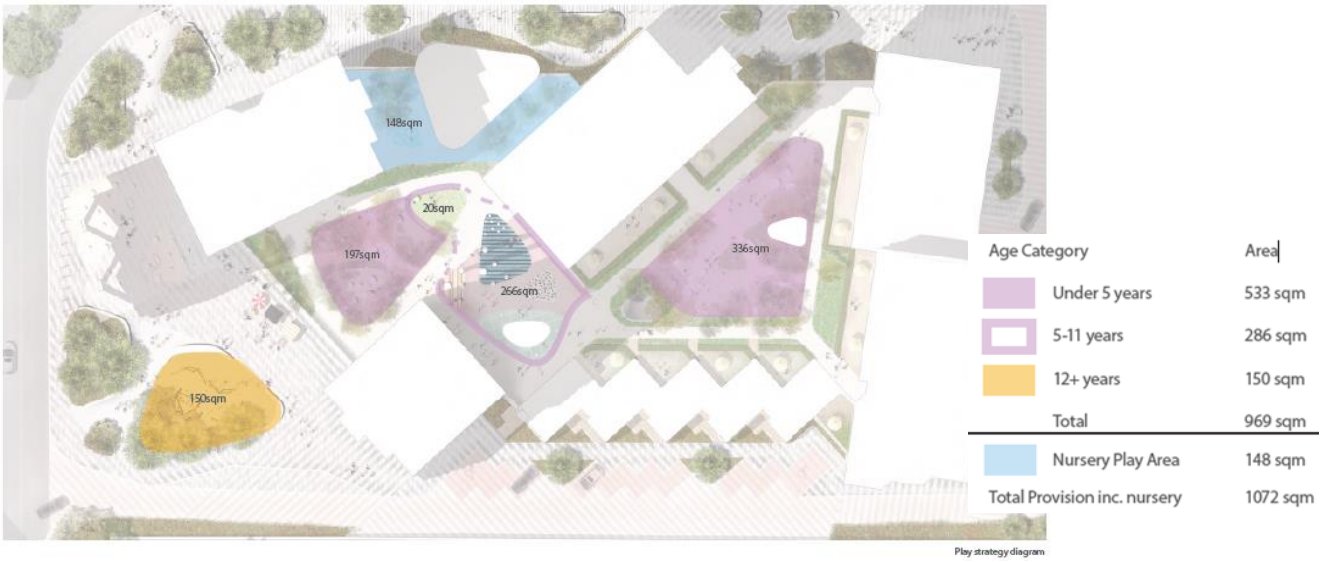



**Figure 12.1 Play Strategy Diagram**

13.2.27 The proposed development is assessed to have a long term, direct, local, major beneficial effect on the provision of open space in comparison to the existing building which affords no opportunities.

## 13.3 Evaluation of Significance

13.3.1 The assessment of the significance of these effects remains unchanged based on our professional judgement.

## 13.4 Cumulative effects

13.4.1 The cumulative assessment of socio-economic effects has used a combination of information taken from the planning application documents and Environmental Statements for the cumulative schemes relating to estimates of employment and number of residents that could be accommodated by these developments.

13.4.2 The cumulative schemes would bring forward a range of floorspace including residential, commercial, and community floorspace, bringing new residents and employees to the area.

13.4.3 The impact of developments coming forward in the vicinity will need to be fully considered in order to ensure that any potential negative effects are suitably mitigated through contributions and/or additional provision as part of these developments.

13.4.4 Positive impacts will also be cumulative. Each of the cumulative developments considered together with the proposed development will contribute towards meeting the regeneration objectives of the wider aspirations for the area. The delivery of new housing, including affordable housing, the creation of new employment opportunities, increased economic activity, the enabling or provision of new social infrastructure and the creation of new open spaces and play space will all contribute to regeneration. The cumulative effect upon regeneration is therefore assessed to be of major beneficial significance at the local and district level and of minor beneficial significance at the regional level.

13.4.5 Since the planning application was submitted in November 2017 (Application Ref: 01508/A/P6), the previously identified cumulative scheme ‘ Units 1-4 Capital Interchange Way’ for “Demolition of existing warehouse/storage buildings and advertisement stanchion, and redevelopment of the site to provide a two-storey podium building, three 18, 19 and 20 storey buildings, comprising a bus depot (Sui Generis), up to 550 residential units (Use Class C3), offices (Use Class B1), cafe (Use Class A3), pod buildings, publicly accessible open space, hard and soft landscaping; basement car parking and cycle parking, plant room and refuse storage, and two LED advertisement display panels with all necessary ancillary and enabling works” was refused planning permission.

