

7 Traffic and Transport

7.1 Introduction

7.1.1 This chapter has been prepared by Velocity Transport Planning and assesses the likely significant effects on transport and access as a result of the Development. The chapter describes the potential traffic and transport effects on the surrounding highways and public transport network of the Development, and is based on an assessment of the interaction between future Development related traffic and pedestrian movements and existing patterns of traffic and pedestrian movement.

7.1.2 The chapter is accompanied by the following technical appendices:

- Appendix 7.1: Transport Assessment (TA), including Travel Plan, Delivery and Servicing Plan; Car Park Management Plan and Outline Construction Traffic Management Plan (CTMP); and
- Appendix 7.2: GLA Comments and Responses.

Competence

7.1.3 Lloyd James Bush is the principal author of this chapter. Lloyd has a Master of Science in Transport Planning and Engineering from London Southbank University, and is a member of the Chartered Institution of Highways & Transportation. Lloyd has been professionally engaged in traffic and transport in the private sector for fourteen years.

7.1.4 Lloyd is a Director at Velocity Transport Planning Ltd, a specialist consultancy dealing in transport planning. Lloyd's experience is primarily with determining and, if appropriate, addressing the changes in transport activity associated with development/redevelopment proposals.

7.2 Legislation, Planning Policy and Guidance

7.2.1 This section of the assessment refers to the policy and guidance at a national, regional and local level of relevance to the Development. Further details regarding the relevant policy and guidance can be found in Appendix 7.1.

Legislation

7.2.2 There is no legislation of relevance to the Transport Assessment.

Planning Policy Context

National

7.2.3 The following national planning policy is relevant to the Development:

- The National Planning Policy Framework (NPPF)¹ (updated February 2019)².

Regional

7.2.4 The following regional planning policy is relevant to the Development:

- The London Plan³;
- The Draft London Plan (2017)⁴, with minor suggested changes⁵; and
- The Mayor's Transport Strategy (2018)⁶.

Local

7.2.5 The following local planning policy is relevant to the Development:

- LB Barnet Core Strategy⁷;
- LB Barnet Local Plan Development Management Policies⁸; and
- LB Barnet’s Planning Brief for Pentavia Retail Park, Mill Hill⁹.

Guidance

7.2.6 The following guidance is relevant to the Development:

- Planning Practice Guidance (Live Document)¹⁰;
- Institute of Environmental Management and Assessment (IEMA) Guidelines for Environmental Assessment of Road Traffic (IEMA Guidance)¹¹;
- Transport Assessment Best Practice Guidance (2014)¹²;
- Transport for London’s (TfL) Travel Planning Guidance (2013)¹³;
- TfL’s Delivery and Servicing Plan Guidance¹⁴; and
- TfL’s Construction and Logistics Guidance¹⁵.

IEMA Guidelines

7.2.7 The IEMA Guidelines recommend a detailed environmental assessment for highways links where:

- traffic flows will increase by more than 30%;
- the number of Heavy Goods Vehicles (HGVs) will increase by more than 30%; or
- specific environmental problems may occur (sensitive areas affected by traffic increases of at least 10% unless there are significant changes in the composition of traffic).

7.3 Assessment Methodology

Consultation

7.3.1 As set out in Chapter 2: EIA Methodology, a scoping note was submitted to the GLA, which confirmed topics that would be assessed during the EIA process. The scope and approach of this assessment was informed by an earlier scoping study, subsequent 2016 ES and 2017 ES Addendum.

7.3.2 Consultation with LB Barnet, the GLA and TfL has been on-going since preparation began in the 2016 Submitted Scheme. Table 7.1 provides a summary of key consultation comments of relevance to the EIA, together with a response on how the issue was addressed through the EIA process.

Table 7.1: Consultation Response Summary

Consultee (Date) and Comment	Response
LB Barnet	
Access for the disabled to and from the site is a key consideration for the LB Barnet, and step free access must be provided where ever feasible.	The Development will provide a new step free access to Bunns Lane which also facilitates a new pedestrian connection across the Site.
Details of the surveys, did not identify the two Automatic Traffic Count (ATCs) on the A1. This potential requirement needs to be confirmed with TfL.	ATC’s were not required on the A1 as traffic surveys captured existing flow at both Mill Hill Circus (north of the Site) and Fiveways (South of the Site).

Consultee (Date) and Comment	Response
Junction capacity assessment is associated with any new access junction. Assessment will also be required at existing junctions within the area.	Junction capacity assessment has taken place, the scope of which was agreed with LB Barnet. The assessment is contained within the TA; the results of which have been used to assist professional judgement on the assessment of effects within this chapter.
A separate Transport Scoping Report has been submitted to the Local Authority's Highways Officer. The outcome from these discussions will need to form part of the fuller EIA assessment for Transport.	The Transport Scoping Note, and agreements in relation to assessment within the TA is referred to where applicable in this chapter.
Transport for London	
We would like to understand the impact of development against the observed current use of the site as well as the lawful permitted.	The assessment is presented within this chapter by identification of increase in traffic flow associated with the Development by comparison to a future base which does not include any uplift in use of the Site based on its lawful permitted use. The impact relative to the lawful permitted use of the site is assessed within the Transport Assessment, however this ES Chapter assesses the full impact of the development relative to current conditions.
TfL considers that a direct pedestrian and cycle access onto Bunns Lane is necessary for a residential use of the site and should be provided by the Applicant.	Pedestrian and cycle access are proposed as part of the Development, the effects of which are accounted for in the completed development section of this chapter.
It should be assumed that for access to London Underground services that bus will be used.	Although it is anticipated that some London Underground access will take place by other modes, trips were assumed to predominantly use buses for access within this assessment. With the exception of some walking trips to Colindale Station.
In the assessment (of bus patronage) trips should be assigned to either routes 221 or 113	Whilst it is recognised that these are the most accessible routes, in order to access Burnt Oak London Underground Station, other accessible services will be used. Assignment has taken place in accordance with that described within the TA.
Following call-in of the planning application by the Mayor of London, a meeting was held with TfL on 5 December 2018 and subsequently a Scoping Note was produced for the revised assessment of the amended proposal.	TfL responded by e-mail with clarifications and requests on minor items, a copy of which is contained within the appendices of the TA (Appendix 7.1). TfL accepted that the Development vehicle trip generation should be recalculated based on a per parking space rate determined by the original submission.

Consultee (Date) and Comment	Response
<p>Historic England</p> <p>A Construction Management Plan is required to demonstrate that the impact during construction will be mitigated. Otherwise no other concerns with regard to the impact of the development on the SRN, subject to statutory consultation on the Transport Assessment and Travel Plan.</p>	<p>A Construction Traffic Management Plan is included in Appendix 7.1. Further consultation is expected upon submission of the planning application.</p>

Study Area and Scope

- 7.3.3 The study areas were established through a comprehensive consultation with LB Barnet on the area over which each travel mode has the potential to result in significant effects. The appraisal of the area (the 'study area') was supported by a site walkover undertaken with a LB Barnet Highway Officer on 26 June 2016. The extent of the study area for assessing operational effects was further determined and agreed with TfL.
- 7.3.4 The scope set out in the LB Barnet Scoping Opinion on 28 July 2016 (Appendix 2.4) was used for this assessment. Following further consultation with LB Barnet and TfL in November 2017 (see Table 7.1), it was agreed that the approach to trip generation for the Site (i.e. the 2016 Submitted Scheme) would be amended to reflect TfL's Best Practice Guidance (where previously LB Barnet had requested the use of TRAVL sites with data older than 5 years). On 5 December 2018, a meeting with TfL was held to discuss revisions to the assessments following amendments to the proposal. A Scoping Note was produced summarising the agreed revised assessment methodologies and is contained within the appendices of the TA (Appendix 7.1).
- 7.3.5 Primary healthcare facilities were assessed within 1km of the Development. This distance was used as it is considered to be the mean length for walking journeys (taking approximately 15 minutes), by the DfT¹⁶.
- 7.3.6 The traffic flows were from 2016 surveyed data. The future year assessments were based on growth of the base traffic for a period of five years. It is recognised that this represents the year 2021 and is therefore 2 years short of the Future Year 2024 as outlined within Chapter 2: EIA Methodology. However, the TA (Appendix 7.1) assesses the Future Year +5 Years (2026) which remains a point in time in which the Development is anticipated to be fully operational. As such, this chapter also includes information on the Year 2026 for further context and validation of the impacts identified. Since the GLA call in of the planning application, further discussion with the GLA and TfL were undertaken, and this approach on assessment years and baseline data (i.e. 2016) was agreed (Appendix 7.2).
- 7.3.7 Since submission of the 2017 ES and subsequent 2018 ES Addendum, the indicative year for commencement of enabling works has shifted from 2018 to 2019. It is not anticipated that any material change in traffic flows would be prevalent from 2018 to 2019, and therefore 2018 has been retained as the indicative year for commencement of enabling works for the purpose of assessment within this chapter.

Establishing Baseline Conditions

- 7.3.8 Full details of the methodology for determining the baseline conditions is described in the TA (Appendix 7.1). This section of this chapter provides a short summary of that methodology and the data sources used.

7.3.9 Baseline conditions were determined via traffic surveys of the surrounding highway network, observations of existing pedestrian infrastructure, pedestrian comfort levels, and interrogation of personal injury accident data obtained from TfL.

7.3.10 Potential sensitive receptors were determined following an assessment of baseline conditions, and dialogue with LB Barnet and TfL, as follows:

- motorised users on the local highway network;
- pedestrians on the footways adjacent to the Site; and
- public transport users using public transport facilities around the Site.

Existing Highway Capacity/Users

7.3.11 The study area for vehicular routes has been agreed with the LB Barnet Highway Officer and TfL, and includes the road links shown in Figure 7.1 and described in Table 7.2.

