Land at Carpenders Park

Transport Assessment

Client: Burlington Property Group

i-Transport Ref: PH/RW/JL/ITL200107-002B R

Date: 31 March 2025

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SECTION 1 Introduction

1.1 Overview

1.1.1 Burlington Property Group has appointed i-Transport LLP to provide highway and transport advice with regard to a proposed residential development on Land east of Oxhey Lane, Carpenders Park. The proposed development would provide 257 homes, housing with care and a children's home.

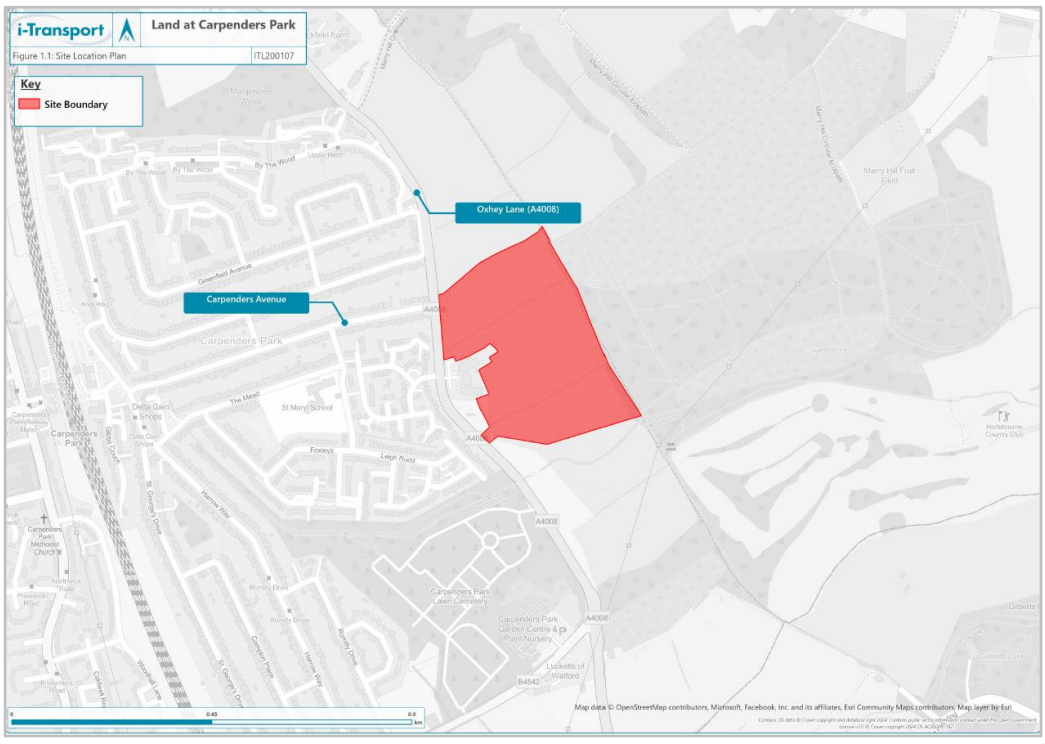
1.1.2 This Transport Assessment (TA) has been prepared to assess the transport impacts of the proposed development and accompanies an outline planning application with all matters reserved (except access). The full description of the scheme is provided below:

> ***"Outline application for the erection of up to 257 homes (market, affordable and self/custom build housing), housing with care and children's home, with vehicular access onto Oxhey Lane (Appearance, Layout, Landscaping and Scale as reserved matters)."***

1.1.3 The site is located on land to the east of Oxhey Lane, Carpenders Park. The site is bordered to the north, east and south by grassland, scrub and woodland, and to the west by A4008 Oxhey Lane and Carpenders Park Care Home. A public right of way (Footpath 013) routes east-west across the northern part of the site.

1.1.4 A site location plan is provided as **Figure 1.1**.

Figure 1.1: Site Location Plan



1.2 Site Context

1.2.1 The site is located within Hertfordshire County Council (HCC), which is the Local Highway Authority and Three Rivers District Council (TRDC) as the local planning authority.

1.2.2 The site was included in the draft Local Plan (*Part 2: Sites for Potential Allocation*) in 2021 as site ref: *CFS69a*. However, the draft LP was subsequently reviewed, and the process was paused to allow for updated studies, with the next consultation expected in early 2026.

1.2.3 There is also a draft site allocation for a secondary school as *CFS11* directly north of the site. Three Rivers District Council consider this site to be suitable and deliverable for a school site subject to revision of the green belt boundary.

1.3 Pre-application discussions

1.3.1 Highways pre-application advice specifically on the proposed access arrangements was sought from HCC site. Two access arrangement options were issued to HCC for review: a signalised crossroads with Oxhey Lane and Carpenders Park Avenue; and a ghost island priority junction with Oxhey Lane. A copy of the drawings and accompanying Note issued to HCC is provided at **Appendix A**.

1.3.2 The full pre-application response from HCC (dated 12th March 2025) is provided at **Appendix B**, a summary of which is provided below:

- The site is not currently allocated within an adopted Local Plan. The highway authority would therefore likely object to an application at this time, due to access being taken from a primary/main distributor road and, in the absence of an allocation (or other special circumstance in favour of the proposals), it would be contrary to Policy 5(f) of the HCC Local Transport Plan 4.
- Although a definitive view on the site access options could not be provided ahead of detailed design, modelling and safety auditing, HCCs preference is for the signalised crossroad junction.
- The Applicant should explore the option of providing a pedestrian crossing across the southern arm of the proposed site access junction instead of the northern arm.
- A review of SW Herts Growth and Transport Plan was required to understand potential improvements in the local area.
- The Rights of Way team would seek to retain the existing alignment of the Public Right of Way within the site.

1.3.3 The above comments have been incorporated where appropriate into the access design and site layout as is noted within subsequent sections of the TA.

1.3.4 It is noted that the highway authority's position is that any access onto a primary/main distributor road is likely to result in an objection in the absence of special circumstances in favour of the proposals, as per Policy 5(f) of the LTP4. However, this policy (and the application) needs to be assessed in the context of the key transport policy 'tests' of the National Planning Policy Framework (NPPF). This TA assesses the development against these key tests.

1.4 Scope and Structure

1.4.1 This TA assesses the transport acceptability of the development proposal in transport terms. The remainder of the report is structured as follows:

- **Section 2** – Sets out the national, regional and local transport policies that the development proposal has been assessed against. This summarises the 'key transport tests' and sets out the high bar for preventing development on transport grounds.
- **Section 3** – Provides an overview of the existing transport conditions in the vicinity of the site, including a focus on the active and sustainable travel opportunities available in the vicinity of the site.
- **Section 4** – Provides a detailed review of the proposed access arrangements as well as setting out the transport and parking requirements that the internal site layout will adhere to in future applications.
- **Section 5** – Provides an overview of the Sustainable Transport Strategy of the site.
- **Section 6** – Sets out the multi-modal trip generation methodology used to inform the impact assessments.
- **Section 7** – Provides an analysis of the impacts of the development proposals on transport network and determines whether they are significant.
- **Section 8** – Provides a summary and concludes the Assessment setting out how the proposed development performs against the 'key transport tests'.

1.4.2 In conclusion, the proposed development prioritises sustainable transport modes due to its proximity to local facilities and public transport, and safe and suitable access is provided for all users. The development will be designed in line with national guidance, and the impact of the proposed development on the local transport networks is acceptable. The development is therefore acceptable in transport and highways terms.

SECTION 2 Policy Context

2.1 National Policy

National Planning Policy Framework (NPPF) December 2024

2.1.1 The NPPF sets out the Government's planning policies and provides information on how these are expected to be applied. It also constitutes guidance for local planning authorities and decision makers both in drawing up plans and as material consideration in determining applications.

2.1.2 The specific transport policies are contained within Section 9 of the NPPF. This sets out the importance of facilitating sustainable development by reducing the need to travel and offering a 'genuine' choice of transport in favour of sustainable modes.

2.1.3 The NPPF requires all developments that generate significant amounts of movement to provide a travel plan, and to be supported by either a Transport Statement or Transport Assessment. The key transport tests are set out in Paragraph 115:

- ***Sustainable transport modes are prioritised taking account of the vision for the site, the type of development and its location;***
- ***safe and suitable access to the site can be achieved for all users;***
- ***the design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance, including the National Design Guide and the National Model Design Code; and***
- ***any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree through a vison led approach."***

2.1.4 With regards to highways matters, it states that development ***"...should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network, following mitigation, would be severe"*** *(ref: NPPF, Paragraph 116).*

2.1.5 Paragraph 117 of the NPPF goes onto state:

"within this context, applications for development should:

a) Give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second - so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;

b) Address the needs of people with disabilities and reduced mobility in relation to all modes of transport;

c) Create places that are safe, secure, and attractive - which minimise the scope for conflicts between pedestrians, cyclists, and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;

d) Allow for the efficient delivery of goods, and access by service and emergency vehicles; and

e) Be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations."

2.1.6 Finally, Paragraph 118 states:

"All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a vision-led transport statement or transport assessment so that the likely impacts of the proposal can be assessed and monitored."

2.2 Regional Policy

Hertfordshire's Local Transport Plan 2018 – 2031

2.2.1 Hertfordshire County Council (HCC) sets out how transport can deliver a positive future vision for Hertfordshire within its Local Transport Plan 4 (LTP4). It does this through providing aims and policies that should be considered when proposing new development.

2.2.2 ***Policy 1: Transport User Hierarchy*** sets out the transport user hierarchy for Hertfordshire, which prioritises sustainable transport options and sets out that HCC will support the creation of built environments that encourage greater and safer use of transport modes. The priorities of a transport strategy for any proposed development are set out below:

1. Reduce travel demand and the need to travel.
2. Active modes such as pedestrians and cyclists.
3. Public transport users.
4. Powered two-wheeler (mopeds and motorbikes) users.
5. Other motor vehicles.

2.2.3 ***Policy 2: Influencing land use planning*** encourages development that is placed such that it is served by or can potentially make use of high-quality passenger transport, and where key facilities are accessible through active modes.

2.2.4 ***Policy 5: Development Management*** looks to ensure that development proposals:

> ***(a) Ensure the location and design of proposals reflect the LTP Transport User Hierarchy and encourage movement by sustainable transport modes and reduced travel demand.***
>
> ***(b) Ensure access arrangements are safe, suitable for all people, built to an adequate standard and adhere to the county council's Highway Design Standards.***
>
> ***(c) Consider the adoption of access roads and internal road layouts where they comply with the appropriate adoption requirements and will offer demonstrable utility to the wider public. Where internal roads are not adopted the county council will expect suitable private management arrangements to be in place.***
>
> ***(d) Secure developer mitigation measures to limit the impacts of development on the transport network, and resist development where the residual cumulative impact of development is considered to be severe.***
>
> ***(e) Require a travel plan for developments according to the requirements of 'Hertfordshire's Travel Plan Guidance'.***
>
> ***(f) Only consider new accesses onto primary and main distributor roads where special circumstances can be demonstrated in favour of the proposals.***
>
> ***(g) Resist development that would either severely affect the rural or residential character of a road or other right of way, or which would severely affect safety on rural roads, local roads and rights of way especially for vulnerable road users.***
>
> ***(h) Ensure new developments provide facilities for charging plug-in and other Ultra Low Emission vehicles, as well as shared mobility solutions such as car clubs.***

2.2.5 These policies have been considered within the design and assessment of this application with regard to transport. Notably, Policy 5(f) states that HCC will only consider new accesses onto primary and main distributor roads where special circumstances can be demonstrated in favour of the proposals. This is covered in Sections 4 and 5 of this TA, and a conclusion within the context of the NPPF is provided in Section 8.

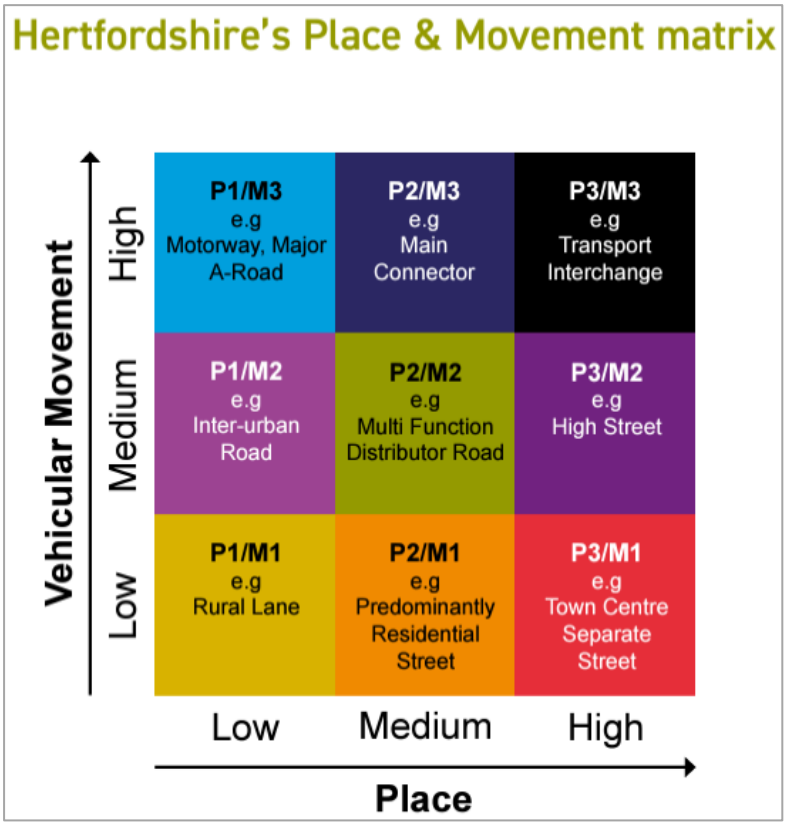
Hertfordshire Place and Movement Planning and Design Guide (March 2024)

2.2.6 Hertfordshire's place and movement planning and design guide provides detailed design advice for developers and sets out the framework of policy, advice and standards within which alterations and additions to the highway network in the County shall be planned and delivered.

2.2.7 The Design Guide establishes a Place & Movement matrix for streets which recognises the range of functions between different categories of roads. The Place and Movement categories of a street inform the recommended design standards of each category.

2.2.8 There are nine place and movement categories which are shown in Image 2.1.

Image 2.1: Hertfordshire's Place & Movement Matrix



Source: Place & Movement Planning and Design Guidance for Hertfordshire Part 3

2.2.9 The above matrix and its implications on the design of the site access are considered in Section 4 of this TA.

South West Hertfordshire Growth and Transport Plan (GTP) (June 2019)

2.2.10 The SW Herts GTP is a strategic spatial transport plan developed by HCC and district/borough councils to support the LTP, and is informed by the overarching guidance and direction of the LTP. It seeks to apply HCC LTP policies and objectives to form appropriate plans to tackle transport pressures in growth areas.

2.2.11 Package 8 of the GTP sets out a package of potential transport interventions for the Watford South area, which includes Carpenders Park and South Oxhey. Specifically for Carpenders Park, a set of interventions are proposed to enhance connectivity between South Oxhey and Carpenders Park and to improve the pedestrian and cycle environment on Delta Gain in the centre of Carpenders Park. These are summarised in Table 2.1 alongside the associated cost range.

Table 2.1: SW Herts GTP - Package 8 Interventions

Scheme ID	Intervention Name	Intervention description	Cost range
PR40	Improved South Oxhey - Carpenders Park Link	Enhanced road, cycle and pedestrian links over the railway line linking South Oxhey and Carpenders Park areas. To address current constrained and limited linkages and tie into improved Station Square.	£0-£500k
PR103	Delta Gain (South Oxhey-Carpenders Park)	Enhancements to the pedestrian and cycle environment on Delta Gain and Gibbs Couch on the approach to Carpenders Park Station including measures to manage on-street parking.	£0-£500k

Source: SW Herts GTP

2.2.12 The interventions above are considered in further detail in Section 5 of this TA.

2.3 Local Policy

Three Rivers District - Development Plan Core Strategy (adopted October 2011)

2.3.1 The Three Rivers District Council Local Plan is split into a number of different documents including the Core Strategy and the Development Management Policies.

2.3.2 The Core Strategy sets out the transport policies for the district in *Policy CP10 Transport and Travel*. The policy echoes the transport user hierarchy set out by HCC and the requirements of the NPPF key transport tests.

2.3.3 The policy requires development to demonstrate that:

- ***"It is appropriate in scale to the existing transport infrastructure, including public transport and where necessary, infrastructure can be improved.***
- ***It is integrated with the wider network of transport routes, including public rights of way and cycle paths where appropriate.***
- ***It makes adequate provision for all users, including car and other vehicle parking, giving priority to people with mobility difficulties, pedestrians, cyclists and equestrians."***

Development Management Policies Local Development Document (adopted July 2013)

2.3.4 The parking standards for Three Rivers District are set out in the TRDC Development Plan (current Local Plan), whereby the maximum car and minimum cycle parking standards are included in Appendix 5 of the Local Plan respectively.

2.3.5 **Table 2.2** and **Table 2.3** summarises the car and cycle parking standards for residential uses in this location.

Table 2.2: Three Rivers District Parking Standards

Use Class	Description	Parking Standards
C3 Residential	1 bedroom dwelling	1.75 spaces per dwelling (1 assigned space)
	2-bedroom dwellings	2 spaces per dwelling (1 assigned space)
	3-bedroom dwellings	2.25 spaces per dwelling (2 assigned space)
	4+ bedroom dwellings	3 space per dwelling (3 assigned spaces within curtilage)

Source: TRDC Development Management Policies (2013)

Table 2.3: Three Rivers District Cycle Parking Standards

Use Class	Description	Parking Standards
C3 Residential	1 bedroom dwelling	1 long-term space per unit if no garage or shed provided
	2-bedroom dwellings	
	3-bedroom dwellings	
	4+ bedroom dwellings	
	Houses in multiple occupation (i.e. separate households sharing facilities.	
	Flats	1 space per 2 units

Source: TRDC Development Management Policies (2013)

Local Cycling and Walking Infrastructure Delivery Plan Watford City Council & Three Rivers District Council (April 2023)

2.3.6 In May 2023, HCC consulted on a Local Cycling and Walking Infrastructure Plan for Three Rivers and Watford. This put forward a number of aspirations for the local area's walking and cycling infrastructure and is related to the aspirational plans of the SW Herts GTP outlined earlier.

2.3.7 Relevant to the site within the Carpenders Park area, two key routes emerged, including Carpenders Park Station to Oxhey Lane via Carpenders Avenue (Key Walking Route 4) and Carpenders Park to Watford (Key Cycling Route 6).

2.3.8 Further details of the LCWIP and routes are provided in Sections 3 and 5 of this TA.

2.4 Summary

2.4.1 The NPPF identifies four key transport tests, which can be summarised as follows:

- Will sustainable transport modes be prioritised?
- Will safe and suitable access be provided?
- Will the site layout comply with design guidance?
- Will the transport impacts be acceptable?

2.4.2 These tests are reflected in Hertfordshire and local planning policy and the development proposal has been assessed against these tests within this TA.

2.4.3 The Highways Place and Movement Planning and Design Guide, which establishes a Place & Movement matrix for streets which recognises the range of functions between different categories of roads, has been used to inform the access design. Alongside which Policy 5(f) of the LTP 4 states that HCC will only consider new accesses onto primary and main distributor roads where special circumstances can be demonstrated in favour of the proposals.

SECTION 3 Existing Transport Conditions

3.1 Introduction

3.1.1 This section of the Transport Assessment provides a review of the existing transport conditions in the area including the opportunities for walking, cycling and public transport provision, as well as the characteristics of the local highway network.

3.2 Site Location

3.2.1 The site is located on land to the east of Oxhey Lane, Carpenders Park. The site is bordered to the north, east and south by grassland, scrub and woodland, and to the west by A4008 Oxhey Lane and Carpenders Park Care Home. A public right of way (Footpath 013) routes east-west across the northern part of the site. The site rises quickly from Oxhey Lane with significant level differences across the site.

3.2.2 Carpenders Park Overground station is situated circa 1,050m west from the site and the nearest bus stop is circa 700m from the site on By the Wood Road.

3.3 Active Travel

Walking

3.3.1 The site is located adjacent to the Carpenders Park residential area with direct pedestrian routes to local facilities.

3.3.2 Oxhey Lane routes north-south along the western site frontage. Oxhey Lane has continuous footway provision on the eastern side of the carriageway and a continuous footway on the western side of the carriageway south of the junction with Carpenders Avenue. An uncontrolled pedestrian crossing on Oxhey Lane is situated 40m south of Carpenders Avenue and includes a refuge island, dropped kerbs and tactile paving. There are currently no other pedestrian crossing facilities of Oxhey Lane in the vicinity of the site.

Image 3.1: Pedestrian Crossing Oxhey Lane

3.3.3 Carpenders Park local centre can be accessed from the site via Carpenders Avenue. Footways are provided on both sides of the road, which are separated from the kerb by intermittent grassed verges and vehicle crossovers. Footway widths are variable, ranging from 1.2m to 1.8m between residential properties and the grass verges.

Image 3.2: Footways on Caprenders Avenue (Looking East)

3.3.4 All crossing points along Carpenders Avenue have dropped kerbs but are not equipped with tactile paving. Street lighting is provided along the extent of Carpenders Avenue.

Image 3.3: Junction and Footways on Foxleys

Source: Google Maps

3.3.5 The network of pedestrian routes spread throughout the residential area of Carpenders Park, providing pedestrian routes to primary schools, green space, local shops, Carpenders Park station and South Oxhey. There is a lack of tactile paving in numerous locations and a lack of coherence around Delta Gain and towards Carpenders Park station.

3.3.6 Carpenders Park is identified as a local priority core walking zone within Hertfordshire LCWIP document. **Image 3.4** shows the key walking routes, and can be summarised as follows:

- Key Walking Route 1 – Carpenders Park Station to Hayling Road
- Key Walking Route 2 – Carpenders Park Station to Watford Heath
- Key Walking Route 3 – Prestwick Rd (South) Carpenders Park Station to Greenfields School
- Key Walking Route 4 – Carpenders Park Station to Oxhey Lane
- Key Walking Route 5 – Prestwick Rd (North) Carpenders Park Station to Hampermill Lane

Image 3.4: Key Walking Routes Around South Oxhey and Carpenders Park

Source: HCC LCWIP

3.3.7 Key Walking Route 4, which routes along Carpenders Avenue and connects the site to Carpenders Park Overground Station, was audited on five different factors: attractiveness, comfort, directness, safety and coherence. The audit gave an overall score of 68%, with the lowest individual scores attributed to comfort and coherence categories. This is further identified within the SW Herts GTP which states that coherence scores are generally low which reflects the lack of dropped kerbs and tactile paving on some routes.

3.3.8 Appendix A of the LCWIP document provides a summary of potential improvements that could be made along Walking Route 4. The route could be improved with consistent dropped kerbs and crossing points and the ambitions of the LCWIP are to raise the overall score to 90%. There are therefore opportunities to improve this route in line with HCC and TRDC ambitions, and this is considered in Section 5 of his TA.

Public Rights of Way

3.3.9 A public right of way (Footpath 013) routes east-west within the northern parcel of the site from Oxhey Lane. This provides a direct route to Bushey Heath through Merry Hill Wood.

Cycling

3.3.10 Carpenders Avenue has a speed limit of 30mph and low traffic which is appropriate for cycling.

3.3.11 Carpenders Avenue connects to the wider cycle network on Prestwick Road through an underpass under Carpenders Park Overground Station. An off-carriageway shared footway/cycleway is provided on the eastern side of the Prestwick Road and routes north to Bushey and Watford. This route is also identified in HCCs LCWIP as a route suitable for walking and cycling as shown in Image 3.4.

3.3.12 Oxhey Lane does not provide any dedicated provision for cycling in the vicinity of the site, although a shared footway/cycleway is provided on the eastern side of Oxhey Lane circa 300m north of the site.

3.4 Public Transport

Bus

3.4.1 The proposed development is located circa 700m walking distance from the bus stop 'Upper Hitch', which is located on By the Wood Road, to the north of the site. The bus stop infrastructure at the stops consists of a bus stop flag, timetable information and seating.

3.4.2 The bus stops provide access to a number of bus services, **Table 3.1** summarises the destination and frequency of the bus routes served by these bus stops.

Table 3.1: Local Bus Services

Service No.	Route	Typical Frequency	
		Mon-Fri	Sat
346	Watford – Carpender Park	Bus every two hours from 08:02 – 18:08	Bus every two hours from 08:13 – 18:03
R17	Carpender Park Railway – Hatch End Harrow Arts Centre	One bus on Wednesday at 10:15	-
R16	Bushey Railway Station – North Watford Sainsburys	Two buses on Monday and Friday only	-

Source: Bustimes.org (accessed January 2025)

London Overground

3.4.3 The nearest overground station is Carpenders Park circa 1,050m (equivalent to a 14-minute walk) west of the site. London Overground Lioness Line serves the station with regular and reliable services every 15 minutes to destinations between London Euston and Watford Junction. **Table 3.2** shows the destinations accessible from this station and the journey duration.