13.4.6 Accordingly, this application should no longer considered a cumulative development and should not be considered for its potential cumulative impact on social infrastructure in the local area.

13.4.7 The resident population arising from the remaining scheme subject to determination (Land at Chiswick Roundabout, Great West Road: LBH Reference P/2015/5555) is estimated to be 505 people in total, including 26 at primary school age and 18 at secondary school age. This additional demand is recognised as having a minor adverse impact on social infrastructure in the area, given that it has been established through the baseline that there is existing capacity across schools and GPs in the locality.

## 13.5 Conclusion

13.5.1 This update on the potential socio-economic effects of the Proposed Development at the former Citroen Garage site, Capital Interchange Way addresses the modifications proposed by the Applicant prior to the determination of the planning application by the Mayor of London, including:

- Increase in unit numbers from 427 to 441 residential units;
- Increase of affordable housing provision to 50% (on a habitable room basis);
- Additional playspace provision.

13.5.2 It is considered these changes will not alter the baseline defined in the ES (November 2017), although they have been taken into consideration for the purposes of the impact assessment. The potential impact of the proposed development on primary educational facilities and healthcare has now changed due to the increase in population. The potential impacts still remain negligible.

13.5.3 The impact on child playspace has not changed due to the additional provision proposed as part of the amendments. There is a requirement to provide play space for a child yield of 96 children and therefore some 962.5 sqm. 969 sqm of play space has been provided as part of the Proposed Development.

13.5.4 The omission of the cumulative development at 1-4 Capital Interchange Way will reduce the potential adverse impact on social infrastructure in the area. The potential cumulative effect remains minor adverse.

**REFERENCES**

Ref: 15.1 Census 2011

Ref: 15.2 LBH Housing Market Assessment (June 2016)

Ref: 15.3 LBH Infrastructure Delivery Plan 2015-2030

Ref: 15.4 London Plan 2016

Ref: 15.5 LBH Employment Land Review 2016 (Peter Brett Associates)

Ref: 15.6 Office for National Statistics Annual Population Survey (2016)

Ref: 15.7 LBH School Site Sequential Assessment 2016 (Cundall)

Ref: 15.8 LBH Local Plan (September 2015)

Ref: 15.9 Education Funding Agency (EFA) Local Authority School Place Scorecard 2016

Ref: 15.10 DCLG English Indices of Deprivation 2015

Ref: 15.11 Public Health England Hounslow Health Profile (July 2017)

Ref: 15.12 Office for National Statistics Life Expectancy at Birth (2012 to 2014)

Ref: 15.13 Metropolitan Police Data 2017 - Crime Statistics

Ref: 15.14 LBH Community Safety Strategy 2014-2017

Ref: 15.15 LBH Residents Survey 2016

Ref: 15.16 UK Contractors Group 2012

Ref: 15.17 Office for National Statistics Workforce Jobs (WFJ) Series 2014

Ref: 15.18 Homes and Communities Agency Employment Densities Guide

Ref: 15.19 Office for National Statistics: Family spending in the UK: financial year ending March 2016