Figure 7.1: Road Link Assessment Area

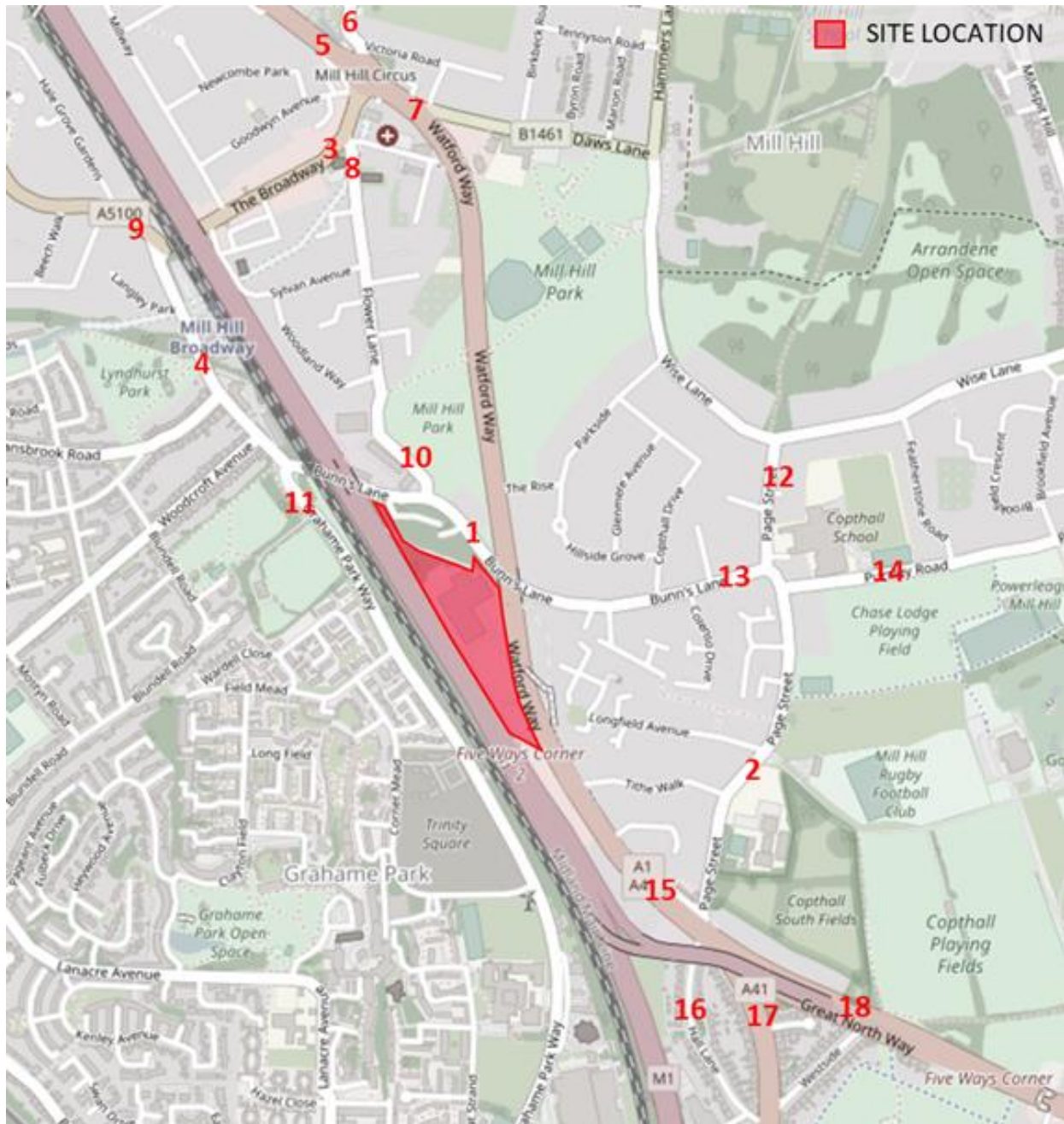


Table 7.2: Road Links

Road Link (Name)

1. Bunn's Lane (adjacent to Site)	10. Flower Lane (South end)
2. Page Street	11. Grahame Park Way
3. The Broadway	12. Page Street (North of Bunn's Lane)
4. Bunn's Lane (North of Lyndhurst Ave)	13. Bunn's Lane (East End)
5. A1 (North of Mill Hill Circus)	14. Pursley Road
6. Lawrence Street	15. A1 (North of Page Street)

Road Link (Name)

7. A1 (South of Mill Hill Circus)	16. Hall Lane
8. Flower Lane (North end)	17. A41 Watford Way
9. Hale Lane	18. A1 (South of A41)

7.3.12 Baseline scenarios have been considered to be the existing observed conditions, and the conditions which would otherwise prevail in future years. The following represent the baseline scenarios:

- Existing Operation – Base 2016 (the current observed behaviour collected in accordance with the methodology described in the TA and within this chapter);
- Construction Operation – Future Base 2018 (the year in which it is anticipated peak vehicle movements would take place as a result of earthworks);
- Year of Opening – Future Base 2021 (the year in which the Development could become fully operational. It includes growth in background traffic and committed developments assumed to be in place by this time); and
- Year of Opening +5 Years – Future Year Base +5 Years 2026. This has been included on the basis that the development is expected to be occupied in 2023, and validates the impacts identified within the Future Base 2021.

7.3.13 It is noted that the Future Base 2021 and Future Year Base +5 Years scenarios differ from the equivalent scenarios presented within the TA (Appendix 7.1). The traffic that could be generated by the full operation of the Site under its permitted use has not been included in future scenarios such that the full environmental effects of the Development can be considered.

7.3.14 Existing traffic flows were collected by surveys undertaken in June 2016. Surveys included classified turning counts at seven junctions and four Automatic Traffic Counters (ATC's) in locations agreed with LB Barnet to capture data for all links (Figure 7.1).

7.3.15 Growth to traffic between 2016 and the future years has been applied in accordance with growth rates which were extracted from the CAAP traffic model supplied by LB Barnet. The change in traffic flows on surrounding links were supplied for 2007 to 2026. A linear growth has been applied to produce a rate of growth for the future years 2018, 2021 and 2026. The CAAP model growth rates also contain all committed developments with the exception of the Millbrook Park development, which has been included as an additional committed development upon request by LB Barnet.

7.3.16 The Millbrook Park development (LB Barnet ref: H/04017/09) is 2km east of the Site, adjacent to Mill Hill East London Underground station. Once complete, the Millbrook Park development will provide 2,174 homes, a primary school and commercial uses. The methodology for application of traffic flows associated with the Millbrook Park development are fully described within the TA (Appendix 7.1).

7.3.17 Although there are some existing vehicle trips on the network generated by minor activity from current uses on the Site, this has not been deducted from the 'with Development' traffic flow scenarios. As such, the trips applied in the 'with Development' scenarios are considered to be robust.

Existing Pedestrian Movements

7.3.18 To assess the base conditions of footways, a Pedestrian Environment Review System (PERS) audit was undertaken to determine current infrastructure conditions. The assessment included Bunn's

Lane, Flower Lane, Woodcroft Avenue, Woodland Road and Station Way and is presented within the TA (Appendix 7.1).

- 7.3.19 Surveys were undertaken in June 2016 to determine existing pedestrian flow levels and produce a Pedestrian Comfort Level (PCL) assessment on the links at Bunns Lane (1) and Flower Lane (10), where the Development is anticipated to generate its greatest demand. The PCL assessment was undertaken for both the AM (08:00 to 09:00) and PM (17:00 to 18:00) peak hours, which represent times when the local footways are expected to be most heavily utilised.

Existing Bus Capacity/Users

- 7.3.20 The potential use of existing bus occupancy data was discussed with TfL during the formal pre-application meeting. It was determined that the bus capacity/users baseline conditions should be identified by determining the existing unladen capacity of routes accessible within an 8-minute walk of the Site. This was identified for the 113, 221, 302, 303, 114, 186 and 251 bus services (see Baseline Conditions).
- 7.3.21 The identification of capacity within the existing bus services was calculated for seated (64 patrons) and both seated and standing (87 patrons) capacity.

Rail and London Underground Capacity/Users

- 7.3.22 Published timetable information was used to establish the available services for both rail and London Underground services in the area.
- 7.3.23 Based on discussions with TfL, it was assumed that access to London Underground services would take place by bus. As such, although Burnt Oak Station and Colindale Stations are more closely located to the Site, access to Hendon Central (by bus route 113) and Mill Hill East (by bus route 221) is also attractive.

Identifying Likely Significant Effects

Construction

Existing Highway Capacity/Users

- 7.3.24 The estimated numbers of enabling, demolition, and construction related vehicle journeys were calculated based on volumes of demolition/excavated waste material, together with imported concrete, piling, and cladding.
- 7.3.25 Details regarding the construction programme are provided in Chapter 5: Demolition and Construction, which identifies that earthwork activities for the Development are anticipated to take place in 2019. It is not anticipated that any material change in traffic flows would be prevalent from 2018 to 2019, and therefore 2018 was retained as the indicative year for commencement of enabling works for the purpose of this assessment. This will be the most intensive period of activity for generation of vehicle movements, and the average daily and peak hour movements were calculated as follows:
- Construction will be undertaken for a period of 5.5 days (55 hours) each week;
 - Earthworks will take place for a period of 24 weeks;
 - 0% of personnel movements would take place within peak hours; and
 - During earthworks approximately 23,000m³ of material requires off-site removal;
 - Vehicles carry, on average, 20m³ of spoil;

- Each vehicle will generate an inbound and outbound movement on the highway network; and
- 10% of daily vehicle trips will occur in the AM and PM peak hours.

7.3.26 The assessment was undertaken using professional judgement and experience of such analysis at other sites across London.

Operational Development

7.3.27 The methodology for determining effects of the completed Development is described in detail in the TA (Appendix 7.1). This section provides a short summary of that methodology and the data sources used.

Existing Highway Capacity/Users

7.3.28 Trip generation for each proposed use within the Development was calculated using the TRICS and TRAVL databases of comparable sites. Trip generation principles were agreed with TfL, further details are provided in the TA (Appendix 7.1). Assessment of vehicle trip generation was agreed with TfL based on conversion of trips to a trip rate per car parking space.

7.3.29 This chapter summarises the effect on the identified highway links (Figure 7.1) by identification of the future uplift in flow in the Opening Year of 2021. It was not deemed necessary to determine the proportional uplift in traffic relative to any further future years, given that the Development effects will become more diluted by increases in background traffic. However, it has been deemed appropriate to demonstrate this is the case, and provide context by presenting summaries associated with the Opening Year +5 Years 2026 given that the development is anticipated to open in 2023.

7.3.30 IEMA Guidance^{Error! Bookmark not defined.} suggests that effects on driver stress, amenity and journey time should be considered as environmental effects. These receptors are inherent within the assessment of changes in traffic flow. Professional judgement was applied to assess the effects (i.e. driver stress, amenity and journey time in conjunction with the results of junction modelling results of the wider network, assessed in the TA (Appendix 7.1).

Existing Pedestrian Movements

7.3.31 Trips assigned to the pedestrian network are based on a review of local destinations for pedestrian journeys, including trips to transport interchanges such as bus stops and rail stations. Therefore, the number of pedestrian movements includes trips contained within other main modes of travel, given that the start and end of these trips will result in demand on the footways. The assignment of the trips on the pedestrian network is fully described within the TA (Appendix 7.1).

