BUROHAPPOLD ENGINEERING

TfL Landholdings at Northwood

Transport Assessment

034233

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1 Introduction

1.1 Preamble

Buro Happold (BH) has been commissioned by Transport for London (TfL) to undertake a Transport Assessment (TA) in support of a hybrid planning application for the redevelopment of TFL Landholdings at Northwood, London, HA6 2QB.

The purpose of this TA is to enable all stakeholders, including the public, to assess the proposed development the extent of the potential impacts it may have upon the transport network.

The hybrid planning application for comprehensive redevelopment of the site comprising full planning permission involving demolition of existing buildings to provide 93 residential units (C3) and associated car parking, 1,440 sq.m retail (A1-A5), a new operational station (Sui Generis) with step free access and associated car parking for the station; new bus interchange, and a new piazza. Outline planning consent for up to 34 residential units, car parking (all matters reserved apart from access) and refurbishment works to existing retail units along Station Approach.

1.2 Site Description

The site is located on the junction of Green Lane (B469) and Eastbury Road within the London Borough of Hillingdon (LBH).

The site comprises land north and south of Green Lane including part of the highway. The area of land north of Green Lane comprises a parade of single storey retail units located over the railway bridge with a two storey adjoining unit on the Corner of Eastbury Road. The northern part of the site is bounded by the Eastbury Surgery to the north; Green Lane to the south; Eastbury Road to the east and the retail units on the bridge to the west.

The site is 1.91ha.

The majority of the site lies south of Green Lane, in Northwood and comprises the existing London Underground station and a mix of A-Class uses, residential flats, a light industrial use, dental practice and area of surface car parking. The southern part of the site is bounded by Green Lane to the north; the London Underground compound to the south; the railway line to the east; and the rear boundaries of the Northwood Central Club, St John's United Reformed Church and residential properties fronting Hallowell Road to the west.

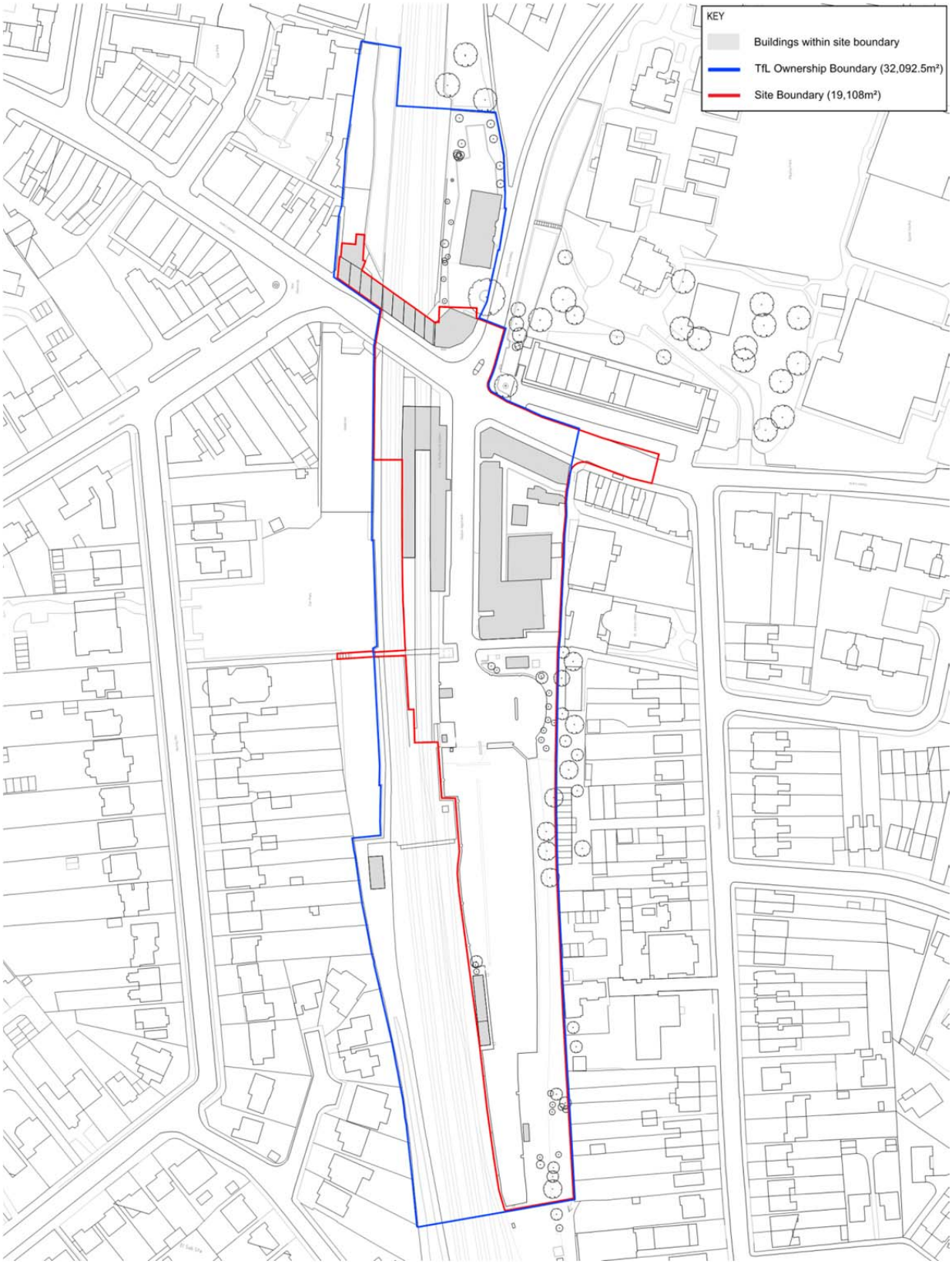
1.3 TFL's objectives

TfL recognise there is an opportunity to deliver comprehensive place-making through redevelopment of their landholdings for the benefit of Northwood which would meet aspirations to deliver the following objectives:

- Deliver a high quality design for Northwood;
- Step-free access as part of a new Underground Station;
- Improve accessibility for all users around the station;
- Improve the interchange at this transport hub between underground trains, buses, vehicle users, pedestrians and cyclists;
- Provide a new public space in the form of a piazza;

- Provide a dedicated area for drop off/ pick up and taxis;
- Provide a mix and range of housing types to meet different needs; and
- Provide new commercial uses which will improve and contribute towards the vitality and viability of the existing centre.

Figure 1-1 - Existing Site Layout



1.4 Scope of the Transport Assessment

A scoping exercise has been undertaken with LBH Highways Officers and the scope of work proposed for this report is shown in Appendix B. Consideration has been given to NPPF and TfL guidance; the Transport Assessment report will include the following chapters:

- **Introduction;**
- **Policy** – including a review of National, Regional and Local Policy;
- **Existing Conditions** including Highway Network, Public Transport, Walking and Cycling;
- **Development Proposals** including Quantum & Mix, Access (Vehicular, Cycling and Pedestrian), Parking (Vehicular and Cycling), Buses, Taxis, and Refuse and Servicing & Deliveries;
- **Trip Generation and Distribution** for all modes including Vehicular, London Underground, Bus, Walking and Cycling. Consideration will also be given to committed developments;
- **Transport Impacts** including Junction Capacity Modelling;
- **Mitigation Measures** including Junction Improvement Scheme, Framework Travel Plan; Framework Construction and Logistics Plan, Framework Delivery & Servicing Plan and Framework Car Park Management Plan.
- **Summary & Conclusions**

2 Planning Policy

The following policy documents have been reviewed as part of this TA.

2.1 National Policy

National Planning Policy Framework (NPPF)

The NPPF was published by the DCLG on 27th March 2012. The NPPF replaces and consolidates a number of Planning Policy Guidance notes (PPGs), Planning Policy Statements (PPSs), Minerals Planning Guidance notes (MPGs), Circulars and Letters to Chief Planning Officers. This includes PPG13: Transport.

The aim of the NPPF is to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth.

> *'At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan-making and decision taking'.*

The NPPF has a set of 12 core planning principles that underpin both plan-making and decision taking. This includes a principle that new development should:

> *''actively manage the patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable''*

Section 4 of the NPPF, covering paragraphs 29 through 41, sets out the Government's guidance on promoting sustainable transport. It recognises that the smarter use of technologies can reduce the need to travel.

Paragraph 32 states that development that generate a significant amount of movement should be supported by a Transport Statement or Transport Assessment and should take into account whether:

> *'the opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure;*
>
> *Safe and suitable access to the site can be achieved for all people; and*
>
> *Improvements can be undertaken within the transport network that cost effectively limit the significant impacts of the development. Development should only be prevented or refused on transport grounds where residual cumulative impacts of development are severe.'*

Paragraph 35 states that, where practical, developments should be located and designed to:

> *i. 'accommodate the efficient delivery of goods and supplies;*
>
> *ii. give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;*
>
> *iii. create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians, avoiding street clutter and where appropriate establishing home zones;*
>
> *iv. incorporate facilities for charging plug-in and other ultra-low emission vehicles; and*
>
> *v. consider the needs of people with disabilities by all modes of transport.'*

It is recognised that a key tool to delivering sustainable travel, and the principles set out in the NPPF, will be the implementation of Travel Plans. Paragraph 36 states;

> *'All developments which generate significant amounts of movements should be required to provide a Travel Plan.'*

The NPPF does not provide guidance on vehicle or cycle parking, however, it does provide guidance on what local authorities should take into account when setting their local parking standards. This includes:

> *i. 'the accessibility of the development;*
>
> *ii. the type, mix and use of development;*
>
> *iii. the availability of and opportunities for public transport;*
>
> *iv. local car ownership levels; and*
>
> *v. an overall need to reduce the use of high-emission vehicles.'*

2.2 Regional Policy

The London Plan

On 10th March 2015, the Mayor published i.e. adopted the Further Alterations to the London Plan (FALP). From this date, the FALP are operative as formal alterations to the London Plan (the Mayor's spatial development strategy) and form part of the development plan for Greater London.

Chapter 6 of the adopted London Plan (2015) provides transport policy. Policy 6.3 makes recommendations in relation to the effects of development on transport capacity. It is stated that the impacts of development on transport capacity should be fully assessed. Where insufficient transport capacity exists to accommodate demand generated from new development and there are no proposals to increase capacity, development proposals should be phased or refused. Transport Assessments in accordance with Transport for London (TfL) guidance should be produced to support planning applications for new development.

Policy 6.9 provides policy on cycling and it is recommended that planning decisions should ensure that new developments have secure, integrated and accessible cycle parking facilities in line with the minimum standards outlined in the plan and that on-site changing and showering facilities should be provided for cyclists.

Policy 6.10 provides policy on walking and recommends that planning decisions should ensure that developments have a high quality pedestrian environment and emphasise the quality of pedestrian and street space.

Mayor's Transport Strategy, May 2010

Final consultation on the Mayor's Transport Strategy was completed in January 2010. The Strategy was published in May 2010 and sets out the Mayor's transport policies for the period up until 2031. The main goals of the strategy include supporting economic and population growth, and enhancing the quality of life and transport opportunities for Londoners. The strategy aims to achieve a modal shift away from private motorised transport to more sustainable modes, including public transport, walking and cycling, is sought.

The importance of 'local travel' is highlighted in section 3.1.5 of the Strategy. 'Local travel' represents 70% of trips made by London's residents and constitutes trips made on a daily basis to local facilities within 5km from home, including schools. It is highlighted that the majority of trips for 'International' or 'Sub-regional' travel also begin as trips on the local level. Walking and cycling are the most important modes for local trips up to 500m or 1km and thereafter private car and bus are important modes for trips between 1km and 5km.

The Mayor's Transport Strategy includes proposals that will be brought about by the Mayor through working with TfL, the London Boroughs, developers and stakeholders. Proposal 60 supports walking to local facilities and includes the following:

> *'Development of a 'key walking route' approach, to encourage walking and improve corridors between local destinations where people want to travel'*
>
> *'Providing direct and convenient pedestrian access*'
>
> *'Enhancing pavement space for pedestrians and removing guardrails and other obstacles*'
>
> *'Supporting developments that emphasise the quality and permeability of the pedestrian environment*'

Proposal 62 outlines how the benefits of walking will be promoted through information campaigns, events to raise the profile of walking, and smarter travel initiatives including School and Workplace Travel Plans.

In terms of educating children, paragraph 494 of the Transport Strategy highlights the importance of ensuring that messages associated with road safety reach children and other vulnerable users who may not interact with transport authorities. It is noted that TfL road safety campaigns commence with the involvement of children aged 3 years in the 'Children's Traffic Club' and evolve as the target group ages.

The Transport Strategy places emphasis on the increased use of Travel Plans as a means of achieving modal shift at workplaces and Schools.

Sub-regional Transport Plan – West London (SRTP), 2010

The purpose of the SRTP for West London is to 'address the goals and challenges set out in the MTS and how they will be met in the sub-region. The west sub-region of London comprises Boroughs of Ealing, Hammersmith & Fulham, Hounslow, Brent, Harrow and Hillingdon.

The SRTP is set to bridge the gap between Mayor's Transport Strategy and Borough LIPs. It is aimed at helping the Boroughs meet their ambitions by setting out a range of measures and providing a framework for implementation of the Mayor's vision in the region.

This SRTP is intended to identify some specific priorities and projects for west London but also present a broader framework or toolkit that is to be applied to local circumstances in relation to modal planning and implementation.

Chapter 2.2 discusses the need to improve connectivity in the sub-region. It mentions cycle infrastructure enhancements in order to increase the cycle mode share as well as enhancing bus priority to improve journey time reliability.
Chapter 2.3.7 discusses Smarter Travel Initiatives with emphasis on reducing pressure on the transport network by way of influencing how people travel. In this regard Travel Plans are among the principal techniques to bring about changes in travel patterns.

Chapter 3 relates to enhancing the quality of life for all Londoners with one of the main challenge being that of improving health impacts. This can be achieved by facilitating an increase in walking and cycling.

Chapter 4 discusses the improvement of safety and security of all Londoners and the challenges are reducing crime, improving road safety and improving public transport safety.

This sub-regional plan is set to be delivered over the next twenty years and the delivery process is set out in the Mayor's Transport Strategy and LIPs.

2.3 Local Policy

UDP Saved Policies, September 2007

The UDP was adopted in 1998 and subsequently the policies have been saved or deleted under direction from the Secretary of State (SoS) as part of the development of the Local Plan. Part One policies were intended to be strategic policies which follow the guiding principles of key regional and Government policies. Relevant part one policies include the following:

> *'To promote the construction of new roads or the widening of existing roads only where they would: improve safety; promote pedestrian movement, cycling or public transport, or the improvement of the environment; reduce local congestion in a cost effective way; or are required to accommodate traffic likely to be generated by new development.' (Pt 1.33)*
>
> *'To maintain the road hierarchy set out in this Plan and accordingly seek to segregate different types of traffic by the function of the various tiers of the hierarchy through traffic management schemes, road signing and planning control over development and redevelopment schemes.' (Pt 1.34)*
>
> *'To accord priority to pedestrians in the design and implementation of road construction and traffic management schemes, and to seek to provide a network of cycle routes through the Borough to promote safer cycling and better conditions for cyclists.' (Pt 1.35)*
>
> *'To seek a reduction in road accident casualties through highway improvements including traffic calming and the design of new highway schemes.' (Pt 1.38)*
>
> *'To seek, where appropriate, planning obligations to achieve benefits to the community related to the scale and type of development proposed.' (Pt 1.39)*

Chapter 14 deals with Accessibility and Movement in the Borough. Policies contained in this chapter cover the following three themes:

> *i. Reducing the demand for travel;*
>
> *ii. Stabilising new vehicle trip generation by limiting the availability of car parking and promoting sustainable travel; and*
>
> *iii. Dealing with day-to-day problems caused by traffic through traffic management.*

Policy AM2 recommends that all proposals for new development will be assessed against their contribution to vehicular traffic generation, impact on congestion and the present and potential availability of public transport capacity to meet demand.

Policy AM6 indicates that the Council's Primary concern will be of the impact of development on the Primary road network. Policy AM7 states that the Local Planning Authority will not grant planning permission for developments that are likely to increase demand at junctions or links that already experience capacity issues and prejudice the free flow of traffic or conditions of general road safety.

Policy AM14 highlights that new development must accord with the Council's adopted car parking standards and Policy AM15 requires provision of car parking for disabled drivers in all car parks provided for new development.

Local Plan: Part 1 – Strategic Policies (Adopted November 2012)

The Hillingdon Local Plan: Part 1- Strategic Policies document was adopted by the Council on 8 November 2012. The Development Plan for the borough now comprises:

> *i. The "Hillingdon Local Plan: Part 1- Strategic Policies";*
>
> *ii. The extant 2007 Saved Unitary Development Plan policies adopted as the "Hillingdon Local Plan: Part 2", pending the preparation and adoption of subsequent site specific allocations, development management policies and a policies map; and*
>
> *iii. The London Plan published by the Mayor of London in January 2014.*

The Hillingdon Local Plan: Part 1- Strategic Policies is the Borough's vision for the next 15 years. It sets out the main aims and objectives for new development, for example where it goes, what it looks like and who it will serve.

> *'The aim of the transport policies contained within the Local Plan is to provide a sustainable transport system that addresses whole length journeys, reduces car dependency, supports the economy, encourages active travel and improves quality of life. The policies also aim to reduce congestion and smooth traffic flow. These aims reflect the six goals set out in the Mayor's Transport Strategy (MTS) and seek to ensure that the design of new infrastructure respects the local environment and historic assets'.*
>
> *'The cycling and walking networks form part of a comprehensive transport network. Journeys by foot have reduced in recent years, while there has been only a slight increase in cycle journeys. These modes of transportation have an important role in helping to create healthier lifestyles and reduce the level of harmful emissions from vehicles.'*

Policy E5 relates to town and local centres and states that the Council will see to improve public transport, walking and cycling connections to town and local centres. It also seeks to ensure that adequate parking provision is provided in relation to local services and amenities.