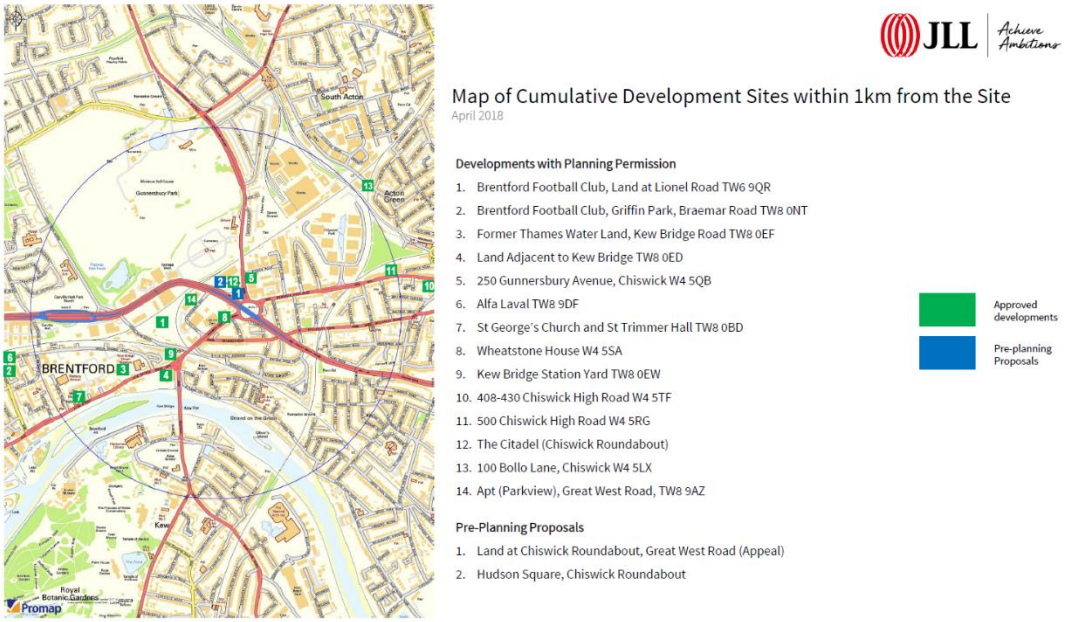
# 14. Cumulative Developments

14.1.1 The Regulations require consideration of cumulative effects of a development insofar as Schedule 4 (5) – referring to information to be included in an Environmental Statement – includes 'cumulative' effects within a description of the likely significant effects of a development on the environment. The Environmental Assessment process has given consideration to the potential for cumulative effects to arise from both a combination of different effects of the development and the effects of the development in combination with other developments in the area.

14.1.2 Since the planning application was submitted in November 2017 (Application Ref: 01508/A/P6), the previously identified cumulative scheme 'Units 1-4 Capital Interchange Way' for "Demolition of existing warehouse/storage buildings and advertisement stanchion, and redevelopment of the site to provide a two-storey podium building, three 18, 19 and 20 storey buildings, comprising a bus depot (Sui Generis), up to 550 residential units (Use Class C3), offices (Use Class B1), cafe (Use Class A3), pod buildings, publicly accessible open space, hard and soft landscaping; basement car parking and cycle parking, plant room and refuse storage, and two LED advertisement display panels with all necessary ancillary and enabling works" was refused planning permission.

14.1.3 Accordingly, this application should no longer be considered a cumulative development and has not be considered for its potential cumulative impact on environmental topic areas within this ES Addendum. The updated cumulative development map and table are included as Appendix 11.

14.1.4 The cumulative effect of the change has been considered within each individual environmental topic area as set out above. No significant effects will arise from the Capital Interchange Way scheme no longer coming forward.




ES Figure 18.1 Map of Cumulative Development Sites

14.1.5 The consideration of cumulative effects of developments has not identified any significant effects likely to arise during the construction period.

14.1.6 Although not appropriate to be explicitly considered in this cumulative assessment due to uncertainties, conceivably some of the other potential developments in the wider area could come forward for construction within the phased programme for the proposed development. In such circumstances, individual construction site management controls should reasonably be expected to regulate and limit the potential, frequency and significance of any cumulative incidents.

14.1.7 Upon completion of the proposed development several beneficial long term effects are predicted to arise from the delivery of new housing, including affordable housing, the creation of new employment opportunities and increased economic activity which will collectively contribute to the wider regeneration of the area. Similarly, significant beneficial cumulative effects in terms of heritage, townscape and visual effects are considered to arise from the completion of the developments.

# *15. Conclusion*

15.1.1 This report supports the Environmental Statement (ES) submitted alongside the Planning Application (Ref. 01508/A/P6) for the comprehensive redevelopment of the former Citroen site, Capital Interchange Way, Brentford.

15.1.2 This Addendum report has been prepared in response to a request from Greater London Authority (GLA) for amendments to the scheme to provide increased provision of affordable housing.

15.1.3 The addendum report has further considered the implications on:

- Heritage, Townscape and Visual Impact Assessment prepared by JLL Heritage as an addendum to the original Volume II Townscape, Visual and Built Heritage Assessment November 2017;
- Sunlight, Daylight and Overshadowing prepared by Point 2 Surveyors which provides a full update to ES Chapter 8: Sunlight, Daylight and Overshadowing;
- Transport prepared by PBA which provides a full update to ES Chapter 9: Transport;
- Air Quality prepared by REC which provides a full update to ES Chapter 10: Microclimate – Air Quality;
- Wind prepared by RWDI have provided a qualitative addendum to the Technical Report on Microclimate – Wind which is include in Appendix 6.
- Socio-Economic prepared by JLL which provides a full update to ES Chapter 15: Socio-Economic.

15.1.4 This Addendum to the ES considers whether the amendments to the proposed development alter the findings of the original ES. Whilst the design amendment and increase in the level of affordable housing provision does result in some amendments to the content of the original ES the amendments are minor and there are no substantial changes to the assessment of significance of effects set out in the original ES.