7.3.32 A PCL assessment has been undertaken on the links identified within the baseline assessment to understand the effects of any additional demand on pedestrian comfort levels.

Existing Bus Capacity/Users

7.3.33 The effects of additional bus patronage generated by the Development was assessed by comparing existing capacity (unladen) and anticipated future demand for bus services. The existing capacity was based on the minimum frequency of services expected according to published timetable information.

7.3.34 Based on discussions with TfL it was assumed that access to London Underground services would take place by bus. These trips were included within the additional demand on bus patronage generated by the Development.

7.3.35 The existing bus patronage data was not made available by TfL. Therefore, it was not possible to accurately determine the sensitivity of each route based on current utilisation. However, it is understood from liaison with both TfL and members of the public that the bus network, more specifically bus routes 221 and 113, is likely to be sensitive to changes in demand.

Existing Rail Users

7.3.36 All trips by rail are expected to take place from Mill Hill Broadway station as the most accessible rail station from the Site. The additional demand generated by the Development was assigned proportionally to the number of services per route within the peak hours. Services are more frequent for travelling south (i.e. central London).

7.3.37 The effect of additional trips generated by the Development on existing rail users was determined by considering the additional loading per train within the peak hours. The frequency of trains was based on the minimum expected frequency according to the published timetable information.

Existing London Underground Users

7.3.38 Trips to the London Underground network were identified within the TA (Appendix 7.1). Whilst Burnt Oak Station is the closest geographically, upon request from TfL, all trips other than those to Collingdale Station were assumed to take place via an interconnecting bus service. As such, trips to Hendon Central via bus route 113 and Mill Hill East via bus route 221 were also included.

7.3.39 Due to the location of these bus services on the northern extent of the Northern Line, it was deemed both reasonable and robust that all trips will seek to utilise southbound services.

7.3.40 The effect of additional London Underground trips generated by the Development was determined by consideration of the additional average loading per train within the peak hours. As described previously, peak hours comprise the weekday AM and PM hours of 08:00 to 09:00 and 17:00 to 18:00. The peak hours represent times when the local transport network is most heavily utilised, therefore the assessment has focused on these hours to provide a reasonable worst-case scenario.

Cumulative Effects

7.3.41 The cumulative effects of the schemes identified within Chapter 2: EIA Methodology are inherent within the Completed Development Assessment of Effects.

Determining Effect Significance

7.3.42 The assessment of likely significant effects as a result of the Development took into account both the demolition and construction phase and the completed and occupied Development. Guidance provided by IEMA^{Error! Bookmark not defined.} was consulted to identify applicable significance criteria. The overall significance of a transport effect is determined by consideration of the magnitude of impact alongside the sensitivity of receptor.

Sensitivity of Receptor

7.3.43 The definitions of receptor sensitivity are set out in Table 7.3.

Table 7.3: Definitions of Receptor Sensitivity

Value (Sensitivity)	Descriptor
High	Receptors which are heavily used (by all users or particularly by vulnerable road users) relative to other receptors within the study area

Medium	Receptors which are used (by all users or particularly by vulnerable road users) to a roughly average level relative to other receptors within the study area
Low	Receptors which are lightly used (by all users or particularly by vulnerable road users) relative to other receptors within the study area

7.3.44 The potential receptors are those people making journeys within the assessment area for each travel mode. The receptors considered for each travel mode are:

- those people travelling by that mode; and
- those people travelling by other modes but which are affected by the mode in question.

7.3.45 For example, a significant increase in vehicle activity on a route with pedestrian crossings may increase delay for pedestrians crossing the road.

Magnitude of Impact

7.3.46 The magnitude of impact is set out in Table 7.4.

Table 7.4: Definitions of Magnitude of Effect

Value	Descriptor
High	Changes which are likely to be perceptible and which would significantly change conditions which would otherwise prevail to the extent that it would significantly affect travel behaviour
Medium	Changes which are likely to be perceptible and which would materially change conditions which would otherwise prevail to the extent that it may affect travel behaviour to some degree
Low	Changes which are likely to be perceptible but not the extent that it would materially change conditions which would otherwise prevail
Negligible	Changes which are unlikely to be perceptible

Evaluation of Significance

7.3.47 Chapter 2: EIA Methodology outlines in detail the significance matrix used to demonstrate how the significance of effect is determined using the magnitude of impact and the sensitivity of the receptor. Moderate to major effects are considered to be significant, whereas minor to negligible effects are not considered significant.

Evidence Assumptions and Limitations

7.3.48 The data and results presented in this chapter are subject to the following limitations and assumptions:

- development occurs broadly in accordance with the demolition and construction programme outlined in Chapter 5: Demolition and Construction;
- committed development comes forward as included for within the Colindale Area Action Plan model, and based on a linear relationship from 2007 to 2026;
- traffic additions in all future years do not take benefit from reassignment of existing traffic to balance network delays;

- traffic flows were taken from 2016 surveyed data. The future year assessments were based on growth of the base traffic for a period of five years, it is recognised that this is 1.5 years short of the Future Year 2023 as outlined in Chapter 2: EIA Methodology. However, information is given in regard of the Future Year 2026 (post completion) to validate the assessment;
- since the submission of 2017 ES and 2018 ES Addendum, it is recognised the indicative year for commencement of enabling works has shifted from 2018 to 2019. However, it is not anticipated that any material change in traffic flows would be prevalent from 2018 to 2019, and therefore 2018 was retained as the indicative year for commencement of enabling works for the purpose of assessment within this chapter;
- Although there are some existing vehicle trips on the network generated by minor activity from current uses on the Site, this has not been deducted from the 'with Development' traffic flow scenarios;
- traffic, pedestrian and bus trip additions were distributed in accordance with the methodology set out in the TA and summarised in this chapter; and
- due to lack of available data on the current utilisation of accessible bus routes, it was assumed that they are highly sensitive to ensure a worst-case assessment of effects.

7.4 Baseline Conditions

Site Accessibility

Access to Education

- 7.4.1 Details regarding the location availability of pupil places of both primary and secondary schools within accessible distance of the Development are described in Chapter 6: Socio-Economics.
- 7.4.2 The nearest nursery to the Site (Bright Little Stars) is located to the north of the Site on Bunns Lane. Despite its close geographic proximity, there is no direct access to Bunns Lane from the Site. The nursery is currently accessible by an approximately eight-minute walk.
- 7.4.3 There are four primary schools within the 1km (geographic distance) of the Site. The nearest primary school is The Orion Primary School which is located to the west of the Site, across a major motorway (M1). The school can be accessed from the Site via a footpath to the south (approximately 12-minute walking distance).
- 7.4.4 The closest secondary school to the Development is St James' Catholic High School to the south of the Site (approximately 1.13km or 12-minute walking distance).
- 7.4.5 Barnet College is the nearest college, located 500m to the south of the Site. The college is accessible via the footbridge over the M1 (approximately 6-7 minute walking distance).
- 7.4.6 The nearest university to the Site is Middlesex University, located 2.5km from the Site. It accessible by public transport by taking bus route 113 (16-minute travel time).

Access to Retail

- 7.4.7 The nearest convenience store is a Marks & Spencer food outlet located within the petrol filling station, adjacent the southern boundary of the Site. There are a number of other local stores located to south of the Site within a small parade of shops at the junction of the A1 and Page Street. These include an off-licence, restaurant and home supply stores. These can be accessed within approximately a 10-minute walk, via the A1 underpass at Tithe Walk.

7.4.8 The closest retail centre with a wide variety of shops is located on The Broadway, to the north of the Site. The facilities can be accessed by walking in approximately 19 minutes, either via the A1, or by taking the step from the A1 at Bunns Lane, to travel via Flower Lane.

Access to Healthcare Facilities

7.4.9 There are three GP practices within 1km of the Development (approximately a 15-minute walk). The total number of general practitioners within these three GP practices is 24. The closest GP practice to the Development is the Everglade Medical Centre to the south west of the Site.

7.4.10 There are three pharmacies, five dentists and two opticians within 1km of the Development. These facilities are concentrated to the north along The Broadway and to the south west around Grahame Park.

7.4.11 Further details regarding the location availability healthcare services within accessible walking distance of the Development are described in Chapter 6: Socio-Economics.

Access to Leisure Facilities

7.4.12 The nearest public outdoor centre (Grahame Park Astro Pitch) and private gym (The Box Gymnasium) are located 1.1km and 900m respectively from the Site by walking. Mill Hill Park is located 750m walk from the Site.

7.4.13 The Burnt Oak Leisure Centre is approximately 1.8km from the Site, approximately 13 minute walk, eight-minute cycle, and 20 minutes by public transport.

7.4.14 Mill Hill Park is located to the north east of the Development and provides a wide range of facilities including sports facilities, gardens, multi-sport courts, play areas, an outdoor gym and a café.

7.4.15 Local open spaces include Woodcroft Park, Lyndhurst Park and Grahame Park to the west of the Site on the other side of the M1.

7.4.16 A number of play spaces are located within these open spaces including within Mill Hill Park, Woodcroft Park, Lyndhurst Park and Grahame Park.

Pedestrian Network

7.4.17 Pedestrian access to the Site is possible from the western side of the A1 (Watford Way) via an existing footway. Connectivity to the west of the Site is achieved via a pedestrian bridge over the M1 and via a subway under the railway line at the southern end of the Site.

7.4.18 The overall condition of the pedestrian environment around the Site has been considered within the TA (Appendix 7.1). A PERS audit is included in the TA, which assesses the most popular pedestrian routes anticipated to be utilised by users of the Site. The PERS audit provides a detailed review of the existing local pedestrian infrastructure, including footway widths, crossing facilities, surfacing, condition and suitability. The PERS audit demonstrates that, in general, the existing local pedestrian environment is of a good standard.

7.4.19 A footway capacity assessment was carried out to assess the PCL along the key routes that are expected to be most used by pedestrians to access the Development (Appendix 7.1).

7.4.20 Table 7.5 sets out the baseline pedestrian flow on the key receptor links in the AM and PM peak periods. The PCL is categorised as follows:

- PCL A – Comfortable for All Areas;
- PCL B – Recommended Minimum for All Areas;
- PCL C – Increasingly Uncomfortable; and
- PCL D or E – Very Uncomfortable.

Table 7.5: Baseline AM and PM Peak Pedestrian Comfort Levels

Receptor	Base Flow (peds)	Base PCL
Bunns Lane East (northern footway)	103	A+
Bunns Lane East (southern footway)	91	A+
Bunns Lane West (northern footway)	103	A+
Bunns Lane West (southern footway)	91	A+
Flower Lane (eastern footway)	49	A+
Flower Lane (western footway)	12	A+

7.4.21 The data presented in Table 7.5 shows that the maximum comfort level currently prevails on all footpath links. On this basis, the sensitivity of all footpath links is low.