Section 8 sets out the Core Policies in relation to environmental improvement. The aim of the section is to manage Hillingdon's natural environment and improve local air quality while addressing the impacts of climate change and minimising carbon emissions.

Policy EM1 states that the Council will require climate change mitigation to be addressed in the development process by promoting a modal shift from the private car and prioritising development in urban and town centres which are well served by sustainable transport modes.

Section 9 sets out Strategic Policies T1 to T5 in relation to transport and CI1 to CI3 in relation to infrastructure. The policies considered relevant are T1-T3. The main focus of the policies is to promote sustainable forms of transport, improve quality of life and reduce reliance on the private car.

Policy T1 identifies that development will be steered to locations to reduce impact on the transport network and that;

> *'all development should encourage access by sustainable modes and include good cycling and walking provision'.*

Policy T2 relates to how the;

> *'Council will facilitate improved public transport interchanges at Uxbridge, Hayes, West Drayton, Heathrow Airport, West Ruislip and other locations as appropriate in future'.*

Policy T3 relates to how the;

> *'Council will improve north-south public transport links in the borough and link residential areas directly with employment and transport interchanges'.*

Local Plan: Part 2 – Draft Development Management Policies

The Council has prepared a draft of Part 2 of the Local Plan. It was published for public comment in the period of 22nd September-4th November 2014. On 24 September 2015, Cabinet gave approval to undertake further consultation on proposed changes to the proposed submission version of the Local Plan Part 2. Following the consultation, the Local Plan Part 2 documents and comments received will be submitted to the Secretary of State for Communities and Local Government for public examination. The next consultation event will commence on October 26th and will end on December 8th 2015.

The Local Plan: Part 2 consists of three documents, namely Development Management Policies, Site Allocations and Designations and Policies Map. Together they;

> *'identify actual sites and provide a framework of development management policies to ensure sustainable growth in the borough'.*

The relevant document is considered to be Development Management Policies and within the document chapter 8 is considered relevant.

Chapter 8 relates to transport and the management and integration of new development to the boroughs transport network. Transport Assessments or Transport Statements are required with development proposals so that transport impacts can be identified and addressed.

Policy DMT1 relates to managing transport impacts by requiring proposals to meet the transport needs of the developments while addressing the impacts in a sustainable way. For developments to be acceptable they should;

i. be accessible by sustainable transport modes such as walking, cycling and public transport;

ii. ensure safe, convenient and inclusive accessibility to and from the development as well as within it;

iii. address the provision for access for delivery, servicing and drop-off; and

iv. not have significant adverse impacts in transport term, either on the local or wider area.

Policy DMT1 further states that Transport Assessments / Statements and Travel Plans / Local Level Travel Plans are required with development proposals so that transport impacts can be identified and addressed.

Policy DMT2 relates to highways impacts and states that; *'Development proposals must be compatible with the safe and efficient movement of the highway'*. Proposals must ensure;

i. that access to the highway network is safe and efficient;

ii. cyclist and pedestrian access is safe, secure and convenient; and

iii. suitable mitigation measures are in place to address any traffic impacts.

DMT5 seeks to ensure that safe and inclusive access for pedestrians and cyclists is provided on the side connecting it to the wider network. It states that there should be provision for well signposted and attractive pedestrian and cycle routes and high quality public realm. In addition cycle parking provision should be in accordance with Table 1 in Appendix A.

DMT6 relates to vehicle parking and states that development proposals must comply with the parking standards in Appendix A where;

i. Table 1a details specific requirements including for; car parking bay sizes, uses likely to generate coach traffic, servicing arrangements, footpaths and crossovers, cycle parking and motorcycle parking.

ii. Table 1b states the maximum requirements of vehicle and cycle parking.

2.4 Summary

The objective of this TA is to establish whether the proposed development accords with the policy guidance set out here. The degree to which it does will be tested in the material that follows with conclusions drawn at the end of the document.

3 Existing Conditions

3.1 Existing Site

The site currently comprises the existing Northwood London Underground Station and a mix of A-Class uses, 14 residential flats, a light industrial use, dental practice and area of surface car parking.

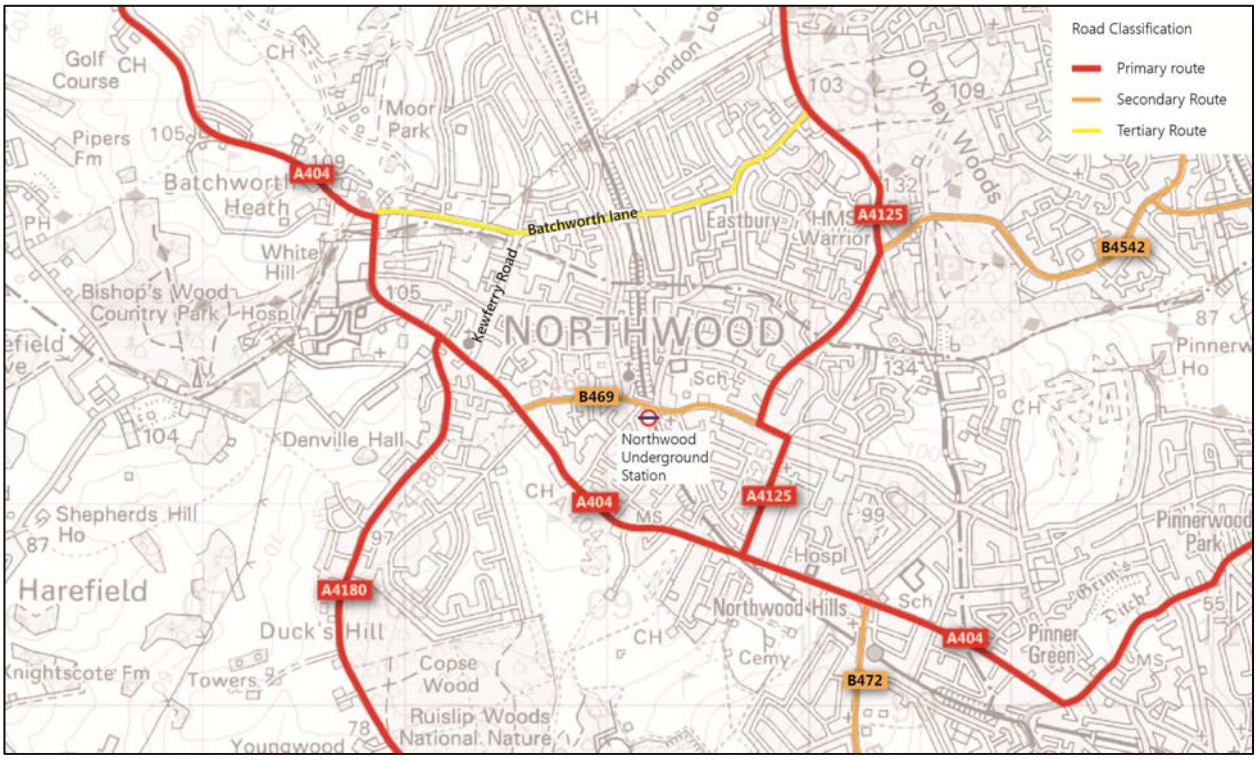
The existing mix of A-Class uses and light industrial use totals approximately 2,050 m^2. The highest contributor to this total is a mechanics which occupies an area of 970 m^2. Food retail i.e. café, takeaway and restaurant uses account for 365 m^2 of the area with the remainder being split across a number of retail uses such as estate agents, barbers, Post Office and newsagents.

The site is currently accessed via Station Approach by all modes which is a vehicle dominated and moderately sloping road that is difficult for the elderly and disabled to use.

3.2 Highway Network

Figure 3-1 shows the primary and secondary routes in the Northwood area. The key primary routes broadly connect Northwood to the north (A4125), east (A404), south (A4180) and west (A404). The B469 secondary route, which gives access to Northwood Underground Station also forms Northwood's 'high-street'. The B469 connects to the A404 in the west and the A4125 in the east, and although it does provide a through route between these two primary roads, its main function is a local collector.

Figure 3-1 - Local Highway Network



Considering non-local traffic travelling in an east / west direction, the A404 is the most direct route, and likely to be used by the majority of traffic. Traffic movements between the A404 in the west and the Oxhey area served by the B4542 is likely to avoid the town centre and travel via Batchworth Lane (no traffic restrictions) and the A4125, this is a shorter and quicker route than the alternative through the town centre.

Traffic travelling in a north/south direction between the A4180 (south) and the A4125 (north) is most likely to travel via the A404, and Batchworth Lane, being the directed route. Alternatively vehicles can also use Kewferry Road to reduce the trip length; however this route takes the same amount of time and may be unsuitable for larger vehicles. It is very unlikely that vehicles would choose to travel through the town centre as this is both a longer and slower route.

Traffic between the B472 in the south and any of the roads in the north will travel via the A404 or the A4125, hence avoiding the B469 via the town centre.

Traffic movement between the A4180 in the south and the A4125 / B4542 in the north-east is likely to travel via the B469 as this provides the shortest route. This is indeed the only non-local traffic movement that is likely to use the B469. The B4542 is a local collector and leads only to the Oxhey area, it is therefore likely that a very small number of vehicles will be making the movement between the A4180 and the B4542.

To conclude, although the B469 provides a connection between two primary routes (A404 and A4125), when the convenience of this link is explored in more detail it becomes apparent that for the majority of non-local traffic movements, the B469 will not from part of the quickest or shortest route. To this end it is likely that the majority of traffic on the B469 will be local traffic travelling to and from origins/destinations along this route.

Traffic Flows

Traffic counts were undertaken on Thursday 10th September 2015 between 0700 – 1000 and 1500 – 1900 and on Saturday 12th September between 1100 – 1400 at the following junctions:

- Green Lane / Station Approach / Eastbury Road signalised junction;
- Green Lane / Maxwell Road mini roundabout; and
- Green Lane / Hallowell Road priority junction.

As part of these surveys queue length data was also collected to assist in the validation of junction capacity modelling. The traffic count and queue length data is shown in Appendix C.

As the car park predominantly serves the London Underground station and given the proximity to several schools there are three pronounced peaks during a typical weekday. To determine the network peak i.e. the peak flow through all three junctions, the entry flows into the network have been totalled. For clarity the entry points to the network are traffic flows travelling:

- Eastbound from Green Lane (west of Maxwell Road);
- Northbound from Maxwell Road;
- Southbound from Eastbury Road;
- Northbound from Station Approach;
- Northbound from Hallowell Road; and
- Westbound from Green Lane (east of Hallowell Road).

Tables 3-1, 3-2 and 3-3 (overleaf) show the total vehicle flow and HGV % hourly network traffic flows.

Table 3-1 - AM Peak Traffic Flows

AM Peak		
Time Period	**Total Vehicles**	**% HGV**
0700-0800	1183	4.4%
0715-0815	1463	3.3%
0730-0830	1651	2.8%
0745-0845	**1729**	**2.9%**
0800-0900	**1723**	**3.6%**
0815-0915	1621	4.4%
0830-0930	1492	5.2%
0845-0945	1311	6.3%
0900-1000	1196	6.4%

Table 3-1 shows that the AM peak hour occurs between 0745 – 0845. However, there were only 6 vehicles more in this peak hour than the typical peak hour of 0800 – 0900.

Table 3-2 - PM Peak Traffic Flows

AM Peak		
Time Period	**Total Vehicles**	**% HGV**
1500-1600	1398	3.2%
1515-1615	1487	3.2%
1530-1630	**1527**	**3.3%**
1545-1645	1521	3.7%
1600-1700	1515	4.0%
1615-1715	1511	4.4%
1630-1730	1490	4.2%
1645-1745	1473	3.7%
1700-1800	**1497**	**3.2%**
1715-1815	1479	3.0%
1730-1830	1488	3.0%
1745-1845	1491	3.2%
1800-1900	1470	3.1%

Table 3-2 shows that there are 2 peak hours that occur in the afternoon/evening. The first peak occurs between 1530 – 1630 which is most likely due to the parents picking up their children from the local schools in the area. The second peak occurs between 1700 – 1800 which is the typical PM peak hour.

Table 3-3 - Saturday Peak Traffic Flows

AM Peak		
Time Period	**Total Vehicles**	**% HGV**
1100-1200	1327	3.4%
1115-1215	1297	3.0%
1130-1230	1344	2.4%
1145-1245	1381	2.5%
1200-1300	1395	2.4%
1215-1315	1380	2.5%
1230-1330	1362	3.1%
1245-1345	1301	3.0%
1300-1400	1254	3.1%

Table 3-3 shows that traffic flows are consistently the same throughout the 1100 – 1400 time period. However, the traffic flows did peak between 1200 – 1300 which is the typical Saturday peak hour.

Accident Analysis

TfL has provided accident data for the 36 months preceding 31st May 2015 for all highway within a 100m of the following junctions:

- Green Lane / Station Approach / Eastbury Road signalised junction;
- Green Lane / Maxwell Road mini roundabout; and
- Green Lane / Hallowell Road priority junction.

Table 3-4 - Accident Analysis

Accident Severity	12 months to 31/05/2013	12 months to 31/05/2014	12 months to 31/05/2015	Total
Fatal	0	0	0	0 (0.0%)
Serious	0	0	0	0 (0.0%)
Slight	1	3	1	5 (100.0%)
Total	1 (20%)	3 (60%)	1 (20%)	5 (100.0%)

Table 3-4 shows that there have been a low number of accidents (no fatalities) during the 36 months preceding 31st May 2015 and that all accidents were only slight accidents recorded, no accidents resulting in fatal or serious injury. Two accidents occurred on Green Lane (B469), two on Eastbury Road and one on Station Approach.

All the accidents in the Northwood area have been recorded as slight. Pedestrians were involved in 60% of accidents, while 20% occurred in the dark, and 40% in wet conditions.

The causes of accidents varied significantly. Three accidents involving a vehicle hitting a pedestrian occurred because both driver and pedestrian failed to look properly or misjudged the vehicles speed. One accident was caused when a passenger fell over on a moving bus and one when a vehicle reversed into a stationary vehicle.

The accident data provided by TfL including a plot of all accident locations is shown in Appendix D.

3.3 Parking

Parking Occupancy and Length of Stay surveys were undertaken during July (Thursday 22nd – Saturday 24th) and September (Thursday 10th – Saturday 12th) to identify the existing level of non-private parking supply and demand within Northwood.

Off-Street

There are 3 main off-street car parks within Northwood which are:

- Northwood Station Car Park (Public – TfL/NCP) – 191 spaces;
- Green Lane Car Park (Public – LBH) – 149 spaces; and
- Waitrose Car Park (Private) – 191 spaces.

Note: NCP has a contract with TfL to provide 175 parking space.

The road leading in to Northwood Station Car Park, Station Approach, prohibits parking. However, the highway is not 'adopted' by the highway authority and this has not been enforced. Due to the lack of enforcement, unregulated parking occurs on a regular basis. Similarly, the existing bus turnaround facility located between Station Approach and Northwood Station Car Park is also subject to frequent unregulated parking. These spaces do not form part of NCP's existing contract with TfL and given that parking is unregulated and not charged at a daily tariff it is often fully occupied.

Station Approach has kerbside space for 14 cars to park and the Bus Turnaround can accommodate up to 26 cars. However, these numbers are regularly exceeded as is demonstrated in the results of the survey.

For the purposes of this assessment only the public off-street parking supply will be analysed as that is the supply that will be available to those visiting the proposed development (with the exception of residents of the proposed development who will have a separate parking provision). An assessment of the unregulated off-street parking will also be included as they will be displaced as part of the proposed development and may choose to relocate to the public car parks.

To provide an accurate representation of the average parking demand across a year the data has been presented for July, September and then averaged. Table 3-5 (overleaf) shows a summary of the peak occupancy data.

The full results of the parking surveys for all public and private car park is shown in Appendix E.

Table 3-5 - Parking Survey Results Summary

		Northwood Station				Green Lane				Station Approach				Bus Turnaround				Total			
		191				149				14				26				380			
Month	Peak	Thurs	Fri	Ave	Sat	Thurs	Fri	Ave	Sat	Thurs	Fri	Ave	Sat	Thurs	Fri	Ave	Sat	Thurs	Fri	Ave	Sat
July	Occupied Spaces	145	125	135	40	149	120	130	98	26	23	22	22	27	14	21	10	338	271	302	154
	Vacant Spaces	46	66	56	151	0	29	19	51	-12	-9	-8	-8	-1	12	6	16	42	109	78	226
	% Occupancy	76%	65%	71%	21%	100%	81%	87%	66%	186%	164%	154%	157%	104%	54%	79%	38%	89%	71%	79%	41%
September	Occupied Spaces	175	142	157	48	84	100	86	108	24	24	24	23	25	23	24	25	297	275	283	173
	Vacant Spaces	16	49	34	143	65	49	63	41	-10	-10	-10	-9	1	3	3	1	83	105	97	207
	% Occupancy	92%	74%	82%	25%	56%	67%	58%	72%	171%	171%	168%	164%	96%	12%	12%	13%	78%	72%	74%	46%
Average	Occupied Spaces	160	134	146	43	113	107	108	102	24	23	22	22	24	18	20	17	315	271	292	164
	Vacant Spaces	31	58	45	148	36	42	42	48	-10	-9	-8	-8	3	9	6	9	65	109	88	217
	% Occupancy	84%	70%	76%	23%	76%	72%	72%	68%	168%	161%	157%	157%	90%	67%	78%	65%	83%	71%	77%	43%

The data shown in Table 3-5 displays the peak value from the surveys which typically occurred around the middle of the day around 13:30.