Table 3.2: Local Rail Destinations

Destination	Average Journey Duration
Euston	45 mins
Wembley Central	18 mins
Watford Junction	10 mins
Bushey	3 mins
Harrow & Wealdstone	9 mins
Willesden Junction	25 mins

Source: TfL

3.4.4 Overground services from Carpenders Park Station provide fast, convenient services to common commuting destinations for the local area, including key workplace and leisure destinations in inner and outer London, and also Watford a short journey to the north. Thus, the Overground will serve as a popular method of travel for work and leisure for existing and future residents of the local area.

3.5 Local Facilities and Services

3.5.1 The site is located within close proximity to a good number of local facilities and services that are accessible via sustainable means. **Table 3.3** details the facilities and the walking and cycling times from the centre of the site.

Table 3.3: Summary of Local Facilities

Purpose	Destination	Distance (m)	Walking Journey Time (mins)	Cycle Journey Time (mins)
Leisure	Roots Hairdresser	800	10	3
	Absolute health & beauty	800	10	3
	Pizza Delight	800	10	3
	The Partridge Pub	950	12	3
	Carpenders Park Community Hall	1,000	11	4
	Carpenders Park Garden Centre	1,150	16	5
	Green Park Play Area	1,250	17	5
	Carpenders Park Skate & BMX Park	1,350	19	6
	Oxhey Library	1,350	18	7
	South Oxhey Leisure Centre	1,550	21	7
	Grims Dyke Golf Club	1,750	25	7

Purpose	Destination	Distance (m)	Walking Journey Time (mins)	Cycle Journey Time (mins)
	South Oxhey Choir	1,850	25	8
	South Oxhey Family Centre	1,850	25	8
Education	Little hearts pre-school	550	7	2
	St. Meryl Primary School	550	7	2
	Warren Dell Primary School	1,650	22	7
	Colnbrook School	1,650	22	7
	Oxhey Wood Primary School	1,850	25	8
	St. Joseph's Primary School	2,050	28	9
Retail	Carpenders Park Sub Post Office	800	10	3
	L Cook Florist	800	10	3
	Co-op Food	800	10	3
	Nisa Local	1,050	16	6
	Tesco Express	1,150	16	6
	Lidl	1,250	18	7
Healthcare	DB Jones Pharmacy	800	10	3
	Viks Pharmacy	1,100	15	5
	Esom's Pharmacy	1,250	17	6
	Manor View Practice	1,650	22	7
	Dale Pharmacy	1,750	24	7

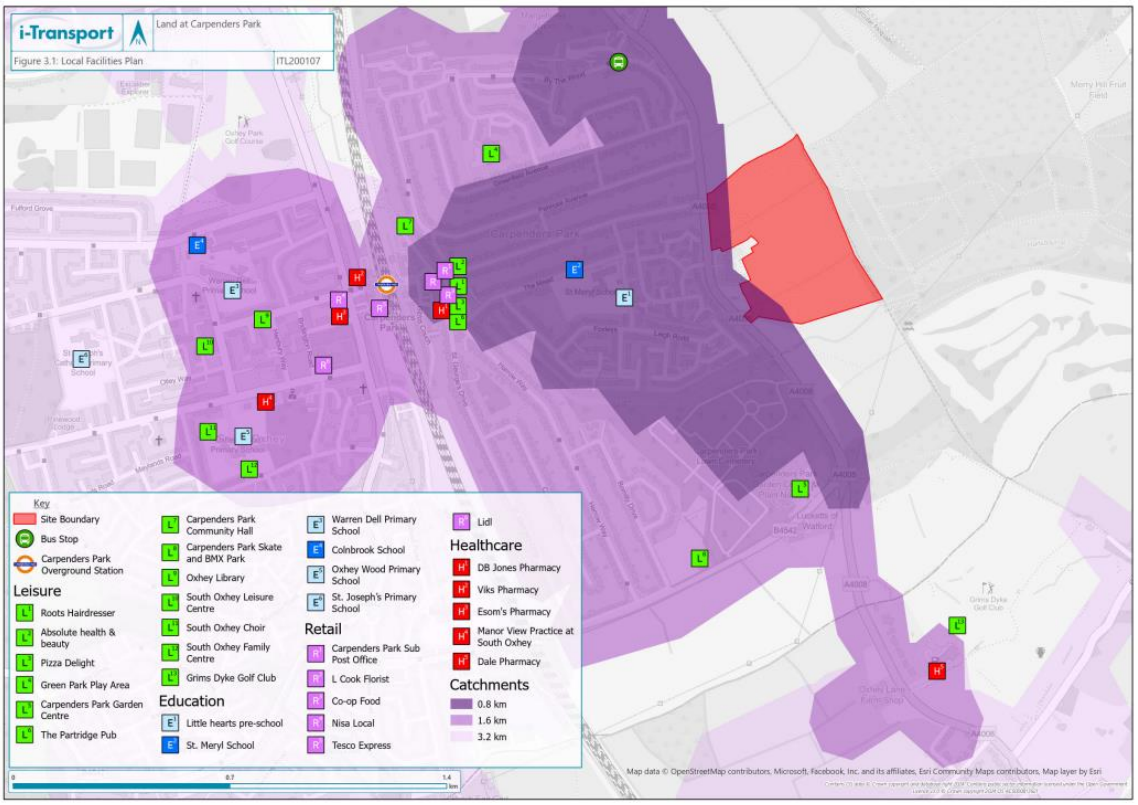
Key:

Within 800m
Within 1600m
Within 3200m

3.5.2 **Table 3.3** shows that many local facilities are located within a short walking or cycling distance from the site. All facilities are within a reasonable walking distance of 1,600 metres and many essential facilities within 800m, a comfortable walking distance[1]. The facilities are also shown on **Figure 2**, an extract of which is provided at **Image 3.5**.

[1] Chartered Institution of Highways and Transportation (CIHT) guidance 'Planning for Walking' (2015)

Image 3.5: Local Facilities Plan (Extract)



Source: Consultant Drawing

3.6 Local Highway Network

A4008 Oxhey Lane

3.6.1 A4008 Oxhey Lane is a two-way single carriageway road and is subject to a 40mph speed limit. Along the northwestern frontage of the site, Oxhey Lane is circa 9m wide with two traffic lanes and ghost-island right turn lanes into Carpenders Avenue, Highfield, and the existing care home. Footways are present on both sides of the carriageway and there is regular street lighting. Oxhey Lane rises to the south of Carpenders Avenue, with the Carpenders Park Care Home situated at the crest of the road which then falls further south.

Image 3.6: A4008 Oxhey Lane (Looking South) along Site Frontage

Image 3.7: A4008 Oxhey Lane (Looking North) along Site Frontage

3.6.2 To the north, Oxhey Lane routes to Bushey and Watford. To the south it routes into Harrow, Headstone and other destinations in north London.

Carpenders Avenue

3.6.3 Carpenders Avenue has a speed limit of 30mph and has a 'no waiting' prohibition on vehicles over 5 tonnes during off peak periods (weekday evenings and weekends). It is residential in nature, with frequent dropped kerbs for driveways. On-street parking is otherwise uncontrolled except for near the junction with Oxhey Lane.

3.6.4 The junction with Oxhey Lane currently features a give-way line and a ghost-island right turn is provided for right-turners from Oxhey Lane. Visibility is currently restricted from Carpenders Avenue to the north due to the presence of overgrown vegetation outside the adopted highway on the northern corner of the junction.

Image 3.8: Carpenders Avenue Junction with Oxhey Lane

Traffic Speeds and Volumes

3.6.5 A suite of traffic surveys was undertaken on the local highway network to understand existing traffic flows and speeds and form a baseline for future year assessments. The surveys included:

- Automatic traffic counts (ATC) surveys on Oxhey Lane
- Junction turning count data for the A4008 Oxhey Lane / Carpenders Avenue priority junction
- Queue length data for Carpenders Avenue

3.6.6 Automated Traffic Count (ATC) surveys were undertaken on Oxhey Lane between 24th November to 7th December 2024[2] at the three locations set out below and shown in **Image 3.9**.

- ATC 1 - South of Carpenders Avenue
- ATC 2 - Care Home access
- ATC 3 - South of Care Home

[2] ATC surveys were placed for two weeks due to ATC equipment being damaged during the first survey week. A full set of data for 11 survey days have therefore been obtained.

Image 3.9: ATC Locations

3.6.7 The full traffic survey data is provided at **Appendix C**, and a summary of the observed traffic flow and traffic speed data is summarised in **Table 3.4**. The 85th percentile speed data has been calculated by excluding any days of wet weather.

Table 3.4: Observed Traffic Speeds & Volumes

	ATC 1 – South of Carpenders Avenue		ATC 2 – Care Home Access		ATC 3 – South of Care Home	
	NB	SB	NB	SB	NB	SB
Weekday Morning Peak Flow	556	643	543	638	554	617
Weekday Evening Peak Flow	608	663	604	675	621	665
Daily Flow	8,239	8,894	8,263	8,946	8,303	8,834
Average Speed	32.3 mph	32.4 mph	30.5 mph	31.0 mph	35.2 mph	36.5 mph
1000-1200 & 1400-1600 85th Percentile speeds	37.8 mph	37.6 mph	34.4 mph	34.7 mph	40.0 mph	41.3 mph
24hr 85th Percentile speeds	38.0 mph	37.3 mph	34.4 mph	34.6 mph	39.8 mph	40.7 mph

Source: Innowise Works and Consultants Calculations

3.6.8 **Table 3.4** demonstrates that northbound 85th percentile speeds range from 34.4mph to 40.0mph, and southbound between 34.6mph and 41.3mph. 85th percentile speeds at ATC 1 and ATC 2 were notably lower than at ATC 3, with free flow speeds below the posted speed limit of 40 mph.

3.6.9 Notably, 85th percentile speeds at ATC 2, the crest of the hill on Oxhey Lane, were 34.4mph in the northbound direction which were significantly lower than speeds to the north and south of this location, demonstrating that vehicles slow down as they reach the crest of the hill.

3.6.10 The flows across all three sites were consistent given their close proximity to each other and limited places in which to turn off A4008. Weekday morning flows northbound varied between 543 and 556 vehicles, evening flows varied between 604 and 621 vehicles. Southbound flows were between 617 and 643 in the morning and 663 and 675 in the evening. Daily flows averaged out at 8,268 northbound and 8,891 southbound. Flows are broadly evenly split northbound and southbound.

3.6.11 Queue length surveys were also recorded at the Oxhey Lane / Carpenders Avenue junction. The average queue length during the morning and evening peak hours was around one vehicle, although on occasions a snapshot of the queues demonstrated queues of up to 5 vehicles during the peak hours.

3.7 Operational Assessment – Carpenders Avenue / Oxhey Lane priority junction

3.7.1 To determine the operation of existing Carpenders Avenue / Oxhey Lane junction, the industry standard Junctions11 software was used with the recorded traffic flows inputted and calibrated with the queue length surveys. The observed traffic flows are shown on TFD Figures 1 and 2.

3.7.2 The result of the modelling is shown below in **Table 3.5**, with the full outputs shown at **Appendix D.**

Table 3.5: Carpenders Avenue / Oxhey Lane Priority Junction - Operational Assessment

	AM Peak Hour		PM Peak Hour	
	RFC	Queue	RFC	Queue
2024 – Observed Flows				
Carpenders Avenue	0.57	1.3	0.46	0.8
Oxhey Lane N (right turn)	0.19	0.2	0.29	0.4

Source: Junctions 11

3.7.3 **Table 3.5** demonstrates that the existing junction works well within operational capacity with the 2024 observed flows, with minimal delays.

3.8 Personal Injury Accident Data

3.8.1 A comprehensive review of Personal Injury Accident (PIA) data recorded within the vicinity of the site in the last five years (01/11/2019 – 31/10/2024) has been undertaken. This has been completed to assess whether highway safety issues exist in close proximity to the site.

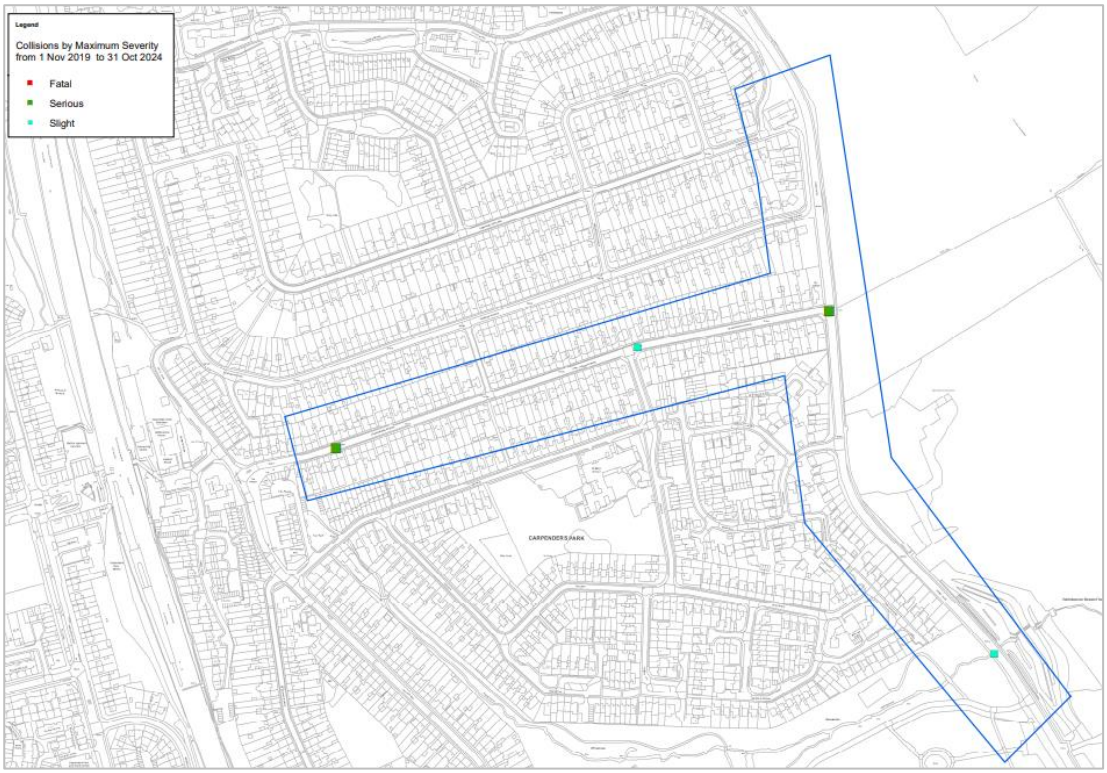
3.8.2 **Table 3.6** summarises the accident reports, and **Image 3.10** shows the PIA study area and the locations of collisions. The area covered includes Oxhey Lane along the site frontage between Greenfield Avenue and the Carpenders Park Lawn Cemetery, and Carpenders Avenue.

Table 3.6: PIA Data Summary

Location	*Fatal (involving ped or cyclist)*	*Serious (involving ped or cyclists)*	*Slight (involving ped or cyclists)*	*Total*
Oxhey Lane	0	1 (0)	1 (1)	2
Carpenders Avenue	0	1 (0)	1 (0)	2
Total	**0**	**2**	**2**	**4**

Source: Hertfordshire County Council

Image 3.10: Personal Injury Accident Data



Source: Hertfordshire County Council

3.8.3 Four PIAs were recorded in the past five years, one of which involves a cyclist. There were two serious PIAs, one at the Oxhey Lane priority junction with Carpenders Avenue and another on Carpenders Avenue. The non-confidential accident report is shown in **Appendix E**.

3.8.4 The two serious PIAs were both caused by driver error. One of these involved a speeding vehicle travelling east on Carpenders Avenue over the brow of a hill, and crashed into a vehicle heading west as they did not react in time due to irresponsible speeds. The other serious PIA occurred when a driver failed to look properly when pulling out of Carpenders Avenue onto Oxhey Lane, resulting in sudden braking of a motorcyclist and a collision.

3.8.5 Whilst any accident is regrettable, this review demonstrates that there does not appear to be any existing highway safety concern close to the site, that the proposed development traffic would be exacerbating.

3.9 Summary

3.9.1 The site is located on the eastern side of Carpenders Park, with site frontage along A4008 Oxhey Lane. There are good opportunities for walking and cycling close to the site as Carpenders Park has been identified as a core walking zone in the Watford and TRDC LCWIP.

3.9.2 The site is approximately 1,050m from Carpenders Park Overground Station which is served by the Lioness Line, providing frequent services between Watford and London Euston Station. There are a large number and a wide range of local facilities and services available within a comfortable walking and cycling distance from the site with all daily essentials being present within Carpenders Park and South Oxhey.

3.9.3 Traffic survey data undertaken in November 2024 demonstrated that 85th percentile speeds on Oxhey Lane varied between 34.4mph to 41.3mph.

3.9.4 There were four isolated accidents that occurred close to the site within the past five years, demonstrating that there are no existing highways safety concerns in the local area, that the proposed development would exacerbate.

SECTION 4 Proposed Development

4.1 Development Overview

4.1.1 The proposed development encompasses an area to the east of Oxhey Lane and the Carpenders Park Care Home, which would provide an extension to the existing residential area of Carpenders Park. The proposed development would comprise:

- A residential development of up to 257 dwellings;
- Housing with care (circa 60 units) and a children's home (one unit);
- Landscaping, including areas required for sustainable drainage and biodiversity enhancements;
- A variety of secondary streets, private drives and shared surfaces for all users;
- Dedicated and direct cycleway and footpath linkages throughout the development, creating a permeable network of streets for pedestrians and cyclists;
- An orbital pedestrian route around the site, linking with the existing public right of way in the north of the site;
- Two dedicated active travel accesses to the site (including one emergency vehicle access);
- A primary vehicular access to the site; and
- Associated infrastructure works

4.1.2 The majority of development is concentrated to the east and south of the Carpenders Park Care Home, with a small number of units to the north.

4.1.3 The development is roughly split into three parcels:

- The northern parcel experiences significant level changes and therefore the built area is restricted in this parcel. It also provides the main vehicular access into the site alongside sustainable drainage and the existing public right of way.
- The middle parcel will support the main bulk of the development, including residential housing, housing with care and the children's home. Dedicated pedestrian access from Oxhey Lane will be provided to this part of the site, including the main vehicular access through route.

- The southern parcel will support the remaining housing and will also feature sustainable drainage and a pedestrian / cyclists and emergency vehicle access.

4.1.4 Whilst the application is in outline, an Access and Movement plan has been prepared to guide future reserved matters along with an illustrative masterplan of the layout, both are provided at **Appendix F**, with an extract of the Access and Movement plan shown at **Image 4.1**.

Image 4.1: Access and movement Plan (Extract)

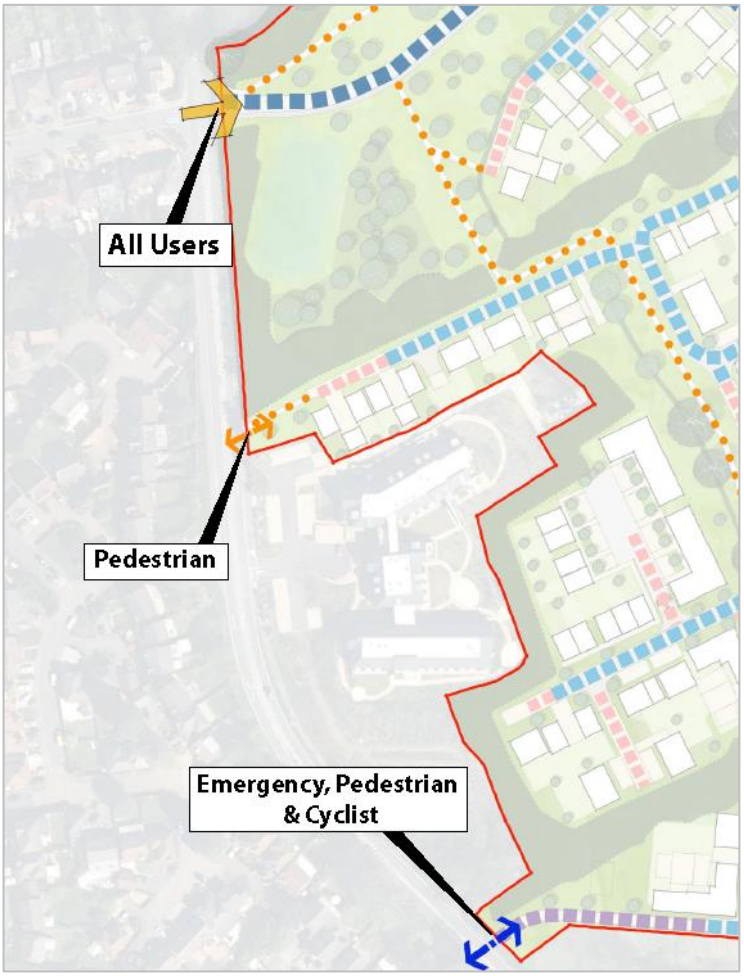
Source: Pegasus Group

4.2 Site Access Arrangements

4.2.1 In line with the transport user hierarchy set out in HCCs Local Transport Plan, the development proposals have been designed to prioritise walking and cycling whilst ensuring safe and suitable access is provided for all users including vehicles.

4.2.2 A key feature of the development proposals is that all parcels of land can be accessed directly from Oxhey Lane by active travel modes. In total there would be three accesses which are shown in demonstrated in **Image 4.2.**

Image 4.2: Access Locations



Source: Pegasus and Consultant

Pedestrian and Cycle accesses

4.2.3 A new pedestrian crossing on Oxhey Lane is proposed as part of a new vehicular access arrangement to the site. This crossing will be a signalised puffin crossing and will route into the site on footways running alongside to the proposed site access road.

4.2.4 A dedicated pedestrian access from Oxhey Lane is also proposed to route across the north of the Care Home towards the centre of the development. The detail of this pedestrian access will be provided as part of a Reserved Matters application.

4.2.5 A pedestrian / cyclist / emergency vehicle access from Oxhey Lane is proposed to be provided to the south of the Care Home and will route into the southern parcel of the site.

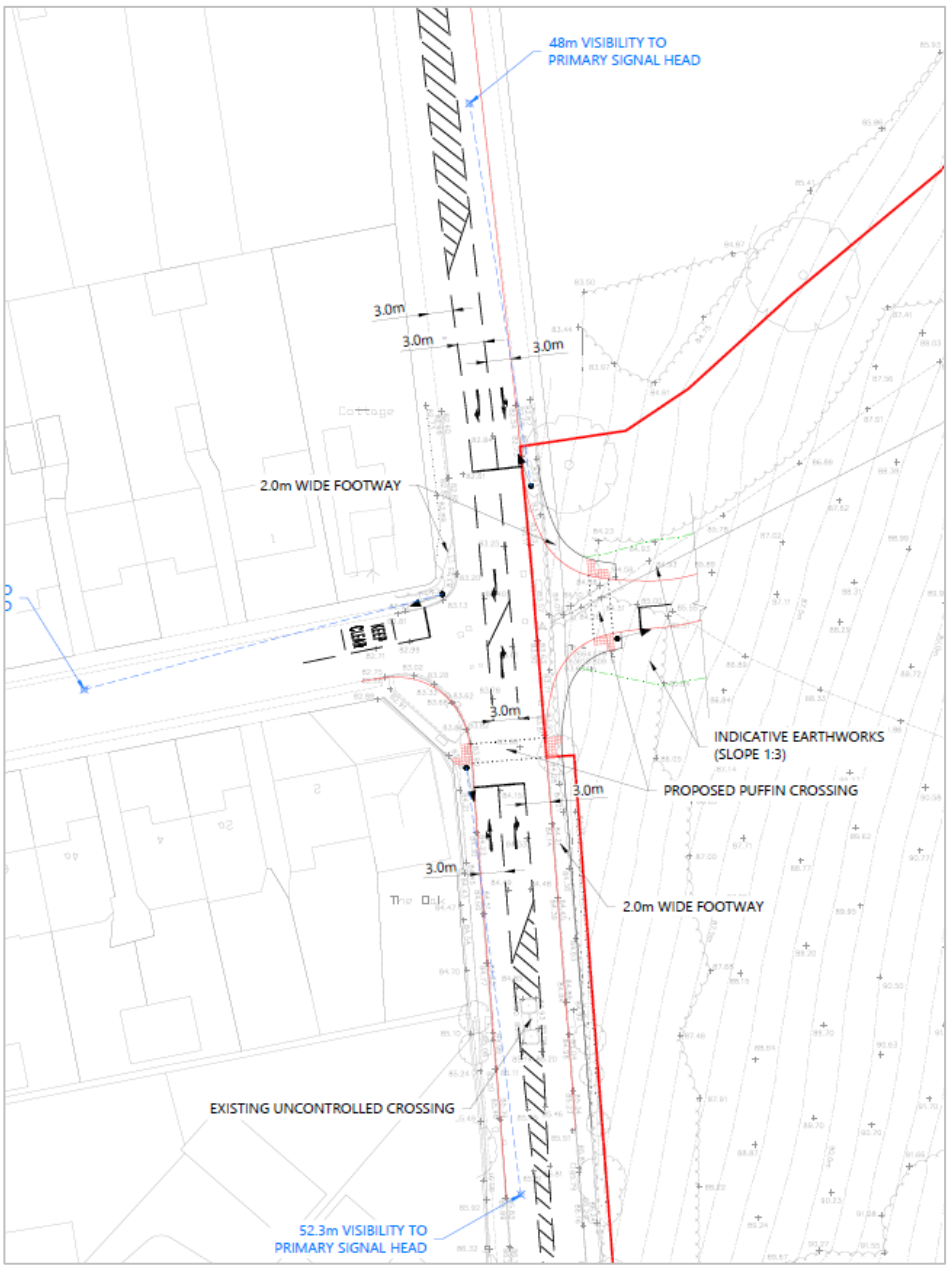
4.2.6 These two accesses will allow pedestrians and cyclists to access Oxhey Lane and Carpenders Park from a more direct route than using the main vehicular access. The design of this is set out further in this section.