Cycle Routes and Facilities

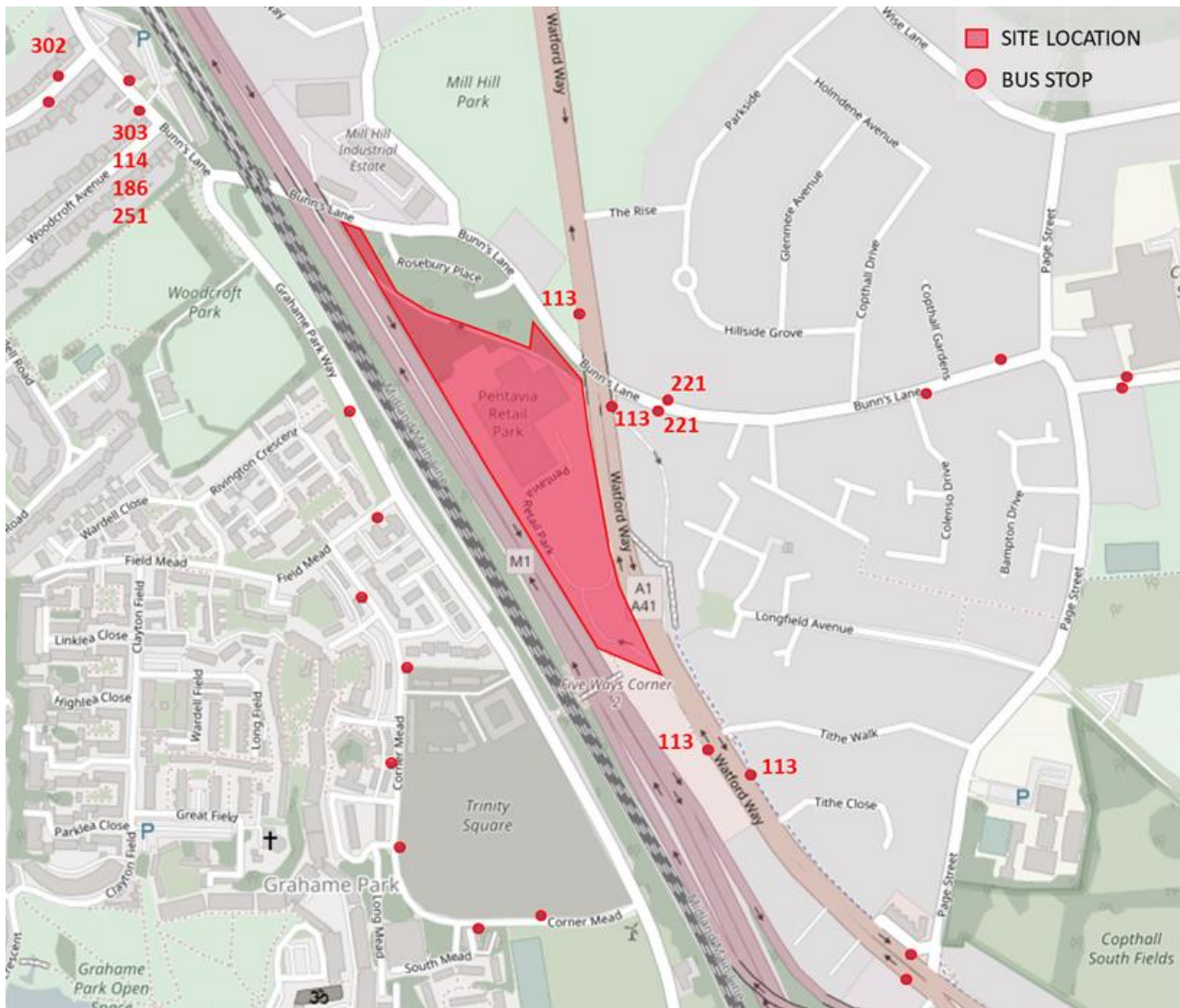
7.4.22 There is an off-road cycle route which extends south to Hendon and on to Brent Cross. Grahame Park Way, which runs parallel to M1, is also signed for cyclists. This route can be accessed by cyclists via the provision of the subway under the railway line and footbridge. Cyclists are required to dismount as cycling is not permitted.

Bus Routes and Facilities

7.4.23 The closest bus stop to the Site is located on the northbound carriageway of the A1, adjacent to the existing petrol station at the southern end of the Site, and serves the northbound bus route.

7.4.24 The location of existing bus stops is shown by Figure 7.2.

Figure 7.2: Existing Bus Stop Locations



- 7.4.25 Southbound bus stops can be accessed via two routes. Pedestrians can head north on the western footway of the A1 and take steps down onto Bunn's Lane, walk under the A1 and up steps on the eastern side to gain access to the footpath adjacent southbound traffic. Alternatively, pedestrians can walk south on the western side of the A1 to access an underpass which links to Tithe Walk to the east of the Site, and bus stop just south of this point. The bus stops are served by bus route 113 which provide services between Edgware and Marble Arch (5 to 8 buses per hour).
- 7.4.26 Bus route 221 operates frequent service (10 to 15 buses per hour) between Edgware and Turnpike Lane and provides a direct service from the Site to Mill Hill Station. Bus stops are located on Bunn's Lane and are accessed via the steps on the A1.
- 7.4.27 More bus services are available within the residential streets to the west of the M1, (303,302, 251, 114 and 186) and are accessible via the existing subway under the railway line, and via the footbridge.
- 7.4.28 Table 7.6 summarises the frequency of local bus services.

Table 7.6: Frequency of local bus services

Service No.	Direction	First Bus/Last Bus	AM Peak Frequency (per hour)	PM Peak Frequency (per hour)
113	Southbound	First 04:40 Last 00:09	7-12	5-8
	Northbound	First 06:08 Last 01:38	5-9	5-9
221	Eastbound	First 05:35 Last 00:30	5-7	5-6
	Westbound	First 05:49 Last 00:49	5-6	5-6
302	Westbound	First 05:30 Last 00:10	6-10	6-10
	Eastbound	First 06:19 Last 00:37	7-10	7-10
303	Westbound	First 05:27 Last 00:07	4-5	4
	Eastbound	First 05:37 Last 00:15	4	4
114	Westbound	First 04:55 Last 01:15	5-8	5-8
	Eastbound	First 05:22 Last 01:17	5-9	5-9
186	Westbound	First 06:08 Last 00:48	5-7	5-8
	Eastbound	First 05:26 Last 00:01	5	5
251	Westbound	First 05:30 Last 00:20	5-7	5-7
	Eastbound	First 05:19 Last 00:29	5-9	4-6

7.4.29 Although existing bus patronage data was not made available for interrogation, it is understood from liaison with both TfL and members of the public that the bus network, and more specifically bus routes 221 and 113, are likely to be sensitive to changes in demand. It is therefore considered that the bus network is highly sensitive to the effects of the Development.

London Underground Services

7.4.30 The nearest London Underground station is Burnt Oak on the Northern Line, located 1.6km to the west of the Site. Table 7.7 summarises the services from Burnt Oak London Underground Station.

Table 7.7: Frequencies of Burnt Oak tube services

Station/Line	Direction	First/Last Train	AM Peak Frequency (per hour)	PM Peak Frequency (per hour)
Burnt Oak/Northern Line	Towards Edgware	First 05:42 Last 01:10	21	20
	Towards Morden/Golders Green	First 05:25 Last 00:47	21	20
Mill Hill East/Northern Line	Towards Finchley Central/Kennington	First 05:25 Last 00:54	5	4
Colindale/Northern Line	Towards Edgware	First 05:40 Last 01:08	19	21
	Towards Morden/Golders Green	First 05:27 Last 00:49	21	20
Hendon Central/Northern Line	Towards Edgware	First 05:38 Last 01:05	19	21
	Towards Morden/Golders Green	First 05:30 Last 00:52	21	20

7.4.31 Given the number of services provided both before and after peak hours, and the level of frequency/capacity of the network, all stations are of medium sensitivity to effects of the Development.

National Rail Services

7.4.32 The nearest railway station to the Site is Mill Hill Broadway located approximately 750m north west of the Site, which is served by First Capital Connect running Thameslink services. The typical daytime service from the station is four trains per hour to central London, Wimbledon and Sutton, of which two terminate at St Albans and two at Luton.

Table 7.8: Frequencies of Mill Hill Broadway services

Station/Line	Direction	First/Last Train	AM Peak Frequency (per hour)	PM Peak Frequency (per hour)
Mill Hill Broadway	Towards Bedford	First 00:05 Last 23:37	1	1
	Towards Sutton	First 05:14 Last 23:18	3-4	3-4
	Towards St Albans	First 06:06 Last 22:14	2-3	2-3

	Towards Luton	First 06:32 Last 22:00	1-2	2
	Towards Sevenoaks	First 06:32 Last 20:12	1-2	1-2
	Towards Bromley South	First 07:10 Last 07:48	2	None

7.4.33 It is understood from the consultation process with both LB Barnet, TfL and the public that southbound rail services from Mill Hill Broadway are congested. As such, and given that services are less frequent in comparison to the London Underground network, they will be highly sensitive to effects of the Development.

Public Transport Accessibility Level

7.4.34 A 'Public Transport Accessibility Level' (PTAL) assessment has been undertaken. The PTAL is a detailed measure of the accessibility of a location to the public transport network, taking into account walk access time to stations/stops, service availability and frequency.

7.4.35 The PTAL value is categorised in six levels, 1a to 6b, where 1a is the lowest level of accessibility (very poor) and 6b is the highest level of accessibility (excellent). The Site currently has a PTAL of 1b, signifying it currently has poor access to public transport.

Local Highway Network

7.4.36 The Site is bounded by the A1 (Watford Way) to the east and the M1 to the west. The A1 Watford Way forms part of the Transport for London Road Network (TLRN). The Site is closely located to Bunns Lane to the north, but is currently segregated from the Site by an area of vegetation.

7.4.37 Vehicular access/egress to the Site is available from the northbound carriageway of the A1. Access and egress are via an on and off-slip road connecting to a three-arm roundabout from where access to the existing Pentavia Park is achieved.

Traffic Volumes

7.4.38 A series of traffic surveys were undertaken in June 2016 to identify the baseline traffic conditions of the local highway network. Traffic data was captured both by Automatic Traffic Counters (ATCs) laid at four locations and by Manual Classified Counts (MCCs) at a further seven junctions.