The data shows that July and September have very distinct profiles with regards to car park use which is most likely due to the main purpose for travelling to Northwood changing due to the summer holidays. Green Lane car park is utilised much more during the summer holidays which may be due to an increase in shopper trips during the summer months and it is priced as a short stay car park.

The data for Thursday only showed that:

- Northwood Station Car Park reached a peak occupancy at any one time of 76% (46 vacant spaces) in July, 92% (16 vacant spaces) in September and an average of 84% (31 vacant spaces);
- Green Lane Car Park reached a peak occupancy at any one time of 100% (0 free spaces) in July, 56% (65 vacant spaces) in September and an average of 76% (36 vacant spaces);
- Station Approach reached a peak occupancy at any one time of 186% (over parked by 12 vehicles) in July, 171% (over parked by 10 vehicles) in September and an average of 168% (over parked by 10 cars); and
- Bus Turnaround reached a peak occupancy at any one time of 104% (over parked by 1 vehicle) in July, 96% (1 vacant space) in September and an average of 90% (24 vacant spaces).

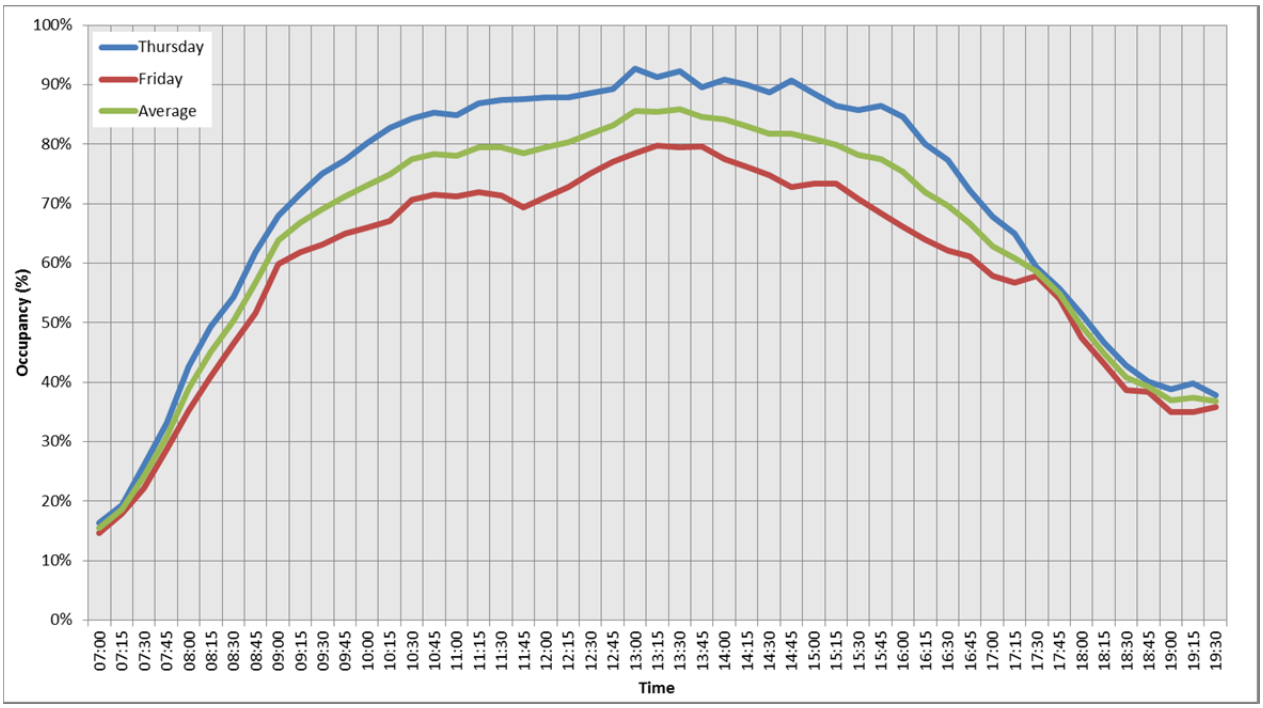
In total, the two public car parks and two areas of unregulated parking provide 380 parking spaces which reached a peak occupancy at any one time of 89% (42 vacant spaces) in July, 78% (83 vacant spaces) in September and an average of 83% (65 vacant spaces).

By removing Station Approach and the Bus Turnaround from the parking supply, this reduces the total number of spaces to 340 spaces i.e. Northwood Station Car Park and Green Lane Car Park. The average peak occupancy at any time reached 315 cars parked which suggests that there is sufficient supply to accommodate all of the unregulated parking.

However, it should be noted this is a worst case assumption as those choosing to park in areas of unregulated parking may decide to not use public car parks, use other means of transport or park at an alternative location outside of the study area. The peak occupancies are also for off-street car parks only and does not take in to account on-street parking provision. Furthermore, the parking occupancy is taken as a snapshot every 15 minutes and does not take in to account how long a vehicle has been parked there.

Figure 3-2 displays the July and September average daily occupancy profiles for a Thursday, Friday and an average of the two using the recorded demand against the capacity of Northwood Station and Green Lane Car Parks. It shows that on average the peak occupancy in Northwood Town Centre occurs between 13:00 and 14:00. The demand significantly decreases after 16:30 and levels out at 40% at 18:15.

Figure 3-2 - July / September Average Daily Occupancy Profile



As the data shown overleaf demonstrates, Station Approach and the Bus Turnaround are frequently used for less than 30 minutes and are known to be areas that are used for pick-up/drop-off for passengers using Northwood Station. This further demonstrates that it is unlikely that all of this demand would be long stay parking that would occupy a space with Northwood's public parking supply.

To validate the parking survey data NCP (National Car Parks), who operate the Northwood Station Car Park, provided an annual profile of parking occupancy data. The data showed that the annual average peak occupancy was 145 vehicles parked, an occupancy of 76%, which is slightly lower than average of the parking survey data average for July and September. The raw data provided by NCP is shown in Appendix E.

The parking surveys also recorded the average length of stay for each of the car parks. This data is shown in Tables 3-6, 3-7, 3-8 and 3-9 (all overleaf).

Table 3-6 - Northwood Station Car Park Length of Stay

Northwood Station Car Park											
Thursday 10th September 2015-Thursday			Friday 11th September 2015			Average			Saturday 12th September 2015		
Duration	Number of Vehicles	% Length of Stay	Duration	Number of Vehicles	% Length of Stay	Duration	Number of Vehicles	% Length of Stay	Duration	Number of Vehicles	% Length of Stay
0 to 30 minutes	13	12%	0 to 30 minutes	13	13%	0 to 30 minutes	13	12%	0 to 30 minutes	12	37%
30 minutes to 1 hour	3		30 minutes to 1 hour	3		30 minutes to 1 hour	3		30 minutes to 1 hour	5	
1 to 2 hours	3		1 to 2 hours	2		1 to 2 hours	2		1 to 2 hours	8	
2 to 3 hours	3		2 to 3 hours	4		2 to 3 hours	3		2 to 3 hours	4	
3 to 4 hours	6	22%	3 to 4 hours	5	23%	3 to 4 hours	5	22%	3 to 4 hours	5	46%
4 to 5 hours	8		4 to 5 hours	7		4 to 5 hours	8		4 to 5 hours	10	
5 to 6 hours	7		5 to 6 hours	8		5 to 6 hours	7		5 to 6 hours	8	
6 to 7 hours	7		6 to 7 hours	9		6 to 7 hours	8		6 to 7 hours	8	
7 to 8 hours	14		7 to 8 hours	7		7 to 8 hours	10		7 to 8 hours	6	
8 to 9 hours	13	66%	8 to 9 hours	8	63%	8 to 9 hours	10	64%	8 to 9 hours	5	17%
9 to 10 hours	26		9 to 10 hours	14		9 to 10 hours	20		9 to 10 hours	4	
10 to 11 hours	39		10 to 11 hours	26		10 to 11 hours	33		10 to 11 hours	5	
11 to 12 hours	27		11 to 12 hours	28		11 to 12 hours	27		11 to 12 hours	0	
12 to 13 hours	17		12 to 13 hours	19		12 to 13 hours	18		12 to 13 hours	0	
13 to 14 hours	3		13 to 14 hours	2		13 to 14 hours	2		13 to 14 hours	0	
Minimum Stay	00:01:00		Minimum Stay	00:01:00		Minimum Stay	00:01:00		Minimum Stay	00:01:00	
Average Stay	08:27:11		Average Stay	08:20:40		Average Stay	08:23:55		Average Stay	04:24:18	
Maximum Stay	13:00:00		Maximum Stay	13:00:00		Maximum Stay	13:00:00		Maximum Stay	10:00:00	

Table 3-6 shows that Northwood Station Car is typically used for long stay parking which suggests it is primarily used by commuters. However, there is a notable proportion (12%) of short stay parking during weekdays which is probably attributed to shoppers. The parking tariff for Northwood Station Car Park is a flat day rate of £4.20 (£4.00 if paying by card) which is to encourage long stay parking.

Table 3-7 - Green Lane Car Park Length of Stay Data

Green Lane Car Park											
Thursday 10th September 2015			Friday 11th September 2015			Average			Saturday 12th September 2015		
Duration	Number of Vehicles	% Length of Stay	Duration	Number of Vehicles	% Length of Stay	Duration	Number of Vehicles	% Length of Stay	Duration	Number of Vehicles	% Length of Stay
0 to 30 minutes	269	87%	0 to 30 minutes	322	92%	0 to 30 minutes	296	90%	0 to 30 minutes	223	95%
30 minutes to 1 hour	107		30 minutes to 1 hour	145		30 minutes to 1 hour	126		30 minutes to 1 hour	125	
1 to 2 hours	120		1 to 2 hours	130		1 to 2 hours	125		1 to 2 hours	131	
2 to 3 hours	92		2 to 3 hours	31		2 to 3 hours	61		2 to 3 hours	46	
3 to 4 hours	21	10%	3 to 4 hours	13	6%	3 to 4 hours	17	8%	3 to 4 hours	7	5%
4 to 5 hours	16		4 to 5 hours	8		4 to 5 hours	12		4 to 5 hours	6	
5 to 6 hours	13		5 to 6 hours	6		5 to 6 hours	9		5 to 6 hours	4	
6 to 7 hours	9		6 to 7 hours	7		6 to 7 hours	8		6 to 7 hours	7	
7 to 8 hours	8		7 to 8 hours	6		7 to 8 hours	7		7 to 8 hours	4	
8 to 9 hours	8	3%	8 to 9 hours	5	2%	8 to 9 hours	7	3%	8 to 9 hours	1	0%
9 to 10 hours	8		9 to 10 hours	7		9 to 10 hours	7		9 to 10 hours	1	
10 to 11 hours	3		10 to 11 hours	3		10 to 11 hours	3		10 to 11 hours	1	
11 to 12 hours	2		11 to 12 hours	0		11 to 12 hours	1		11 to 12 hours	0	
12 to 13 hours	0		12 to 13 hours	0		12 to 13 hours	0		12 to 13 hours	0	
13 to 14 hours	0		13 to 14 hours	0		13 to 14 hours	0		13 to 14 hours	0	
Minimum Stay	00:00:09		Minimum Stay	00:00:15		Minimum Stay	00:00:12		Minimum Stay	00:00:13	
Average Stay	03:11:36		Average Stay	02:38:07		Average Stay	02:54:52		Average Stay	01:03:31	
Maximum Stay	11:23:42		Maximum Stay	10:41:53		Maximum Stay	11:02:47		Maximum Stay	09:39:57	

Table 3-7 shows that Green Lane Car Park is typically used for short stay parking which suggests that it is the main car park within Northwood Town Centre for shopper parking. The parking tariff at Green Lane Car Park encourages short stay parking and also offers discounted rates for Northwood Residents.

Table 3-8 - Station Approach Length of Stay Data

Station Approach										
Thursday 10th September 2015			Friday 11th September 2015			Average			Saturday 12th September 2015		
Duration	Number of Vehicles	% Length of Stay	Duration	Number of Vehicles	% Length of Stay	Duration	Number of Vehicles	% Length of Stay	Duration	Number of Vehicles	% Length of Stay
0 to 30 minutes	315	94%	0 to 30 minutes	425	96%	0 to 30 minutes	370	95%	0 to 30 minutes	222	94%
30 minutes to 1 hour	16		30 minutes to 1 hour	12		30 minutes to 1 hour	14		30 minutes to 1 hour	10	
1 to 2 hours	20		1 to 2 hours	18		1 to 2 hours	19		1 to 2 hours	15	
2 to 3 hours	8		2 to 3 hours	4		2 to 3 hours	6		2 to 3 hours	5	
3 to 4 hours	3	2%	3 to 4 hours	4	2%	3 to 4 hours	4	2%	3 to 4 hours	6	6%
4 to 5 hours	1		4 to 5 hours	4		4 to 5 hours	3		4 to 5 hours	2	
5 to 6 hours	3		5 to 6 hours	0		5 to 6 hours	2		5 to 6 hours	4	
6 to 7 hours	1		6 to 7 hours	0		6 to 7 hours	1		6 to 7 hours	2	
7 to 8 hours	0		7 to 8 hours	1		7 to 8 hours	1		7 to 8 hours	2	
8 to 9 hours	1	3%	8 to 9 hours	2	2%	8 to 9 hours	2	3%	8 to 9 hours	0	0%
9 to 10 hours	5		9 to 10 hours	1		9 to 10 hours	3		9 to 10 hours	1	
10 to 11 hours	1		10 to 11 hours	3		10 to 11 hours	2		10 to 11 hours	0	
11 to 12 hours	3		11 to 12 hours	2		11 to 12 hours	3		11 to 12 hours	0	
12 to 13 hours	1		12 to 13 hours	0		12 to 13 hours	1		12 to 13 hours	0	
13 to 14 hours	2		13 to 14 hours	3		13 to 14 hours	3		13 to 14 hours	0	
Minimum Stay	00:00:04		Minimum Stay	00:00:04		Minimum Stay	00:00:04		Minimum Stay	00:00:06	
Average Stay	00:50:51		Average Stay	00:41:43		Average Stay	00:46:17		Average Stay	00:32:52	
Maximum Stay	13:00:00		Maximum Stay	13:00:00		Maximum Stay	13:00:00		Maximum Stay	09:02:36	

Table 3-8 shows that Station Approach is typically used for short stay parking. Station Approach is currently lined with various shops which correlates with the findings that vehicles parked here typically do so for less than 30 minutes. The minimum stay of approximately 4 seconds suggests pick-up and drop-off activity is prevalent in this location.

Table 3-9 - Bus Turnaround Length of Stay Data

Bus Turnaround										
Thursday			Friday			Average			Saturday		
Duration	Number of Vehicles	% Length of Stay	Duration	Number of Vehicles	% Length of Stay	Duration	Number of Vehicles	% Length of Stay	Duration	Number of Vehicles	% Length of Stay
0 to 30 minutes	55	90%	0 to 30 minutes	62	84%	0 to 30 minutes	59	87%	0 to 30 minutes	35	84%
30 minutes to 1 hour	28		30 minutes to 1 hour	2		30 minutes to 1 hour	15		30 minutes to 1 hour	5	
1 to 2 hours	8		1 to 2 hours	0		1 to 2 hours	4		1 to 2 hours	2	
2 to 3 hours	4		2 to 3 hours	1		2 to 3 hours	3		2 to 3 hours	0	
3 to 4 hours	2	4%	3 to 4 hours	0	5%	3 to 4 hours	1	4%	3 to 4 hours	0	8%
4 to 5 hours	1		4 to 5 hours	1		4 to 5 hours	1		4 to 5 hours	2	
5 to 6 hours	0		5 to 6 hours	2		5 to 6 hours	1		5 to 6 hours	1	
6 to 7 hours	1		6 to 7 hours	0		6 to 7 hours	1		6 to 7 hours	1	
7 to 8 hours	0		7 to 8 hours	1		7 to 8 hours	1		7 to 8 hours	0	
8 to 9 hours	1	7%	8 to 9 hours	2	10%	8 to 9 hours	2	8%	8 to 9 hours	0	8%
9 to 10 hours	3		9 to 10 hours	3		9 to 10 hours	3		9 to 10 hours	0	
10 to 11 hours	2		10 to 11 hours	2		10 to 11 hours	2		10 to 11 hours	4	
11 to 12 hours	0		11 to 12 hours	0		11 to 12 hours	0		11 to 12 hours	0	
12 to 13 hours	1		12 to 13 hours	1		12 to 13 hours	1		12 to 13 hours	0	
13 to 14 hours	0		13 to 14 hours	0		13 to 14 hours	0		13 to 14 hours	0	
Minimum Stay	00:01:00		Minimum Stay	00:00:09		Minimum Stay	00:00:34		Minimum Stay	00:00:08	
Average Stay	01:20:05		Average Stay	01:29:59		Average Stay	01:25:02		Average Stay	01:25:25	
Maximum Stay	12:18:00		Maximum Stay	12:30:03		Maximum Stay	12:24:02		Maximum Stay	10:00:00	

Table 3-9 shows that the Bus Turnaround is typically used for short stay parking. The majority of vehicles parking in this location do so for less than 30 minutes. However, there is a small proportion that do so for over 8 hours which suggests that these may be commuters due to the opportunity to park for free.

On-Street

The site is situated within a controlled parking zone (CPZ), with restrictions that prohibit parking between 13:00 and 14:00, unless a residential parking permit is owned by the user.

A one off on-street parking beat survey was undertaken on Thursday 10Th September 2015 between 13:00 and 14:00 which is the time when the parking occupancy reaches its peak within Northwood Town Centre.

Table 3-10 (overleaf) shows the on-street parking occupancy levels by restriction for an area that covers 200 metres from the red line boundary of the proposed development.