Main Vehicular Access

4.2.7 The main vehicular access proposed into the development site is a signalised crossroad junction from A4008 Oxhey Lane, with a new access located opposite Carpenders Avenue. This location is the least constrained in terms of horizontal and vertical alignment, and the arrangement has been developed based on the characteristics of A4008 Oxhey Lane (as set out in Section 3) and the expected level of development proposed at the site.

4.2.8 The access junction is shown in **Drawing ITL200107-GA-002C**, an extract of which is provided at **Image 4.3**.

Image 4.3: Proposed Signalised Crossroads Junction



4.2.9 The access option has been designed with reference to CD123 Geometric Design of At-grade Priority and Signal-controlled Junctions (part of DMRB), and these design requirements are generally achieved.

4.2.10 In accordance with HCC place and movement matrix (set out in Section 2), Hertfordshire have categorised A4008 Oxhey Lane as a P2/M2 (Multi-Function Distributor Road)[3]. However, having reviewed the various categories against the existing geometric characteristics of the A4008 Oxhey Lane in the vicinity of the site it could reasonably be either a category P1/M2 (Inter-Urban Road) or P2/M3 (Main Connector) road. This is explained fully in the Access Appraisal note submitted as part of pre-application discussions with HCC, included at **Appendix A**.

4.2.11 The Access Appraisal note sets out that for P1/M2 category roads (which A4008 Oxhey Lane could reasonably be categorised as) the design should accord with Manual for Street 2 (MfS2) guidance. Thus, the relevant design speed for A4008 Oxhey Laneis the observed 85th percentile speeds as in **Table 3.5**. Carpenders Avenue is subject to a 30mph speed limit which has been used as the design speed on this arm. Similarly, the proposed site access arm has been designed with a 30mph design speed. The following features are included:

- All arms of the junction to be signalised with filter lanes on major arms for vehicles entering minor arms. Minimum 3.0m lane widths would be retained on Oxhey Lane;
- Visibility of 52.3m from the primary signal head to north and 48.0m to the south on Oxhey Lane in line with recorded 85th percentile speeds[4]. Visibility of 43.0m for the minor arms of Carpenders Avenue and the site access road;
- Proposed puffin crossings across southern arm of Oxhey Lane and site access junction and 2.0m wide footways on both sides of the carriageway;
- Keep Clear markings outside 'The Cottage' to maintain private access; and
- Minor changes to the alignment of Footpath 013.

Vertical visibility

4.2.12 Vertical visibility has been considered in the access design. Oxhey Lane rises to the south of the proposed access location. The crest of the hill is located in the vicinity of the Care Home access junction, circa 130m south of the stop line of the proposed access junction.

[3] within the sub-category of Main/Secondary Distributor

[4] Applying DMRB desirable minimum SSD to the 40mph speed limit,120m is achievable which is well in excess of requirements of MfS2.

4.2.13 The junction modelling (covered in **Section 7** of this TA) demonstrates that the introduction of the development and the signalised site access junction could result in a mean maximum queue of around 65m of Oxhey Lane South.

4.2.14 85th percentile speeds in the northbound direction recorded at the crest of the hill were 34.4m, which when using Manual for Streets requires stopping sight distance of 52.3m.

4.2.15 This SSD is then required to the back of the queue (65m). The resulting total distance required from the stop line on Oxhey Lane South is therefore around 115m, which is just prior to the crest in the hill to the south.

4.2.16 Drawing **ITL200107-GA-005A** shows a long section of the proposed access design on Oxhey Lane. It demonstrates that vertical visibility is achievable along the approach to the proposed signal in line with the existing approach speeds and expected back of queue.

Intervisibility

4.2.17 The initial junction arrangement proposed a puffin crossing of the northern arm of Oxhey Lane. After subsequent pre-application discussions with HCC, the puffin crossing has been relocated to the southern arm of the junction, which would provide improved intervisibility at the junction for pedestrians.

4.2.18 A junction intervisibility zone as per the requirements of CD123, shows that intervisibility is achieved on three of four arms. Intervisibility is restricted on one of four arm arms where the intervisibility encroaches land outside of the highway in the northwestern corner.

4.2.19 However, as explained above and in the Access Appraisal note at **Appendix A**, Manual for Streets 2 is the appropriate design code in this location which states the following on junction intervisibility with reference to the requirements of DMRB:

> ***'..designers may need to consider whether the strict application of these visibility requirements is always appropriate, particularly in urban situations where speeds are low; or where stop lines are set back considerable distances due to swept requirements or other reasons, giving rise to large intervisibility zones.'*** *(MfS 2, paragraph 9.8.7)*

4.2.20 Therefore, there should be some flexibility in the provision of intervisibility on every arm of a junction in urban environments. Thus, adherence to the requirements of CD123 on inter-visibility is not necessary. Indeed, given the uphill gradient on Carpenders Avenue approach to A4008 Oxhey Lane the speed of vehicles emerging Carpenders Avenue will be low. Coupled with which the southbound traffic on the far side of A4008 Oxhey Lane will be visible to drivers emerging Carpenders Park before any conflict could occur.

Road Safety Audit

4.2.21 The access design will be subject to a Stage 1 Road Safety Audit (RSA).

Emergency Access

4.2.22 As mentioned above, an emergency access into the site from Oxhey Lane will be provided in a location to the south of the existing Care Home. This will be 3.7m wide with a 1.0m buffer on both sides, with dropped kerb and a bollard structure to prevent unauthorised vehicular access but to ensure emergency access is achievable and pedestrian and cycle access is provided at all times. This is provided at drawing **ITL200107-GA-007A.**

4.3 Site Layout

4.3.1 Although in outline, the site layout has been designed following HCC Place & Movement Planning and Design Guidance, with priority given to active travel users.

4.3.2 At the site access junction, pedestrians will have the opportunity to use a footway routing along the south side of internal site access road, or make use the existing public right of way, the alignment of which is to be retained. The public right of way will then link a footway on the north side of the internal access road as it diverts into the main residential provision of the site.

4.3.3 This will connect to a variety of secondary streets, private drives, shared surfaces to create a slow speed layout which emphasises the place function of the roads.

4.3.4 Turning heads will be provided at appropriate places to ensure all vehicles can enter and exit residential streets.

4.3.5 Dedicated and direct pedestrian routes beyond the road network will create a permeable network for walking for both recreational and utility purposes connecting to the three accesses onto Oxhey Lane.

4.3.6 The proposals also feature an orbital pedestrian route around the site which will link with the existing public right of way in the north of the site providing access to wider countryside.

4.3.7 The proposals involve the provision of housing with care (circa 60 units) and a children's home (one unit). These units will be provided along the western side of the site to correspond with the location of the existing care home.

4.4 Parking

4.4.1 Parking is a reserved matters and at the appropriate stage would be provided in accordance with the adopted Three Rivers District standards. This would include:

- Car parking (including visitor parking)
- Cycle parking
- Electric Vehicle charging

4.5 Refuse and Servicing

4.5.1 Swept path analysis has been undertaken which demonstrates that a 10.2m refuse vehicle could enter and exit the proposed site access junction. This is shown at **Appendix G**.

4.5.2 A future Reserved Matters application would consider refuse collection arrangements within the residential parcels to ensure that adequate provision would be made on site.

4.6 Summary

4.6.1 The proposed development would comprise 257 residential dwellings, housing with care and a children's home with landscaping and associated infrastructure on land to the east of Oxhey Lane.

4.6.2 The proposed development is shown on the illustrative masterplan which in transport terms provides for sustainable travel between the proposed residential areas and the existing services and facilities with Carpenders Park. The illustrative layout and pedestrian and cycle infrastructure would provide for safe, direct and convenient routes for pedestrians and cyclists which would provide the opportunity for a substantial proportion of journeys to the existing services and facilities within Carpenders Park to be undertaken by these modes.

4.6.3 A signalised crossroad junction arrangement with Oxhey Lane and Carpenders Avenue is proposed to access the site. This arrangement would provide improved crossing of Oxhey Lane for pedestrians, providing a signalised crossing and improved pedestrian desire lines towards Carpenders Avenue.

4.6.4 All other matters are in outline and would be subject to Reserved Matters applications.

SECTION 5 Sustainable Transport Strategy

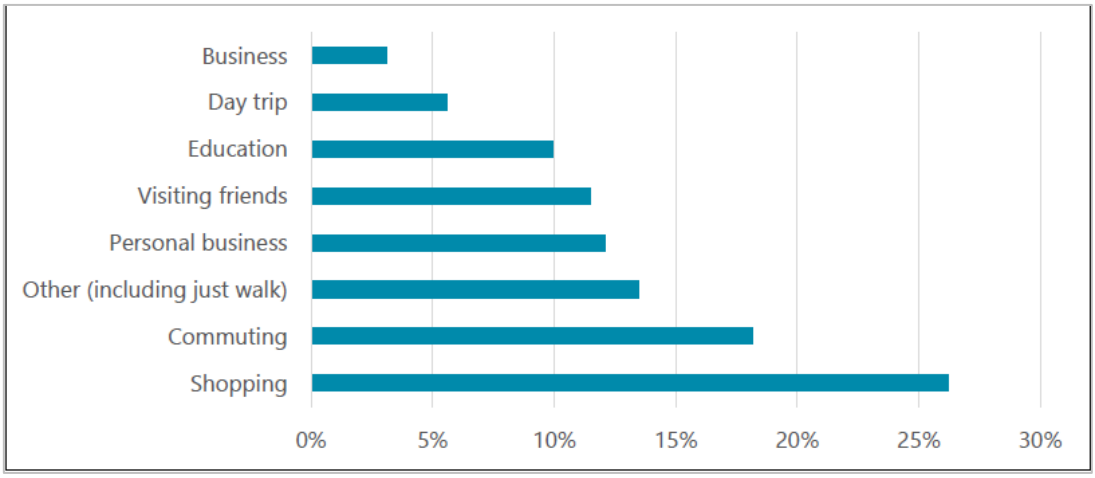
5.1 Overview

5.1.1 This section of the TA considers the accessibility of the site to key local services and facilities and employment destinations by non-car modes of transport. A Transport Vision for the site is put forward, and strategies that will be used to enable the realisation of the transport vision are described.

5.2 Journey Purposes

5.2.1 In considering accessibility and promoting sustainable travel it is important to consider the reason why future residents of the proposed development would make journeys. The Department for Transport's (DfT) National Travel Survey (NTS) identifies the proportion of trips by the principal journey purposes. This is summarised in **Image 5.1**.

Image 5.1: National Travel Survey - Trips by Journey Purpose



Source: NTS (2023)

5.2.2 **Image 5.1** shows that leisure, shopping and education trips account for approximately 53% of journey purposes. Each type of journey would have different requirements in terms of destination, time constraints and route choice. This section will assess the opportunities for potential future residents to access local facilities and services by a range of transport modes.

5.2.3 Commuting and business account for approximately 21% of journeys purposes. This section will assess the opportunities for potential future residents to access the likely employment destinations by non-car modes.

5.3 Walking and Cycling Trends

Walking Trends

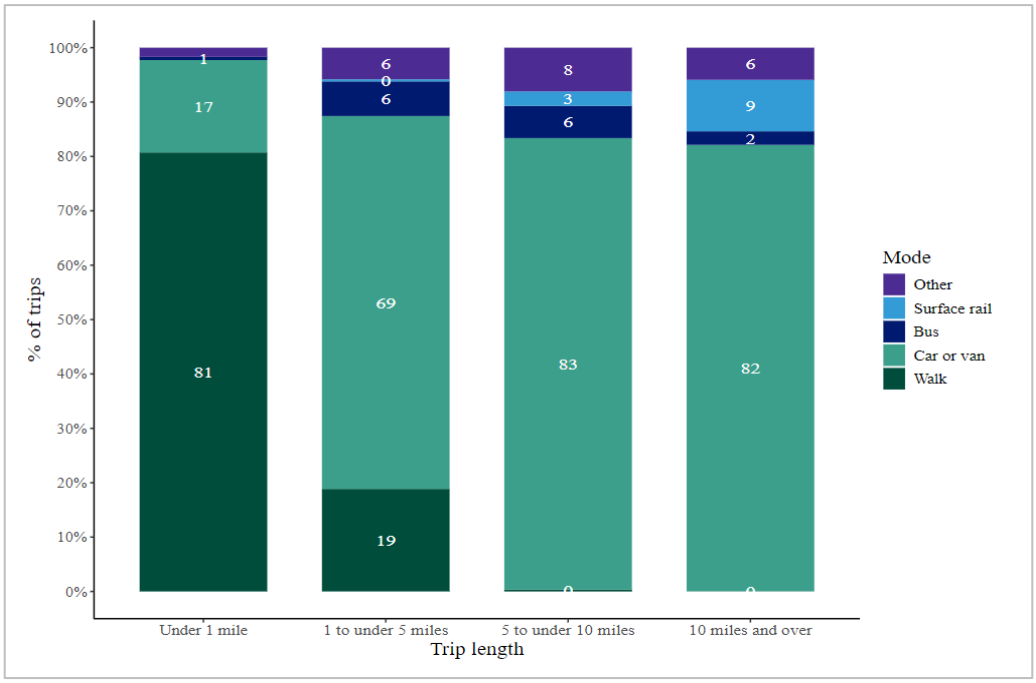
5.3.1 Paragraph 4.4.1 of the Manual for Streets identifies that:

> ***"Walkable neighbourhoods are typically characterised by having a range of facilities within 10 minutes' (up to about 800 m) walking distance of residential areas which residents may access comfortably on foot. However, this is not an upper limit and PPS134 states that walking offers the greatest potential to replace short car trips, particularly those under 2 km."***

5.3.2 The data in the NTS (Table NTS308), identifies that the vast majority (81%) of trips of up to one mile (1.6km) are undertaken on foot. The data also shows that 19% of journeys between 1 and 2 miles will be on foot, i.e., a significant proportion of people are prepared to walk for journeys of up to 2 miles (3.2km). Walking is therefore a realistic and feasible option for many short trips.

5.3.3 **Image 5.2** from the National Travel Survey (2023) shows illustratively the change in mode share as the trip length increases.

Image 5.2: Mode of Travel by Distance



Source: National Travel Survey, England 2023

5.3.4 The one-mile (1.6km) distance is reflected in recent Chartered Institution of Highways and Transportation (CIHT) guidance 'Planning for Walking' (2015) which states:

> ***"Across Britain, approximately 80% of journeys shorter than 1 mile are made wholly on foot – something that has changed little in 30 years. The main reason for the decline in walking is the fall in the total number of journeys shorter than 1 mile, which has halved in thirty years. It is not that people are less likely to make short journeys on foot but rather that fewer of the journeys they make can be accomplished on foot. If destinations are within walking distance, people are more likely to walk if walking is safe and comfortable and the environment is attractive."***

5.3.5 Therefore, providing new homes within one mile of facilities and services would provide the greatest opportunity for trips to be made on foot.

5.3.6 That is not to say that a mile is the maximum that people are prepared to walk, or that development must be located within a mile of everything. It is clear from the NTS data that around one-fifth of journeys between one and two miles are undertaken on foot. This is supported by paragraph 2.3 of the DMRB TD91/05 'Provision for Non-Motorised Users', which identifies that walking is a 'normal' mode of transport for journeys undertaken within a range of two miles, as follows:

> ***"Walking is used to access a wide variety of destinations including educational facilities, shops, and places of work, normally within a range of up to 2 miles. Walking and rambling can also be undertaken as a leisure activity, often over longer distances".***

5.3.7 Against all of this background, the following walking distances are identified:

- 800m – i.e., under a 10-minute walk typically characterised as a "walkable neighbourhood";
- 1,600m or one mile – i.e., the distance within which circa three-quarters of journeys are made on foot;
- 2,000m – i.e., the distance that "offers the greatest potential to replace short car trips"; and
- 3,200m or two miles – i.e., the distance within which a significant proportion (circa one-fifth) of journeys will be on foot.

5.3.8 These distances are applied to the local facilities and services set out in **Table 3.3** of this TA and demonstrate that a significant number of facilities and services are well within the distance within which 81% of journeys are made on foot.

Cycling Trends

5.3.9 The Department for Transport's Cycling and Walking Investment Strategy (2017) states at paragraph 1.16 that:

> ***"... there is significant potential for change in travel behaviour. Two out of every three personal trips are within five miles - an achievable distance to cycle for most people, with many shorter journeys also suitable for walking. For school children, the opportunities are even greater. Three quarters of children live within a 15-minute cycle ride of a secondary school, while more than 90% live within a 15 minute walk or bus journey from a primary school."***

5.3.10 The DfT's 'Gear Change - A bold vision for cycling and walking' states (page 11) that:

> ***"In particular, there are many shorter journeys that could be shifted from cars, to walking, or cycling. We want to see a future where half of all journeys in towns and cities are cycled or walked. 58% of car journeys in 2018 were under 5 miles. And in urban areas, more than 40% of journeys were under 2 miles in 2017–1817. For many people, these journeys are perfectly suited to cycling and walking."***

5.3.11 Paragraph 2.2.2 of the DfT Document LTN 01/20 'Cycle Infrastructure Design' discusses typical cycle trip distances and states that "***Two out of every three personal trips are less than five miles (8km) in length –an achievable distance to cycle for most people, with many shorter journeys also suitable for walking***".

5.3.12 A cycling distance of over 2km offers an active travel mode alternative to walking and provides the opportunity to replace short car trips. A cycling distance of up to around 5km (3 miles) therefore offers the greatest potential to replace cars trips and is therefore a "reasonable" cycling distance, although a number of cycle journeys may be longer at 8km (5 miles). Cycling also frequently forms part of a longer journey in combination with public transport.

5.4 Transport Vision

5.4.1 The development proposals have been subject to a vision-led approach in terms of transport planning. This involves setting a vision for the development, and assessing it in transport terms against the key transport test of the NPPF.

5.4.2 The transport vision for the development is to:

- Reduce the number of vehicle trips to and from local schools in favour of active travel.
- Reduce the number of vehicle trips to and from the site for commuting purposes in favour of public transport.

5.4.3 Ultimately, the target is to roughly reduce the number of vehicle trips by 10% across the network peak hours.

5.4.4 A reduction in vehicle trips for other journey purposes will also occur from the vision, but for the purposes of this assessment, the vision has focussed on a reduction in vehicle trips to schools and commuting due to proximity of nearby schools and habitual nature of commuter travel. The impact of the vision will be most greatly realised in these two journey purposes.

5.5 Active Travel Strategy

5.5.1 As set out in **Section 4**, the development proposals include three accesses from the site to Oxhey Lane with active travel infrastructure routing into the three distinct development parcels.

Walking & Wheeling Strategy

5.5.2 The main site access junction will provide a signalised pedestrian crossing on Oxhey Lane to link to the footway on the western side of the carriageway. This will provide a much improved and safer alternative to the two existing uncontrolled crossings.

5.5.3 The National Travel Survey shows that around 58% of all trips are to leisure, shopping and educational services and facilities. **Table 3.3** shows that there are a range of leisure, shopping and educational services and facilities within Carpenders Park and further facilities at South Oxhey. The majority of services within Carpenders Park are within 800m from the development, which is identified as a reasonable walking distance. Many further facilities are available in South Oxhey, which is within the 1,600m distance by which three-quarters of journeys are made on foot.

5.5.4 The NTS also shows that around 10% of all trips are to educational uses. St. Meryl School is one of the closest amenities to the site and well within a comfortable walking distance of the proposed development. The signalised pedestrian crossing of Oxhey Lane would provide a safe crossing of Oxhey Lane which would provide a short and direct route to St Meryl School, with mostly continuous footways and street lighting along the route.

5.5.5 An audit of the walking and cycling route on Carpenders Avenue has identified some deficiencies at junction crossings and along footways, with a lack of tactile paving and coherent routes for pedestrians. Further deficiencies are described within Sections 2 and 3 in the SW Herts Growth and Transport Plan (GTP) and Three Rivers LCWIP.

5.5.6 The SW Herts GTP identified areas for improvement to the active travel infrastructure within the Watford South area as part of Package 8. Specifically for Carpenders Park, a set of interventions are proposed to enhance connectivity between South Oxhey and Carpenders Park and to improve the pedestrian and cycle environment on Delta Gain in the centre of Carpenders Park. These are summarised in Table 5.1 alongside the associated cost range.

Table 5.1: SW Herts GTP - Package 8 Interventions

Scheme ID	Intervention Name	Intervention description	Cost range
PR40	Improved South Oxhey - Carpenders Park Link	Enhanced road, cycle and pedestrian links over the railway line linking South Oxhey and Carpenders Park areas. To address current constrained and limited linkages and tie into improved Station Square.	£0-£500k
PR103	Delta Gain (South Oxhey - Carpenders Park)	Enhancements to the pedestrian and cycle environment on Delta Gain and Gibbs Couch on the approach to Carpenders Park Station including measures to manage on-street parking.	£0-£500k

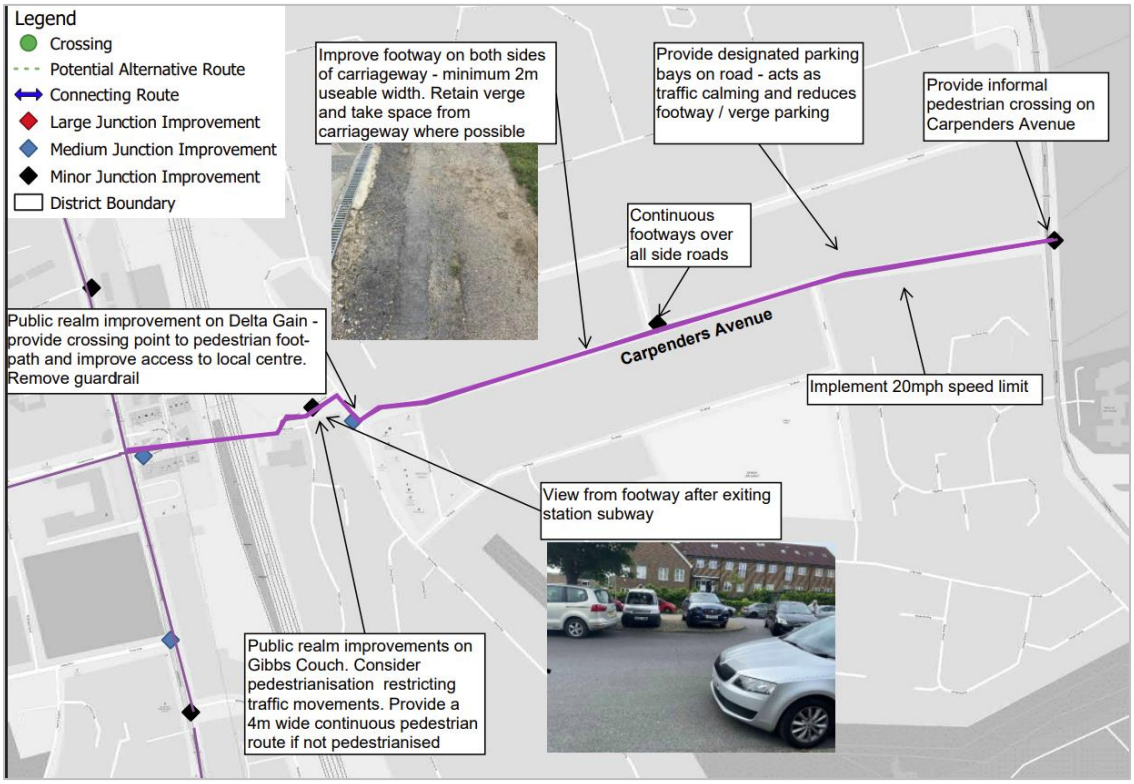
Source: SW Herts GTP (June 2019)

5.5.7 Package 8 does not include any specific details of improvements and enhancements, but instead sets out the principle of potential improvements, which are then used to inform the routes identified in the Three Rivers LCWIP, as set out in Section 3 of this report. The Three Rivers LCWIP identifies Walking Route 4 as a key route to Carpenders Park.

5.5.8 Appendix A of the LCWIP provides an overview of potential improvements on Walking Route 4, an extract of which is provided at **Image 5.3**. It proposes:

- Informal crossing of Carpenders Avenue;
- Provision of continuous footways over all side roads;
- Footway improvements on both sides of Carpenders Avenue;
- Public realm improvements on Delta Gain and Gibbs Couch.

Image 5.3: LCWIP Walking Route 4 - Potential Improvements (Extract)



Source: Three Rivers LCWIP – Appendix B

5.5.9 Almost all pedestrian traffic from the development is expected to travel on this route to the local facilities and services within Carpenders Park and South Oxhey, including to public transport opportunities.