Table 7.9: Traffic Volume Survey results (2016)

Link Name	AM Peak Hour			PM Peak Hour		
	All Vehicles	HGVs	HGV %	All Vehicles	HGVs	HGV (%)
Bunns Lane (adjacent to Site)	1820	26	1.43	1638	17	1.04
Page Street	1009	14	1.39	969	4	0.41
The Broadway	1037	74	7.14	1022	46	4.50
Bunns Lane (North of Lyndhurst Ave)	1178	87	7.39	1272	62	4.87
A1 (North of Mill Hill Circus)	3745	199	5.31	4229	115	2.72

Lawrence Street	936	28	2.99	1027	20	1.95
A1 (South of Mill Hill Circus)	4200	200	4.76	4568	106	2.32
Flower Lane (North end)	379	24	6.33	367	13	3.54
Hale Lane	1046	36	3.44	1112	27	2.43
Flower Lane (South end)	491	22	4.48	451	10	2.22
Grahame Park Way	1028	31	3.02	858	11	1.28
Page Street (North of Bunns Lane)	489	6	1.23	347	3	0.86
Bunns Lane (East End)	1684	28	1.66	1546	20	1.29
Pursley Road	1537	28	1.82	1305	17	1.30
A1 (North of Page Street)	3890	193	4.96	3541	99	2.80
Hall Lane	63	9	14.29	73	4	5.48
A41 Watford Way	2951	146	4.95	3451	77	2.23
A1 (South of A41)	2122	68	3.20	1185	34	2.87

7.4.39 The road links vary in terms of their sensitivity to changes. This is not solely dependent on the level of traffic observed, but is relative to the available capacity, and as such sensitivity was determined by on-site observation, base traffic modelling results contained within the TA (Appendix 7.1) and subsequent professional judgement.

7.4.40 The following links are considered to be of low sensitivity:

16. Hall Lane.

7.4.41 The following links are considered to be of medium sensitivity:

6. Lawrence Street;

8. Flower Lane (North End); and

10. Flower Lane (South End).

7.4.42 The following links are considered to be of high sensitivity:

1. Bunns Lane (adjacent the Site);

2. Page Street;

3. The Broadway;

4. Bunns Lane (North of Lyndhurst Ave);

5. A1 (North of Mill Hill Circus);

7. A1 (South of Mill Hill Circus);

9. Hale Lane;

11. Grahame Park Way;
12. Page Street (North of Bunns Lane);
13. Bunns Lane (East End);
14. Pursley Road;
15. A1 (North of Page Street);
17. A41 Watford Way; and
18. A1 (South of A41).

Traffic Speed

7.4.43 Traffic speed was recorded in conjunction with the ATC surveys and is summarised in Table 7.10 by direction.

Table 7.10: Traffic Speed

Link No.	Name	Direction	Mean Speed (mph)	85th %ile Speed (mph)
1	Bunns Lane (adjacent the Site)	EB	27.1	31.8
		WB	28.0	33.1
2	Page Street	NB	25.2	30.0
		SB	27.0	31.3
3	The Broadway	EB	18.1	24.2
		WB	16.2	22.8
4	Bunns Lane (North of Lyndhurst Ave)	NB	22.2	26.4
		SB	20.8	25.7

Personal Injury Accident Data

7.4.44 Personal injury accident data for the three-year period ending February 2016 has been obtained from TfL for the roads close to the Site. The analysis indicates that a total of 151 injury accidents occurred within the study area during the three-year period, with 92.7% of injuries recorded as being slight. Analysis of accident records suggests no underlying issue with highway safety near the Site.

Future Baseline

7.4.45 There are understood to be no major changes in the Site's accessibility, as described by the baseline conditions for the Future Baseline 2023. As such, the receptors and level of sensitivity for footpaths, bus, London Underground and rail remains as identified in the Baseline Conditions section of this chapter.

Traffic Flows

7.4.46 Growth to traffic observed in 2016 and presented in this chapter were applied in accordance with rates which were extracted from the Collingdale Area Action Plan (CAAP) model, supplied by LB Barnet. Full details of growth rates are contained within the TA (Appendix 7.1).

7.4.47 The CAAP model growth rates also contain all cumulative development deemed to be required for inclusion within the assessment with the exception of the Millbrook Park development which has been included as an additional committed development and is described within the TA (Appendix 7.1).

Table 7.11: Traffic Volume Future Baseline

Link Name	AM Peak Hour			PM Peak Hour		
	All Vehicles	HGVs	HGV %	All Vehicles	HGVs	HGV %
Bunns Lane (adjacent to Site)	1894	27	1.43	1734	18	1.04
Page Street	1054	15	1.42	1025	4	0.39
The Broadway	1077	77	7.15	1082	49	4.53
Bunns Lane (North of Lyndhurst Ave)	1223	90	7.36	1345	65	4.83
A1 (North of Mill Hill Circus)	3908	206	5.27	4478	121	2.70
Lawrence Street	971	29	2.99	1093	21	1.92
A1 (South of Mill Hill Circus)	4389	211	4.81	4836	112	2.32
Flower Lane (North end)	394	25	6.35	388	14	3.61
Hale Lane	1088	37	3.40	1177	29	2.46
Flower Lane (South end)	512	23	4.49	478	11	2.30
Grahame Park Way	1086	32	2.95	910	12	1.32
Page Street (North of Bunns Lane)	512	6	1.17	372	3	0.81
Bunns Lane (East End)	1752	29	1.66	1637	21	1.28
Pursley Road	1611	29	1.80	1390	18	1.29
A1 (North of Page Street)	4054	201	4.96	3758	105	2.79
Hall Lane	65	9	13.85	77	4	5.19
A41 Watford Way	3127	155	4.96	3678	81	2.20
A1 (South of A41)	2206	71	3.22	1274	36	2.83

7.4.48 As with the Baseline, road links vary in terms of their sensitivity to changes in terms of traffic. This is not solely dependent on the level of traffic observed, but is relative to the available capacity. As such, sensitivity was determined by on-site observation, base traffic modelling results contained within the TA (Appendix 7.1) and subsequent professional judgement.

7.4.49 The following links are considered to be of low sensitivity:

16. Hall Lane.

7.4.50 The following links are considered to be of medium sensitivity:

6. Lawrence Street;

8. Flower Lane (North End); and

10. Flower Lane (South End).

7.4.51 The following links are considered to be of high sensitivity:

1. Bunns Lane (adjacent the Site);

2. Page Street;

3. The Broadway;

4. Bunns Lane (North of Lyndhurst Ave);

5. A1 (North of Mill Hill Circus);

7. A1 (South of Mill Hill Circus);

9. Hale Lane;

11. Grahame Park Way;

12. Page Street (North of Bunns Lane)

13. Bunns Lane (East End);

14. Pursley Road;

15. A1 (North of Page Street);

17. A41 Watford Way; and

18. A1 (South of A41).

7.4.52 As previously described, information regarding the Future Base Year 2026 is included within this chapter for the purpose of both context and validation of the assessment. It is again noted that the magnitude of impact is not considered in this scenario on the basis that they are diluted by growth in baseline traffic, and that the sensitivity of the receptors is unchanged from the Future Baseline.

Table 7.12: Traffic Volume Future Baseline +5 Years (2026)

Link Name	AM Peak Hour			PM Peak Hour		
	All vehicles	HGVs	HGV %	All vehicles	HGVs	HGV %
Bunns Lane (adjacent to Site)	1995	28	1.4	1856	19	1.0
Page Street	1121	15	1.3	1103	4	0.4
The Broadway	1441	75	5.2	1404	43	3.1
Bunns Lane (North of Lyndhurst Ave)	1352	93	6.9	1485	69	4.6
A1 (North of Mill Hill Circus)	4160	214	5.1	4773	128	2.7

Lawrence Street	1036	30	2.9	1171	22	1.9
A1 (South of Mill Hill Circus)	4665	215	4.6	5196	118	2.3
Flower Lane (North end)	421	26	6.2	414	14	3.4
Hale Lane	1162	39	3.4	1692	30	1.8
Flower Lane (South end)	554	24	4.3	526	11	2.1
Grahame Park Way	1132	33	2.9	968	12	1.2
Page Street (North of Bunns Lane)	540	6	1.1	398	3	0.8
Bunns Lane (East End)	1850	30	1.6	1679	22	1.3
Pursley Road	1712	30	1.8	1505	19	1.3
A1 (North of Page Street)	4383	207	4.7	5118	110	2.1
Hall Lane	79	10	12.7	84	4	4.8
A41 Watford Way	3292	157	4.8	3926	86	2.2
A1 (South of A41)	2754	73	2.7	2267	38	1.7

Summary of Receptors and Sensitivity

7.4.53 The sensitivity of the surrounding receptors is assessed in Table 7.13.

Table 7.13: Summary of Receptors and Sensitivity

Receptor	Sensitivity (Value)
Existing	
Bus Services – namely route 221 and 113	High
London Underground services – Northern Line	Medium
National Rail Services – Mill Hill Broadway	High
Bunns Lane East (northern footway)	Low
Bunns Lane East (southern footway)	Low
Bunns Lane West (northern footway)	Low
Bunns Lane West (southern footway)	Low
Flower Lane (eastern footway)	Low
Flower Lane (western footway)	Low
Highway Network Link No. 16	Low
Highway Network Link Nos. 6, 8, and 10	Medium
Highway Network Link Nos. 1, 2, 3, 4, 5, 7, 9, 11, 12, 13, 14, 15, 17 and 18	High

7.5 Scheme Design and Management

Construction

- 7.5.1 A CTMP has been prepared as part of the planning submission (Appendix 7.1), which provides a full description of the way in which mitigation measures will be adopted. It is also assumed that a full Construction Logistics Plan (CLP) will be secured by planning condition prior to the commencement of any works.
- 7.5.2 Careful consideration has been given in the CTMP to the likely numbers and size of operational vehicles, the demolition and construction programme requirements, and the routes to and from the Site.

Operational Development

- 7.5.3 A Travel Plan (TP) has been prepared as part of the planning submission and is contained as an appendix to the TA (Appendix 7.1). The TP provides a full description of the way in which typical travel planning measures will be adopted to encourage sustainable travel. It is noted that not all proposed measures are typical of a TP, and are not inherent within the assessment in this chapter. Where relevant these were identified as further mitigation measures.
- 7.5.4 A Delivery and Servicing Plan (DSP) has also been prepared as part of the planning submission and is contained within an appendix to the TA (Appendix 7.1). The DSP provides a full description of mitigation measures that will be adopted in relation to the servicing of the Development, and these are inherent within the assessment in this chapter.