Table 3-10 - On-Street Parking Occupancy Data

					Permit Holder Bay				Pay & Display Bay				Disabled Permit Bay				Loading Bay				Single Yellow Line				Double Yellow Line			
1300 - 1400 Tuesday 28th July 2015	**Street**	**Total Length of Available Kerb Space**	**Length of Junctions**	**Length of Bus stops/other**	Length (m)	Calculated Spaces	Cars Parked	**Stress**	Length (m)	Calculated Spaces	Cars Parked	**Stress**	Length (m)	Calculated Spaces	Cars Parked	**Stress**	Length (m)	Calculated Spaces	Cars Parked	**Stress**	Length (m)	Calculated Spaces	Cars Parked	**Stress**	Length (m)	Calculated Spaces	Cars Parked	**Stress**
	Eastbury Road	520	20	5	20	4	1	**25%**	140	28	11	**39%**	10	2	0	**0%**					228	45	0	**0%**	97	19	0	**0%**
	Green Lane	898	90	179					40	8	7	**88%**	10	2	2	**100%**	22	4	0	**0%**	227	45	0	**0%**	330	66	1	**2%**
	Rowland Place	138	0	0					70	14	9	**64%**	5	1	0	**0%**									63	12	3	**25%**
	Hallowell Road	380	35	0	80	16	13	**81%**													195	39	0	**0%**	70	14	0	**0%**
	Ashurst Close	160	5	0	70	18	6	**33%**													80	16	0	**0%**	5	1	0	**0%**
	Chester Road	197	15	0	90	18	2	**11%**													88	17	0	**0%**	4	0	0	**0%**
	Maxwell Road	311	25	77	10	2	1	**50%**	95	19	10	**53%**	10	2	2	**100%**	10	2	1	**50%**	54	10	0	**0%**	30	6	0	**0%**
	Murray Road	548	10	0	135	27	11	**41%**					5	1	1	**100%**					394	78	1	**1%**	4	0	0	**0%**
	Oaklands Gate	175	20	0					35	7	7	**100%**	5	1	1	**100%**					35	7	1	**14%**	80	16	0	**0%**
	Total per Beat by Restriction					85	34	**40%**		76	44	**58%**		9	6	**67%**		6	1	**17%**		257	2	**1%**		134	4	**3%**
	Total per Beat					176	91	**52%**																				

Table 3-10 show that public parking i.e. Pay & Display is 58% occupied at the peak time for Northwood Town Centre. This survey suggests that there would typically be approximately 30 parking spaces vacant which is a similar level of parking to the amount of unregulated parking that occurs on Station Approach and in the Bus Turnaround.

Eastbury Road, which is located immediately opposite the site is the least utilised road for on-street parking within the Town Centre with an occupancy of 39% (17 vacant spaces).

Pick-Up / Drop-Off Activity

Northwood Station does not currently have a dedicated pick-up/drop-off facility. Station Approach is currently used for informal pick-up/ drop-off activity which often occurs on double yellow lines or in bus stops. As part of the parking surveys that were undertaken in September the number of pick-up and drop-offs were recorded including the length of time for each activity. The results of the September survey are summarised in Table 3-11.

Table 3-11 - Existing Pick-up and Drop-Off Activity

Time Period		Dropping Off Passenger		Picking Up Passenger		Combined	
		Number of Vehicles	Average Time	Number of Vehicles	Average Time	Number of Vehicles	Average Time
Thursday	0700 - 1000	49	00:00:51	7	00:00:26	56	00:00:39
	1000 - 1500	45	00:00:26	30	00:00:45	75	00:00:35
	1500 - 1900	16	00:00:32	50	00:00:51	66	00:00:42
	Day	120	00:00:38	104	00:00:48	224	00:00:43
Friday	0700 - 1000	87	00:00:27	20	00:00:38	107	00:00:32
	1000 - 1500	35	00:01:11	26	00:00:44	61	00:00:57
	1500 - 1900	42	00:00:38	65	00:00:52	107	00:00:45
	Day	135	00:00:38	66	00:00:49	201	00:00:43
Average	0700 - 1000	68	00:00:39	14	00:00:32	82	00:00:35
	1000 - 1500	40	00:00:48	28	00:00:44	68	00:00:46
	1500 - 1900	29	00:00:35	58	00:00:52	87	00:00:43
	Day	128	00:00:38	85	00:00:48	213	00:00:43

Table 3-11 shows that on average there are:

- 82 pick-up or drop-off activities during the AM peak period (0700-1000) which is an activity every 2 minutes and 11 seconds that typically lasts less than a minute.
- 87 pick-up or drop-off activities during the PM peak period (1500 -1900) which is an activity every 2 minutes and 55 seconds that typically lasts less than a minute.
- 68 pick-up or drop-off activities during the inter peak (1000 – 1500) which is an activity every 4 minutes and 24 seconds that typically lasts less than a minute.

It should be noted that this survey included taxi activity but did not distinguish between a private vehicle and a taxi.

3.4 Public Transport

Public Transport Accessibility Level (PTAL)

Transport for London's webptal website (http://www.webptals.org.uk) was used to determine the public transport accessibility level (PTAL) of the site. PTALs are a measure of the accessibility of a point to the public transport network, taking into account walk access times and service availability.

An accessibility index (AI) is calculated based upon the following elements:

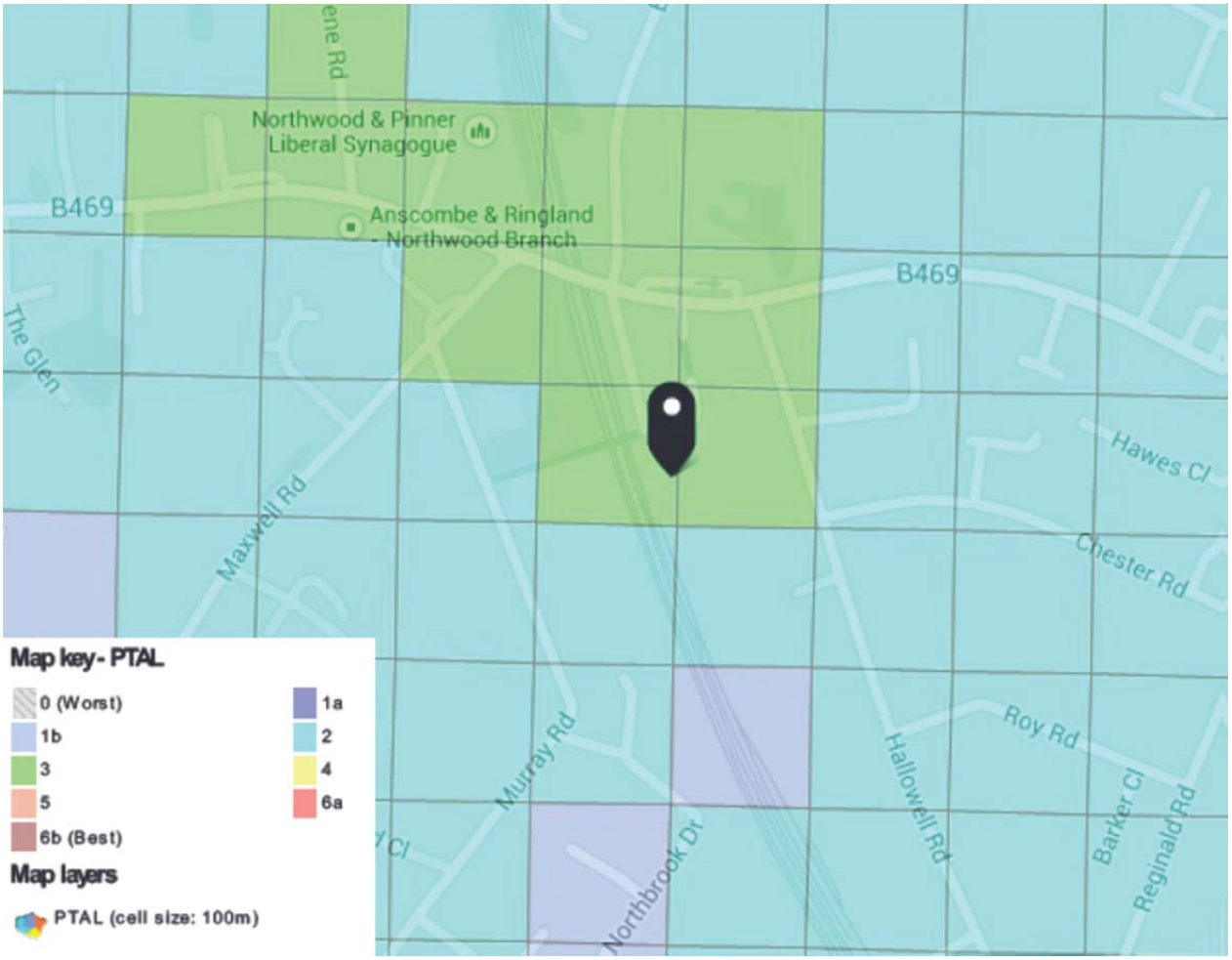
- The distance between the point of interest (POI) and the nearest bus stops, rail and underground stations, etc. (termed 'service access points', or SAPs); only SAPs within a certain distance of the POI are included (640m for bus stops and 960m for rail stations, which correspond to a walking time of 8 minutes and 12 minutes respectively at the standard assumed walking speed of 80m/min).
- The service level (i.e. frequency of bus/trains on the route), which allows assessment of a notional average waiting time; and
- A weighting factor for each route, to simulate the enhanced reliability and attractiveness of a route with a higher frequency over other routes.

This Accessibility Index (AI) can then be converted to a PTAL score which can range from 1a to 6b, where a score of 1a indicates a "very poor" level of accessibility and 6b indicates an "excellent" accessibility level.

The methodology does not consider the speed or usefulness of the accessible services, whether they are crowded or difficult to board, or the ease of interchange, but does provide a simple, standardise way of generally examining the level of access to public transport services in a particular location.

The PTAL rating for the northern half of the site is 3; this indicates a moderate level of public transport accessibility. However, the southern half of the site falls to PTAL of 2 (with a small area a PTAL of 1) which indicates a poor level of public transport accessibility respectively. Figure 3-3 (overleaf) illustrates that PTAL levels across the site and the surrounding area.

Figure 3-3 - PTAL Map



TfL's WebCAT (Web-based Connectivity Assessment Toolkit) is a toolkit that is used to assess the accessibility connectivity of a site with regards to public transport. The TIM (Time Mapping) feature generates the average journey times to and from a site using all modes of public transport or bus only.

TIM outputs have been extracted for the site to demonstrate the average journey times in the AM and PM peak to any location within London.

Figure 3-4 shows the TIM output for public transport journeys from the site in the AM peak. This output shows that the majority of Central London can be travelled to in under 60 minutes. The City of London can also be travelled to within 75 minutes.

Figure 3-4 - AM TIM Output

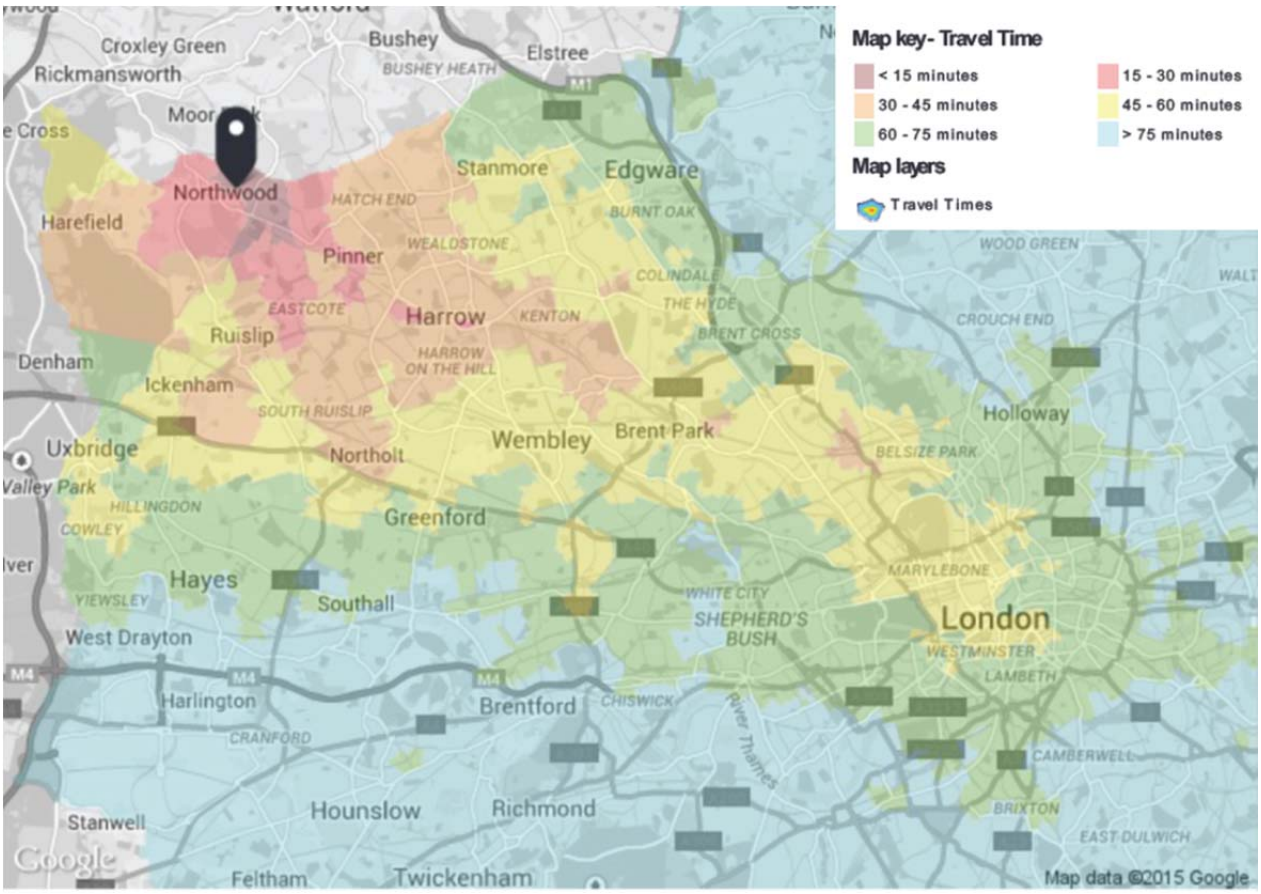
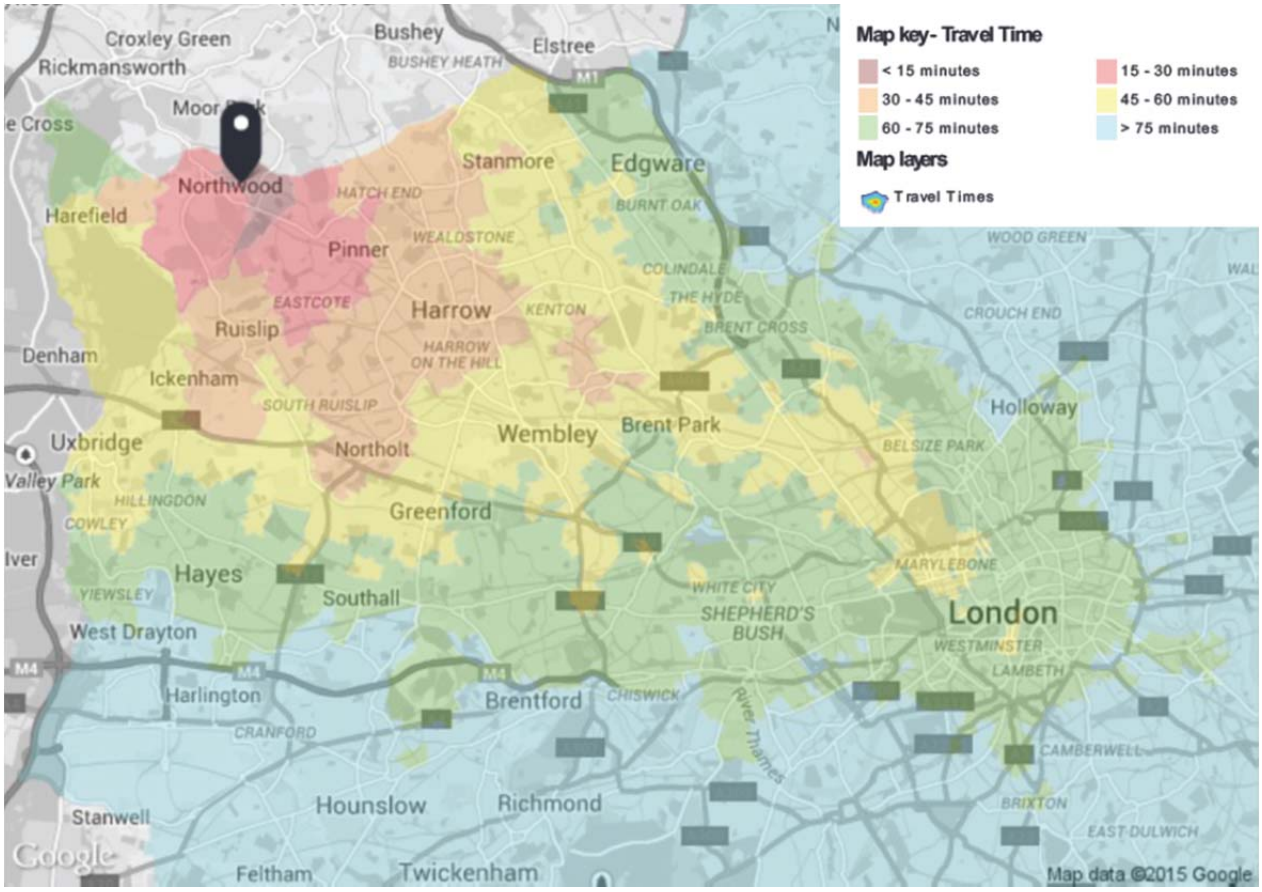


Figure 3-5 shows the TIM output for public transport journeys to the site in the PM peak. This output is similar to the AM peak as the site can be travelled to by most of Central London in under 60 minutes. Journeys to the site from the City of London can be made within 75 minutes.