5.5.10 The Applicant is therefore willing to support active travel improvements along this route by way of a Section 106 contribution of an appropriate scale for the development.

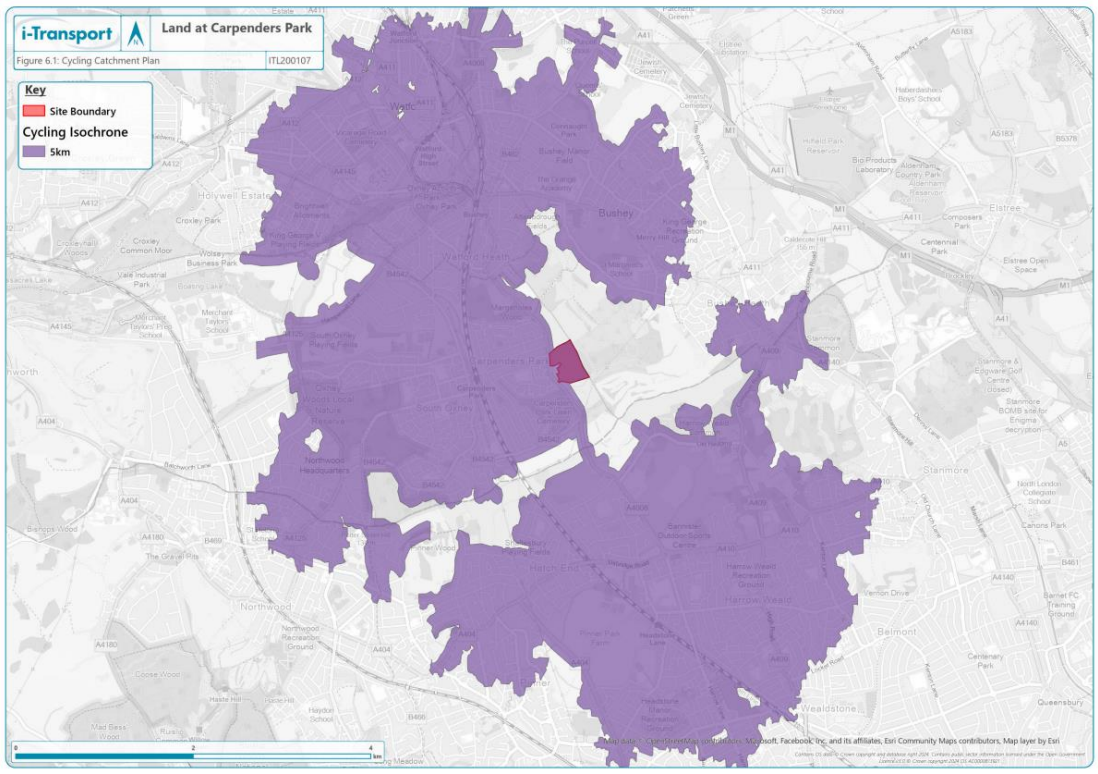
5.5.11 It should be noted that the proposed signalised site access junction will provide formal pedestrian crossings of Oxhey Lane and the site access. Whilst an informal crossing of Carpenders Avenue is not included, the site access junction will enable pedestrians to cross Oxhey Lane and use the continuous footway on the eastern side of the road.

Cycle Strategy

5.5.12 As set out above, **Table 3.3** shows that there are a range of leisure, shopping and educational services and facilities within Carpenders Park and further facilities at South Oxhey.

5.5.13 **Figure 5.1** (an extract of which is provided at **Image 5.4**) shows visually that larger conurbations of Watford, Harrow and Pinner, with much more extensive range of facilities and services, would be well within a reasonable cycling distance (5km) from any point within the proposed development.

Image 5.4: Cycling Catchment Plan



Source: Consultant Drawing

5.5.14 The provision of a signalised junction at the main site access will also benefit cyclists due to slower vehicle speeds. Cyclists can also dismount and utilise the puffin crossing Oxhey Lane if required.

5.5.15 The residential roads within Carpenders Park and South Oxhey are relatively low trafficked and low speed. Therefore, in accordance with guidance in MfS and LTN 1/20 cyclists can be safely accommodated on the carriageway.

Draft Site Allocation - Site Reference CFS11 (secondary school)

5.5.16 A secondary school (CFS11) directly north of the site was proposed for allocation within the draft Local Plan (Part 2: Sites for Potential Allocation) in 2021. TRDC consider the site to be suitable and deliverable for a school site subject to revision of the green belt boundary.

5.5.17 For this allocation to be realised, safe and suitable access from A4008 Oxhey Lane will need to be provided to a secondary school in this location. It will need to provide for a high number of children to access the site from the surrounding residential areas, and any proposal will need to ensure the site is highly accessible by non-car modes.

5.5.18 The lack of a nearby secondary school (indicative of the draft site allocation) would suggest that many future pupils would attend from the Carpenders Park and South Oxhey local area.

5.5.19 There is currently no dedicated crossing of A4008 Oxhey Lane except for an uncontrolled signalised crossing near the Carpenders Park Care Home and an uncontrolled pedestrian crossing near the junction with By-The-Wood, which would be wholly unsuitable for a high-level of pedestrian footfall (particularly that of school pupils).

5.5.20 Although any future access to the school would include provision for pedestrians, the signalised crossroad arrangement for the proposed development would offer a safe and dedicated pedestrian crossing of Oxhey Lane from Carpenders Avenue (likely a future desire line aligned with Walking Route 4) and would also act to slow vehicle speeds along the carriageway on approach to the signals.

5.6 Public Transport

5.6.1 The site is within walking distance of frequent Lioness line services from Carpenders Park. This provides 15-minute services to Watford and Central London locations.

5.6.2 It is highly likely that future residents will make use of these regular services to travel to work within Watford or London, and also the extensive range of facilities and services available in the nearby centres through which the Lioness line routes. Onward travel on public transport on London Underground and National Rail is then available at transport interchanges at Lioness line stations.

5.6.3 The provision of footways within the site and contributions to improvements on Carpenders Avenue will improve the journey for pedestrians to and from the Carpenders Park station, making for a more pleasant journey and encouraging the uptake of sustainable travel behaviours.

5.7 Residential Travel Plan

5.7.1 A separate residential travel plan has been prepared (*i-Transport report reference: ITL200107-003 R*). The primary purpose of the travel plan is to identify opportunities for the effective promotion and delivery of sustainable transport initiatives e.g., walking, cycling and public transport, in connection with the proposed development in Carpenders Park and through this to thereby reduce the demand for travel by less sustainable modes.

5.7.2 The travel plan proposes a range of non-infrastructure or 'soft' measures aimed at influencing modal choice for travel to the site, which would complement the infrastructure and improvements set out above.

5.8 Summary

5.8.1 The transport vision for the development is to reduce the number of vehicle trips associated with education and commuting purposes to around 10% across the peak hours.

5.8.2 Data from the NTS shows that the leisure, shopping and education trips account for approximately 58% of the average trips undertaken, whereas commuting and business trips account for around 18% of the average trips undertaken. It is demonstrated that the site is well located to a large range of everyday services and facilities in Carpenders Park and South Oxhey.

5.8.3 The SW Herts GTP and Three Rivers LCWIP have identified potential improvements to walking routes within Carpenders Park, including Walking Route 4. The Applicant is willing to support active travel improvements along this route by way of a Section 106 contribution of an appropriate scale for the development.

5.8.4 The site's distance from the London Overground means that the opportunities to use public transport are excellent, with regular services to key workplace and leisure destinations in Watford, Harrow, Wembley and central London, alongside a large proportion of journeys being undertaken by walking and cycling.

5.8.5 Therefore, the proposed development is in accordance with the first test of the NPPF.

5.8.6 The proposed development would also implement a Travel Plan to identify opportunities for the promotion and delivery of sustainable transport initiatives in connection with the site. The Travel Plan would propose a series of measures to influence modal choice including a Resident's Welcome Pack.

SECTION 6 Multi-modal Trip Generation Methodology

6.1 Residential Trip Generation

Multi-modal Trip Generation

6.1.1 Several trip generation methodologies were identified for the residential element of the proposed development, including:

- Multi-modal trips obtained from TRICS database;
- Total person trips obtained from TRICS database applied to Census 2011 Journey to Work data; and
- Total person trips obtained from TRICS database combined with modal split and trip purpose data from TEMPro v8.1

6.1.2 Multi-modal trip rates have not been directly obtained from the industry standard TRICS database. This is because the site is unique in that it is not within the Greater London boundary, yet it has access to a regular London Overground service linking it to key destinations within Central London and Watford. There are very few sites within TRICS database with similar characteristics, and therefore a representative level of multi-modal trip rates may not be obtained from any multi-modal TRICS outputs.

6.1.3 A second option would be the application of TRICS person trip rates to Census 2011 Journey to Work data. The Census 2011 data is now 14 years old, and only provides journey options for people travelling to work which, as outlined in Image 5.1 of Section 5, only accounts for 21% of journeys. Whilst it is a helpful guide, it does not take account of all the other journey purposes.

6.1.4 A combination of TRICS and TEMPro has therefore been used to provide an accurate and robust multi-modal trip generation for the proposed development. The TEMPro dataset makes use of the National Travel Survey data (from 2023) and provides peak period modal split data for the district level.

6.1.5 Whilst multi-modal trip rates from TRICS may not be representative (in respect of the mode split), total person trip rates and temporal distribution are broadly similar at residential sites across England, whether they are inside or outside of Greater London. A total person trip rate was therefore obtained from TRICS using the following site characteristics:

- Land use: Residential, houses privately owned;
- Location: Edge of Town sites in England, including Greater London;

- No. of dwellings: range between 150-300.

6.1.6 The total person trip rates are provided at **Appendix H**. A summary of the two-way peak period trip rates between 0700-1000 and 1600-1900 are shown below in **Table 6.1** alongside the proportion of the peak hour trips. These peak periods align with the outputs required for the TEMPro dataset, discussed later in this section.

Table 6.1: Two-way Trip Rates – Residential

Hourly Time Period	Two-way Trip Rate	% of Trips between 7-10	Hourly Time Period	Two-way Trip Rate	% of Trips between 16-19
7:00-8:00	0.604	28%	16:00-17:00	0.827	35%
8:00-9:00	1.010	48%	17:00-18:00	0.834	35%
9:00-10:00	0.516	24%	18:00-19:00	0.719	30%
7:00-10:00	**2.130**	**100%**	**16:00-19:00**	**2.380**	**100%**

Source: TRICS

6.1.7 **Table 6.1** identifies 08:00-09:00 and 17:00-18:00 as the peak hours. It also shows that 48% of trips in the morning peak period occur between 08:00-09:00, and 35% evening peak period trips occur between 17:00-18:00.

6.1.8 The total peak period (three-hourly) trip rates and trip generation shown in **Table 6.2**:

Table 6.2: Total Person Trip Generation – Peak Periods

	AM Peak Period 7:00-10:00			PM Peak Period 16:00-19:00		
	Arr.	Dep.	Two-way	Arr.	Dep.	Two-way
Total Person Trip Rate (per dwelling)	0.553	1.577	2.13	1.59	0.79	2.38
Trip Generation (257 dwellings)	142	405	547	409	203	612

Source: TRICS and consultant calculations

6.1.9 **Table 6.2** demonstrates that 547 two-way person trips would occur between 0700-1000 and 612 two-way person trips would occur between 1600-1900.

TEMPro Modal Split

6.1.10 To determine the modal split of the calculated trip generation, TEMPro 8.1 was used. The National Trip End Model uses a combination of different sources and factors to determine the modal split that it has for different local areas. Principally the NTS is used as the baseline data, but information is also gathered from local plans among other sources. The criteria below were used in the TEMPro calculation:

- Dataset version and type: 8.1, Core

- Result Type: Trip Ends by time period
- Base Year: 2025
- Trip Purpose Group: All purposes – individually
- Time Periods: Weekday AM Peak (0700-0959) & Weekday PM Peak (1600-1859)
- Trip End Type: Origin / Destination
- Location: Three Rivers 010 MSOA

6.1.11 The TEMPro output provides for peak periods (0700-1000 and 1600-1900) only. The subsequent dataset sets out the journey purpose for all modes during the peak periods and the modal split for each journey purpose. The resulting modal split of Three Rivers 010 is shown in **Table 6.3**, and the TEMPro outputs are provided at **Appendix I**.

Table 6.3: Modal Split for Three Rivers 010

Mode	07:00 – 10:00 (% Split)	16:00 – 19:00 (% Split)
Car Driver	40.4%	47.5%
Car Passenger	20.2%	19.9%
Walk	18.9%	15.5%
Public Transport	19.1%	15.8%
Cycle	1.2%	1.2%
Total	**100%**	**100%**

Source: TEMPro 8.1

6.1.12 **Table 6.3** demonstrates that between 0700-1000 around 40% of trips are undertaken by car, with 20% of persons travelling as a car passenger. Around 2% of trips are taken by active travel modes, and 19% of trips are taken by public transport.

6.1.13 For the evening peak periods between 1600-1900, around 48% of trips are taken by car with a further 20% undertaken as a car passenger. 17% of trips are undertaken by active travel and 16% of trips are undertaken by public transport.

6.1.14 The journey purpose split of Three Rivers 010 is shown in **Table 6.4**.

Table 6.4: All Modes Journey Purpose Split for Three Rivers 010

Purpose	07:00 – 10:00 (% Split)	16:00 – 19:00 (% Split)
Work	46.4%	38.1%
Education	31.0%	8.5%
Shopping	9.1%	17.2%
Leisure	13.5%	36.2%
Total	**100%**	**100%**

Source: TEMPro 8.1

6.1.15 **Table 6.4** shows that during the morning peak period, 46% of trips are undertaken for work/business, 31% for education and the remaining 23% for shopping and leisure. Comparatively in the evening peak period, 38% of trips are for work/business, and only 9% of trips are for education (as school pick-up will have mostly occurred around 3pm). The remaining 53% of trips are for shopping and leisure.

6.2 Development Vision Scenarios - With and Without Vision

6.2.1 In line with the requirements of the NPPF, a vision-led approach has been taken to assess the trip generation of the development. The following subsections therefore provide two trip generation scenarios, summarised as:

- Without Development Vision – where no vision is applied to the trip generation parameters, which is based on historic trends.
- With Development Vision – where a vision of the future development is applied to the trip generation. The vision is based on the proximity of the site to local facilities and services, and provision of suitable measures which will encourage the uptake of sustainable transport. This includes changes to education trips and car driver mode-share.

Without Vision Trip Generation

6.2.2 The 'Without Vision' trip generation scenario is estimated combining total person trip generation set out in Table 6.2 with the modal split in Table 6.3. This is then broken down into just the peak hour trip generation using the proportion of peak hour trips set out in **Table 6.1** and using the network peak hours of 8:00 – 9:00 and 17:00 – 18:00. The resulting multi-modal trip generation is shown below in **Table 6.5**.

Table 6.5: Multi-Modal Residential Trip Generation – No Vision

Mode	AM Peak (8:00 – 9:00)				PM Peak (17:00 – 18:00)			
	%	Arr.	Dep.	2-Way	%	Arr.	Dep.	2-Way
Walk	18.9%	13	36	49	15.5%	22	11	33
Cycle	1.3%	1	2	3	1.3%	2	1	3
Car Driver	40.4%	27	78	105	47.5%	68	34	102
Car Passenger	20.2%	14	39	53	19.9%	28	14	42
Public Transport	19.2%	13	37	50	15.8%	23	12	35
Total	**100**	**68**	**192**	**260**	**100**	**143**	**72**	**215**

Source: Consultation Calculations

6.2.3 **Table 6.5** demonstrates that the proposed development would generate:

- 105 two-way vehicle trips in the morning peak hour and 102 two-way vehicle trips in the evening peak hour.
- 53 car passenger trips in the morning peak hour and 42 car passenger trips in the evening peak hour.
- 50 two-way trips on public transport during the morning peak hour and 35 two-way public transport trips in the evening peak hour.
- 52 two-way active travel trips in the morning peak hour and 36 two-way active travel in the evening peak hour.

6.2.4 The proposed development in the 'without vision' scenario would generate the equivalent of just under two new vehicle trips every minute. This is equivalent to a 9% increase on the existing flows on Oxhey lane as per the flows recorded in **Table 3.4**. This represents the baseline, without adjustments for the vision of the site.

With Vision Trip Generation – Vehicle Trip Reassignment

6.2.5 The transport vision aims to reduce the number of peak hour vehicle trips by roughly 10%.

6.2.6 To determine where the most appropriate and achievable gains can be made in favour of encouraging residents to complete more journeys by sustainable modes, the existing journey purpose split for car drivers in Three Rivers 010 MSOA has been examined. The baseline journey purpose split is shown below in **Table 6.6**. These percentages are different from those shown in **Table 6.4** as they reflect the journey purpose of the car drivers in isolation, rather than all modes.

Table 6.6: Car Driver Trip Generation by Purpose – No Vision

Purpose	AM Peak (8:00 – 9:00)				PM Peak (17:00 – 18:00)			
	%	Arr.	Dep.	2-Way	%	Arr.	Dep.	2-Way
Work	67.1%	18	52	70	47.6%	33	15	48
Education	9.5%	3	7	10	4.2%	3	1	4
Shopping	11.0%	3	9	12	17.2%	12	6	18
Leisure	12.4%	3	10	13	31.0%	20	12	32
Total	**100%**	**27**	**78**	**105**	**100%**	**68**	**34**	**102**

Source: Consultation Calculations

6.2.7 In the AM Peak Hour, 67% of car driver trips are to work/commuting, and around 10% are to education. In the PM peak hour, around 48% of car driver trips are for work/commuting, and only 4% for education.

Education trips

6.2.8 **Table 6.6** shows that around 10% of car driver trips in the morning peak hour in Three Rivers 010 are for education. This would result in around 10 two-way trips are taken for educational purposes during the morning peak hour, and 4 two-way trips in the evening peak hour.

6.2.9 Given that there are a number of schools within a comfortable walking and cycling distance from the site, as evidenced in **Section 3.5**, it is acceptable to envisage that with the actions put forward in Section 5, that all of the educational vehicle trips could switch to walking and cycling journeys in five years.

Commuting trips

6.2.10 Furthermore, there is excellent propensity for car drivers to commute via sustainable modes to popular work locations for the area in Watford, Greater London and Bushey. Therefore, it is reasonable to suggest that there will be a 5% reduction in work-related car trips after five years with all of these being redirected onto rail (via Carpenders Park) where there is a regular and reliable service to key destinations.

6.2.11 These adjustments have been applied to the multi-modal residential trip generation set out in **Table 6.5** and the subsequent vision-led multi-modal residential trip generation is set out in **Table 6.7**.

Table 6.7: Multi-Modal Residential Trip Generation – With Vision

Mode	AM Peak (8:00 – 9:00)				PM Peak (17:00 – 18:00)			
	%	Arr.	Dep.	2-Way	%	Arr.	Dep.	2-Way
Walk	21.6%	15	42	57	16.9%	24	12	36
Cycle	2.4%	2	5	7	1.8%	3	1	4
Car Driver	35.2%	24	68	92	44.4%	64	32	96
Car Passenger	20.2%	14	39	53	19.9%	28	14	42
Public Transport	20.5%	14	39	53	17.0%	24	12	36
Total	**100%**	**69**	**193**	**262**	**100%**	**143**	**71**	**214**

Source: Consultation Calculations

6.2.12 The vision for the proposed development could reduce the number of peak hour car driver trips associated with the residential development by:

- 13% in the morning peak hour, from 105 to 92 two-way vehicle trips.
- 7% in the evening peak hour, from 102 to 96 two-way vehicle trips.

6.2.13 This demonstrates a reduction of 13 vehicle trips in the morning peak hour and 6 vehicle trips in the evening peak hour. Across the combined peak hours this equates to a total of 19 trips or a 10% reduction. The Vision scenario would be equivalent to an increase of one vehicle approximately every 45 seconds in the network peak hours which is very modest given the scale of the development.

6.3 Housing with Care & Children's Home Trip Generation

6.3.1 The proposed development includes the provision of housing with care of circa 60 units and a 1 four-bed children's home.

6.3.2 Whilst the detail of these uses is to be determined at a reserved matters stage, both facilities are proposed to operate as Use Class C2.

6.3.3 To estimate the trip generation of the housing with care, the trip rates of the approved Carpenders Park Care Home application (*TRDC reference: 17/1010/FUL*) have been obtained from the Transport Assessment submitted as part of the application. These trip rates were approved by HCC at the time of application and have been reproduced in **Table 6.8**.

Table 6.8: Trip Generation - Housing with Care & Children's Home

	Morning Peak Hour			Evening Peak hour		
	Arr	Dep	Two-Way	Arr	Dep	Two-Way
Total Persons						
Person Trip Rate (per unit)	0.070	0.064	0.133	0.080	0.138	0.218
Trip Generation (61 units)	4	4	8	5	8	13
Total Vehicles						
Vehicle Trip Rate (per unit)	0.055	0.050	0.105	0.063	0.109	0.172
Trip Generation (61 units)	3	3	6	4	7	11

Source: TRICS

6.3.4 **Table 6.8** demonstrates that the housing with care could generate 6 two-way vehicle movements in the morning peak hour and 10 two-way vehicle movements in the evening peak hour.

6.3.5 The remaining trips (2 two-way in the morning and 3 two-way trips in the evening) will be undertaken by walking, cycling, public transport or car sharing.

Total Vehicle Trip Generation

6.3.6 The total development vehicle trip generation is summarised in **Table 6.9** for both the with and without Vision development scenarios. For robustness, the Vision assumptions have not been applied to the Housing with Care element of the scheme.

Table 6.9: Total Car Driver Trip Generation

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	Arr.	Dep.	2-Way	Arr.	Dep.	2-Way
Proposed Development – without Vision						
Vehicle Trip Generation	30	81	111	72	40	112
Proposed Development – with Vision						
Vehicle Trip Generation	27	71	98	68	38	106

Source: Consultants calculations

6.4 Summary

6.4.1 A combination of TEMPro and TRICS was used to create a bespoke multi-modal trip rates for the site. This is appropriate as the excellent public transport connections are of a different character to sites outside of Greater London but not similar enough to sites within Greater London such that either set of sites could be used with full confidence.

6.4.2 The vision for the site sets out the ambition that all educational car driver trips will be undertaken by active modes within 5 years of occupancy due to the proximity to local schools. It also proposes that there will be a 5% reduction in work trips by car within the same timeframe.

6.4.3 The vision for the site would mean that there could 98 and 106 two-way vehicle trips in the morning and evening peaks (respectively), equivalent to roughly one additional vehicle every 45 seconds. This is a relatively modest increase in traffic flows given the scale of the development.

SECTION 7 Multi-modal Impact Assessment

7.1 Overview

7.1.1 This section of the TA provides a detailed summary of the multi-modal impacts associated with the proposed developments, including assessments of walking, cycling, public transport and traffic impacts.

7.2 Walking Impact

7.2.1 The main pedestrian desire line out of the site is along Carpenders Avenue as the most direct route to the Overground station, Carpenders Park and South Oxhey local centres. It is also expected that a small number of trips will travel via Highfield, as it is the most direct route towards the nearest schools from the southern part of the site. An 80/20 split is therefore assumed on the trips via each route.

7.2.2 Public transport users will also need to route down Carpenders Avenue to access Carpenders Park station and local bus services. It is assumed that all of these will use Carpenders Avenue.

7.2.3 **Table 7.1** provides a summary of the morning peak hour trips (as per **Table 6.7** and **6.8**) on each link.

Table 7.1: Walking Impact Morning Peak Hour

Link	Distribution	Assignment (two-way)
Pedestrian trips		
Carpenders Avenue	80%	47
Highfield	20%	10
Public transport trips		
Carpenders Avenue	100%	54
Highfield	0%	0

Source: Consultants Calculations

7.2.4 **Table 7.1** demonstrates that circa 101 two-way walking trips will occur on Carpenders Avenue in the morning peak hour, with 10 two-way trips on Highfield.

7.2.5 This level of pedestrian activity would therefore benefit substantially (in terms of safety and comfort) from a signalised formal crossing of Oxhey Lane and improvements to Carpenders Avenue, which are referred to in **Sections 4** and **5**.

7.3 Cycling Impact

7.3.1 A cycle isochrone plan is shown at **Figure 5.1**, an extract of which is shown at **Image 5.4.** This helps visualise where future residents may be able to cycle to within a 5km cycle of the site.

7.3.2 **Figure 5.1** shows that all of Carpenders Park and South Oxhey are well within a short cycling distance of the site, and large parts of Watford, Harrow and Pinner are accessible within a 5km distance. These areas support numerous employment, leisure and shopping centres and therefore it is likely that cycling trips will be towards these areas.

7.3.3 It is likely that most cycle journeys will route along Carpenders Avenue upon exiting the site. For journeys north towards Watford it is likely that the most journeys will travel under the railway and head north on the shared footway/cycleway on the eastern side of Prestwick Road which is part of the Watford Priority Cycle Route 6. This provides a direct route into Bushey and Watford where it connects to other parts of the wider cycle network in the Watford area.