7.6 Construction

Assessment of Effects

Construction Traffic

- 7.6.1 Construction access and egress will take place via the existing slip roads of the northbound carriageway of the A1. It is anticipated that all trips will originate from north of the Site, and return to the north. As such inbound movements will generate two movements on the A1 north of the Fiveways junction, and south of the Development (junction of links 2, 15, 16, 17, 18 as identified by Figure 7.1).
- 7.6.2 On-site parking for construction workers will be restricted to an absolute minimum. It will only be made available to those construction personnel who need to carry heavy equipment or materials to the Site.
- 7.6.3 Enabling works are anticipated to take place in 2019, and are expected to generate the peak traffic movements of the demolition and construction period. During these works existing hardstanding (concrete/asphalt parking areas, concrete floor slabs and foundations) will be broken up. Large quantities of materials including concrete, asphalt, sub-base material, engineered fill material, aggregates, soils and sub-soils are to be generated, with approximately 23,000m³ to be removed from the Site over a 24-week programme.
- 7.6.4 During the earthworks the Development could generate up to 12 vehicle trips per day, and a maximum of two might generate an inbound and outbound traffic movement within the highway network peak hours.
- 7.6.5 Tables 7.14 and 7.15 below present the effect of these movements relative to the future link flows in the AM and PM peak hours respectively. The assessment assumes the CTMP would be in place, as described under 'Design and Management'.

Table 7.14: Construction Traffic Estimates AM Peak Hour

Link Name	Baseline Flow (2018)	Construction Traffic	% Change	
	HGVs	HGVs	All Vehicles	HGVs
Bunns Lane (adjacent the Site)	26	0	0.0	0.0
Page Street	14	0	0.0	0.0
The Broadway	75	0	0.0	0.0
Bunns Lane (north of Lyndhurst Ave)	88	0	0.0	0.0
A1 (North of Mill Hill Circus)	202	4	0.1	2.0
Lawrence Street	28	0	0.0	0.0
A1 (South of Mill Hill Circus)	203	4	0.1	2.0
Flower Lane (North end)	24	0	0.0	0.0
Hale Lane	37	0	0.0	0.0
Flower Lane (South end)	22	0	0.0	0.0
Grahame Park Way	31	0	0.0	0.0
Page Street (North of Bunns Lane)	6	0	0.0	0.0
Bunns Lane (East End)	28	0	0.0	0.0
Pursley Road	28	0	0.0	0.0
A1 (North of Page Street)	196	4	0.1	2.0
Hall Lane	9	0	0.0	0.0
A41 Watford Way	148	0	0.0	0.0
A1 (South of A41)	69	0	0.0	0.0

Table 7.15: Construction Traffic Estimates PM Peak Hour

Link Name	Baseline Flow (2018)	Flow	Construction Traffic		% Change	
	All vehicles	HGVs	All vehicles	HGVs	All Vehicles	HGVs
Bunns Lane (adjacent to Site)	1675	17	0	0	0.0	0.0
Page Street	991	4	0	0	0.0	0.0
The Broadway	1045	47	0	0	0.0	0.0
Bunns Lane (North of Lyndhurst Ave)	1300	63	0	0	0.0	0.0
A1 (North of Mill Hill Circus)	4323	118	4	4	0.1	3.4
Lawrence Street	1050	20	0	0	0.0	0.0
A1 (South of Mill Hill Circus)	4670	108	4	4	0.1	3.7
Flower Lane (North end)	375	13	0	0	0.0	0.0

Hale Lane	1137	28	0	0	0.0	0.0
Flower Lane (South end)	461	10	0	0	0.0	0.0
Grahame Park Way	877	11	0	0	0.0	0.0
Page Street (North of Bunns Lane)	355	3	0	0	0.0	0.0
Bunns Lane (East End)	1580	20	0	0	0.0	0.0
Pursley Road	1334	17	0	0	0.0	0.0
A1 (North of Page Street)	3620	101	4	4	0.1	4.0
Hall Lane	75	4	0	0	0.0	0.0
A41 Watford Way	3528	79	0	0	0.0	0.0
A1 (South of A41)	1211	35	0	0	0.0	0.0

Effects on Travel by Car (including HGVs)

- 7.6.6 As show in Tables 7.14 and 7.15, the only road users likely to be affected by construction traffic would be those using the A1. In no instance does proportional traffic increase greater than the level recommended by the IEMA guidance for detailed assessment (i.e. 10% in sensitive areas).
- 7.6.7 In all scenarios, while percentage increase in HGV flow may appear larger, the absolute effect is low and not perceptible in the context of the volume of traffic on the road. The proportional increase of HGV flows is less than the level recommended by the IEMA guidance for detailed assessment (30%).
- 7.6.8 On the basis of the data presented above and applying judgement to consider the potential effect of construction vehicles in the context of the absolute and percentage changes, the magnitude of impact on travel by car/HGV, and in particular vehicle delay is negligible.
- 7.6.9 The road links which are subject to increases in traffic flow are considered to be of high sensitivity in regard of its existing users, as the A1 forms a busy strategic route with existing delay. The significance is therefore minor where the magnitude of impact is negligible for high sensitivity receptors. The adverse effect would be minor, temporary, and at a local level given that its occurrence is for demolition and construction purposes only and affects only the A1 in the immediate vicinity of the Site.

Effects on Travel by Pedestrians and Cyclists

- 7.6.10 On the basis of the data presented above, the magnitude of impact on pedestrians and cyclists, and in particular severance, delay and amenity is negligible in all instances. Vehicle movements will occur on the A1 which is already subject to high vehicle demand, and are of low sensitivity in regard of travel by foot and cycles since the A1 is not extensively used by these modes. Therefore, the significance of construction traffic on pedestrians and cyclists is negligible, temporary at a local level.

Effects on Travel by Bus

- 7.6.11 On the basis of the data presented above in regard of traffic movements associated with demolition and construction of the Development, and applying judgement to consider the potential effect in the context of the absolute and percentage changes, the magnitude of impact on travel by bus, and in particular delay to buses, is negligible.
- 7.6.12 Bus route 113 on links where additional traffic will be generated during the demolition and construction of the Development is considered to be highly sensitive. As previously indicated in this

chapter, this was assumed to be the worst case in the absence of data on the existing use of the service. The significance of the adverse effect of construction traffic on bus travel is therefore minor, temporary, at the regional level, as effect of delay impacts the full extent of the route.

Effects on Travel by Rail and London Underground

- 7.6.13 Effects of construction traffic on rail and London Underground users would be negligible. Therefore, the significance of construction traffic on rail and London Underground users is negligible, temporary, and at a regional level.

Mitigation, Monitoring and Residual Effects

Construction Traffic

- 7.6.14 All achievable mitigation for the demolition and construction of the Development is inherent within the assessment of the effects of construction traffic by inclusion within the CTMP (Appendix 7.1).

Residual Effects on Travel by Car (including HGVs)

- 7.6.15 Residual effects remain as described above.

Residual Effects on Travel by Pedestrians and Cyclists

- 7.6.16 Residual effects remain as described above.

Residual Effects on Travel by Bus

- 7.6.17 Residual effects remain as described above.

Residual Effects on Travel by Rail and London Underground

- 7.6.18 Residual effects remain as described above.

7.7 Completed Development

Assessment of Effects

- 7.7.1 The Development comprises construction of 844 Build to Rent and conventional housing units, with retail, food and other community uses.
- 7.7.2 The TA (Appendix 7.1) summarises in detail the trip generation exercise that has been agreed with TfL and undertaken to determine the effects of the completed Development. A summary of the multi-modal trips generated by the Development is presented in Table 7.16.

Table 7.16: Multimodal Completed Development Trips

AM Peak Hour			PM Peak Hour		
Arr	Dep	Total	Arr	Dep	Total
26	49	75	64	45	109
0	14	14	19	1	22
7	38	45	26	8	36
21	73	92	42	26	64
37	102	139	87	47	134
5	12	17	5	6	8

3	3	6	6	4	10
2	6	8	5	2	7

Effect of Additional Vehicle Trips

7.7.3 Tables 7.17 and 7.18 set out the degree of change in vehicle and HGV flow on the key receptor links comparing the AM and PM peak hours, respectively, of the Future Baseline and the change as a result of the Development.

Table 7.17: Future Baseline + Development AM Peak Hour Traffic

Link Name	Future Base Flow (2021)	Future Base Flow (2026)		Development Change in Flow		Development Change in 2021 (%)
	HGVs	All vehicle	HGVs	All vehicle	HGVs	All vehicle
Bunns Lane (adjacent the Site)	27	1995	28	2	0	0.0
Page Street	15	1121	15	5	0	0.0
The Broadway	77	1441	75	8	0	0.0
Bunns Lane (North of Lyndhurst Ave)	90	1352	93	4	0	0.0
A1 (North of Mill Hill Circus)	206	4160	214	26	0	0.0
Lawrence Street	29	1036	30	9	0	0.0
A1 (South of Mill Hill Circus)	211	4665	215	61	0	0.0
Flower Lane (North end)	25	421	26	2	0	0.0
Hale Lane	37	1162	39	1	0	0.0
Flower Lane (South end)	23	554	24	2	0	0.0
Grahame Park Way	32	1132	33	2	0	0.0

Page Street (North of Bunns Lane)	6	540	6	4	0	0.0
Bunns Lane (East End)	29	1850	30	2	0	0.0
Pursley Road	29	1712	30	9	0	0.0
A1 (North of Page Street)	201	4383	207	61	0	0.0
Hall Lane	9	79	10	0	0	0.0
A41 Watford Way	155	3292	157	35	0	0.0
A1 (South of A41)	71	2754	73	31	0	0.0

Table 7.17: Future Baseline + Development PM Peak Hour Traffic

Link Name	Future Base Flow (2021)		Future Base Flow (2026)		Development Change in Flow		Development Change in 2021 (%)	
	All vehicle	HGVs	All vehicle	HGVs	All vehicle	HGVs	All vehicle	HGVs
Bunns Lane (adjacent the Site)	1734	18	1856	19	4	0	0.2	0.0
Page Street	1025	4	1103	4	11	0	1.1	0.0
The Broadway	1082	49	1404	43	11	0	1.0	0.0
Bunns Lane (North of Lyndhurst Ave)	1345	65	1485	69	4	0	0.3	0.0
A1 (North of Mill Hill Circus)	4478	121	4773	128	39	0	0.9	0.0
Lawrence Street	1093	21	1171	22	10	0	0.9	0.0
A1 (South of Mill Hill Circus)	4836	112	5196	118	77	0	1.6	0.0
Flower Lane (North end)	388	14	414	14	2	0	0.5	0.0
Hale Lane	1177	29	1692	30	2	0	0.2	0.0