Figure 3-5 - PM TIM Output



London Underground

Northwood is a station on the Watford branch of the Metropolitan line. The station is currently located on the south-west corner of the junction between Green Lane and Station Approach. The line serves as the sole continuous link between the town of Northwood and London.

The station is located on a four-track section of the Metropolitan line. The two platforms are on the slow lines. There are no platforms on the fast lines because fast services do not stop at this station.

In the northbound direction the station is served by trains to Watford, Amersham and Chesham trains. In the southbound direction services run to Baker Street and to Aldgate.

Table 3-12 (overleaf) provides the frequency information for Metropolitan Line services to/from Northwood Station in the AM and PM peak.

Table 3-12 - Metropolitan Line Frequency

Direction	0800 - 0900	0700 - 1000	1000 - 1600	1700 - 1800	1600 - 1900
Towards Amersham, Chesham and Watford	11	36	48	9	26
Towards Aldgate	9	28	49	11	32

RODS Data

TfL has provided London Underground's RODS data (Rolling Origin and Destination Survey) which provides an understanding of how utilised Northwood Station is and how many passengers travel in each direction on the Metropolitan Line.

Table 3-13 - RODS Data

Boarding or Alighting	Direction	AM		PM	
		0700 - 1000	1600 - 1900	1700 - 1800	1700 - 1800
Boarding	Northbound	24	6	46	16
	Southbound	1,846	743	854	261
Alighting	Northbound	653	312	1114	368
	Southbound	81	37	38	11

The RODS data shows that the flow in to and out of Northwood Station is tidal with the majority of trips out of Northwood in the morning heading southbound towards Central London and the City. In the evening the opposite occurs as commuters return home from work.

Buses

Northwood is served by 4 bus routes which are the 331, 282, H11 and 8 (Non-TfL). As shown in Figure 3-6 (overleaf) all of these routes serve Northwood Underground Station.

The 282, H11 and 8 services terminate at Mount Vernon Hospital which is located just under 1 mile to the west of Northwood Underground Station.

The 8 service provides a link to Watford and Abbots Langley in the north, the headway for this service is 30-60 minutes.

The 282 service provides a link to Ealing Hospital in the south, the headway for this service is 10-15 minutes.

The H11 service provides a link to Harrow in the east, the headway for this service is 15-20 minutes.

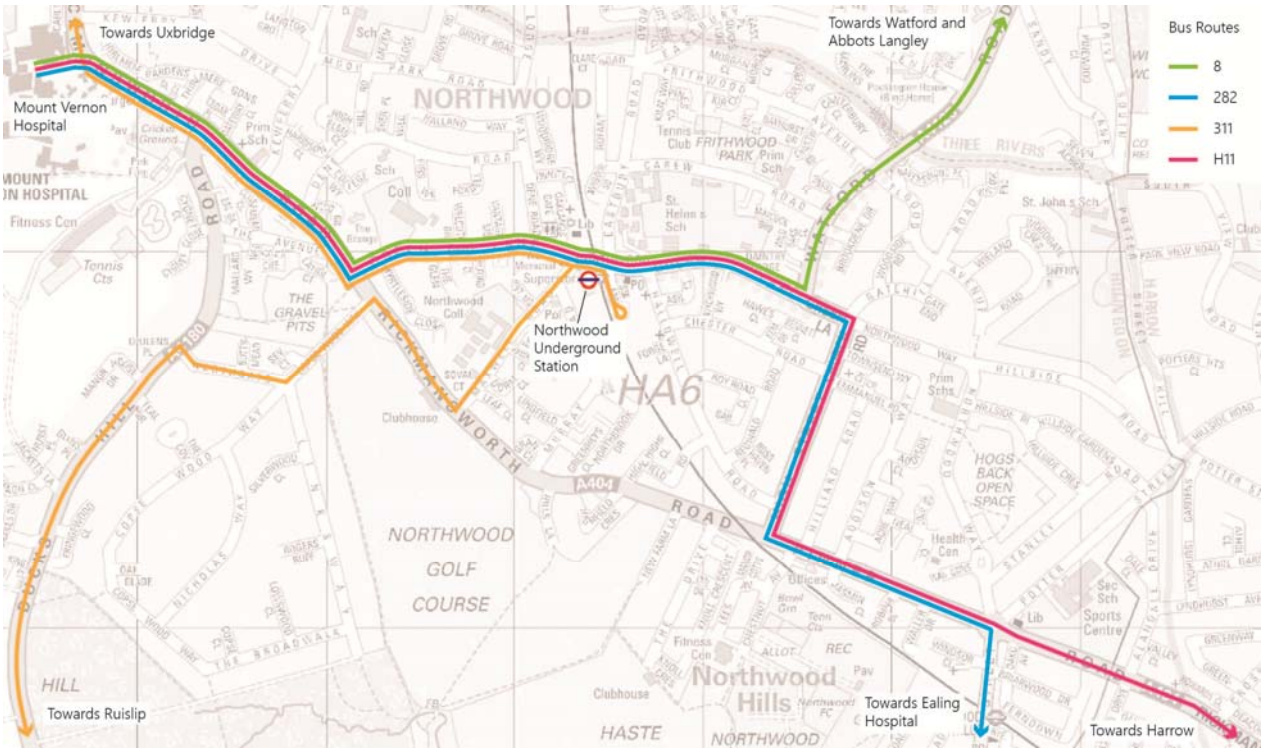
The 331 service provides links to Uxbridge (via Harefield) and Ruislip. The headway for this service is 20-30 minutes.

Table 3-14 (overleaf) summarises the bus route and frequency information.

Table 3-14 - Bus Route and Frequency

Service	Route	AM		INTER	PM	
		0800 - 0900	0700 - 1000	1000 - 1600	1700 - 1800	1600 - 1900
331	Towards Mount Vermon Hospital	6	17	30	5	15
	Towards Ealing Hospital	5	16	30	5	15
282	Towards Mount Vermon Hospital	4	13	24	4	12
	Towards Harrow	4	12	24	4	12
H11	Towards Uxbridge	3	9	18	3	9
	Towards Ruislip	3	9	18	3	9
8	Towards Harrow	1	5	12	2	6
	Towards Watford and Abbots Langley	2	6	12	2	5

Figure 3-6 - Bus Network Plan



BODS Data

TfL has provided their most recent BODS data (Bus Passenger Origin-Destination Survey) which provides an understanding of how utilised a service is and how many passengers travel in each direction across a day.

Route 282 – Surveyed 16 Nov 2012 (Friday)

390 passengers boarded or alighted at Northwood station, towards Mt Vernon Hospital.

333 passengers boarded or alighted at Northwood station, towards Ealing Hospital.

Total: 723

Route 331 – Surveyed 22 Mar 2013 (Friday)

451 passengers boarded or alighted at Northwood station, towards Ruislip.

387 passengers boarded or alighted at Northwood station, towards Uxbridge.

Total: 838

Route H11 – Surveyed 26 Sept 2014 (Friday)

346 passengers boarded or alighted at Northwood station, towards Mt Vernon Hospital.

351 passengers boarded or alighted at Northwood station, towards Harrow bus station.

Total: 696

The BODS data shows that all three TfL operated buses have very similar levels of use and equal directional travel splits. BODS data is not available for Route 8 as this bus is not operated by TfL.

3.5 Walking and Cycling

Walking

There is a good pedestrian provision within the vicinity of the site that facilities movement between the site and the existing town centre (War Memorial). The site is linked to the town centre via a wide footway to the west on the southern edge of Green Lane. At the Green Lane / Maxwell Road junction there is a zebra crossing to facilitate a safe pedestrian crossing location. The wide footway on Green Lane continues east towards St Helen's School where there is an informal crossing located just east of the junction with Hallowell Road.

At the existing signalised crossroads between Green Lane / Station Approach and Eastbury Road there are pedestrian crossing on all arms which operate under an all-red stage.

Approximately 100 metres in to the site at the end of Station Approach is an existing east-west footpath link which runs between Hallowell Road and the Waitrose Supermarket Car Park. The link between Hallowell Road and Station Approach is made via an alleyway that runs south of the St John's Church. The link between Station Approach and the Waitrose Supermarket Car Park is made via a bridge over the railway line.

Cycling

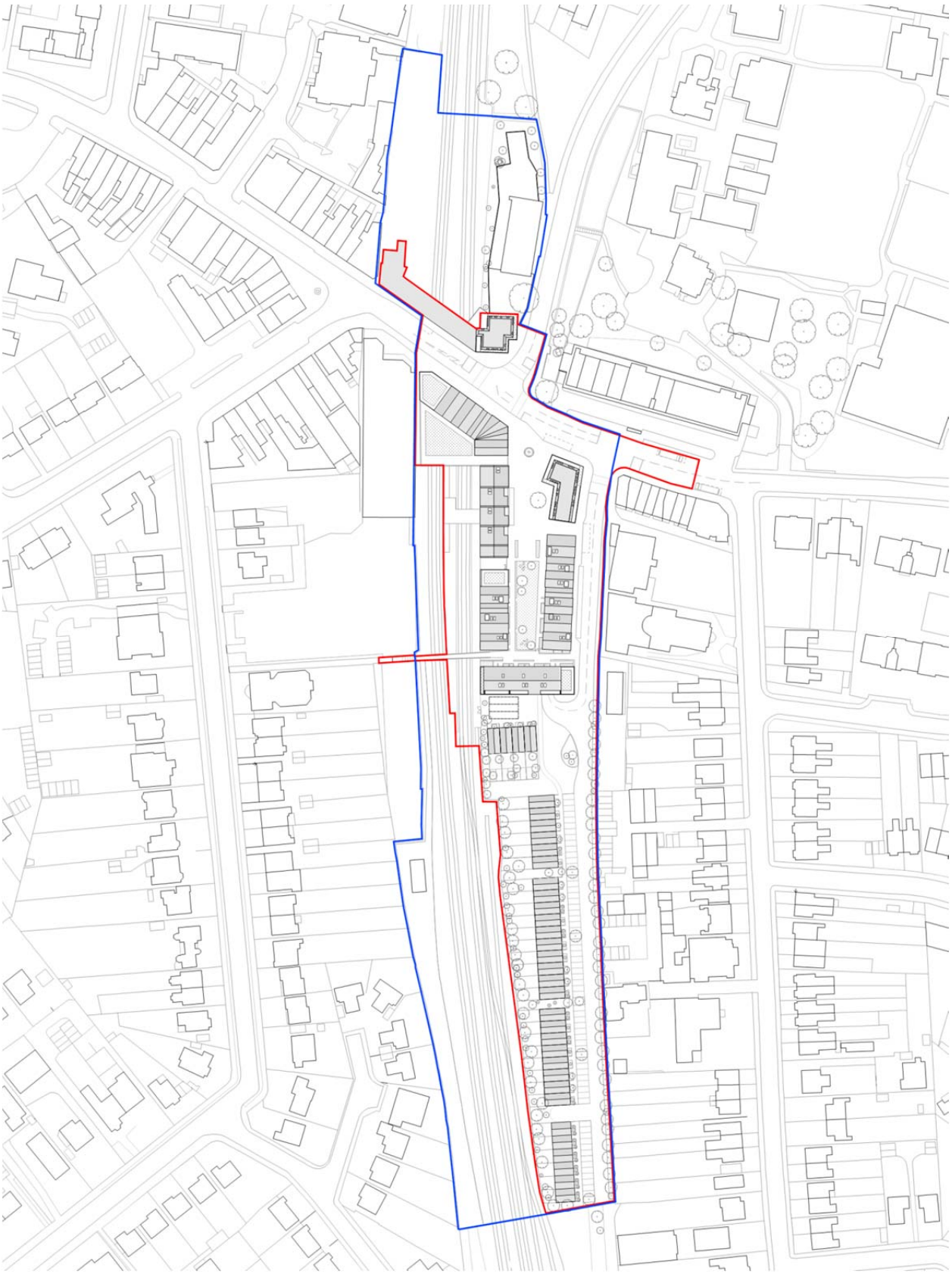
There are no signposted cycle routes within the immediate vicinity of the site. However, the existing signalised junction does provide advanced stop lines for cyclists which will be maintained as part of the proposed development.

4 Development Proposals

The proposed development will comprehensively redevelop the site to provide 127 residential units (C3) and associated car parking, 1,440 sq.m retail (A1-A5), a new operational station (Sui Generis) with step free access and associated car parking for the station; new bus interchange, and a new piazza.

Figure 4-1 (overleaf) shows an extract of the masterplan which is also shown in Appendix A.

Figure 4-1 - Masterplan Extract



The proposed residential area schedule is shown in Table 4-1.

Table 4-1 - Residential Area Schedule

Unit Type	No. of Units	%
1 Bed Apartment	32	25%
2 Bed (small) Apartment	39	31%
2 Bed Apartment	17	13%
3 / 4 Bed Apartment	5	4%
Townhouse	34	27%
Total	127	100%

To facilitate four of TfL's key objectives the way the site is currently accessed will be fundamentally changed. These objectives are:

- Improve accessibility for all users around the station;
- Improve the interchange at this transport hub between London Underground trains, buses, vehicle users, pedestrians and cyclists;
- Provide a new public space in the form of a piazza; and
- Provide new commercial uses which will improve and contribute towards the vitality and viability of the existing centre.

To achieve these objectives Station Approach will be removed from the highway network and existing buildings along its length will be demolished to create an area to provide a new public space in the form of a piazza. The new public space will be level which is a vast improvement upon the moderate slope that exists on Station Approach.

The public space creates an area that can be lined with commercial uses that will improve and contribute towards the viability of the existing centre. It also creates a safer and more viable environment for pedestrians, cyclists, the elderly and disabled to use when interchanging between car, bus and rail.

To improve the interchange between bus and London Underground trains one of the two bus stops currently associated with Bus Stop C (located east of Central Way) will be relocated approximately 50 metres west so that it is situated at the northern end of the piazza. The remaining Bus Stop C located east of Central Way will continue to serve the 8 and H11 whilst the relocated bus top will serve the 282.

The 331 has two routings which are currently serviced by two separate bus stops on Station Approach. Bus Stop A services the 331 towards Uxbridge and Bus Stop B services the 331 towards Ruislip. Bus Stop A will be relocated to the top of the piazza and will be consolidated with the relocated part of Bus Stop C that will also service the 282. Bus Stop B will be located on Central Way approximately 20 metres south of the junction with Green Lane. The revised location for the bus stop is parallel with the relocated station entrance. Bus Stop E is no longer required for alighting passengers.

Due to the location of the new site access junction, Bus Stop D, which services the 8, H11 and 282 travelling eastbound along Green Lane, has been move east by approximately 20 metres to allow vehicles to egress Central Way.

Figure 4-2 and 4-3 (overleaf) shows existing and proposed location of all bus stops respectively.

Figure 4-2 - Existing Bus Stop Locations

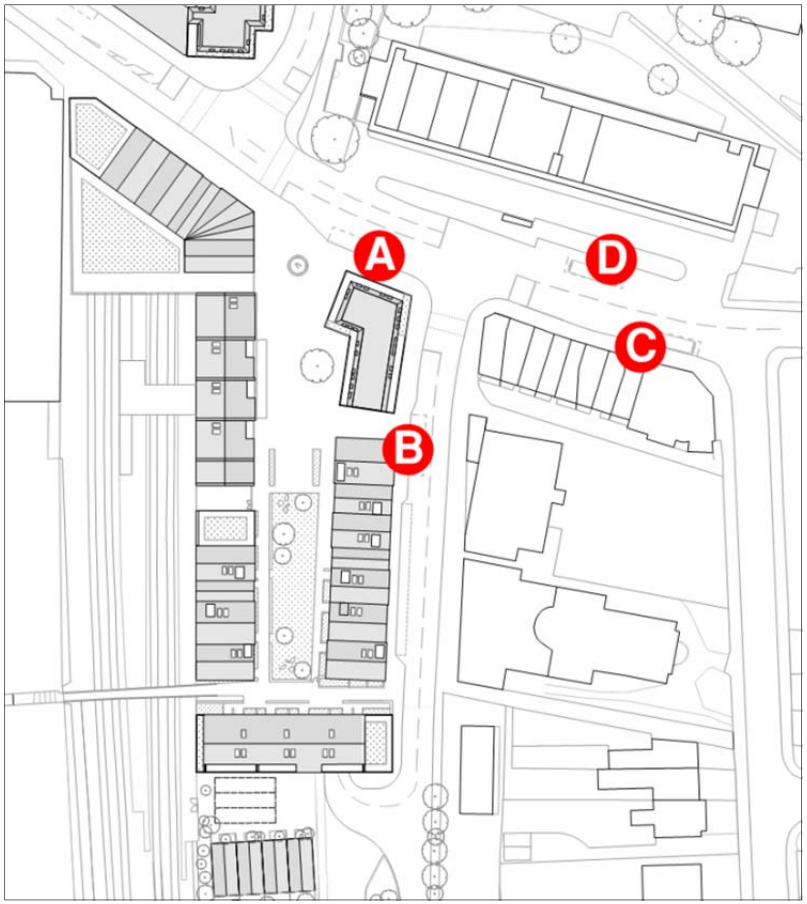
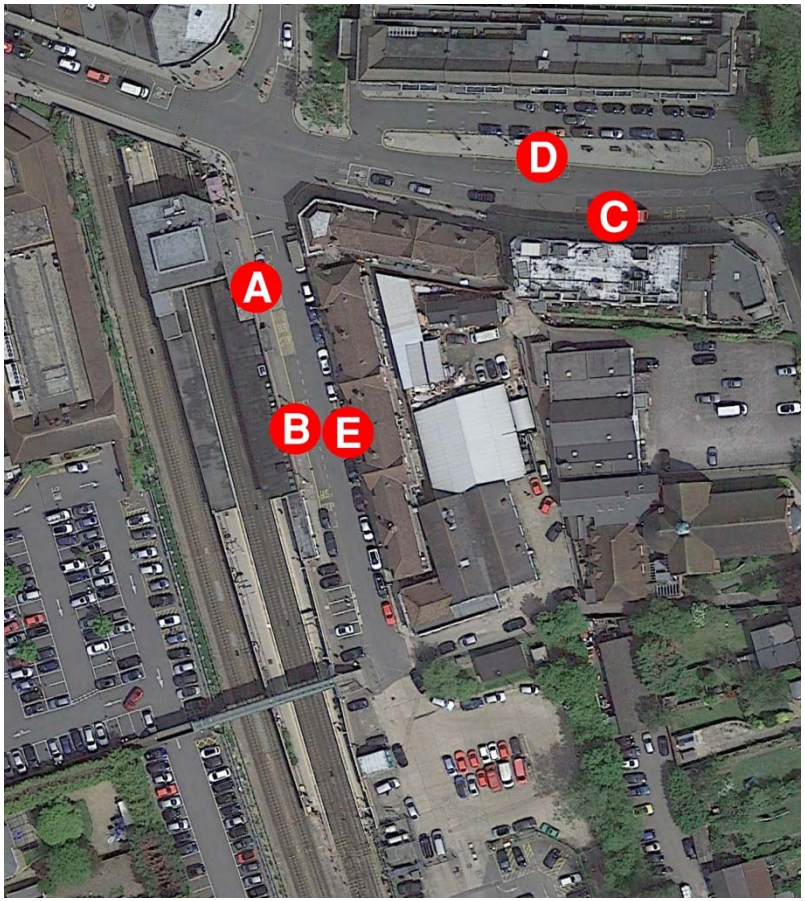


Figure 4-3 - Proposed Bus Stop Locations



The existing Northwood Station Car Park will be provided in a basement underneath the piazza across two levels of parking that will comprise of both public and private parking. A lift will be provided that connects the basement car parking to the pizza so that step-free access can be made between the two.