7.3.4 There is limited cycle provision south of the site and therefore southbound journeys towards London will likely be via the A4008.

7.3.5 Overall, the number of cycling trips across the network is not expected have a discernible impact on the local highway network.

7.4 Public Transport Impact

7.4.1 As the vision sets out, it is expected that 5% of car driver trips for work purposes will become public transport trips within 5 years of occupation of the development. As set out in Table 6.7, the development could generate 53 two-way public transport trips in the morning peak hour and 36 two-way public transport trips in the evening peak hour.

7.4.2 Public transport trips from the site will mostly make use of the Lioness line services from Carpenders Park Overground station, due to its regular services to key destinations. In comparison, the local bus services are much less frequent and serve fewer destinations.

7.4.3 It is anticipated that Greater London and Watford will be the biggest attractors when it comes to public transport trips. Northbound trips are expected to be popular as it provides an under ten-minute journey time to central Watford. Comparatively, there is a vast range employment and leisure opportunities to the south within Greater London, but at a further distance.

7.4.4 It is therefore assumed that around 40% of public transport users will head north to Watford and 60% will head south to Greater London. This would be the equivalent of up to 32 two-way trips to/from the south on public transport, and 22 two-way trips to the north during the network peak hours. Assuming all by Overground with 8 services in both directions to and from London across the peak hour this would equate to an increase of 4 passengers per train. This would have no discernible impact on the existing services.

7.5 Traffic Impact

7.5.1 The vehicle trip generation of the development with and without vision scenarios are summarised in Table 6.9. The trip generation scenarios have been applied to the background traffic growth detailed in the following paragraphs.

Background Traffic Growth

7.5.2 TEMPro 8.1 has been used to find the growth rate for the background traffic for the Three Rivers 010 MSOA. A target opening year of 2030 has been used to obtain the growth rates, the AM and PM peak hour growth rates are shown below:

- AM Peak: 1.0171
- PM Peak: 1.0297

7.5.3 A thorough review of the TRDC and WBC planning portals was undertaken to obtain any relevant consented or undetermined planning applications in the local area whose traffic impacts would need to be considered alongside the proposed development. No relevant applications were found, and all additional traffic is assumed to be included within the TEMPro growth rates.

7.5.4 The 2030 without development traffic flows are shown on Traffic Flow Figures 3 and 4.

Distribution of Development traffic

7.5.5 The likely journey purpose for the generated car driver peak hour trips has been determined using data derived from TEMPro v8.1 which uses the National Travel Survey from 2023 for Three Rivers 010 MSOA. The proportion of peak hour trips by journey purpose by car is presented in Table 7.2.

Table 7.2: Proportion of Peak Hour Trips by Journey Purpose (Car Driver Only)

Trip Purpose	Morning Peak (08:00 – 09:00)	Evening Peak (17:00 – 18:00)
Commuting / Business	67%	48%
All Other Journey Purposes	33%	52%
Total	100%	100%

Source: TEMPro 8.1 Journey Purpose – Three Rivers 010

7.5.6 Traffic distribution will therefore be based on 67% of the total morning peak vehicular trips being for employment journeys with the remaining 33% assumed to be for all other purposes, including education, shopping, leisure and personal business trips. For the evening peak period, it is assumed that 48% vehicular trips will be for employment purposes, the remaining 52% would be for all other journey purposes.

7.5.7 In order to provide an accurate assessment of the likely distribution of traffic from the site, separate methodologies have been applied to consider the destinations of commuting and business trips to other trip purposes:

- For commuting and business trips, the National Census 2011 Journey to Work statistics (for car drivers) for the Three Rivers 010 Super Output Area – Middle Layer have been used. These identify the location of existing resident's employment locations and so identify existing commuting patterns; and
- For other journey purpose trips, a P/T2 gravity model has been undertaken using the population of key urban areas (from the 2021 Census) within a 30-minute drive from the site (estimated from Google Maps Directions facility).

7.5.8 The distribution of residential trips to both employment and non-commuter (other journey purpose) destinations is presented in **Table 7.3**.

Table 7.3: Distribution of Residential Trips

Destination	Employment Trips %	Non-Commuter Trips %
Borehamwood	2.1%	1.9%
Carpenders Park / South Oxhey	7.1%	33.7%
Harrow / Stanmore / Pinner	13.0%	19.8%
Hemel Hempstead	3.3%	3.0%
Hendon / Edgware	4.3%	3.6%
Northolt	3.3%	1.4%
Rickmansworth	8.2%	1.5%
Ruislip / Uxbridge	7.5%	5.8%
St Albans	2.8%	2.3%
Watford	24.9%	24.5%
Wembley / Neasden	6.7%	2.5%
Other – London	6.2%	-
Other – North	3.0%	-
Other – South	2.9%	-
Other – East	3.8%	-
Other - West	0.9%	-
Total	**100.0%**	**100.0%**

Source: 2011 Census / 2021 Census & Consultants Calculations

7.5.9 The two sets of data are then combined using the proportion of peak hour trips by journey purpose by car presented in **Table 7.3**.

Assignment of Development traffic

7.5.10 The estimated traffic generation from the site has been assigned onto the local network to/from the destinations identified in **Table 7.4**.

7.5.11 To determine the routing of trips to these destinations, trips were assigned to the road network based on the quickest route from the site to the destination location using the Google Maps 'Directions' facility. Within this facility, a start time for journeys of 08:00 on a neutral weekday was used to ensure that peak period traffic conditions were reflected.

7.5.12 The distribution and assignment assumptions are shown at **Appendix J**.

7.5.13 The traffic flows for the proposed development in the morning and evening peak hours are shown illustratively on Traffic Flow Figures 5 and 6 for the without vision, and Traffic Flow Figures 7 and 8 with vision. In summary, the following development vehicle traffic assignment has been calculated:

- 40% route via A4008 Oxhey Lane (north)
- 47% route via A4008 Oxhey Lane (south)
- 13% route via Carpenders Avenue

7.5.14 The assigned development traffic flows have been added to the 2030 baseline scenarios to create 2030 with development scenarios. The traffic flows for each scenario are shown below:

- 2030 with development without Vision - Traffic Flow Figures 9 and 10
- 2030 with development with Vision - Traffic Flow Figures 11 and 12

7.6 Operational Assessments

7.6.1 Using the peak hour vehicle trip generation within **Table 7.2** and the distribution and assignment assumptions outlined above, the following future year scenarios have been assessed:

- 2030 with development – *without vision*
- 2030 with development – *with vision*

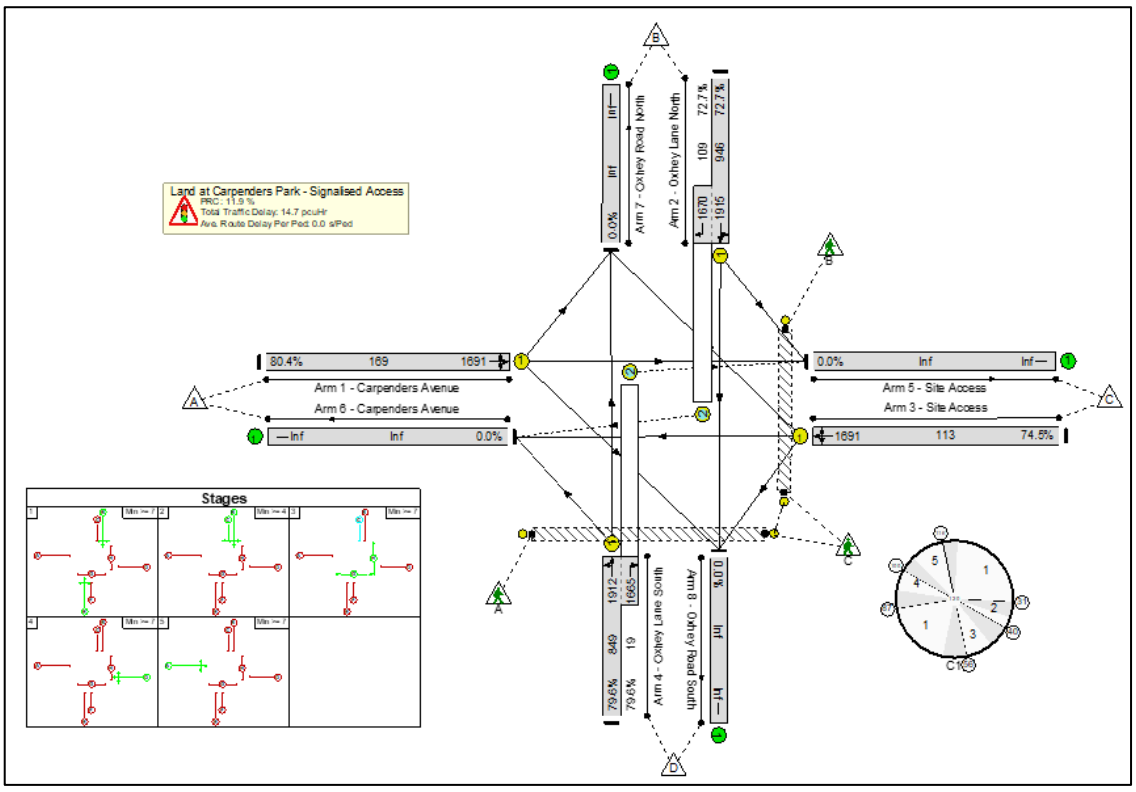
7.6.2 **Table 3.6** in Section 3 provided a summary of the existing operation of the Oxhey Lane / Carpenders Avenue priority junction. It demonstrates that the existing junction works well within operational capacity with the 2024 observed flows, with minimal delays and queueing.

7.6.3 The proposed signalised site access junction has been assessed in the two future year scenarios. The industry standard LinSig software was used to model the proposed signalised site access junction.

7.6.4 The signalling has been optimised to minimise queues on the southern arm of Oxhey Lane whilst also ensuring all arms of the junction operate within theoretical capacity.

7.6.5 A diagram of the model and stages is shown in **Image 7.1**.

Image 7.1: LinSig Junction Model Diagram



Source: LinSig

Oxhey Lane / Carpenders Avenue / Site Access signalised junction – 2030 with Development *without Vision* scenario

7.6.6 The proposed signalised junction has been assessed in the 2030 with development *without vision* scenario. A summary of the outputs is shown in **Table 7.4,** and the full results of the modelling outputs are shown in **Appendix K**.

Table 7.4: Proposed Site Access Operational Assessment - Without Vision

Arm	Degree of Saturation (DoS)	Mean Max Queue (PCU)	Average Delay Per PCU (Seconds/PCU)
Morning Peak Hour (08:00 – 09:00)			
Carpenders Avenue Left / Ahead / Right	80.4%	6.3	101.8
Oxhey Lane North Left / Ahead / Right	72.7%	12.1	17.0
Site Access Left / Ahead / Right	74.5%	4.1	112.3
Oxhey Lane South Left / Ahead / Right	79.6%	11.8	23.8
Evening Peak Hour (17:00 – 18:00)			
Carpenders Avenue Left / Ahead / Right	77.1%	5.5	99.5
Oxhey Lane North Left / Ahead / Right	72.9%	11.6	16.4
Site Access Left / Ahead / Right	36.2%	1.6	78.3
Oxhey Lane South Left / Ahead / Right	75.7%	10.4	21.3

Source: LinSig and Consultant Inputs

Note: Development PCU assumes: car – 1.0 PCU, HGV – 2.3 PCU

7.6.7 **Table 7.4** demonstrates that the proposed access junction operates well within theoretical capacity in the '*without vision*' development scenario. On Oxhey Lane South the highest mean maximum queue (MMQ) occurs in the morning peak and is 12.1 PCU which is approximately 65m.

7.6.8 Given the required stopping sight distance requirements of Oxhey Lane (which is 52.3m as per 85th percentile speeds at the crest of the hill), the MMQ is sufficiently short so as to allow vehicles to reach the crest of the hill and have enough forward visibility and time to slow down to join the back of the queuing traffic. This is shown in drawing **ITL200107-GA-005.**

7.6.9 The highest DoS would be experienced on the Carpenders Avenue arm of the junction, with a DoS of up to 80.4%, although would only result in a MMQ of 6.3 PCUs. However, the cycle time is sufficient such that all queuing vehicles should clear in one light cycle.

7.6.10 Therefore, in the *without vision* development scenario, the traffic impact of the proposed development at the proposed site access junction would not be severe.

Oxhey Lane / Carpenders Avenue / Site Access signalised junction – 2030 with Development *with Vision* scenario

7.6.11 The proposed signalised junction has also been assessed in the 2030 with development *with vision* scenario. A summary of the outputs is shown in **Table 7.5,** and the full results of the modelling outputs are shown in **Appendix K**.

Table 7.5: Proposed Site Access Operational Assessment - With Vision

	Degree of Saturation	Mean Max Queue (PCU)	Average Delay Per PCU (Seconds/PCU)
Morning Peak Hour (08:00 – 09:00)			
Carpenders Avenue Left Ahead Right	79.9%	6.2	100.8
Oxhey Lane North Left Ahead Right	72.6%	11.8	17.0
Site Access Left Ahead Right	64.7%	3.3	97.9
Oxhey Lane South Left Ahead Right	79.4%	11.6	23.8
Evening Peak Hour (17:00 – 18:00)			
Carpenders Avenue Left Ahead Right	76.6%	5.4	98.6
Oxhey Lane North Left Ahead Right	72.7%	11.6	16.3
Site Access Left Ahead Right	34.4%	1.5	77.6
Oxhey Lane South Left Ahead Right	75.5%	10.4	21.3

Source: LinSig and Consultant Inputs

Note: Development PCU assumes: car – 1.0 PCU, HGV – 2.3 PCU

7.6.12 **Table 7.5** demonstrates that the proposed access junction operates slightly better in the *with Vision* scenario. On Oxhey Lane South, the mean maximum queue (MMQ) is at its highest in the AM peak with 11.6 PCU which is approximately 65m.

7.6.13 Given the required stopping sight distance requirements of Oxhey Lane (which is 52.3m as per 85th percentile speeds at the crest of the hill), the MMQ is sufficiently short so as to allow vehicles to reach the crest of the hill and have enough forward visibility and time to slow down to join the back of the queuing traffic. Again, this is shown in drawing ITL200107-GA-005.

7.6.14 The highest DoS would again be experienced on the Carpenders Avenue arm of the junction, with a DoS of up to 79.9%, resulting in a MMQ of 6.2 PCUs. However, as before, the cycle time is sufficient to clear queuing traffic.

7.6.15 Therefore, similar to the without vision scenario, the traffic impact of the proposed development at the proposed site access junction in the development with vision scenario would not be severe.

7.6.16 This can also be seen in **Table 7.6** which shows the percentage impact of the Oxhey Lane.

Table 7.6: Percentage Impact of Development Flows on Oxhey Lane

Link	AM Peak % Impact		PM Peak % Impact	
	Without Vision	With Vision	Without Vision	With Vision
Oxhey Lane North	6.4%	5.6%	5.8%	5.5%
Oxhey Lane South	8.1%	7.1%	8.4%	7.9%

Source: Consultant Estimates

7.6.17 It is clear, therefore, that the given the percentage impact on the surrounding roads is minimal that the impact of the development would not be severe as per the fourth test of the NPPF.

7.7 Summary

7.7.1 Walking, cycling and public transport trips have been distributed and assigned onto the local transport network, with minimal impact expected.

7.7.2 The proposed access junctions has been modelled using LinSig. The model has been optimised such that Oxhey Lane was given priority as it carries the dominant traffic flowsthrough the junction. The proposed signalised junction works well within theoretical capacity in both the development *without vision* and development *with vision* scenarios.

7.7.3 The percentage impact of the development on A4008 Oxhey Lane is below 10% in both directions.

7.7.4 This demonstrates that the traffic impact of the proposed development would not be severe and will fall well below the high bar test of the NPPF.

SECTION 8 Summary and Conclusions

8.1 Summary

8.1.1 Burlington Property Group has appointed i-Transport LLP to provide highway and transport advice with regard to a proposed residential development on Land east of Oxhey Lane, Carpenders Park. The proposed development would provide 257 homes, housing with care and a Children's home.

8.1.2 The NPPF identifies four key transport tests, which can be summarised as follows:

- Are sustainable transport modes prioritised, taking account of the vision for the site?
- Will safe and suitable access be provided?
- Will the site layout comply with design guidance?
- Will the transport impacts be acceptable?

8.1.3 These tests are reflected in Hertfordshire's and Three Rivers local planning policy. The transport acceptability of the development proposal has been assessed against these tests within this TA. HCC LTP4 sets out at Policy 5(f) that new site accesses onto the primary/main distributor roads will not be accepted unless under special circumstances. However, this policy must be taken in the context of the NPPF, whereby developments should be assessed against the four key tests as noted above.

8.1.4 The site is located on the eastern side of Carpenders Park, with site frontage along A4008 Oxhey Lane. There are good opportunities for walking and cycling close to the site with Carpenders Park identified as a core walking zone in the Watford and TRDC LCWIP. Carpenders Park (and South Oxhey) offer a wide range of local facilities and services within a comfortable walking and cycling distance from the site with all daily essentials being present.

8.1.5 The site is located approximately 1,050m from Carpenders Park Overground Station which is served by the Lioness Line, providing frequent services between Watford and London Euston Station.

8.1.6 A4008 Oxhey Lane is categorised as a P2/M2 road within HCC design and movement matrix, although evidence suggest that it could also be categorised as a P1/M2.

8.1.7 Traffic surveys undertaken in November 2024 demonstrated that 85th percentile speeds on Oxhey Lane varied between 34.4mph to 41.3mph, generally below the speed limit of 40mph. Traffic volumes are circa 1,250 vehicles two way during the weekday peak hours, with around 17,000 vehicles across an entire day.

8.1.8 There are no existing highways safety concerns on the surrounding road network with only four isolated accidents having occurred within the past five years. Only one involved a cyclist with no pedestrian injury accidents and no fatal accidents. The safety record reflects the road environment which is principally residential, with footways, street lighting, low vehicles numbers and speeds.

8.1.9 The proposed development would comprise 257 residential dwellings and housing with care (60 units) and a children's home, with landscaping and associated infrastructure on land to the east of Oxhey Lane. The application is in outline however an expected layout is shown on the illustrative masterplan with the final layout guided by parameter plans including an Access and Movement Plan. The Access and Movement plan will guide the pedestrian and cycle infrastructure providing for safe, direct and convenient routes for pedestrians and cyclists across the site. These would connect to the existing wider network providing the opportunity for a substantial proportion of journeys to the existing services and facilities within Carpenders Park to be undertaken by these modes.

8.1.10 A signalised crossroad junction arrangement with Oxhey Lane and Carpenders Avenue is proposed to access the site. This arrangement would provide improved crossing of Oxhey Lane for pedestrians, providing a signalised crossing and along pedestrian desire lines towards Carpenders Avenue.

8.1.11 Data from the NTS shows that the leisure, shopping and education trips account for approximately 58% of all trips undertaken, whereas commuting and business trips account for around a further 18% of all trips undertaken. The site is well located to a large range of everyday services and facilities in Carpenders Park and South Oxhey providing the opportunity to prioritise short trips by active travel modes. Similarly, the London Overground is located within walking distance providing the opportunity to prioritise sustainable travel with regular services to key workplace and leisure destinations in Watford, Harrow, Wembley and central London. As part of the LCWIP improvements to pedestrian routes along Carpenders Avenue have been identified which would the attractiveness of walking along this key route contributing towards the prioritisation of active travel to and from the development. The Applicant is willing to make a suitable contribution towards the delivery of these improvements.

8.1.12 The proposed development would implement a Travel Plan to identify opportunities for the promotion and delivery of sustainable transport initiatives in connection with the site. The Travel Plan includes a series of measures to influence modal choice including a Resident's Welcome Pack.

8.1.13 A combination of TRICS and TEMPro has been used to provide an accurate and robust multi-modal trip generation for the proposed development. The TEMPro dataset makes use of the National Travel Survey data (from 2023) and provides peak period modal split data for the district level.

8.1.14 The transport vision for the site is to reduce the number of vehicle trips to and from local schools in favour of active travel and reduce the number of vehicle trips to and from the site for commuting purposes in favour of public transport. Ultimately, the target is to roughly reduce the number of vehicle trips by 10% across the combined network peak hours. Two proposed development scenarios are assessed for the proposed development, including the development *without vision,* and the development *with vision*.

8.1.15 The development *without vision* for the site would mean that there will be 111 and 112 two-way vehicle trips in the morning and evening peaks (respectively), equivalent to roughly two extra vehicle every 50 seconds. This is a relatively modest increase in traffic flows given the scale of the development

8.1.16 The development *with vision* for the site would mean that there will be 98 and 106 two-way vehicle trips in the morning and evening peaks (respectively), equivalent to roughly one extra vehicle every 45 seconds. This is a relatively modest increase in traffic flows given the scale of the development.

8.1.17 Walking, cycling and public transport trips have been distributed and assigned onto the local transport network, with minimal impact expected. The proposed access junctions has been modelled using LinSig. The model has been optimised such that Oxhey Lane was given priority as it carries the dominant traffic flows through the junction. The proposed signalised junction works well within theoretical capacity in both the development *without vision* and development *with vision* scenarios. This demonstrates that the traffic impact of the proposed development would not be severe.

8.2 Conclusion

8.2.1 Against this background, it is demonstrated that:

- Sustainable transport modes will be prioritised with a range of local facilities within walking and cycling distance, and access to frequent public transport services to key commuting and leisure destinations. The site access strategy and infrastructure proposed to be delivered by the proposed development will ensure that sustainable modes of travel, particularly walking and cycling, are prioritised across the site, connecting to improvements to the wider network.
- The proposed access arrangements are safe and suitable for all users, with two dedicated pedestrian and cycle accesses in addition to the main access;
- Although in outline, the site layout will be guided by the Movement & Access parameter plan and thus designed to reflect national guidance;
- Impacts from the development on the transport network are not significant in terms of capacity, congestion and highway safety and fall well below 'severe'

8.2.2 Therefore, based on the above, it is concluded that the proposed development meets the four key tests of the NPPF and is fully acceptable in highways and transport terms.