Link Name	Future Base Flow (2021)		Future Base Flow (2026)		Development Change in Flow		Development Change in 2021 (%)	
	All vehicle	HGVs	All vehicle	HGVs	All vehicle	HGVs	All vehicle	HGVs
Flower Lane (South end)	478	11	526	11	2	0	0.4	0.0
Grahame Park Way	910	12	968	12	2	0	0.2	0.0
Page Street (North of Bunns Lane)	372	3	398	3	5	0	1.3	0.0
Bunns Lane (East End)	1637	21	1679	22	4	0	0.2	0.0
Pursley Road	1390	18	1505	19	12	0	0.9	0.0
A1 (North of Page Street)	3758	105	5118	110	116	0	3.1	0.0
Hall Lane	77	4	84	4	0	0	0.0	0.0
A41 Watford Way	3678	81	3926	86	40	0	1.1	0.0
A1 (South of A41)	1274	36	2267	38	35	0	2.7	0.0

Effects on Travel by Car (including HGVs)

- 7.7.4 In all cases, the proportional increase in traffic flow resulting from the Development is less than the level recommended by the IEMA guidance for detailed assessment (30%)^{Error! Bookmark not defined.}. The highest proportional change is on A1 (North of Page Street), in the PM peak hour (+3.1%), this is also the highest actual increase in vehicle movements to occur.
- 7.7.5 On the basis of the data presented above, and applying judgement to consider the potential effect in the context of the absolute and percentage changes, the magnitude of impact on travel by car/HGV, and in particular vehicle delay is negligible.
- 7.7.6 The significance of the adverse effect of additional vehicle trips is considered to be negligible where the sensitivity of the road link has been identified as low or medium. This applies to the links listed below:
- 16. Hall Lane;
 - 6. Lawrence Street;
 - 8. Flower Lane (North End); and
 - 10. Flower Lane (South End).
- 7.7.7 There is an adverse effect of minor significance where the sensitivity of the link has been identified to be high. This applies to the links listed below:

1. Bunns Lane (adjacent the Site);
2. Page Street;
3. The Broadway;
4. Bunns Lane (North of Lyndhurst Ave);
5. A1 (North of Mill Hill Circus);
6. A1 (South of Mill Hill Circus);
9. Hale Lane;
11. Grahame Park Way;
12. Page Street (North of Bunns Lane)
13. Bunns Lane (East End);
14. Pursley Road;
15. A1 (North of Page Street);
17. A41 Watford Way; and
18. A1 (South of A41).

7.7.8 For all road links, the effects identified are permanent and local in nature.

Effects on Travel by Foot and Cycles

- 7.7.9 On the basis that no increases to traffic on road links have been identified as being above the thresholds identified by IEMA Guidance, and applying judgement to consider the potential effect in the context of the absolute and percentage changes, the magnitude of impact on pedestrians, in particularly severance and amenity is considered to be negligible. The effect of increased pedestrian activity on existing users is negligible and permanent at the local level.
- 7.7.10 Cyclists are inherent within the assessment of effects on traffic. The significance of effects on cyclists would therefore be as stated above for car users.

Effect of Additional Pedestrian Movements

- 7.7.11 The Development will generate pedestrian movements associated with the new residential properties and other uses. The pedestrian movements identified are inclusive of all movements that could occur as a result of main mode bus trips, London Underground trips, and linked bus to London Underground trips. As such, the assessment is considered robust.
- 7.7.12 Tables 7.18 and 7.19 below set out the degree of change in pedestrian flow on the key receptor links comparing the Baseline to expected increases as a result of the Development in the AM and PM peak periods respectively.

Table 7.18: AM Peak Pedestrian Comfort Levels with and without Development

Receptor	Base Flow (peds)	Base PCL	Additional Development (peds)	With Development PCL	Increase (%)
Bunns Lane East (northern footway)	103	A+	29	A+	28.2
Bunns Lane East (southern footway)	91	A+	21	A+	23.1
Bunns Lane West (northern footway)	103	A+	0	A+	0.0
Bunns Lane West (southern footway)	91	A+	175	A+	192.3
Flower Lane (eastern footway)	49	A+	63	A+	128.6
Flower Lane (western footway)	12	A+	45	A+	375.0

Table 7.19: PM Peak Pedestrian Comfort Levels with and without Development

Receptor	Base Flow (peds)	Base PCL	Additional Development (peds)	With Development PCL	Increase (%)
Bunns Lane East (northern footway)	25	A+	16	A+	64.0
Bunns Lane East (southern footway)	40	A+	20	A+	50.0
Bunns Lane West (northern footway)	25	A+	0	A+	0.0
Bunns Lane West (southern footway)	40	A+	151	A+	377.5
Flower Lane (eastern footway)	39	A+	60	A+	153.8
Flower Lane (western footway)	12	A+	34	A+	283.3

7.7.13 The data presented in Tables 7.18 and 7.19 show that whilst significant proportional changes of pedestrian flow of up to 375% in the AM peak, the high proportional increase relates to a low level of existing pedestrian activity rather than a significant effect. This is further evidenced by the

maximum level for pedestrian comfort/amenity being maintained for all footpaths once the Development is fully occupied.

Effect on Travel by Foot

- 7.7.14 On the basis of the data presented above and the recommendations made by TfL in their Pedestrian Comfort Guidance for London, the magnitude of impact on travel by foot and in particular pedestrian amenity is negligible in all instances.
- 7.7.15 The sensitivity of the footpaths has been deemed to be low given they are not heavily used. The effect of increased pedestrian activity on existing users is negligible and permanent at the local level.
- 7.7.16 On the basis of the data presented above, the magnitude of impact on travel by car, and in particular delay is deemed to be minor. The effect of additional pedestrian movements on car travel is minor, permanent at the local level.

Effect of Additional Bus Trips

- 7.7.17 Tables 7.20 and 7.21 below set out the degree of change in bus patronage on the key receptor routes comparing the existing capacity of bus services to the increase in patronage associated with the Development in the AM and PM peak hours.

Table 7.20: AM Peak Hour Bus Patronage with Development

Seated Capacity	Total Capacity (including standing)	Development Demand
448	609	21
320	435	4
320	435	25
320	435	22
384	522	5
448	609	0
256	348	2
256	348	2
320	435	5
320	435	0
320	435	2
320	435	2
320	435	0
320	435	0

Table 7.21: PM Peak Hour Bus Patronage with Development

Service No.	Seated Capacity (%)	Total Capacity (%)	Additional passengers per bus
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113	1.88	1.38	1.20
	4.88	3.59	3.12
221	2.56	1.89	1.64
	5.25	3.86	3.36
302	0.55	0.40	0.35
	0.42	0.31	0.27
303	0.78	0.57	0.50
	0.00	0.00	0.00
114	0.66	0.48	0.42
	0.59	0.44	0.38
186	0.63	0.46	0.40
	0.00	0.00	0.00
251	0.0	0.0	0.0
	0.0	0.0	0.0

- 7.7.18 The anticipated demand for bus trips inclusive of main mode London Underground trips will predominantly take place on bus routes 113 and 221. These are the both the closest accessible services to the Development, with the 113 providing access to Hendon Central and the 221 to Mill Hill East London Underground stations.
- 7.7.19 Professional judgement has been adopted to assess the magnitude of impact of additional bus patronage based on its proportional impact to unladen seated capacity. Both the eastbound and westbound services of route 221 experience an increase of approximately 7-8% of total capacity in the AM peak hour. This will have a low magnitude of impact on this route.
- 7.7.20 The magnitude of impact on all other routes is negligible with increases of less than 5% experienced.
- 7.7.21 The significance of the adverse effect on the eastbound and westbound route of the 221 is moderate given the high sensitivity of the bus network.
- 7.7.22 The significance of the adverse effect of additional bus trips on all other bus routes is minor given the high sensitivity of the bus network.
- 7.7.23 The effects of increases to bus patronage in all cases are considered to be permanent, long term, and regional in nature.

Effect of Additional Rail Trips

- 7.7.24 All trips by rail are expected to take place from Mill Hill Broadway station being that it is the most accessible station in relation to the Site. The impact of additional rail trips on users other than existing rail users is considered to be inherent within the assessments above. Therefore, the assessment of effect here only considers that of the effect on the rail network.
- 7.7.25 In the AM peak hour, a total of 38 departures and 7 arrivals by rail are anticipated. Given that these do not occur concurrently (i.e. departures board as arrivals alight), the greatest demand is placed by

those departing. By assignment to the six southbound services that are available during the AM peak hour, it is anticipated that the Development will generate an additional demand of approximately six persons per train.

- 7.7.26 In the PM peak hour, a total of 26 arrivals and 8 departures by rail are anticipated. The greatest demand is placed by those arriving. By assignment to the five northbound services that are available during the PM peak hour, it is anticipated that the Development will generate an additional demand of approximately five persons per train.
- 7.7.27 Based on the level of additional demand expected, the magnitude of impact of the Development is considered to be negligible. Due to the fact that the rail network is highly sensitive, the adverse effect will be minor, permanent at the regional level.

Effect of Additional London Underground Trips

- 7.7.28 Tables 7.22 and 7.23 shows the additional demand within the AM and PM peak hours that will be generated by the Development at each station. It is noted that demand at Collingdale and Hendon Central are cumulative in the AM and PM as they are on the same line as Burnt Oak.

Table 7.22: Completed Development AM Peak Hour London Underground Trips

Station/Line	Direction	AM Peak Development Trips	AM Peak Frequency (per hour)	Additional Persons per Train
Burnt Oak / Northern Line	Northbound	0	21	0.00
	Southbound	3	19	0.15
Mill Hill East / Northern Line	Southbound	0	5	0.00
	Terminating (i.e. Northbound)	3	5	0.56
Colindale / Northern Line	Northbound	0	19	0.00
	Southbound	6	21	0.27
Hendon Central / Northern Line	Northbound	0	19	0.00
	Southbound	11	21	0.53

Table 7.23: Completed Development PM Peak Hour London Underground Trips

Station/Line	Direction	PM Peak Development Trips	PM Peak Frequency (per hour)	Additional Persons per Train
Burnt Oak / Northern Line	Northbound	4	20	0.19
	Southbound	0	15	0.01
Mill Hill East / Northern Line	Southbound	4	4	0.95
	Terminating (i.e. Northbound)	0	5	0.04
Colindale / Northern Line	Northbound	8	21	0.36
	Southbound	0	20	0.02

Hendon Central / Northern Line	Northbound	15	21	0.72
	Southbound	1	20	0.07

7.7.29 Tables 7.22 and 7.23 demonstrate the greatest increase in demand as a result of the completed Development occurs in the AM and PM peak hours at Hendon Central due to the cumulative effect of development trips passing through the station. The greatest impact per train also occurs at Hendon Central, but only an additional 0.72 passengers per train are expected on average in the PM peak hour.