The proposed development will provide a new vehicular access located approximately 45 metres east of the existing junction between Green Lane and Station Approach which is currently where the north-south footpath known as Central Way is located. Central Way will be upgraded to a fully operational road suitable for all vehicle types (including pedestrians and cyclists) that will provide the sole access point for vehicles to the site. However, it should be noted that the proposed development has been design in such a way to encourage pedestrians to permeate through the site via the piazza and away from Central Way.

4.1 Access

All Vehicles

The site will be accessed by all vehicles via Central Way which will form an arm of a signalised staggered crossroads junction between Green Lane / Eastbury Road / Central Way. Central Way will provide a vehicular access that runs through the entirety of the site along the eastern boundary from Green Lane through to the TfL compound located at the southern end of the site. However, access to the compound will be restricted for TfL's use only and will not be accessible to the public.

Cars

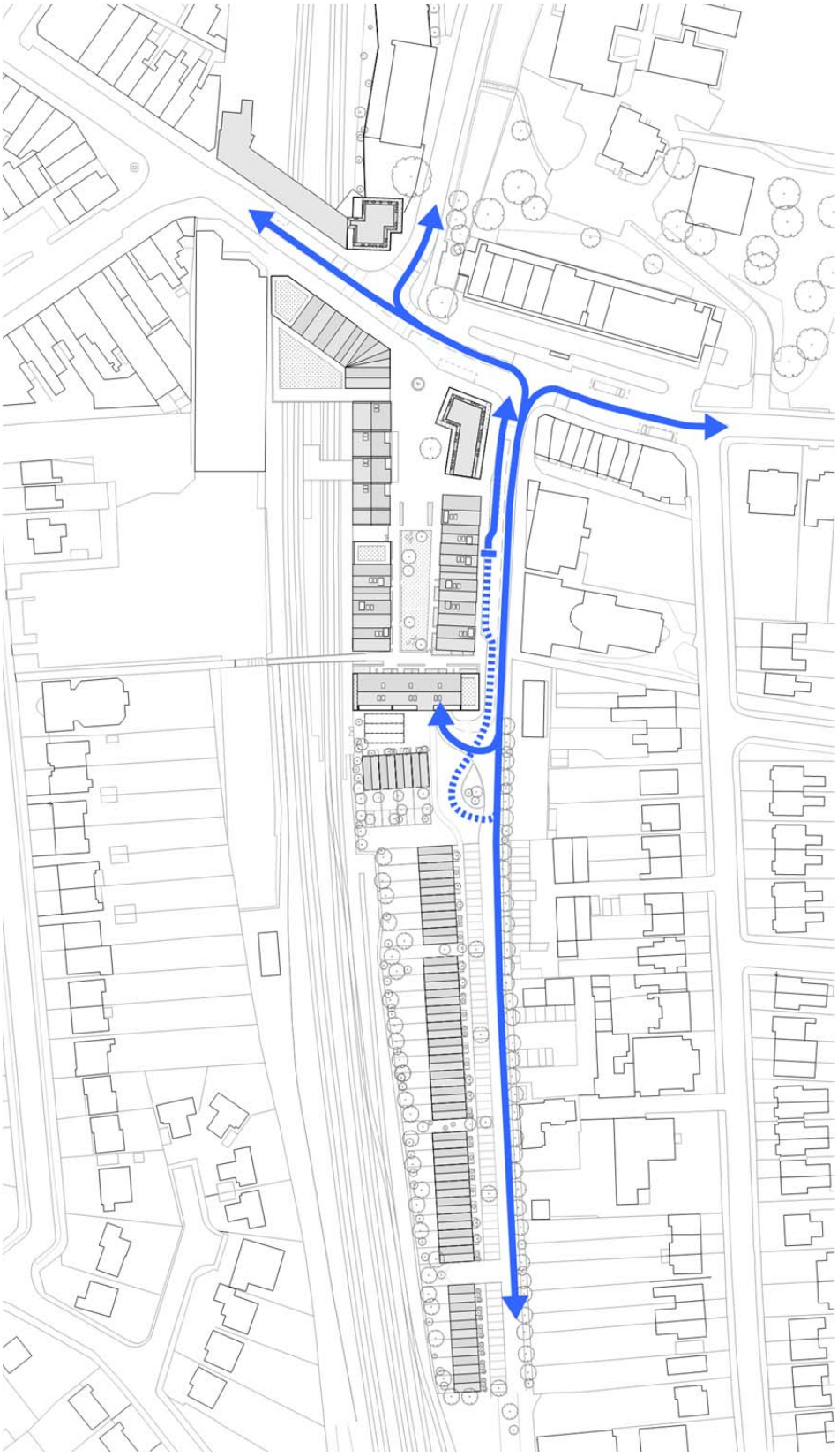
To access/egress the basement car park vehicles will use Central Way before performing a 180 degree turn in to the car park access/egress with is located approximately 100 metres south of the Green Lane / Central junction. This route will be used by vehicles requiring access to the public parking and by residents of the apartments.

Vehicles undertaking a pick-up or drop-off trip will travel southbound along Central Way before performing a turn around the island located in the centre of the site before travelling northbound along Central Way to the pick-up/drop-off area that is located on the western side of Central Way closest to the piazza and Northwood Underground Station. Pick-up/drop-off activity will be prohibited between 10:00 and 15:00 to allow Central Way to be used for refuse collection and delivery and servicing activity. Further detail is provided within the Framework Car Park Management Plan (FCPMP) which is shown in Appendix O.

Residents of the townhouses (and their visitors) will travel southbound along Central Way until they reach the row of parking adjacent to their residence.

Figure 4-3 (overleaf) shows all car movements permitted within the site.

Figure 4-4 - Car Access



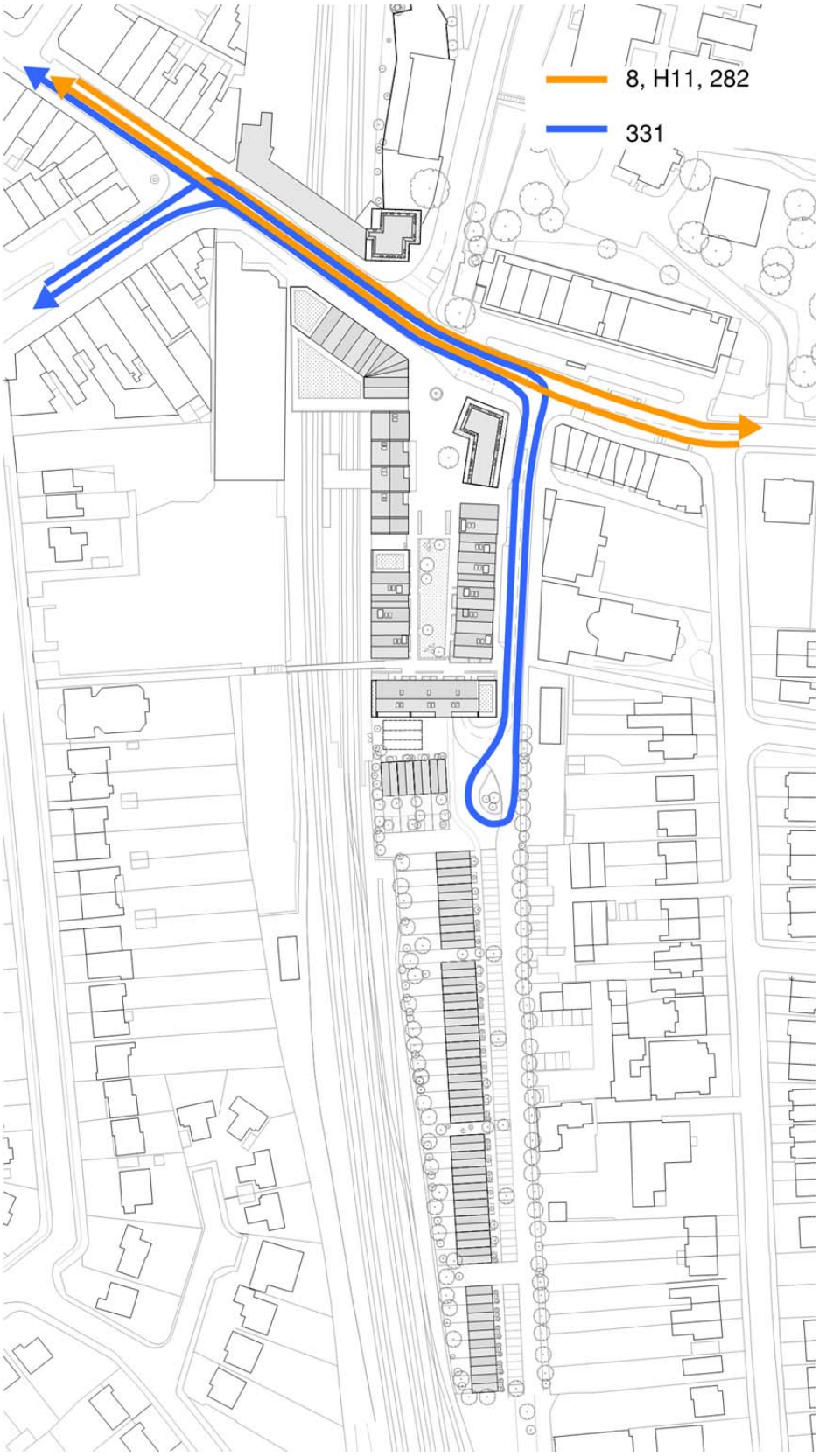
Bus

The 8, H11 and 282 buses will all continue to be served by bus stops located on Green Lane as shown in Figure 4-2.

The 331 bus will enter the site by performing a right hand turn from Green Lane in to Central Way before travelling southbound towards the turnaround facility. Once the 331 has manoeuvred around the turnaround facility the service towards Ruislip will stop at Bus Stop B located on the western side of Central Way. The 331 travelling towards Uxbridge will continue northbound along Central Way before performing a left turn on to Green Lane and in the Bus Stop A. This maintains a similar arrangement to the current operation of the 331.

Figure 4-4 (page 43) shows all bus movements permitted within the site. Swept path analysis of a bus entering and exiting the site is shown in Appendix K.

Figure 4-5 - Bus Access



Refuse (including Delivery and Servicing)

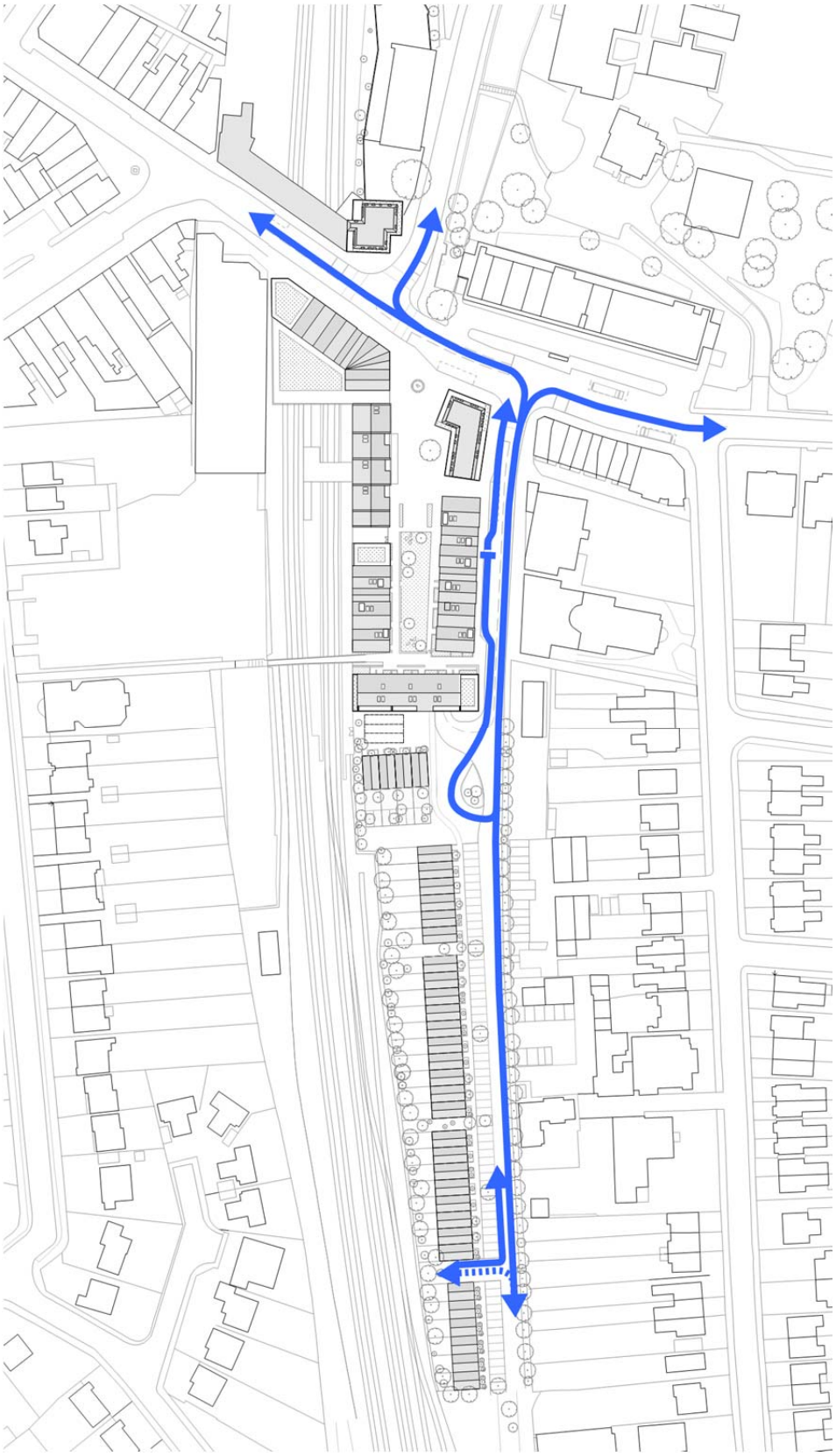
Any vehicles undertaking a collection of refuse or delivery and servicing activity for the townhouses will travel southbound along Central Way in its entirety. A turning head has been provided that allows vehicles to perform a three-point-turn before travelling northbound towards Green Lane.

Vehicles undertaking a collection of refuse or delivery and servicing activity for the apartments or retail will travel southbound along Central Way towards the turnaround facility before performing a U-turn and travelling northbound towards the pick-up/drop-off area on the western side of Central Way. Pick-up/drop-off activity will be prohibited between 10:00 and 15:00 to allow Central Way to be used for refuse collection or delivery and servicing activity. Further detail is provided within the Framework Delivery and Servicing Plan (FDSP) which is shown in Appendix N.

Figure 4-4 (overleaf) shows the permitted refuse or servicing and delivery movements within the site.

Swept path analysis of a LBH Refuse Truck undertaking all turning manoeuvres is shown in Appendix K.