FIGURES

i-Transport

Land at Carpenders Park

Figure 1.1: Site Location Plan | ITL200107

Key

Site Boundary

Oxhey Lane (A4008)

Carpenders Avenue

0 0.45 0.9 km

i-Transport

Land at Carpenders Park

Figure 3.1: Local Facilities Plan | ITL200107

Key

- Site Boundary
- Bus Stop
- Carpenders Park Overground Station

Leisure

- L1 Roots Hairdresser
- L2 Absolute health & beauty
- L3 Pizza Delight
- L4 Green Park Play Area
- L5 Carpenders Park Garden Centre
- L6 The Partridge Pub
- L7 Carpenders Park Community Hall
- L8 Carpenders Park Skate and BMX Park
- L9 Oxhey Library
- L10 South Oxhey Leisure Centre
- L11 South Oxhey Choir
- L12 South Oxhey Family Centre
- L13 Grims Dyke Golf Club

Education

- E1 Little hearts pre-school
- E2 St. Meryl School
- E3 Warren Dell Primary School
- E4 Colnbrook School
- E5 Oxhey Wood Primary School
- E6 St. Joseph's Primary School

Retail

- R1 Carpenders Park Sub Post Office
- R2 L Cook Florist
- R3 Co-op Food
- R4 Nisa Local
- R5 Tesco Express
- R6 Lidl

Healthcare

- H1 DB Jones Pharmacy
- H2 Viks Pharmacy
- H3 Esom's Pharmacy
- H4 Manor View Practice at South Oxhey
- H5 Dale Pharmacy

Catchments

- 0.8 km
- 1.6 km
- 3.2 km

0 0.7 1.4 km

i-Transport

Land at Carpenders Park

Figure 5.1: Cycling Catchment Plan | ITL200107

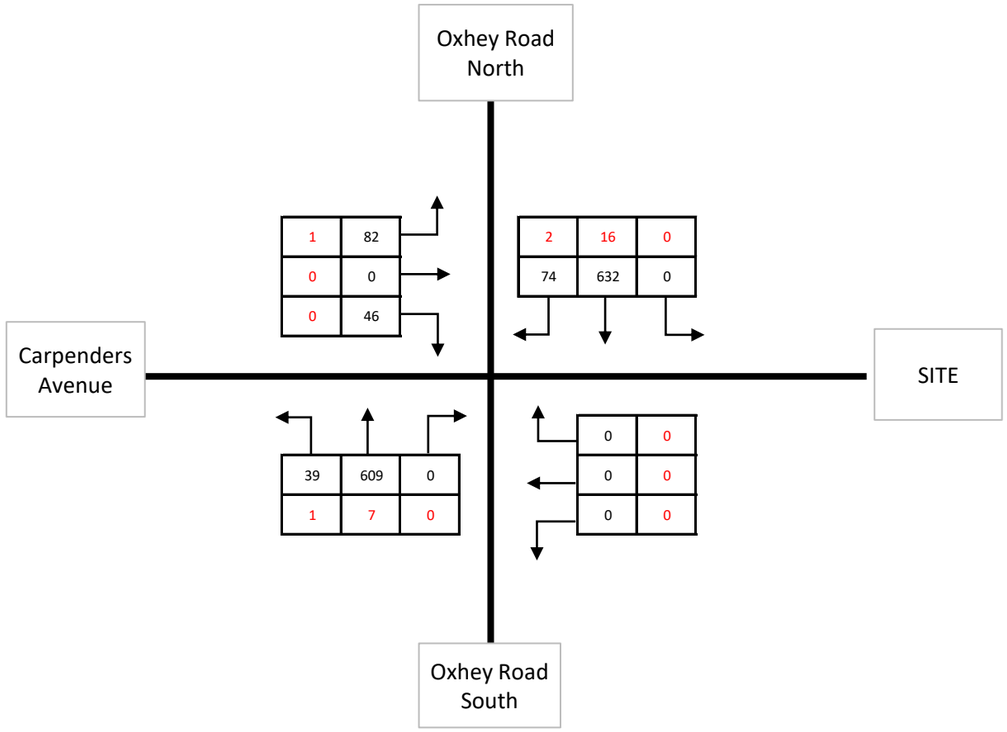
Key

Site Boundary

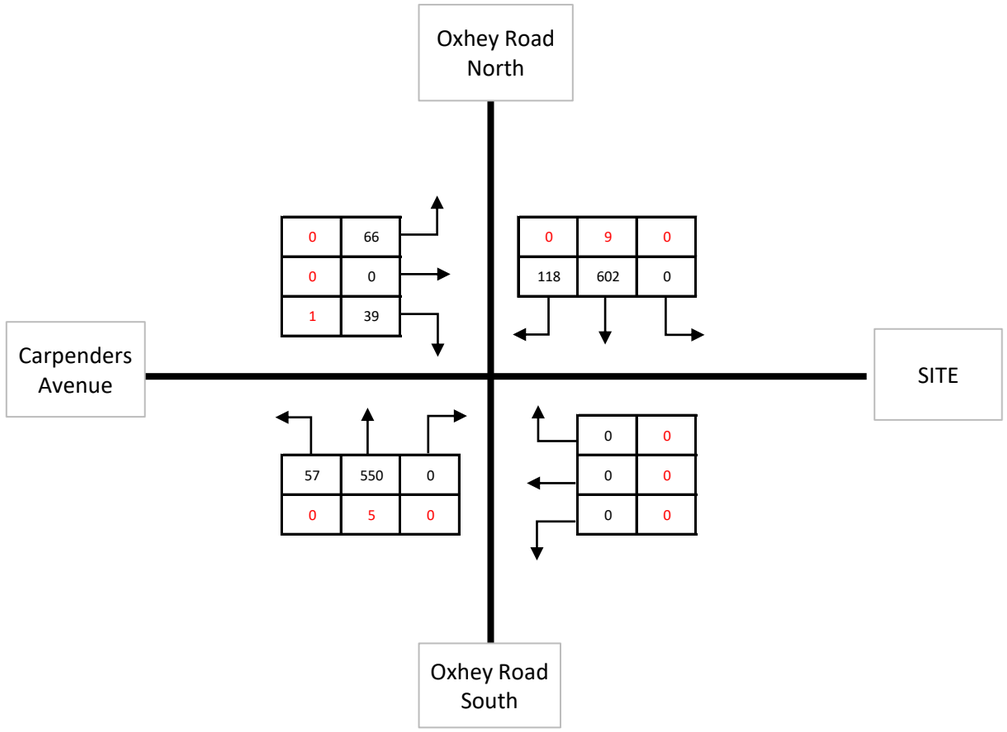
Cycling Isochrone

5km

0 2 4 km



i-Transport	33 Queen Street, London EC4R 1AP www.i-transport.co.uk	KEY 500 = TOTAL VEHICLES 25 = HGVs
Land at Carpenders Park		
TFD 1		
2024 Observed Traffic Flows - AM Peak Hour (0800 - 0900)		



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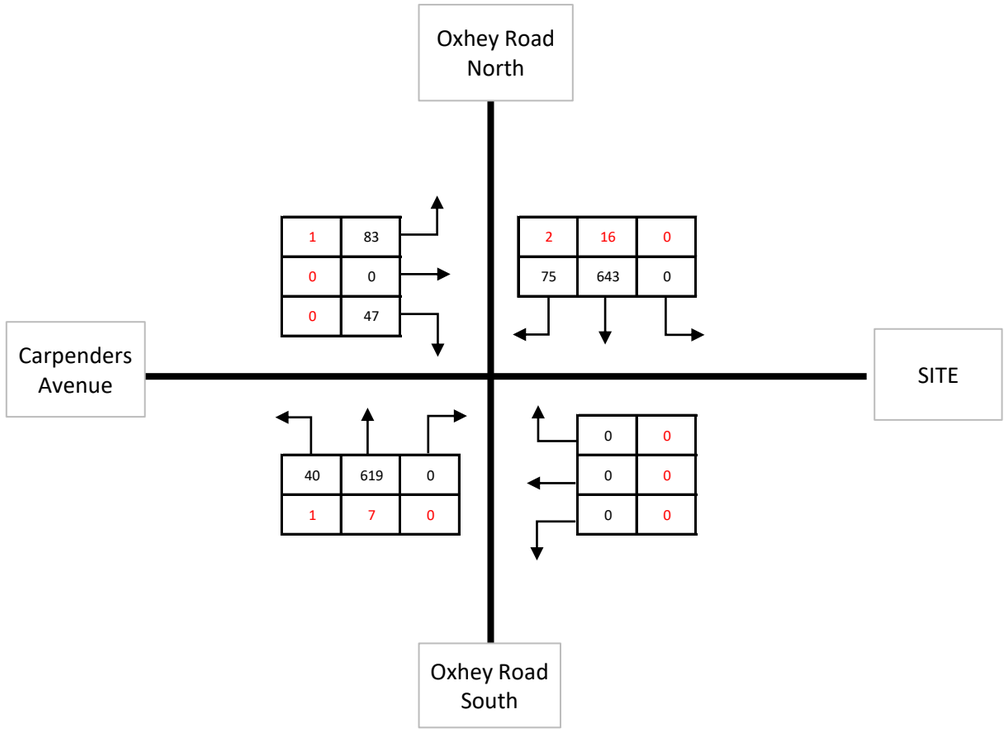
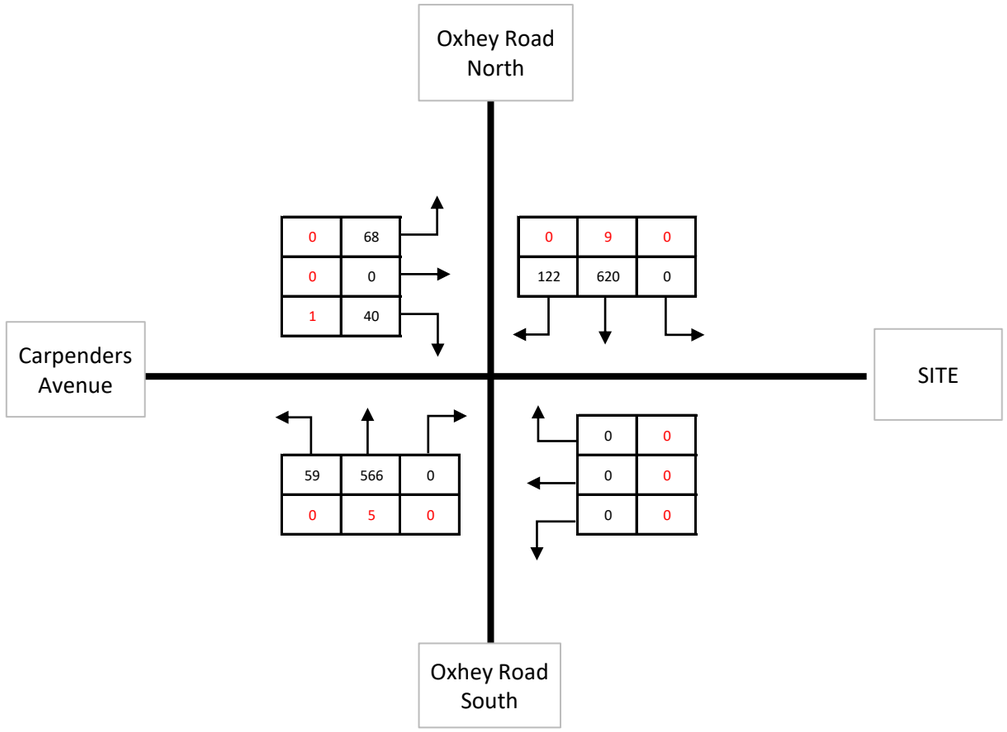
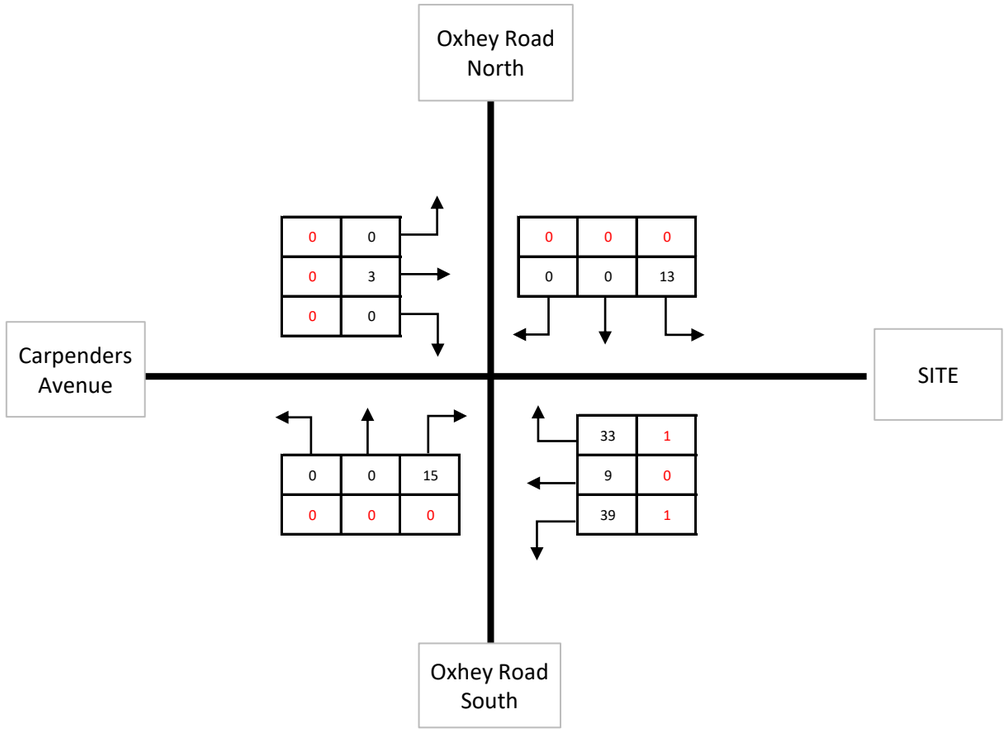
Land at Carpenders Park		500 = TOTAL VEHICLES
TFD 2		25 = HGVs
2024 Observed Traffic Flows - PM Peak Hour (1700 - 1800)		



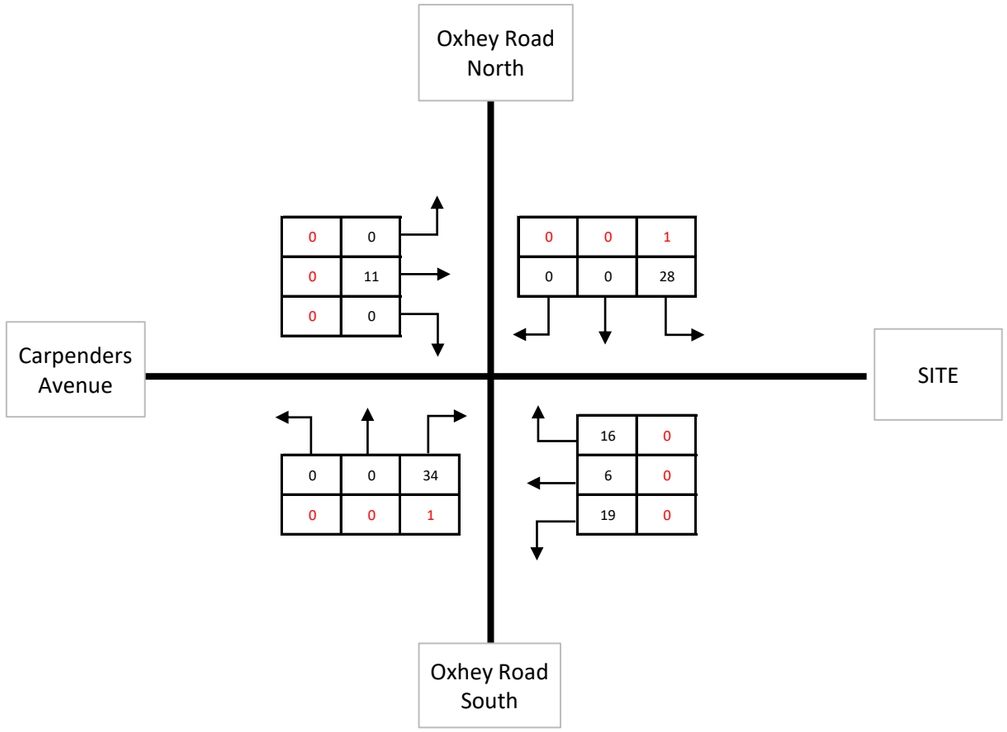
i-Transport	33 Queen Street, London EC4R 1AP www.i-transport.co.uk	KEY 500 = TOTAL VEHICLES 25 = HGVs
Land at Carpenders Park		
TFD 3		
2030 "without development" Traffic Flows - AM Peak Hour (0800 - 0900)		



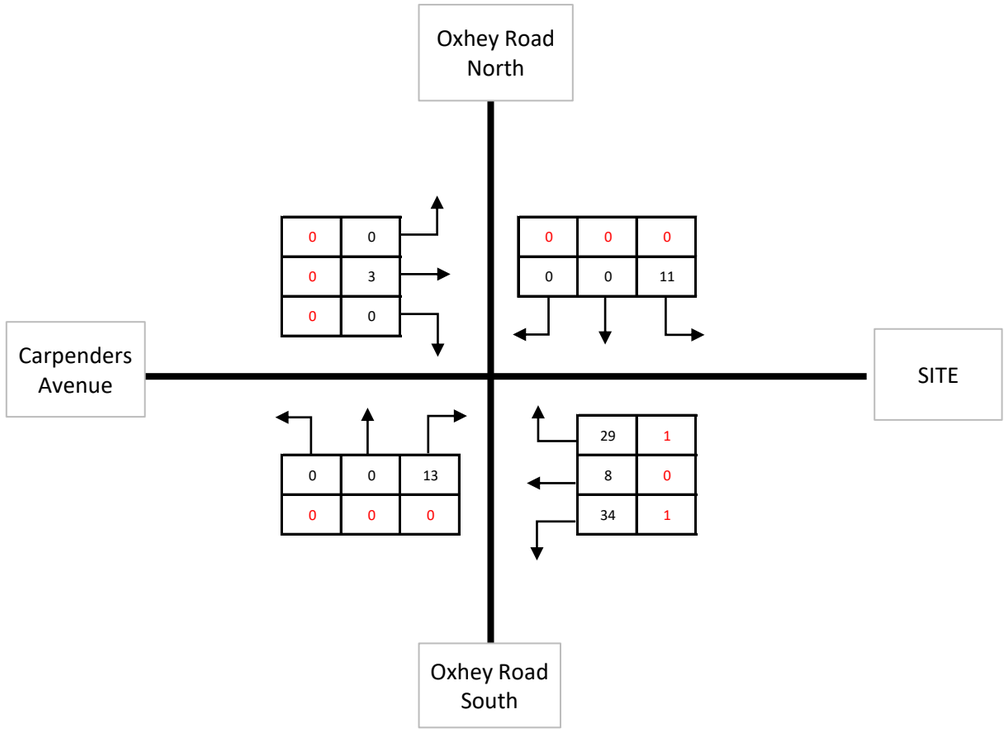
i-Transport	33 Queen Street, London EC4R 1AP www.i-transport.co.uk	KEY
Land at Carpenders Park		500 = TOTAL VEHICLES
TFD 4		25 = HGVs
2030 "without development" Traffic Flows - PM Peak Hour (1700 - 1800)		



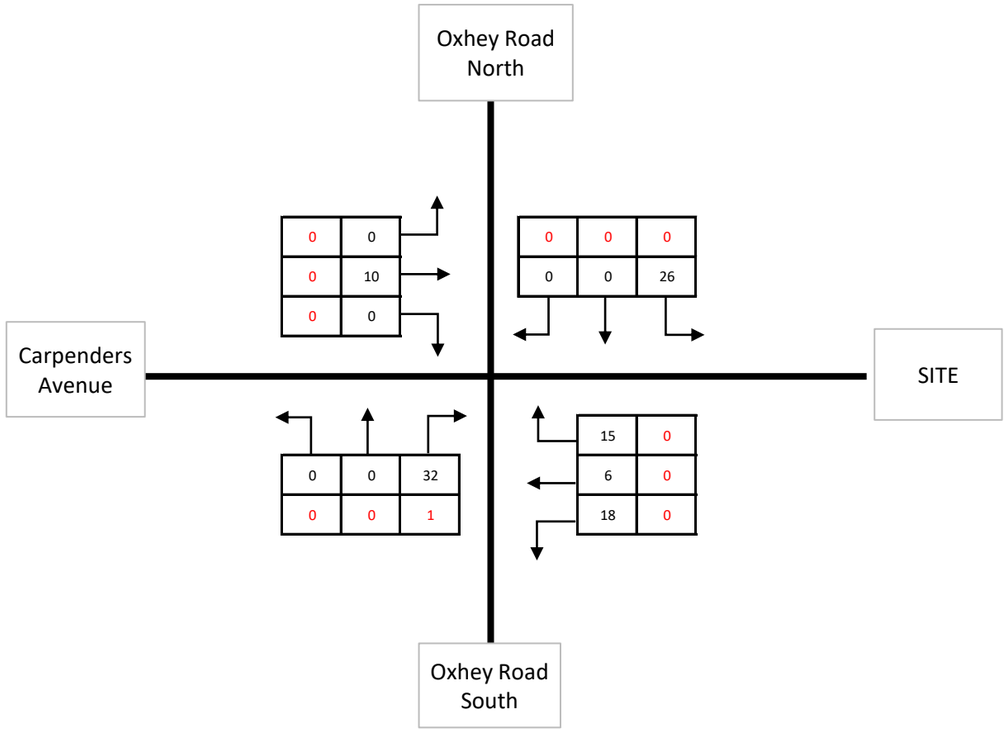
i-Transport	33 Queen Street, London EC4R 1AP www.i-transport.co.uk	KEY 500 = TOTAL VEHICLES 25 = HGVs
Land at Carpenders Park		
TFD 5		
Total Development - without Vision AM Peak Hour		



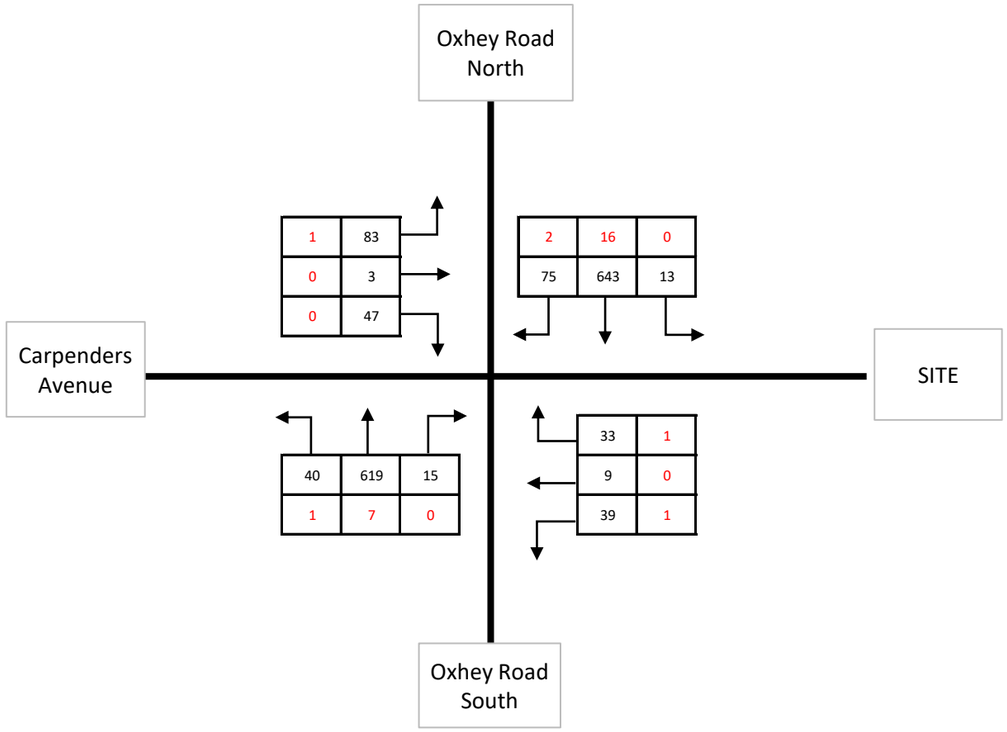
i-Transport	33 Queen Street, London EC4R 1AP www.i-transport.co.uk	KEY 500 = TOTAL VEHICLES 25 = HGVs
Land at Carpenders Park		
TFD 6		
Total Development - without Vision PM Peak Hour		



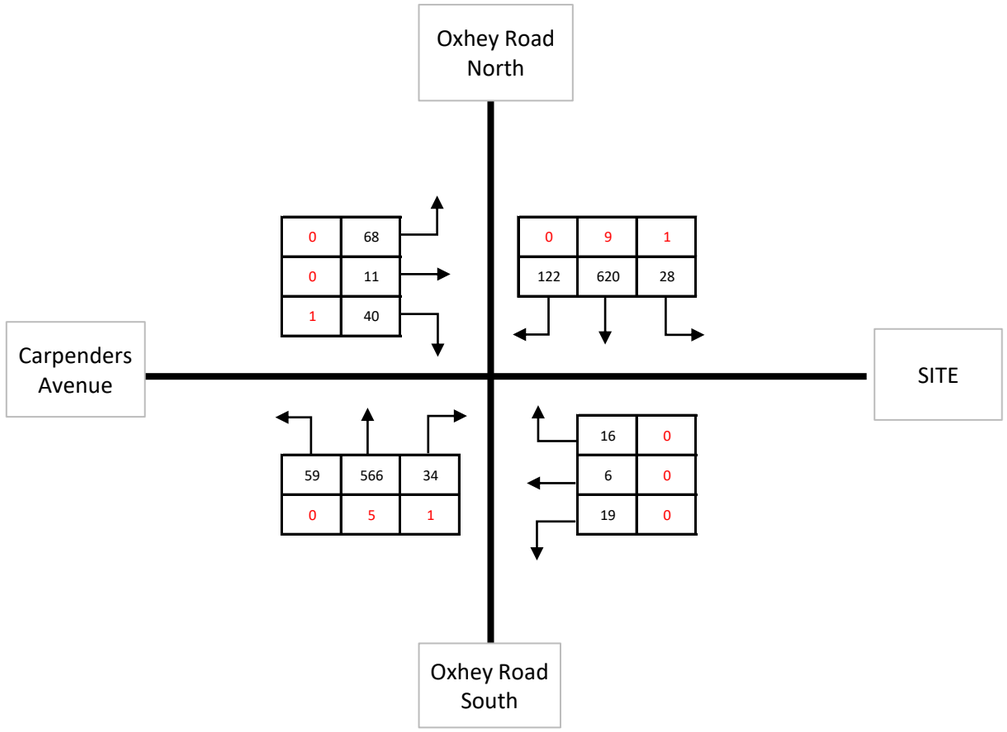
i-Transport	33 Queen Street, London EC4R 1AP www.i-transport.co.uk	KEY
Land at Carpenders Park		500 = TOTAL VEHICLES
TFD 7		25 = HGVs
Total Development - with Vision AM Peak Hour		