7.7.30 Based on the level of additional demand expected, the magnitude of impact of the Development is considered to be negligible. Due to the fact that the London Underground network is of medium sensitivity, the effect of additional London Underground trips will be negligible, permanent at the regional level.

Accidents and Safety

7.7.31 The effect on accidents and safety was considered in the context of the baseline personal injury accident data which identified there was no underlying issue with highway safety near the Site, and the information presented in relation to increase in traffic and pedestrian movements in this chapter.

7.7.32 In all cases the proportional increase in traffic flow is less than the level recommended by the IEMA guidance for detailed assessment (30%)^{Error! Bookmark not defined.}. Increased pedestrian activity has also been shown to be negligible given the immediate area maintains an A+ PCL rating with the completed Development.

Effects on Car Travel (including HGVs)

7.7.33 Given the low proportional increases to traffic and negligible effect of additional pedestrian movements, the effect of the completed Development on accidents and safety of vehicular traffic is negligible. The effect is considered to be negligible, permanent at the local level.

Effects on Pedestrians and Cyclists

7.7.34 Given the low proportional increases to traffic and negligible effect of additional pedestrian movements, the effect of the completed Development on accidents and safety of pedestrians and cyclists negligible. The effect is considered to be negligible, permanent at the local level.

Mitigation and Residual Effects

7.7.35 Mitigation measures described here are in addition to those deemed to be inherent within the assessment of effects above. Where mitigation impacts the effects of the completed Development, the residual effect has been identified. For all other effects the residual effect remains as described above.

7.7.36 It is recognised that off-site highway works may be requested and delivered through CIL and S106 contributions. These additional measures are not defined and therefore are not inherent within the assessment in this chapter, but would reduce the effect of the completed Development. The need for these works would be defined in consultation with TfL and LB Barnet and therefore not considered in the identification of residual effects.

7.7.37 The Development will provide car club access on-site. It has not been determined whether this would be operated by the Applicant, or whether an external car club provider might be utilised. However, a viability assessment has indicated that the proposed five car provision is viable at the Development

(Appendix 7.1). Convenient access to a car club facility will encourage lower levels of car ownership, and promote the use of sustainable transport modes.

7.7.38 In response to a request from TfL, the Development will commit funding of £95,000 per year for a period of 5 years (a total of £475,000) to add a return journey to bus route 221. It is recognised that the increased frequency, in conjunction with the relocation and direct connection to Bunns Lane, offers an excellent and convenient connection to the public transport network.

Residual Effects on Travel by Car

7.7.39 The provision of an on-site car club has the potential to reduce car ownership and enable some replacement of private car trips with other sustainable modes. Given that the effect of traffic flows generated by the Development have been identified as negligible, the residual effect remains as described.

Residual Effects on Travel by Pedestrians and Cyclists

7.7.40 Although the provision of an on-site car club could be expected to increase the level of pedestrian movements generated by the Development (by encouraging less car ownership and replacement of unnecessary car trips), the associated increase would be small in quantity and it has been demonstrated through the PCL assessment that a large influx of pedestrian movements would be required to change the assessed effect of the completed Development on all other modes of travel. This is identified as negligible, permanent and at the local level, and therefore the residual effect would remain as described.

Residual Effects on Travel by Bus

7.7.41 Although the provision of an on-site car club could be expected to increase the level of bus trips generated by the Development (by encouraging less car ownership and replacement of less necessary car trips), the associated increase would be small in magnitude.

Table 7.24: AM Peak Hour Route 221 Bus Patronage with Development (Post Mitigation)

Direction	Buses/Hr (lower range)	Seated Capacity	Total Capacity (including standing)	Development Demand	Seated Capacity (%)	Total Capacity (%)	Additional passengers per bus
EB	6	384	522	25	6.50	4.70	4.17
WB	6	384	522	22	5.73	4.21	3.67

7.7.42 Professional judgement has been adopted to assess the magnitude of impact, which is expected to be minor for Bus Route 221. For all other routes the residual effects would remain minor.

7.7.43 The effects of residual increases to bus patronage in all cases are considered to be permanent, long term, and regional in nature.

Residual Effects on Travel by Rail/London Underground

7.7.44 The proposed mitigation is not deemed to impact upon rail or London Underground trips. No further mitigation measures are proposed and as such the residual effects would remain as stated above.

Accidents and Safety

- 7.7.45 The proposed mitigation is not deemed to impact upon accidents or road safety. No further mitigation measures are considered necessary and as such the residual effects would remain as stated above.

7.8 Cumulative Effects

Demolition and Construction

Assessment

- 7.8.1 The cumulative impacts during the demolition and construction of the Development are inherent within the assessment of effects summarised above, as traffic growth applied from the CAAP model includes future nearby development.

Mitigation, Monitoring and Residual Effects

- 7.8.2 All achievable mitigation for the demolition and construction of the Development is inherent within the assessment of the effects of construction traffic by inclusion within the CTMP (Appendix 7.1).
- 7.8.3 All residual effects remain as the effects described within the assessment of Demolition and Construction section of the chapter.

Completed Development

Assessment

- 7.8.4 The cumulative effects of the completed Development are inherent within the assessment of effects summarised above.
- 7.8.5 Traffic growth applied from the Colindale AAP model includes future nearby committed development.
- 7.8.6 Additional pedestrian demand from committed development within the area assessed in this chapter is not identified by information prepared within the relevant planning applications. The assessment of effects by additional pedestrian activity in relation to committed development has therefore been given due consideration in the assessment of effects of the completed Development.
- 7.8.7 Additional bus demand due to the cumulative impact of committed development is considered to be inherent within the assessment of effects of the completed Development, given that the bus network has been assumed to be of high sensitivity in the absence of existing bus patronage data being made available by TfL.
- 7.8.8 Additional rail and London Underground use due to the cumulative impact of committed development is considered to be inherent within the assessment of effects of the completed Development.

Mitigation, Monitoring and Residual Effects

- 7.8.9 All residual effects remain as the effects described within the completed Development section of the chapter.

Table 7.25: Summary of Effects of the Development

Effect	Receptor (Sensitivity)	Geographic Scale	Temporal Scale	Significance of Effect (pre-mitigation)	Mitigation and Monitoring	Residual Effect
Construction						
Construction Traffic on Traffic	High	Local	Temporary	Minor adverse	None additional	Minor adverse
Construction Traffic on Pedestrians	Low	Local	Temporary	Negligible	None required	Negligible
Construction Traffic on Cyclists	Low	Local	Temporary	Negligible	None required	Negligible
Construction Traffic on Travel by Bus	High	Regional	Temporary	Minor adverse	None Additional	Minor adverse
Construction Traffic on Travel by Rail	High	Regional	Temporary	Negligible	None required	Negligible
Construction Traffic on Travel by London Underground	Medium	Regional	Temporary	Negligible	Working outside of peak traffic hours	Negligible
Accidents and Safety on Traffic, Pedestrians and Cyclists	Low	Regional	Temporary	Negligible	None required	Negligible
Operational Development						
Additional Vehicle Trips on Traffic (Link 16)	Low	Local	Permanent	Negligible	Provision of on-site car club	Negligible
Additional Vehicle Trips on Traffic (Links 6, 8 and 10)	Medium	Local	Permanent	Negligible	Provision of on-site car club	Negligible
Additional Vehicle Trips on Traffic (Links 1, 2, 3, 4, 5, 7, 9, 11, 12, 14, 14, 15, 17 and 18)	High	Local	Permanent	Minor adverse	Provision of on-site car club	Minor adverse

Effect of Vehicle Trips on Pedestrians	Low	Local	Permanent	Negligible	Provision of on-site car club	Negligible
Effect of Vehicle Trips on Cyclists	Low	Local	Permanent	Negligible	Provision of on-site car club	Negligible
Effect of additional Bus Trips to Route 221	High	Regional	Permanent	Moderate	None additional	Minor adverse
Effect of additional Bus Trips to other bus routes	High	Regional	Permanent	Minor adverse	None required	Minor adverse
Effect of Additional Trips on Rail Travel	High	Regional	Permanent	Minor adverse	None additional	Minor adverse
Effect of Additional Trips on London Underground	Medium	Regional	Permanent	Negligible	None required	Negligible
Effect of Pedestrian Trips on Pedestrians	Low	Local	Permanent	Negligible	None required	Negligible
Effect of Pedestrian Trips on travel by Car	High	Local	Permanent	Minor adverse	None additional	Minor adverse
Accidents and Safety on Traffic, Pedestrians and Cyclists	Low	Local	Permanent	Negligible	None required	Negligible

REFERENCES

- ¹ Department for Communities and Local Government (2012). National Planning Policy Framework.
- ² Department for Communities and Local Government (updated 19 February 2019). National Planning Policy Framework.
- ³ Greater London Authority, 2016. The London Plan: The Spatial Development Strategy for London Consolidated with Alterations since 2011. March 2016.
- ⁴ Greater London Authority (2017). London Plan – The Spatial Development Strategy for Greater London: Draft for Public Consultation, December 2017.
- ⁵ Greater London Authority, 2018. Draft New London Plan showing Minor Suggested Changes.
- ⁶ Greater London Authority, 2018. The Mayor’s Transport Strategy.
- ⁷ London Borough of Barnet (2012). Barnet’s Local Plan (Core Strategy) Development Plan Document.
- ⁸ London Borough of Barnet (2013). Planning Obligations – Local Plan: Supplementary Planning Document.
- ⁹ London Borough of Barnet (2016). Pentavia Retail Park, Mill Hill: Draft Planning Brief, September 2016.
- ¹⁰ Department for Communities and Local Government, (Live Document). Planning Practice Guidance [online]. Available: <http://planningguidance.communities.gov.uk/>.
- ¹¹ Institute of Environmental Assessment and Assessment (1993) Guidelines for the Environmental Assessment of Road Traffic.
- ¹² Transport for London (2014); TfL’s Transport Assessment Best Practice Guidance.
- ¹³ Transport for London (2013); TfL’s Travel Planning Guidance.
- ¹⁴ Transport for London, Managing Freight Effectively: Delivery and Servicing Plans.
- ¹⁵ Transport for London, Building a better future for freight: Construction Logistics Plans.
- ¹⁶ Department for Transport (2004). LTN1/04 Policy Planning and Design for Walking and Cycling.