Figure 4-6 - Refuse / Servicing and Delivery Access

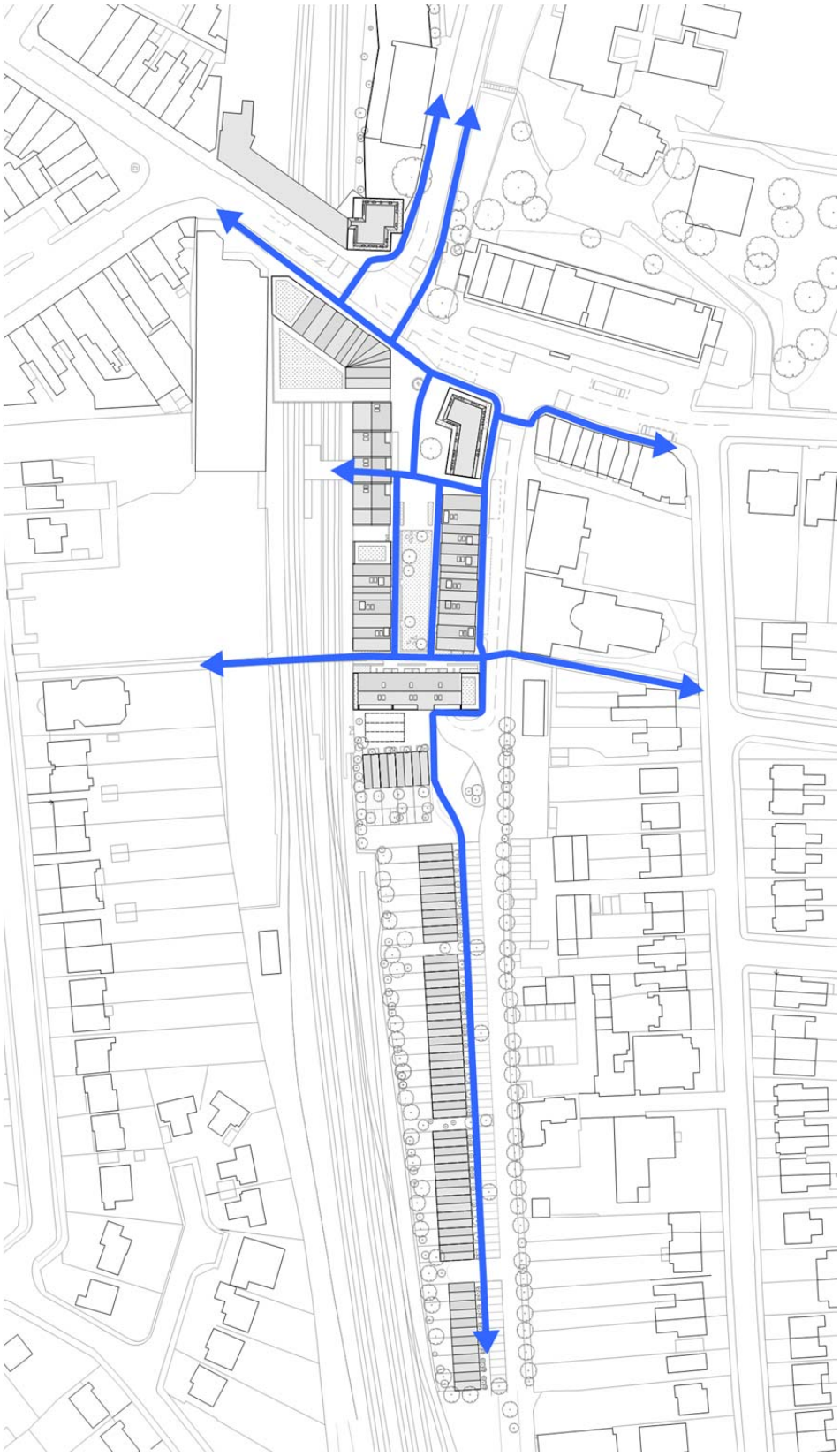


Pedestrian & Cycle

The proposed development has been designed to increase pedestrian permeability through the site and to encourage non-motorised transport to use the piazza as opposed to Central Way. Pedestrians and cyclists will have use Central Way to access the site although it is envisaged that this will be primarily used by residents and visitors to the southern end of the site. The proposed development provides a large area of public realm running through the centre of the site in a north-south direction that will be attractive to pedestrians and cyclists. It provides a wide and vehicle-free route to the relocated station and connects to the existing east-west link between the existing footbridge over the rail lines and the alleyway located south of St John's Church.

Figure 4-5 (overleaf) shows the permitted pedestrian and cycle movements within the site.

Figure 4-7 - Pedestrian & Cycling Access



4.2 Vehicle Parking

The LBH parking standards specify that *'London Plan parking standards to be used unless a specific London Borough of Hillingdon standard is listed'*. Therefore, the parking space provision will be determined against LBH parking standards as a standard is provided. It is also stated within the LBH standards that all car parking standards are maximum and that visitor parking forms part of the standard unless otherwise stated.

In accordance with the London Plan the proposed development will ensure that 20% of all residential parking spaces (both active and passive) will provide an electric charging point to encourage the uptake of electric vehicles. Furthermore, 10% of all parking spaces for commercial use (both active and passive) will also provide an electric charging point. The location of these spaces will be subject to further discussion with LBH and TfL and can be controlled by planning condition.

Public

The proposed development will provide 180 public parking spaces of which 17 will be designated for disabled users. This is an increase of 13 disabled parking spaces (which will be available for blue and brown badge holders) compared to the existing provision which is four parking spaces. This increase in disabled parking provision is to reflect the likely increase of disabled and elderly user demand due to the implementation of step-free access at the new Northwood Station.

Retail

Whilst the planning application is for A1-A5 retail uses a large proportion of Northwood residents have an expressed at Public Consultation Events a desire to maintain several existing retail categories that are located on Central Way. In addition to these retail categories it is understood that the food and beverage sector (A3) is the preferred type of retail that residents would like to see implemented as part of the scheme.

The LBH parking standard for A3 use specifies that 1 space per 50 m^2 is provided. Applying this parking standard to the proposed commercial floor area of 1,440 m^2 suggests that the development should provide 29 dedicated retail parking spaces.

However, it is worth noting that the London Plan states that:

> *'the starting point for meeting parking demand for new retail development should be use of existing public off-street provision. Parking needs should be assessed taking account of the reduction in demand associated with linked trips. If onsite parking is justified there should be a presumption that it will be publicly available.'*.

It was on this this basis that off-street parking surveys were undertaken to explore the existing parking supply and demand in Northwood. As stated in Chapter 3, by removing Station Approach and the Bus Turnaround from the parking supply, this reduces the total number of public off-street parking spaces within Northwood to 340 spaces i.e. Northwood Station Car Park and Green Lane Car Park. The average peak occupancy at any time was 315 cars parked which suggested that there is sufficient supply to accommodate all of the unregulated parking and suggests that there is additional capacity available at the peak time and into the evening.

This is a an absolute worst case assumption as it assumes all unregulated parking activity within the study area would remain. The level of parking demand may reduce as the development will implement tighter parking controls which will be detailed is detailed within the Framework Car Park Management Plan shown in Appendix O.

It should also be noted that the site is currently occupied by mix of A-Class uses and light industrial use totals approximately 2,050 m^2. The highest contributor to this total is a mechanics which occupies an area of 970 m^2. Food retail i.e. café, takeaway and restaurant uses account for 365 m^2 of the area with the remainder being split across a number of non-food retail uses such. The demand associated with the existing uses has not been removed from the parking demand calculations which further enforces that assumed level of demand is a worst case.

Furthermore, the commercial element of the proposed development offer is most likely to comprise of restaurants which typically generate a peak demand after 18:00 (see Chapter 5 – Trip Generation and Distribution). The parking surveys found that parking demand in Northwood Town Centre after 18:00 drops below 50% of the total supply.

Although the London Plan suggests that existing public off-street parking should be surveyed it is worth considering that there is a substantial amount of public on-street parking spaces within Northwood i.e. Pay & Display. The snapshot surveys undertaken in September suggested that at peak times the public on-street parking is 58% occupied.

Irrespective of the on-street parking, which has not been factored, it is concluded that there is sufficient existing capacity within Northwood Town Centre (at Northwood Station and LBH public car parks) to accommodate any additional retail parking demand generated by the development during the day and evening.

Pick-up / Drop-Off

The proposed development will provide a formal pick-up and drop-off area located on the western edge of Central Way that will be able to accommodate up to five large cars. Taxis will also use this area but they will be limited to no more than two vehicles at any one time. Taxis will be required to store within the car park circulation and will be called by the taxi kiosk when a fare is ready to be collected at the pick-up/drop-off. The size of this area has been informed by the data collected for pick-up and drop-off activity on Station Approach.

This data showed that at the busiest time of day, AM peak period (0700-1000) there were 82 pick-up or drop-off activities which is an activity every 2 minutes and 11 seconds that typically lasted less than a minute. Based on this information the area provided is of a suitable size. It should be noted that this survey included taxi activity but did not distinguish between a private vehicle and a taxi.

Pick-up and drop-off activity will be prohibited in the designated area on Central Way between 10:00 and 15:00 to allow refuse collection and delivery and servicing activities to be undertaken. During this time pick-up and drop-off activity will occur within the circulation of the basement car park which allows people to be dropped off nearby the lift that provides a direct link between the car park and the piazza. However, it should be noted that pick-up/drop-off activity within the basement car park is permitted at any time.

Further information regarding the operation of the pick-up and drop-off area including overspill activity is shown in the Framework Car Park Management Plan shown in Appendix O.

Residential

LBH car parking standards state that a maximum of 2 parking spaces should be provided per dwelling for *'dwellings with curtilage parking'* and a maximum of 1.5 parking spaces per dwelling *for 'dwellings without individual cartilages with communal parking in garages or open car parking areas'*.

The proposed development will provide a mix of 93 x apartments and 34 x townhouses. Given the site location and proximity to Northwood Station and supporting bus services, especially at the northern end of the site, the maximum parking provision will not be provided for the apartments.

The proposed development will provide 48 parking spaces for apartments at a ratio of 0.52 parking spaces per apartment which will be provided within the basement car park. These parking spaces will be provided by the use of 24 x 'stackers' which allow one car to park above another. To distinguish the residential parking spaces from the public parking spaces, the residential spaces will be marked by a different colour surface material to enforce that they are private spaces not for public use. The 'stacker' system will be a sufficient deterrent to prevent them being used by the general public and are likely to be fob-operated. The location of the residential parking stackers is shown in Appendix A.

The proposed development will provide 70 parking spaces for townhouses at a ratio of 2.05 parking spaces per townhouse. However, there will be 8 spaces allocated on-plot to the 4 units located adjacent to the entrance to the public car park. The remaining 62 spaces allocated as communal parking spaces that are located off-street along the southern end of Central Way parallel to the townhouses. The LBH parking standards specify that off-plot/communal parking is provided at 1.5 spaces per unit for residential units; therefore there is a requirement for only 45 spaces. This suggests that the remaining 17 parking spaces that are provided above the standard could be allocated to the apartments. This would increase the total parking provision allocated to the apartments to 67 spaces at a ratio of 0.72 parking spaces per apartment.

To summarise, the development proposals will provide 118 residential parking spaces across the site for 127 residential units at a ratio of 0.93 spaces per dwelling. 10% of all residential parking will be dedicated for disabled users (blue and brown badge holders).

Further information regarding the management of the proposed private and public car parking can be found within the Framework Car Park Management Plan which is shown in Appendix O.

4.3 Cycle Parking

LBH Highway Officers have indicated that although they do have their own cycle parking standards they are happy for London Plan standards to be applied.

Northwood Station

There is currently a provision of 13 cycle parking spaces at Northwood station. The proposed development will increase this to 28 cycle parking spaces which will be located in a convenient, secure and covered area approximately 10 m south of the station entrance.

Retail (A3 Food & Drink)

The London Plan cycle parking standards state that for a Food Retail land use that there is a requirement for a minimum provision of:

- 1 cycle parking space per 175m^2 for long stay; and
- 1 cycle parking space per 40 m^2 for short stay.

Therefore the proposed development will provide 54 retail cycle parking spaces which will be located within the public piazza. However, it is pragmatic to provide 50% of this cycle parking provision and to safeguard an area for the remaining provision. The safeguarded provision should only be provided once Travel Plan surveys show that there is a sufficient level of demand to require additional cycle parking. This pragmatic approach will reduce the potential for unnecessary clutter within the piazza i.e. unused cycle stands.

Residential

The London Plan cycle parking standards state that for residential units there is a requirement for a minimum provision of:

- 1 cycle parking space per studio and 1 bed unit;
- 2 cycle parking spaces per 2+ bed unit; and
- 1 cycle parking space per 40 units for visitors.

Therefore the proposed development will provide 226 residential cycle parking spaces which will be located within the basement for the apartments and on-plot for the townhouses.

4.4 Summary

The proposed development will provide:

127 residential units comprising:

- 32 x 1 bed apartments;
- 56 x 2 bed apartments;
- 5 x 3 bed apartments; and
- 34 x townhouses (3/4 bed).

1,440 sq.m A1-A5 retail space.

Car Parking

298 parking spaces comprising:

180 public spaces (17 disabled – shared between blue and brown badge);

- 48 spaces for apartments (93 units);
- 70 spaces for town houses (34 units); and
- 0.93 spaces per dwelling across the site.

Dedicated Pick-Up/Drop-Off area on Central Way – space for five large cars – area will also be used by taxis but limited to two spaces.

Overspill pick-up/drop-off and taxi activity to be undertaken on the circulation of basement car park – lifts provide direct access to public piazza

Pick-up/Drop-Off on Central Way prohibited between 10am and 3pm (this may reduce to 10am and 2pm) to allow for delivery and servicing activity for residents and retail.

Cycle Parking

- Residential – 226 spaces;

- Station – 28 spaces (existing provision of 13 spaces); and
- Retail – 54 spaces.

5 Trip Generation and Distribution

5.1 Trip Generation

Residential

To establish the likely trip generation associated with the proposed development the TRAVL database has been searched for sites with similar characteristics to the proposed development. The search criteria for the residential element of the site are:

- Outer London;
- Surveyed Post 2004 (within last 10 years);
- Under 250 units;
- No affordable housing (provides a robust assessment as private has a higher car ownership);
- PTAL between 2 – 3;
- Within 500m of a rail/underground station; and
- Parking ratio below 1.5 spaces per unit.

This search criteria returned one result – Clarence Close, Barnet (Survey ID - 395). Clarence Close is located within 300 metres of New Barnet train station at the point furthest away from the station. There is a small parade of shops and a Sainsbury's supermarket located within 250 metres of the site which is also very similar to Northwood Station. The development is formed of 104 residential units and provides 120 parking spaces at a ratio of 1.15 spaces per unit.

Clarence Close provides the most similar characteristics to the proposed development and is therefore likely to provide an accurate estimate of the trip generation associated with the proposals. However, it is only one site and is more than 5 years old which goes against best practise.

In discussions with LBH Highway Officers it was suggested that the trip rates agreed and used within the recently approved (December 2014) development of the Former ARLA Food Depot Development, Victoria Road, Ruislip (66819/APP/2014/1600) should be used to forecast the transport impacts of the proposed development.

The TRAVL sites used within the Former ARLA Food Depot application are shown in Table 5-1.

Table 5-1 - Proposed Residential Sites for Trip Generation

Site	Location	Survey Date	No. of Units	Parking Spaces	Parking Ratio
Bed-Zed Mixed Use Site	Mitcham	09/03/2005	84	84	0.8
Bed-Zed Private Site	Mitcham	09/03/2005	84	84	0.8
Clarence Close	Barnet	02/11/2004	120	120	1.1
Stanley Close	Greenwich	24/04/2008	156	175	1.1

Further information about the TRAVL sites used by the Former ARLA Food Depot Development, Victoria Road, Ruislip (66819/APP/2014/1600) have been extracted from appendices within their Transport Assessment and are shown in Appendix G.

Tables 5-2 and 5-3 (overleaf) show the multi-modal trip rates and trip generation based on the sites shown in Table 5-1.

Table 5-2 – Former ARLA Dairy Depot - Multi-Modal Trip Generation - AM Peak

Mode	Mode Split	Trip Rates			Trip Generation – 127 units		
		In	Out	Total	In	Out	Total
Bus	5%	0.00601	0.02325	0.02926	1	3	4
Car Driver	27%	0.03247	0.12554	0.15801	4	16	20
Car Passenger	9%	0.01082	0.04185	0.05267	1	5	7
Motorcycle	1%	0.00120	0.00465	0.00585	0	1	1
Cycle	4%	0.00481	0.01860	0.02341	1	2	3
Rail	26%	0.03127	0.12089	0.15216	4	15	19
Underground	1%	0.00120	0.00465	0.00585	0	1	1
Walk	27%	0.03247	0.12554	0.15801	4	16	20
Total	100%	0.12025	0.46497	0.58522	15	59	74

Table 5-3 - Former ARLA Dairy Depot - Multi-Modal Trip Generation - PM Peak

Mode	Mode Split	Trip Rates			Trip Generation – 127 units		
		In	Out	Total	In	Out	Total
Bus	5%	0.01804	0.01643	0.03447	2	2	4
Car Driver	27%	0.09741	0.08874	0.18615	12	11	24
Car Passenger	9%	0.03247	0.02958	0.06205	4	4	8
Motorcycle	1%	0.00361	0.00329	0.00690	0	0	1
Cycle	4%	0.01443	0.01315	0.02758	2	2	4
Rail	26%	0.09380	0.08545	0.17925	12	11	23
Underground	1%	0.00361	0.00329	0.00690	0	0	1
Walk	27%	0.09741	0.08874	0.18615	12	11	24
Total	100%	0.36078	0.32867	0.68945	46	42	88

It has been agreed with LBH that although the trip rates and generation are reasonable and robust but the mode split does not accurately reflect the expected underground, bus and walking use in Northwood. Therefore, the mode split will be redistributed to consolidate rail and underground in to underground only and the mode split for bus and walking will be split equally.

Tables 5-4 and 5-5 (overleaf) show the redistributed and proposed multi-modal trip rates and trip generation.