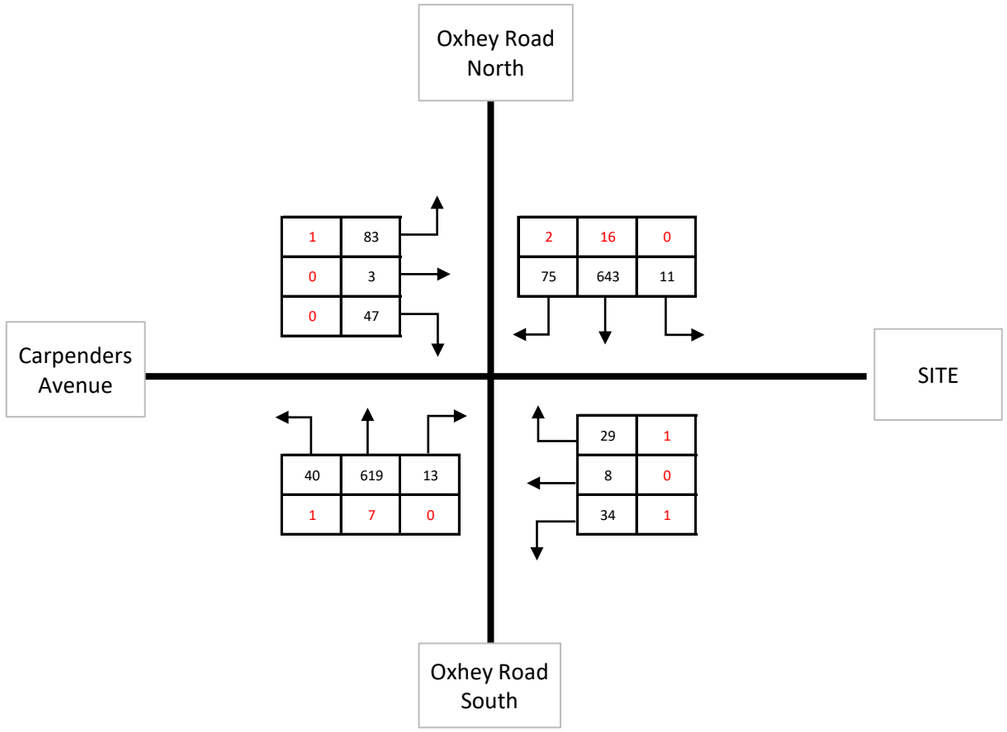
i-Transport	33 Queen Street, London EC4R 1AP www.i-transport.co.uk	KEY 500 = TOTAL VEHICLES 25 = HGVs
Land at Carpenders Park		
TFD 8		
Total Development - with Vision PM Peak Hour		



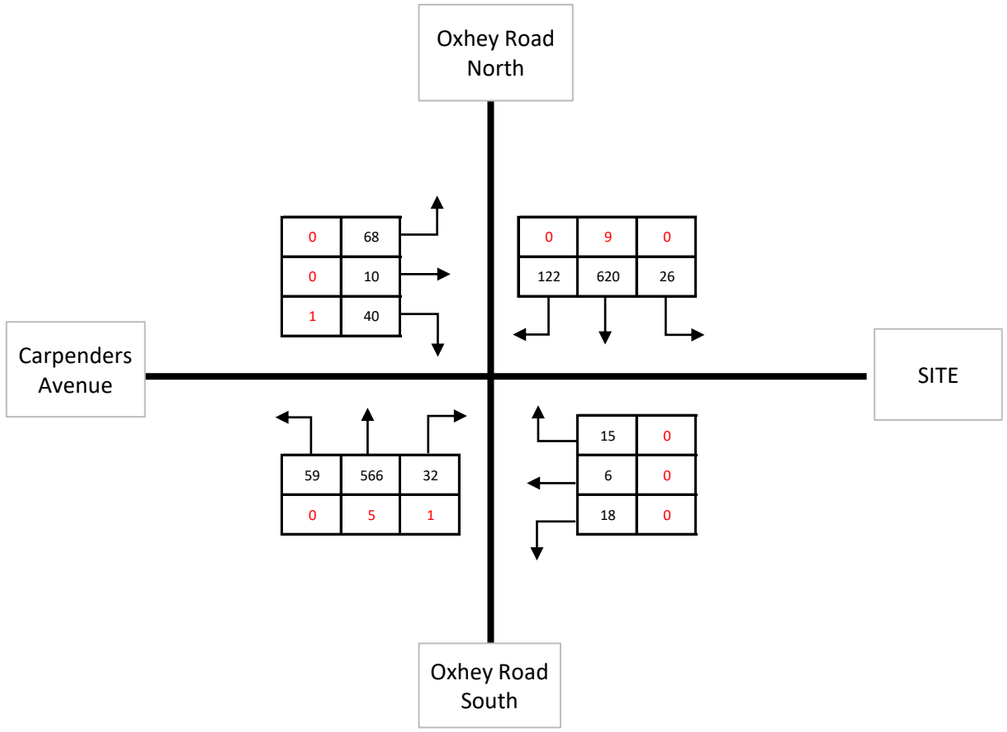
i-Transport	33 Queen Street, London EC4R 1AP www.i-transport.co.uk	KEY 500 = TOTAL VEHICLES 25 = HGVs
Land at Carpenders Park		
TFD 9		
2030 "with development + Carehome" Traffic Flows - AM Peak Hour (0800 - 0900) No Vision		



i-Transport	33 Queen Street, London EC4R 1AP www.i-transport.co.uk	KEY 500 = TOTAL VEHICLES 25 = HGVs
Land at Carpenders Park		
TFD 10		
2030 "with development + Carehome" Traffic Flows - PM Peak Hour (1700 - 1800) No Vision		



i-Transport	33 Queen Street, London EC4R 1AP www.i-transport.co.uk	KEY 500 = TOTAL VEHICLES 25 = HGVs
Land at Carpenders Park		
TFD 11		
(Vision) 2030 "with development + Carehome" Traffic Flows - AM Peak Hour (0800 - 0900)		



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Land at Carpenders Park		
TFD 12		
(Vision) 2030 "with development + Carehome" Traffic Flows - PM Peak Hour (1700 - 1800)		

DRAWINGS

48m VISIBILITY TO
PRIMARY SIGNAL HEAD

3.0m

3.0m

3.0m

2.0m WIDE FOOTWAY

43m VISIBILITY TO
PRIMARY SIGNAL HEAD

KEEP CLEAR

3.0m

INDICATIVE EARTHWORKS
(SLOPE 1:3)

PROPOSED PUFFIN CROSSING

3.0m

3.0m

2.0m WIDE FOOTWAY

EXISTING UNCONTROLLED CROSSING

52.3m VISIBILITY TO
PRIMARY SIGNAL HEAD

Cottage

The Oak

SCALE BAR @ 1:500

0 5 10 25 50

REV	DATE	BY	DESCRIPTION	CHK	APD
C	31.03.25	SH	ACCESS UPDATED	RW	PH
B	28.03.25	SH	SITE BOUNDARY HAS BEEN UPDATED	RW	PH
A	18.03.25	SH	PEDESTRIAN CROSSING UPDATED	RW	PH

CLIENT: BURLINGTON PROPERTY GROUP

STATUS: FOR INFORMATION

TITLE: PROPOSED SITE ACCESS ARRANGEMENT - SIGNALISED JUNCTION

PROJECT: LAND AT CARPENDERS PARK

DRAWN:	CHECKED:	APPROVED:
SH	PH	PH
PROJECT No:	SCALE @ A2:	DATE:
ITL200107	1:500	12.11.24
DRAWING No:		REV:
ITL200107-GA-002		C

i-Transport

33 Queen Street, London, EC4R 1AP Tel: 0204 531 3660

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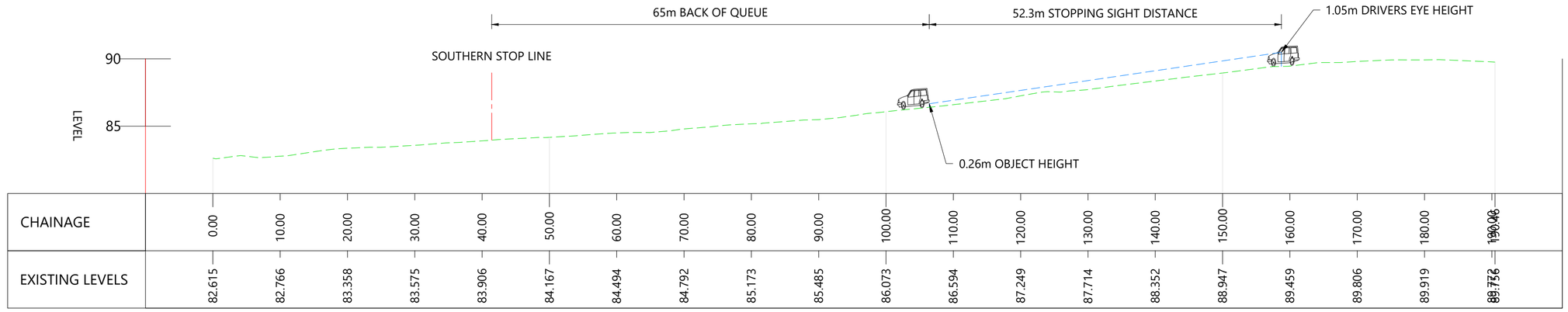
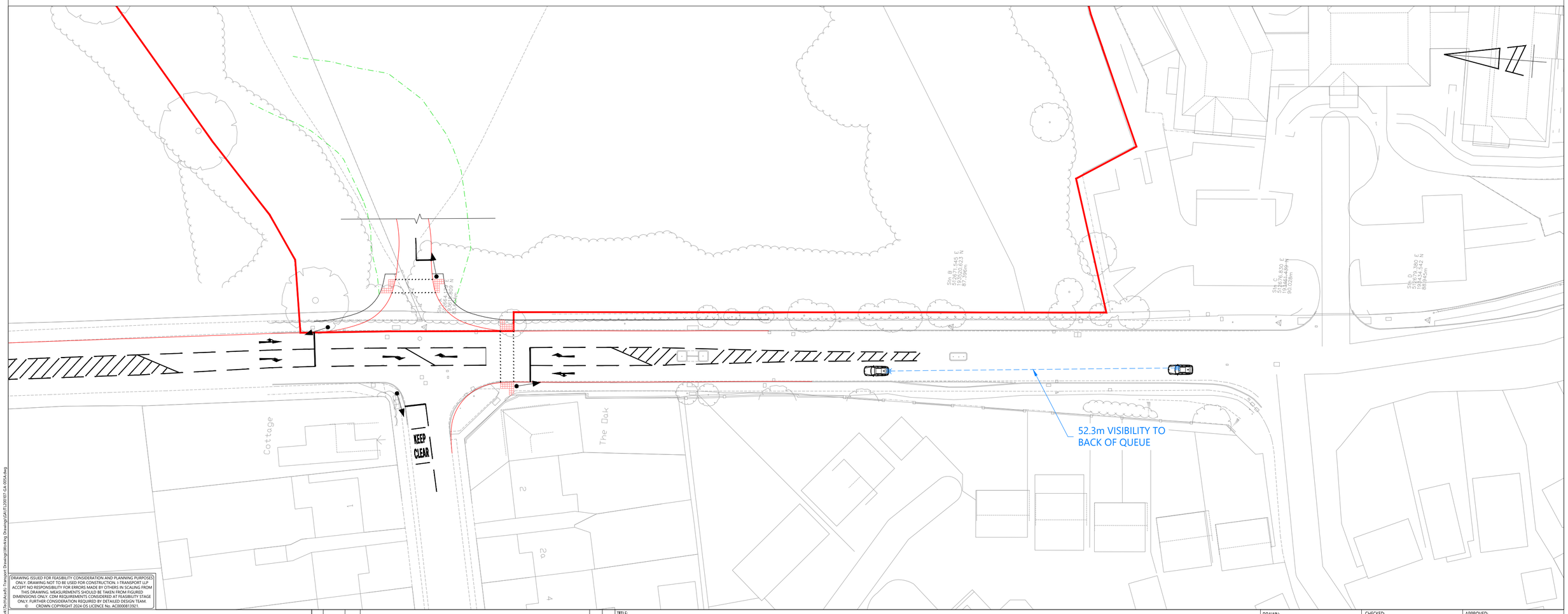
L:\PROJECTS\200000 SERIES\200107 - Land at Carpenders Park\Tech\Acad\i-Transport Drawings\Working Drawings\GA\ITL200107-GA-002C.dwg



EXISTING CARRIAGEWAY CENTRELINE - LONGSECTION
SCALE: H 1:1000,V 1:500. DATUM: 80.000

SCALE BAR @ 1:1000
0 10 25 50 100

SCALE BAR @ 1:500
0 5 10 25 50



DRAWING ISSUED FOR FEASIBILITY CONSIDERATION AND PLANNING PURPOSES ONLY. DRAWING NOT TO BE USED FOR CONSTRUCTION. I-TRANSPORT LLP ACCEPT NO RESPONSIBILITY FOR ERRORS MADE BY OTHERS IN SCALING FROM THIS DRAWING. MEASUREMENTS SHOULD BE TAKEN FROM FIGURED DIMENSIONS ONLY. CDM REQUIREMENTS CONSIDERED AT FEASIBILITY STAGE ONLY. FURTHER CONSIDERATION REQUIRED BY DETAILED DESIGN TEAM.

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REV	DATE	BY	DESCRIPTION	CHK	APD
A	28.03.25	TA	SITE BOUNDARY HAS BEE UPDATED	RW	PH

STATUS: FOR INFORMATION

TITLE: PROPOSED SIGNALISED CROSSING - VERTICAL VISIBILITY

PROJECT: LAND AT CARPENDERS PARK

CLIENT: BURLINGTON PROPERTY GROUP

DRAWN:	CHECKED:	APPROVED:
SH	RW	PH
PROJECT No:	SCALE @ A2:	DATE:
ITL200107	1:500	26.03.25
DRAWING No:		REV:
ITL200107-GA-005		A

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PROPOSED EMERGENCY ACCESS

REMOVABLE BOLLARD

B

3.7m

OXHEY LANE

A4008 Oxhey Lane

1No. overhead wire

dense foliage — no access

wp & mesh fence ht 2.20

wp & wire fence ht 1.20

wp & rail fence ht 1.30

foliage ht 4.0

foliage ht 3.0

brambles ht 0.6–1.0

Oak ø 1.20 ht 21.0

Field Maple ø 0.23 ht 8.0

Oak ø 0.75 ht 16.0

Sycamore multibole ht 8.0

Sycamore ø 0.40 ht 14.0

tarmac

grass

metal gate

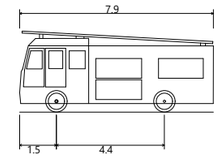
mh cl 81.52

mh cl 80.34

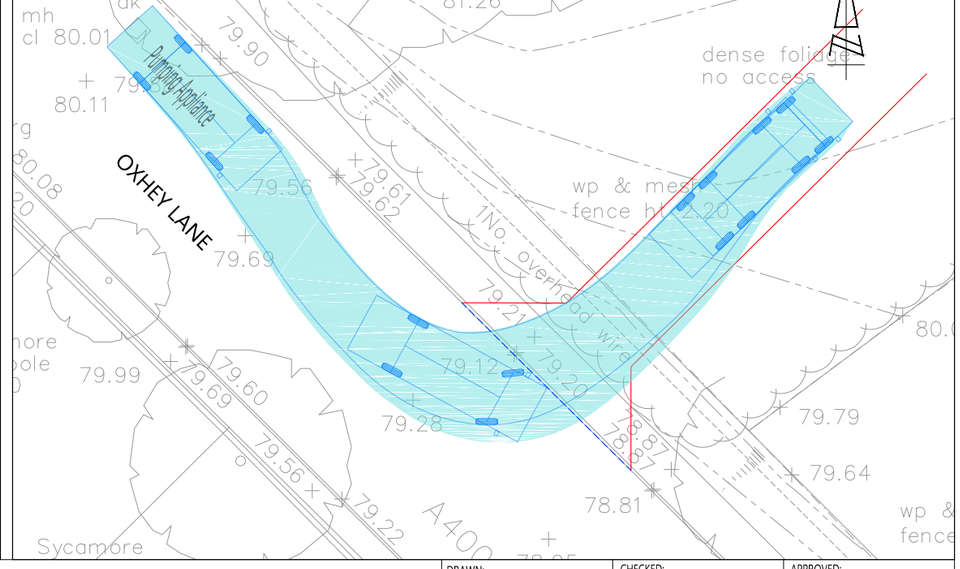
mh cl 80.01

canopy ht 8.0

bw ht 1.50



Pumping Appliance	
Overall Length	7.900m
Overall Width	2.500m
Overall Body Height	3.300m
Min Body Ground Clearance	0.350m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.750m



KEY:

- SITE BOUNDARY
- PROPOSED KERB
- PROPOSED DROPPED KERB
- B • PROPOSED REMOVABLE BOLLARD

SCALE BAR @ 1:250

0 1 2 5 10 25

i-Transport
33 Queen Street, London, EC4R 1AP
Tel: 0204 531 3660
www.i-transport.co.uk

REV	DATE	BY	DESCRIPTION	CHK	APD
A	28.03.25	TA	SITE BOUNDARY HAS BEEN UPDATED	RW	PH

STATUS: FOR INFORMATION

TITLE: EMERGENCY ACCESS ONTO OXHEY LANE

PROJECT: LAND AT CARPENDERS PARK

CLIENT: BURLINGTON PROPERTY GROUP

DRAWN:	CHECKED:	APPROVED:
TA	RW	PH
PROJECT No:	SCALE @ A3:	DATE:
ITL200107	1:250	28.03.25
DRAWING No:		REV:
ITL200107-GA-007		A

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APPENDIX A. Access Appraisal note

i-Transport LLP
33 Queen Street, London, EC4R 1AP

Tel: 0204 531 3660

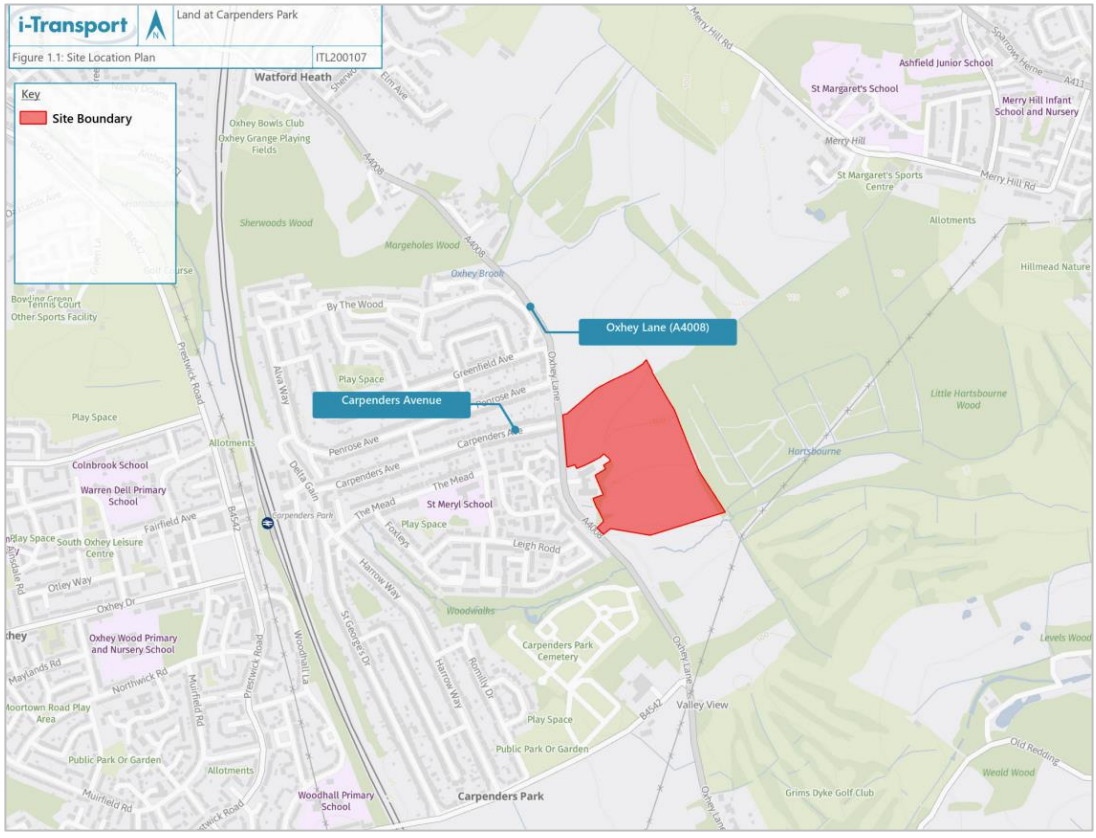
Land at Carpenders Park: Access Options Appraisal

Ref: PH/RW/ITL200107-001 TN
Date: 21 January 2025

SECTION 1 Introduction

1.1 Burlington Property Group has appointed i-Transport LLP to provide transport and highways advice with regard to a proposed residential development on Land east of Oxhey Lane, Carpenders Park. An extract of the site location is provided below.

Image 1.1: Site Location



1.2 The proposed development would provide circa 200-250 homes and an extension to the existing Carpenders Park Care Home. The final development proposals will be subject to pre-application discussions and will be confirmed in a forthcoming Transport Assessment, along with details of the indicative site layout and the wider transport implications.

1.3 This note sets out the potential access arrangements to the site, to inform pre-application discussion with Hertfordshire County Council (HCC) as the local highway authority and Three Rivers District Council (TRDC) as the local planning authority to enable an agreement in principle on a safe and suitable access.

1.4 This note includes detailed information about the design of the potential access and its compliance with prevailing design standards. Agreement is sought from HCC on the location, form and design of a suitable access arrangement.

SECTION 2 Access Appraisal

2.1 Existing Situation

2.1.1 The site is located on land to the east of Oxhey Lane, Carpenders Park. The site is bordered to the north, east and south by grassland, scrub and woodland, and to the west by A4008 Oxhey Lane and Carpenders Park Care Home. A public right of way (Footpath 013) routes east-west across the northern part of the site. The site rises quickly from Oxhey Lane with significant level differences across the site.

2.1.2 Oxhey Lane is a two-way carriageway and is subject to a 40mph speed limit. Along the northwestern frontage of the site, Oxhey Lane widens to provide a ghost-island right turns into Carpenders Avenue, Highfield, and the existing care home. Footways are present on both sides of the carriageway and there is regular street lighting. Oxhey Lane rises to the south of Carpenders Avenue, with the Carpenders Park Care Home situated at crest of the road.

Image 2.1: A4008 Oxhey Lane (looking south) along site frontage

Image 2.2: A4008 Oxhey Lane (looking north) along site frontage

2.1.3 Carpenders Park local centre can be accessed from the site via Carpenders Avenue. There is an uncontrolled pedestrian crossing circa 50m south of Carpenders Avenue providing an accessible connection between the site and the Carpenders Park local centre. All crossing points along Carpenders Avenue have dropped kerbs with no tactile paving.

Image 2.3: Carpenders Avenue junction with Oxhey Lane

2.1.4 Carpenders Avenue has a speed limit of 30mph and has a no waiting prohibition on vehicles over 5 tonnes during off peak periods (weekday evenings and weekends). It is residential in nature, with frequent dropped kerbs for driveways. There are no dedicated cycle facilities and provisions between the site and the centre of Carpenders Park apart from cycle parking within the local centre.

2.2 Traffic Speeds and Volumes

2.2.1 Automated Traffic Count (ATC) surveys were undertaken on Oxhey Lane between 24th November to 7th December 2024[1] at the three locations set out below and shown in Image 2.4.

- ATC 1 - South of Carpenders Avenue
- ATC 2 - Care Home access
- ATC 3 - South of Care Home

Image 2.4: ATC Locations

[1] ATC surveys were placed for two weeks due to ATC equipment being damaged during the first survey week. A full set of data for 11 survey days have therefore been obtained.

2.2.2 A summary of the observed traffic flow and traffic speed data is summarised in Table 2.1. The 85th percentile speed data has been calculated by excluding any days of wet weather.