15.1.5 The findings within Chapter 16 Residual Effects, Interrelationships, Cumulative and Non-Significant Effects of the ES remain valid and unchanged. The Non-Technical Summary of the ES also remains unchanged.

15.1.6 The ES and addendum provides an assessment of the likely significant effects of the proposed development during the construction and operational phases. The documents comply with the Town and Country Planning (Environmental Impact Assessment) 2017 regulations in terms of their scope and methodology for assessment and reporting.

15.1.7 A major development of this nature has the potential for environmental effects and, where appropriate, mitigation measures have been identified to address any adverse impacts. The overall residual impact of the development with mitigation is considered to range from negligible to minor beneficial throughout the proposed development. Given the context of the site, the environmental impact of the development is acceptable given the general compliance with relevant British Standards, London Plan and local policy standards.

The ES and this ES addendum report have been prepared by JLL, with specialist input from the EIA technical consultant team. The EIA Project team are identified in the table below.

**EIA Project Team**

| Architects | Town Planning & Environmental Assessment |
|---|---|
| Hawkins Brown<br>159 St John Street<br>London EC1V 4QJ | JLL<br>30 Warwick St<br>London W1B 5NH |
| **Transport** | **Water Resources and Flood Risk** |
| Peter Brett Associates (PBA)<br>33 Bowling Green Ln<br>Clerkenwell EC1R 0BJ | Peter Brett Associates (PBA)<br>33 Bowling Green Ln<br>Clerkenwell EC1R 0BJ |
| **Ground Conditions** | **Microclimate - Wind** |
| CGL<br>12 Melcombe Place<br>London NW1 6JJ | RWDI<br>Unit 1, Tilers Road<br>Buckinghamshire MK11 3LH |
| **Socio-Economic** | **Noise and Vibration** |
| JLL<br>30 Warwick St<br>London W1B 5NH | Acoustic Logic<br>12 Russell Gardens<br>Kensington W14 8EZ |
| **Sunlight, Daylight and Overshadowing** | **Air Quality** |
| Point 2 Surveyors Limited<br>17 Slingsby Place<br>London WC2E 9AB | REC<br>Osprey House, Pacific Quay<br>Salford M50 2UE |
| **Heritage, Townscape and Visual Impact** | **Archaeology** |
| JLL<br>30 Warwick St<br>London W1B 5NH | Museum of London Archaeology (MOLA)<br>46 Eagle Wharf Road<br>London N1 7ED |
| **Climate Effects** | **Energy and Sustainability** |
| JLL<br>30 Warwick St<br>London W1B 5NH | Silcock Dawson<br>Central Point, 45 Beech Street<br>London EC2Y 8AD |
| **Ecology** | **Waste** |
| MiddleMarch Environmental Ltd<br>Triumph House, Birmingham Road<br>Coventry CV5 9AZ | WSP<br>6 Devonshire Square<br>London EX2M 4YE |
| **Construction** | |
| RPM<br>Derbyshire House, St Chad's Street<br>London WC1h 8AG | |

# Appendix 1: Updated Massing and Scheme Amendments

Appendix 2: Heritage, Townscape and Visual Impact Assessment (HTVIA) Addendum (May 2018)

Appendix 3.1: Exiting and Cumulative Baseline Drawings (April 2018)

Appendix 3.2: VSC, NSL & APSH Analysis (April 2018)

Appendix 3.3: Overshadowing Kew School (October 2017)

# Appendix 3.4: ADF & APSH Results for Cumulative Scheme (April 2018)

Appendix 3.5: Scheme Internal ADF and APSH Assessment (April 2018)

Appendix 3.6: Overshadowing Proposed Amenity Spaces (April 2018)

Appendix 3.7: Letter from Point2 Surveyors (April 2018)

Appendix 4.1: Delivery and Servicing Plan (April 2018)

# Appendix 4.2: Transport Statement Addendum (April 2018)

Appendix 4.3: Residential Travel Plan (April 2018)

Appendix 4.4: ES Transport Statement (November 2017)

Appendix 5.1: Air Quality Assessment (April 2018)

# Appendix 5.2: ADMS Roads Assessment Input Data (April 2018)

## Appendix 6: Letter from RWDI (April 2018)

# Appendix 7: Energy Strategy Update (April 2018)

# Appendix 8: Overheating Risk Assessment Update (April 2018)

# Appendix 9: Waste Management Strategy Update (April 2018)

Appendix 10: Flood Risk Technical Note (April 2018)

# Appendix 11: Cumulative Development Map and Table (April 2018)

This Environmental Statement has been collated by JLL with input from the relevant technical consultants.

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