Table 2.1: Observed Traffic Speeds & Volumes

	ATC 1 – South of Carpenders Avenue		ATC 2 – Care Home Access		ATC 3 – South of Care Home	
	NB	SB	NB	SB	NB	SB
Weekday Morning Peak Flow	556	643	543	638	554	617
Weekday Evening Peak Flow	608	663	604	675	621	665
Daily Flow	8,239	8,894	8,263	8,946	8,303	8,834
Average Speed	32.3 mph	32.4 mph	30.5 mph	31.0 mph	35.2 mph	36.5 mph
1000-1200 & 1400-1600 85th Percentile speeds	**37.8 mph**	**37.6 mph**	**34.4 mph**	**34.7 mph**	40.0 mph	41.3 mph
24hr 85th Percentile speeds	38.0 mph	37.3 mph	34.4 mph	34.6 mph	39.8 mph	40.7 mph

Source: Innowise Works and Consultants Calculations

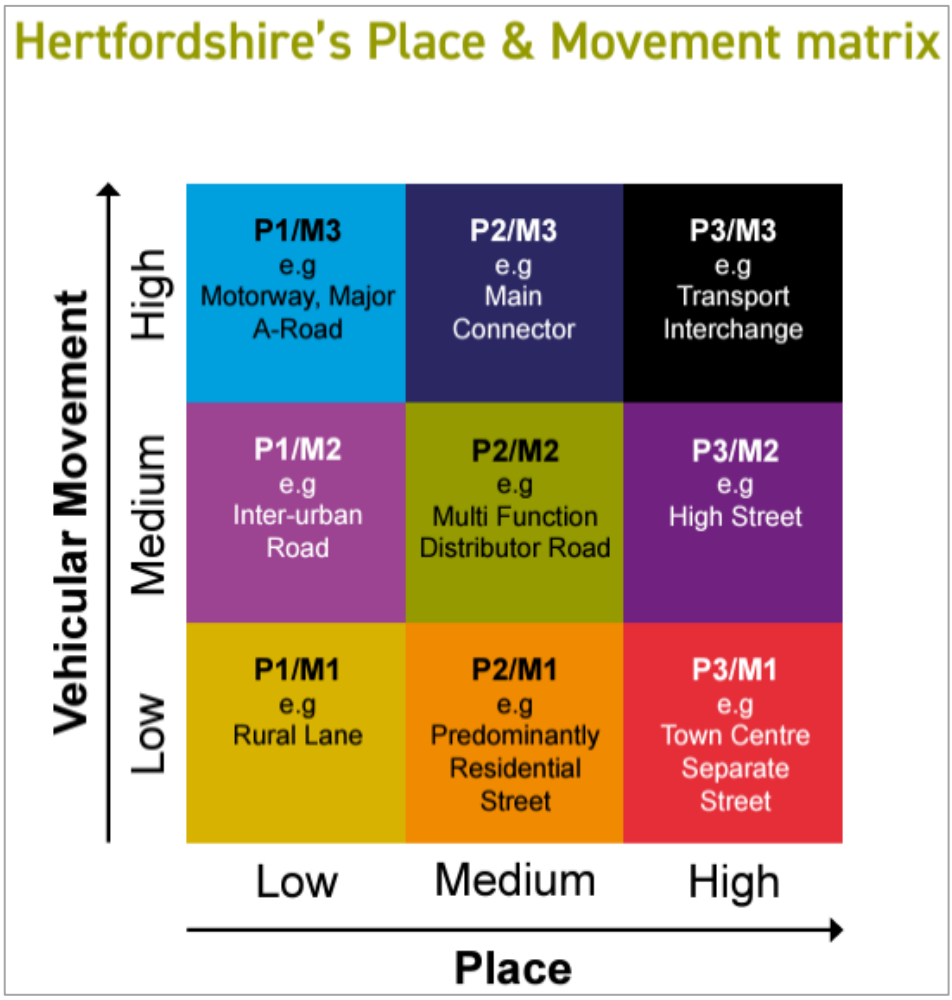
2.2.3 Table 2.1 demonstrates that northbound 85th percentile speeds range from 34.4mph to 40.0mph, and southbound between 34.6mph and 41.3mph. 85th percentile speeds at ATC 1 and ATC 2 were notably lower than at ATC 3, with free flow speeds below the posted speed limit of 40 mph.

2.2.4 The flows across all three sites were consistent given their close proximity to each other and limited places in which to turn off A4008. Weekday morning flows northbound varied between 543 and 556 vehicles, evening flows varied between 604 and 621 vehicles. Southbound flows were between 617 and 643 in the morning and 663 and 675 in the evening. Daily flows averaged out at 8,268 northbound and 8,891 southbound. Flows are broadly evenly split northbound and southbound.

2.3 Design Requirements

2.3.1 HCC Highways Place and Movement Planning and Design Guide establishes a Place & Movement matrix for streets which recognises the range of functions between different categories of roads. The Place and Movement categories of a street inform the recommended design standards of each category. There are nine place and movement categories which are shown in Image 2.5.

Image 2.5: Hertfordshire's Place & Movement matrix



Source: Place & Movement Planning and Design Guidance for Hertfordshire Part 3

2.3.2 HCC has in accordance with the above matrix categorised existing roads across the county with the A4008 Oxhey Lane identified as P2/M2 (Multi-Function Distributor Road)[2]. However, having reviewed the various categories against the existing geometric characteristics of the A4008 Oxhey Lane in the vicinity of the site it could reasonably be either a category P1/M2 (Inter-Urban Road) or P2/M3 (Main Connector) road. The relevant characteristics in respect of a new access junction of each of these categories are set out in Table 2.2.

[2] Expected to be within the sub-category of Main/Secondary Distributor

Table 2.2: P1/M2, P2/M2 and P2/M3 criteria

Criteria	P1/M2 – Inter-Urban Road	P2/M2 – Multi Function Distributor Road	P2/M3 - Main Connector
Road Characteristics			
Description	Inter-urban road (A, B or C but excluding the SRN and MRN network), above 5.5 metres and with a centre line, connecting two settlements within a rural setting.	Multifunctional inter urban/suburban roads (A/B/C/U) and have bus routes, connecting different part of an urban settlement and non-residential access road	Main Connector linking a strategic road (P1/M3) usually to a settlement. The roads should be over 5.5 m wide and are predominantly A roads.
Classifications	• Main Distributor • Secondary Distributor	• Main Distributor • Secondary Distributor • L1 Local Distributor • L2 Local Access	• Rural Main Distributor • Rural Secondary Distributor
Speed Limit	• National Speed Limit • 50 mph	• Main and Secondary distributor - 40 mph • L1 – 30 mph • L2 – 20 mph	• 50 mph
Design Guidance			
Junction Forms	• Signal Junctions • Ghost islands	• Compact Roundabouts • Signal junctions • Priority junctions • Ghost islands	• Signal Junctions • Ghost islands
Active Travel Provision	• Signal Controlled Crossings • Priority at side roads •	• Signal controlled crossing • Priority at side roads • Zebra & Parallel crossings (L1 & L2)	• Signal Controlled Crossings • Priority at side roads •
Design Codes	• Manual for Streets 2	• DMRB for main & secondary distributor • Manual for Streets for L1 and L2	• DMRB
Design Speed	• 40mph	• 40mph	• 40mph
Minimum Forward Visibility	• 120m	• 120m	• 120m
Junction spacing	• 40m opposite • 66m adjacent	• CD 123	• 40m opposite • 66m adjacent

Source: Place & Movement Planning and Design Guidance for Hertfordshire Part 3

2.3.3 The three categories share many similar characteristics and the A4008 Oxhey Lane is consistent with those shaded in green above. Specifically, it meets the following criteria of a P1/M2 road:

- Inter-urban road, over 5.5 metres wide and with a centre line connects two settlements (Watford / Harrow);
- Is a secondary distributor; and

- Has several ghost-island right-turn junctions and a signal junction in the vicinity of the site location.

2.3.4 It also meets the following criteria of a P2/M2 road:

- Multifunctional inter-urban road, bus route connecting parts of urban settlement;
- Is a secondary distributor;
- 40 mph speed limit; and
- Has several ghost-island right-turn junctions and a signal junction in the vicinity of the site.

2.3.5 A4008 Oxhey Lane does not meet the following P2/M3 criteria:

- Link to a strategic road or the strategic road network; and
- Rural Distributor (form or location).

2.3.6 Accordingly, A4008 Oxhey Lane could reasonably be categorised as either an P1/M2 Inter-Urban Road or the P2/M2 Multi Function Distributor Road.

2.3.7 There is an inconsistency between the speed limit, design speed and recommended design code for P1/M2 and P2/M2.

	Speed Limit	Design Code	Design Speed
P1/M2 Inter-Urban Road	50mph	MfS2	40mph
P2/M2 Multi Function Distributor Road	40mph	DMRB	40mph

2.3.8 P2/M2 roads have a 40mph speed limit with a recommended DMRB design code which is focused on the movement function of a road. Whereas P1/M2 roads have a 50mph speed limit with a recommended MfS2 design which is balanced between the movement and place function of a road. This is contrary to the categorisations as P2/M2 roads should be designed to balance the movement and place function, whereas P1/M2 roads should prioritise the movement function.

2.3.9 Accordingly, MfS2 is the most appropriate design code for the A4008 Oxhey Lane.

2.3.10 The design speed for P2/M2 is according to HCC guidance 40mph with appropriate forward visibility or Stopping Sight Distance of 120m (as per DMRB). With respect to design speed Manual for Streets 2 states the following on (SSD):

> ***'It is only where actual speeds are above 40mph for significant periods of the day that DMRB parameters for SSD are recommended. Where speeds are lower, MfS parameters are recommended. Where there may be some doubt as to which guidance to adopt, actual speed measurements should be undertaken to determine which is most appropriate.'*** *(MfS 2, paragraph 1.3.6)*

2.3.11 Manual for Streets 2 recommends that it is appropriate to apply Manual for Streets parameters where actual speed measurements are below 40mph. Actual speeds on A4008 Oxhey Lane are below 40mph as shown in Table 2.1. Thus, it is actual speeds and MfS parameters that are appropriate to apply to A4008 Oxhey Lane. This was the approach accepted by HCC when assessing the visibility requirements of the access to the Carpenders Park Care Home immediately to the south of the site where the accepted visibility was 71.4m for a ghost-island right turn.

SECTION 3 Site Access Options Appraisal

3.1.1 In the context of the HCC guidance two site access options have been developed as primary access options to the site. Both options are located within the vicinity of Oxhey Lane / Carpenders Avenue junction which provides the least constrained horizontal and vertical alignment. Both options have been developed based on the characteristics of A4008 Oxhey Lane (as in Section 2) and the expected level of development proposed as part of the emerging proposals. The two proposed options are a:

- Signalised Crossroad junction arrangement; and
- Ghost-island priority staggered junction arrangement.

3.1.2 Both of these junction forms are appropriate for both the P1/M2 and P2/M2 categories of road as shown in Table 2.2.

3.2 Signalised Crossroads

3.2.1 The first option is the provision of a signalised crossroad junction at Carpenders Avenue, with a new access located opposite. This is shown in i-Transport **Drawing ITL200107-GA-002**. The access option has been designed with reference to CD123 Geometric Design of At-grade Priority and Signal-controlled Junctions (part of DMRB) and these design requirements are generally achieved. However, as explained in Section 2 the design should only need to accord with MfS2 guidance with reference to the observed 85th percentile speeds on A4008 Oxhey Lane at this location as in Table 2.1. Carpenders Avenue is subject to a 30mph speed limit which has been used as the design speed on this arm. Similarly, the proposed site access arm has been designed with a 30mph design speed. The following features are included:

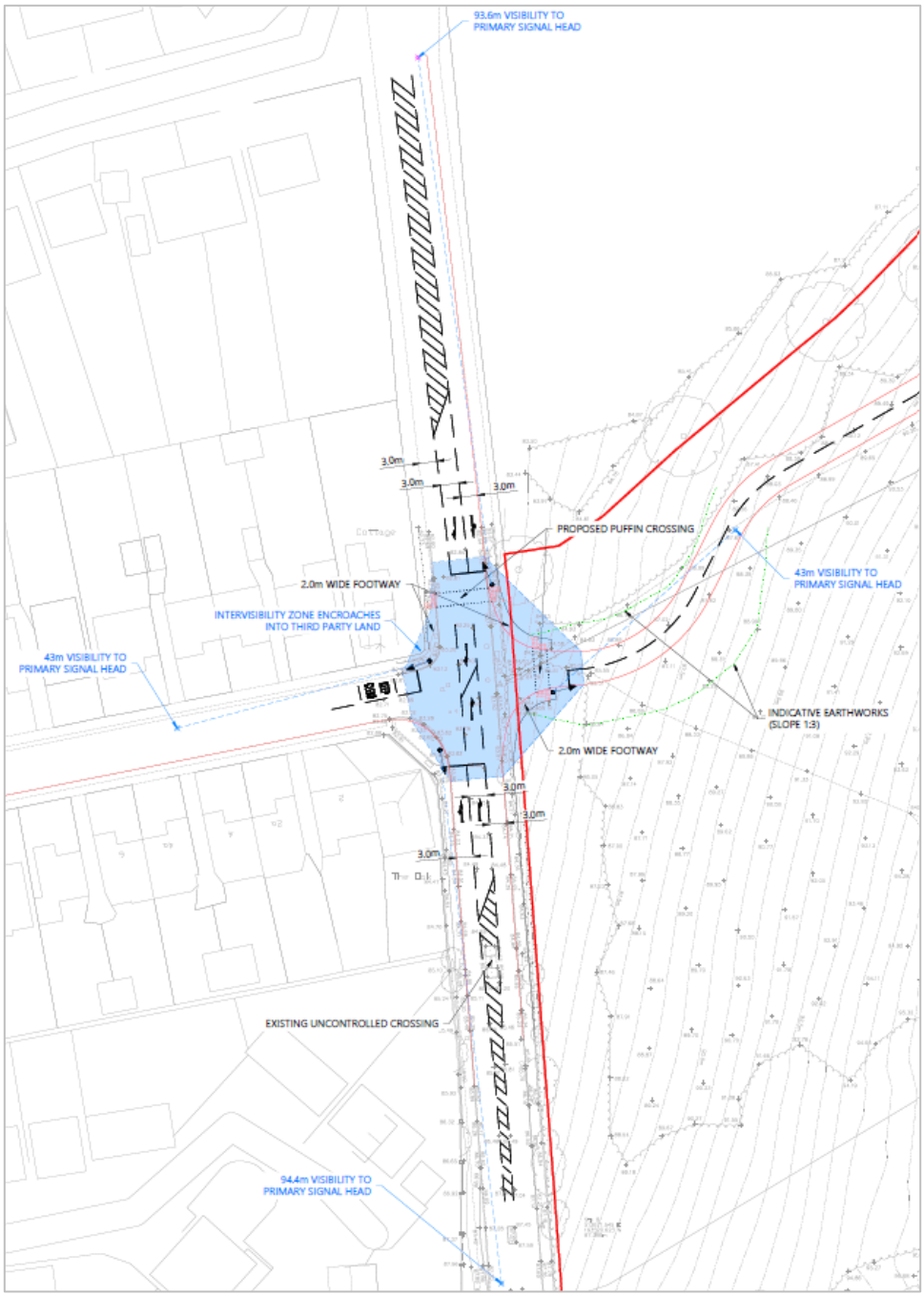
- All arms of the junction to be signalised with filter lanes on major arms for vehicles entering minor arms. Minimum 3.0m lane widths would be retained on Oxhey Lane;
- Visibility of 93.6m from the primary signal head to north and 94.4m to the south on Oxhey Lane in line with recorded 85th percentile speeds[3]. Visibility of 43.0m for the minor arms of Carpenders Avenue and the site access road;
- Proposed puffin crossings across northern arm of Oxhey Lane and site access junction and 2.0m wide footways on both sides of the carriageway;

[3] Applying DMRB desirable minimum SSD to recorded speeds. 120m is achievable. Well in excess of requirements of MfS2

- Keep Clear markings outside 'The Cottage' to maintain private access; and
- Minor changes to the alignment of Footpath 013.

3.2.2 The access arrangements are illustrated in Drawing **ITL200107-GA-002**, with an extract provided in Image 2.6.

Image 2.6: Signalised Crossroad Junction



3.2.3 A junction intervisibility zone as per the requirements of CD123, shows that intervisibility is achieved on three of four arms. Intervisibility is restricted on one of four arm arms where the intervisibility encroaches land outside of the highway in the northwestern corner.

3.2.4 However, as explained in Section 2, Manual for Streets 2 is the appropriate design code in this location which states the following on junction intervisibility with reference to the requirements of DMRB:

> ***'..designers may need to consider whether the strict application of these visibility requirements is always appropriate, particularly in urban situations where speeds are low; or where stop lines are set back considerable distances due to swept requirements or other reasons, giving rise to large intervisibility zones.'*** *(MfS 2, paragraph 9.8.7)*

3.2.5 Therefore there should be some flexibility in the provision of intervisibility on every arm of a junction in urban environments. Thus, adherence to the requirements of CD123 on inter-visibility is not necessary. Indeed given the uphill gradient on Carpenders Avenue approach to A4008 Oxhey Lane the speed of vehicles emerging Carpenders Avenue will be low. Coupled with which the southbound traffic on the far side of A4008 Oxhey Lane will be visible to drivers emerging Carpenders Park before any conflict could occur. The access design would be subject to a Stage 1 RSA which would review any safety implications of the design.

3.3 Ghost island priority staggered junction

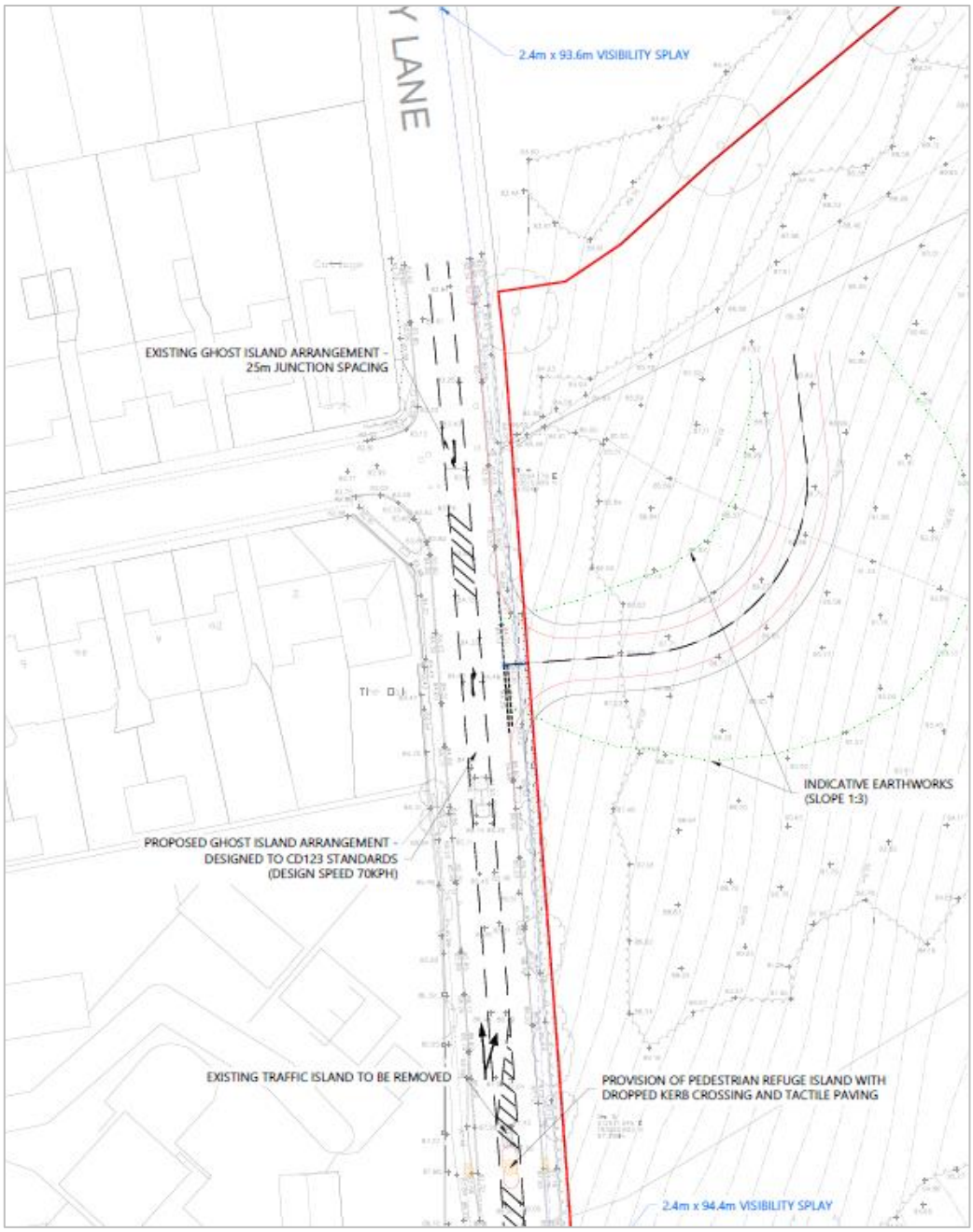
3.3.1 The second option is to provide a ghost-island priority staggered junction circa 25m south of Oxhey Lane junction with Carpenders Avenue. This is shown in i-Transport **Drawing ITL200107-GA-001**. The following features are included:

- Ghost island right turn lane for right turners, located 25m south of existing ghost-island right turn into Carpenders Avenue;
- Footway maintained on both sides of carriageway;
- Visibility splays of 93.6m to north and 94.4m to the south in accordance with observed speeds[4];
- Removal of existing traffic island, and provision of a new pedestrian refuge island on Oxhey Lane with dropped kerb crossing and tactile paving;

3.3.2 The access arrangement is illustrated in **Drawing ITL200107-GA-001**, with an extract provided in Image 2.7.

[4] Applying DMRB desirable minimum SSD to recorded speeds. Well in excess of requirements of MfS2

Image 2.7: Ghost island priority junction option



3.3.3 This arrangement makes use of the existing width and alignment of Oxhey Lane and would have minimal impacts on the existing flow of traffic. It is located as far north as practically possible to ensure the visibility from the site access to the south along A4008 Oxhey Lane is fully achieved within the vertical plane.

3.3.4 Junction spacing between Carpenders Avenue and the proposed junction is 25m which would be below the distance recommended for P2/M2 road classification (50m) and P1/M2 (40m). However, MfS2 which is the appropriate design code has no set distance between opposing priority junctions. All vehicles can safely manoeuvre through the proposed junction arrangement and moving the junction further south would reduce the achievable visibility from the site access to the south. Therefore, the arrangement is safe and suitable.

3.3.5 The design would require the relocation of the existing pedestrian crossing (and refuge) further south. This would still align with the desire line between Carpenders Avenue and the Carpenders Park Care Home. Creating a dedicated pedestrian access to the development site (along the northern side of the Carpenders Park Care Home) would ensure that the crossing was also on the desire line for pedestrians to and from the development site.

3.4 Comparison of Junction Options

3.4.1 Both junctions accord with the preferred junction forms of the P2/M2 road category which the A4008 Oxhey Lane has been allocated by HCC. Both provide designs which would be safe and suitable for all users and meet the design requirements based on observed vehicle speeds and the guidance of MfS2.

3.4.2 The signalised crossroad junction however has one advantage when compared to the ghost-island right turn arrangement – its pedestrian crossing facilities. The signalised crossing arrangement provides a higher standard of crossing of A4008 Oxhey Lane for pedestrians (and potentially cyclists).

3.4.3 HCC are requested to comment on the proposed access arrangements in terms of location, form and design.

SECTION 4 Summary

4.1 This note sets out a proposed access options appraisal for the emerging proposal at Land at Carpenders Park, Three Rivers, Hertfordshire. The site is located to the east of A4008 Oxhey Lane and the Carpenders Park Care Home. The emerging proposals at the site are for the provision of 200-250 homes and an extension to the existing Care Home.

4.2 Automatic traffic count surveys were undertaken during November and December 2024 and recorded traffic flows and speeds on A4008 Oxhey Lane. The surveys demonstrated that 85th percentile speeds on Oxhey Lane range between 34.4-40.0 mph in a northbound direction and 34.7-41.3 mph in a southbound direction. Specifically, 85th percentile speeds at the location of ATC 1 were 37.8 mph northbound and 37.6 mph southbound, below the posted speed limit of 40 mph.

4.2.1 As per HCC Place and Movement Matrix, A4008 Oxhey Lane could be categorised as either a P1/M2 or P2/M2 category road. These recommend the application of either Manual for Streets 2 or DMRB as the suggested design codes.

4.2.2 The preferred site access option would be a signalised crossroad junction, providing a new junction opposite and with Carpenders Avene. This option:

- Is optimally located in terms of levels within the existing site;
- Makes use of existing available width of Oxhey Lane;
- Provides improved crossing of Oxhey Lane for pedestrians, providing a signalised crossing and improved pedestrian desire lines towards Carpenders Avenue compared with the existing crossing provision;
- Meets all Stopping Sight Distance (SSD) requirements for a signalised junction.
- Intervisibility is achievable on three of four arms.
- Retains access to 'The Cottage' through Keep Clear markings and access / egress maintained and demonstrated through vehicle tracking

4.2.3 A second option of a ghost-island right turn has also been developed. This option would have minimal impact on the existing flow of traffic on Oxhey lane but would not provide a signalised crossing of Carpenders Avenue.

4.2.4 A Stage One Road Safety Audit would be undertaken for either option.

4.2.5 HCC are requested to comment on the proposed access arrangements in terms of location, form and design.

DRAWINGS

93.6m VISIBILITY TO
PRIMARY SIGNAL HEAD

3.0m

3.0m

3.0m

PROPOSED PUFFIN CROSSING

2.0m WIDE FOOTWAY

INTERVISIBILITY ZONE ENCROACHES
INTO THIRD PARTY LAND

43m VISIBILITY TO
PRIMARY SIGNAL HEAD

KEEP CLEAR

43m VISIBILITY TO
PRIMARY SIGNAL HEAD

INDICATIVE EARTHWORKS
(SLOPE 1:3)

2.0m WIDE FOOTWAY

3.0m

3.0m

3.0m

EXISTING UNCONTROLLED CROSSING

94.4m VISIBILITY TO
PRIMARY SIGNAL HEAD

Cottage

13

The Oak

Stn B
512671.545 E
193520.623 N
87.396m

SCALE BAR @ 1:500

0 5 10 25 50

i-Transport

33 Queen Street, London, EC4R 1AP Tel: 0204 531 3660

www.i-transport.co.uk

CLIENT: BURLINGTON PROPERTY GROUP

TITLE: POTENTIAL SITE ACCESS ARRANGEMENT - SIGNALISED JUNCTION

PROJECT: LAND AT CARPENDERS PARK

REV	DATE	BY	DESCRIPTION	CHK	APD

STATUS: FOR INFORMATION

DRAWN:	CHECKED:	APPROVED:
SH	PH	PH
PROJECT No:	SCALE @ A2:	DATE:
ITL200107	1:500	12.11.24
DRAWING No:		REV:
ITL200107-GA-002		

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