Table 5-4 – Proposed Multi-Modal Trip Generation - AM Peak

Mode	Mode Split	Trip Rates			Trip Generation – 127 units		
		In	Out	Total	In	Out	Total
Bus	16%	0.01924	0.07440	0.09364	2	9	12
Car Driver	27%	0.03247	0.12554	0.15801	4	16	20
Car Passenger	9%	0.01082	0.04185	0.05267	1	5	7
Motorcycle	1%	0.00120	0.00465	0.00585	0	1	1
Cycle	4%	0.00481	0.01860	0.02341	1	2	3
Underground	27%	0.03247	0.12554	0.15801	4	16	20
Walk	16%	0.01924	0.07440	0.09364	2	9	12
Total	100%	0.12025	0.46497	0.58522	15	59	74

Table 5-5 – Proposed Multi-Modal Trip Generation - PM Peak

Mode	Mode Split	Trip Rates			Trip Generation – 127 units		
		In	Out	Total	In	Out	Total
Bus	16%	0.05772	0.05259	0.11031	7	7	14
Car Driver	27%	0.09741	0.08874	0.18615	12	11	24
Car Passenger	9%	0.03247	0.02958	0.06205	4	4	8
Motorcycle	1%	0.00361	0.00329	0.00689	0	0	1
Cycle	4%	0.01443	0.01315	0.02758	2	2	4
Underground	27%	0.09741	0.08874	0.18615	12	11	24
Walk	16%	0.05772	0.05259	0.11031	7	7	14
Total	100%	0.36078	0.32867	0.68945	46	42	88

Using the redistributed multi-modal trip rates suggests that the residential element of the proposed development is likely to generate 74 and 88 two way person trips during the AM and PM peaks respectively. Of these trips it is estimated that 20 and 24 will be two way car driver trips during the AM and PM peaks respectively.

Table 5-6 - Proposed Multi-Modal Trip Generation - Daily

Mode	Mode Split	Trip Rates			Trip Generation – 127 units		
		In	Out	Total	In	Out	Total
Bus	16%	0.57520	0.57520	1.15040	73	73	146
Car Driver	27%	0.97065	0.97065	1.94130	123	123	247
Car Passenger	9%	0.32355	0.32355	0.64710	41	41	82
Motorcycle	1%	0.03595	0.03595	0.07190	5	5	9
Cycle	4%	0.14380	0.14380	0.28760	18	18	37
Underground	27%	0.97065	0.97065	1.94130	123	123	247
Walk	16%	0.57520	0.57520	1.15040	73	73	146
Total	100%	3.59500	3.59500	7.19000	457	457	913

Table 5-6 shows the proposed daily multi-modal trip generation which suggests that the residential element of the proposed development is likely to generate 319 two way person trips during across the day. Of these trips it is estimated that 247 will be two way car driver trips.

The TRAVL sites used by the Former ARLA Food Depot Development, Victoria Road, Ruislip (66819/APP/2014/1600) did not include Saturday survey data therefore the review TRICS data to derive a factor to convert weekday TRAVL trip rates to Saturday trip rates. The TRICS assessment they undertook used 2 sites located in Surrey that were both located in out of centre suburban areas. Table 5-7 (overleaf) shows the proposed multi-modal trip rates and trip generation applied to the redistributed mode shares.

Table 5-7 - Proposed Multi-Modal Trip Generation – Saturday Peak

Mode	Mode Split	Trip Rates			Trip Generation – 127 units		
		In	Out	Total	In	Out	Total
Bus	16%	0.03437	0.03437	0.06874	4	4	9
Car Driver	27%	0.05800	0.05800	0.11600	7	7	15
Car Passenger	9%	0.01933	0.01933	0.03867	2	2	5
Motorcycle	1%	0.00215	0.00215	0.00430	0	0	1
Cycle	4%	0.00859	0.00859	0.01718	1	1	2
Underground	27%	0.05800	0.05800	0.11600	7	7	15
Walk	16%	0.03437	0.03437	0.06874	4	4	9
Total	100%	0.21481	0.21481	0.42962	27	27	55

Table 5-7 shows the proposed Saturday peak multi-modal trip generation which suggests that the residential element of the proposed development is likely to generate 55 two way person trips during the Saturday peak hour (1200-1300). Of these trips it is estimated that 15 will be two way car driver trips.

It should be noted that there are 14 existing residential units located on Central Way which have not been discounted from the proposed 127 residential units when calculating the trip generation.

Retail

Whilst the planning application is for A1-A5 retail uses a large proportion of Northwood residents have expressed at Public Consultation Events a desire to maintain several existing retail categories that are located on Central Way. In addition to these retail categories it is understood that A3 Food & Beverage i.e. restaurants and cafes is the preferred type of retail that residents would like to see implemented as part of the scheme.

It is envisaged that the retail element of the development will mainly comprise of cafes and/or restaurants and for the purposes of a robust assessment restaurant uses will be assessed as restaurants typically have a high trip generation. Due to the small level of retail area proposed as part of this development (1,440 m^2) and the location of the proposed retail in context of the existing Town Centre, Northwood Station existing retail stores it likely that the majority of trips will be pass-by or linked trips. A vast proportion of customers to the proposed retail will be commuters using cafes before their commute or dining in a restaurant after returning from Central London. During the day it is likely that the customers will already be making a trip to Northwood and will be visiting several shops rather than just one located within the proposed development.

Similarly to the approach taken with the residential trip generation it has been suggested by LBH Highway Officers that the trip rates agreed and used within the recently approved (December 2014) development of the Former ARLA Food Depot Development, Victoria Road, Ruislip (66819/APP/2014/1600) should be used to forecast the transport impacts of the proposed development.

The TA for the Former ARLA Food Depot application reviewed the TRAVL database in order to determine vehicle trip rates for the restaurant proposed within their development. However, their TRAVL database search only yielded two sites which derived Friday PM peak trip rates. Therefore, a TRICS review was undertaken that identified an out of centre site with Friday PM peak trip rates that were considerably higher than the TRAVL trip rates. Table 5-8 shows the rank order of the chosen TRICS sites within the Former ARLA Food Depot application TA within a sample of eight other sites. The TRICS average was used to provide the Friday PM Peak hour restaurant use vehicular trip rates.

Table 5-8 - Proposed Restaurant Vehicular Trip Rates and Generation

Rank	Site Ref	Description	Area	GFA	Date	Trip Rate		
						Arrival	Departure	Total
1	LI-06-B-01	Chinese	Limerick	380	20/05/05	7.895	5.789	13.684
2	DH-06-B-1	Chiquito	Durham	500	04/12/08	5.600	6.800	12.400
3	FA-06-B-01	F&B	Falkirk	425	27/04/10	7.765	4.000	11.765
4	ARLA	-	-	-	-	5.143	3.143	8.286
5	AN-06-B-01	Restaurant	Belfast	1500	28/11/08	1.800	0.000	1.800
6	DL-06-B-01	Dominium	Dublin	330	09/12/09	0.303	0.303	0.606
7	GM-06-B-03	Pizza Hut	Stockport	900	23/11/09	0.222	0.222	0.444
8	MS-06-B-01	Indian	Merseyside	600	22/06/07	0.000	0.167	0.167

Whilst some of the sites used within the Former ARLA Food Depot Development Transport Assessment are very high and may potentially be unrealistic it should be noted that the trip rates shown in Table 5-8 are for a Friday which is typically a busier day than any other weekday i.e. Monday to Thursday. Therefore the use of these trip rates should be considered robust.

The TRAVL database does not have data for Saturday restaurant surveys therefore the TRICS database was reviewed. The TRICS database provided an edge of centre site which was used by the Former ARLA Food Depot Development application TA which produced Saturday peak hour trip rates. This TRICS site was used for the assessment and the vehicular trip rates are shown in Table 5-9.

Table 5-9 - Proposed Vehicular Restaurant Trip Rates - Saturday

Saturday Peak	Trip Rates		
	In	Out	Total
1200 - 1300	5.222	2.350	7.572

Further information about the TRAVL sites used by the Former ARLA Food Depot Development, Victoria Road, Ruislip (66819/APP/2014/1600) have been extracted from appendices within their TA and are shown in Appendix G.

To assess the multi-modal trip generation associated with the proposed restaurant use the mode share from the sites selected from TRAVL database was applied to the vehicular trip rate. Table 5-10 (page 60) shows the proposed multi-modal trip rates and retail (restaurant) trip generation for the proposed development on a weekday.

It should also be noted that the site is currently occupied by mix of A-Class uses and light industrial use totals approximately 2,050 m^2. The highest contributor to this total is a mechanics which occupies an area of 970 m^2. Food retail i.e. café, takeaway and restaurant uses account for 365 m^2 of the area with the remainder being split across a number of retail uses outside of the food offer.

The trip generation values shown in Table 5-10 (overleaf) have been calculated by discounting the existing 365 m^2 food retail element from the proposed 1,440 m^2. However, no further discount has been applied to account for the other existing uses that will no longer remain as part of the proposed development i.e. mechanics. Therefore, the retail trip generation should be considered robust.

Table 5-10 - Proposed Retail Multi-Modal Trip Rates and Generation - Weekday

Time Period	Car Driver						Bus			Car Passenger			Underground			Cycle			Walk			Total		
	Trip Rate			Trip Generation																				
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
10:00 - 11:00	0.286	0.000	0.286	2	0	2	0	0	0	3	0	3	1	0	1	0	0	0	5	0	5	13	0	13
11:00 - 12:00	0.286	0.286	0.572	2	2	4	0	0	1	3	3	7	1	1	3	0	0	1	5	5	11	13	13	25
12:00 - 13:00	2.571	1.429	4.000	19	11	30	3	2	5	29	16	46	11	6	18	2	1	4	48	26	74	113	63	176
13:00 - 14:00	2.286	1.714	4.000	17	13	30	3	2	5	26	20	46	10	8	18	2	2	4	42	32	74	101	76	176
14:00 - 15:00	0.857	1.429	2.286	6	11	17	1	2	3	10	16	26	4	6	10	1	1	2	16	26	42	38	63	101
15:00 - 16:00	2.286	1.714	4.000	17	13	30	3	2	5	26	20	46	10	8	18	2	2	4	42	32	74	101	76	176
16:00 - 17:00	1.143	1.714	2.857	9	13	21	2	2	4	13	20	33	5	8	13	1	2	3	21	32	53	50	76	126
17:00 - 18:00	5.143	3.143	8.286	39	24	62	7	4	11	59	36	95	23	14	37	5	3	7	95	58	153	227	139	365
18:00 - 19:00	6.000	5.143	11.143	45	39	84	8	7	15	69	59	128	26	23	49	5	5	10	111	95	206	265	227	491
19:00 - 20:00	6.000	7.429	13.429	45	56	101	8	10	18	69	85	154	26	33	59	5	7	12	111	138	249	265	328	592
20:00 - 21:00	3.143	4.286	7.429	24	32	56	4	6	10	36	49	85	14	19	33	3	4	7	58	79	138	139	189	328
21:00 - 22:00	0.857	2.857	3.714	6	21	28	1	4	5	10	33	43	4	13	16	1	3	3	16	53	69	38	126	164
Total	30.858	31.144	62.002	231	233	465	41	41	82	354	357	711	136	137	273	27	27	55	572	577	1148	1361	1373	2734
Mode Split				17%			3%			26%			10%			2%			42%			100%		

The multi-modal trip generation suggests that the retail element of the proposed development is likely to generate 365 two way person trips during the PM peak (1700 – 1800). Of these trips it is estimated that 62 will be two way car driver trips. It should be noted that multi-modal trip generation shown in Table 5-10 includes a 30% linked trip discount which was agreed in principle with LBH Highways Officers. Table 5-11 below shows the proposed modal trip rates and retail (restaurant) trip generation for the proposed development on a Saturday.

Table 5-11 - Proposed Retail Multi-Modal Trip Rates and Generation - Saturday

Time Period	Car Driver						Bus			Car Passenger			Underground			Cycle			Walk			Total		
	Trip Rate			Trip Generation																				
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
12:00 - 13:00	5.222	2.350	7.572	39	18	57	7	3	10	60	27	87	23	10	33	5	2	7	97	44	140	230	104	334
Mode Split				17%			3%			26%			10%			2%			42%			100%		

The multi-modal trip generation suggests that the retail element of the proposed development is likely to generate 334 two way person trips during the Saturday peak (1200 – 1300). Of these trips it is estimated that 57 will be two way car driver trips.

Table 5-12 provides the proposed total multi-modal trip generation for proposed development for the AM, PM and Saturday Peaks.

Table 5-12 - Proposed Total Multi-Modal Trip Generation

Mode	AM Peak (0800-0900)			PM Peak (1700-1800)			Saturday Peak (1200-1300)		
	In	Out	Total	In	Out	Total	In	Out	Total
Bus	2	9	12	14	11	25	11	7	19
Car Driver	4	16	20	51	35	86	47	25	71
Car Passenger	1	5	7	63	40	103	62	29	92
Motorcycle	0	1	1	0	0	1	0	0	1
Cycle	1	2	3	6	4	11	6	3	9
Underground	4	16	20	35	25	60	30	18	48
Walk	2	9	12	103	65	167	101	48	149
Total	15	59	74	273	180	453	258	131	388

The total multi-modal trip generation for the proposed development estimates that the site is likely to generate 20 two way car driver trips in the AM peak, 86 two way car driver trips in the PM peak and 71 two way car driver trip in the Saturday peak. There will be a considerable number of walking trips generated by the site, especially in the PM and Saturday peaks. This is mainly attributed to the retail use and is likely to be part of another trip purpose i.e. from another shop in the Town Centre or between Northwood Station and a home address.

5.2 Trip Distribution

The distribution of vehicular trips to and from the proposed development is determined by using the existing turning movements. Traffic counts were undertaken on Thursday 10th September 2015 between 0700 – 1000 and 1500 – 1900 and on Saturday 12th September between 1100 – 1400 at the following junctions:

- Green Lane / Station Approach / Eastbury Road signalised junction;
- Green Lane / Maxwell Road mini roundabout; and
- Green Lane / Hallowell Road priority junction.

The turning movement proportion diagrams i.e. trip distributions are shown in Appendix H.

Residential

Residential trips to and from the site will be distributed in accordance with turning movements in to and out of the surveyed highway network. Table 5-12 (overleaf) shows the distribution of residential trips in the AM, School, PM and Saturday peaks based on the 2015 traffic counts.

Commuters

Commuter trips will be distributed using the residential distribution as it has been calculated using all turning movements in to and out of the surveyed highway network.

Retail

To provide a robust assessment of retail trips travelling to and from the site it is proposed to use the same distribution as residential.

Link (Direction)	AM Peak		School Peak		PM Peak		Saturday Peak	
	To	From	To	From	To	From	To	From
Eastbury Road (North)	1%	3%	2%	2%	2%	2%	2%	2%
Green Lane (East)	37%	44%	34%	41%	39%	40%	39%	41%
Hallowell Road (South East)	6%	7%	9%	8%	7%	8%	5%	7%
Maxwell Road (South West)	14%	12%	15%	14%	14%	13%	18%	17%
Green Lane (West)	42%	35%	40%	34%	39%	38%	36%	34%

Table 5-13 - Proposed Vehicular Trip Distribution

Table 5-13 shows that the vast majority of traffic travelling to and from the proposed development is likely to originate from Green Lane which is most likely due to its strategic connections to the A4040 – Rickmansworth Road via Green Lane (westbound) and the A4125 – Watford Road via Green Lane (eastbound). Connections to these strategic roads can also be made via Maxwell Road and Hallowell Road. However, it is more likely that they will be used to access the surrounding areas of residential within Northwood.

6 Transport Impacts

6.1 Highway Impacts

To assess the likely impact of the proposed development upon the surrounding highway network it is proposed that junction capacity modelling is undertaken on the following junctions as part of a small network using LinSig v3:

- Green Lane / Station Approach / Eastbury Road signalised junction;
- Green Lane / Maxwell Road mini roundabout; and
- Green Lane / Hallowell Road priority junction.

The assessment of the existing network in both layout and level of traffic flow will act as a benchmark to compare the proposed layout of the revised junction against. The layout of the proposed junction is described in Chapter 7 and is shown in Appendix J.

The assessment will undertake junction capacity assessments of the following peak hours which were identified using traffic flow data collected on Thursday 10th September and Saturday 12th September:

- AM Peak (0800 – 0900);
- School Peak (1500 – 1600);
- PM Peak (1700 – 1800); and
- Saturday Peak (1200 – 1300).

These assessment periods will be modelled in the following assessment years which have been specified by LBH Highway Officers:

- Base Year (2015);
- Opening Year (2020) – Without Development;
- Opening Year (2020) – With Development; and
- Opening Year plus 5 Years (2025) – With Development.

To calculate background traffic growth on the local highway network, traffic growth factors will be applied to the 2015 base traffic flows to derive a base traffic flow for the assessment years. Growth factors have been derived using NTM growth factors weighted to local traffic conditions using TEMPRO datasets specific to the local Hillingdon area. A summary of the growth factors applied to the base traffic flows are shown in Table 6-1.

Time Period	NTM Growth Factors with TEMPRO Adjustment	
	2015 to 2020	2015 to 2025
AM Peak	1.08633	1.16583
School Peak	1.09903	1.19937
PM Peak	1.09024	1.17507
Saturday Peak	1.09705	1.18954

Table 6-1 - TEMPRO Growth Factors

For clarity, Table 6-2 summarises the scenarios that will be modelled i.e. the junction layout and assessment year. All scenarios will model the AM, School, PM and Saturday Peaks.

Assessment Year	With or Without Development	Junction Layout	
		Existing	Proposed
2015	Without	X	
	With		
2020	Without	X	
	With		X
2025	Without		
	With		X

Table 6-2 - Modelling Scenarios

The proposed junction layout will only be tested 'with development flows' as the highway improvements scheme is delivered as part of the proposed development i.e. to facilitate the piazza and consolidated bus provision.

6.2 Committed Development Traffic

As part of LBH pre-application advice the Highways Department specified that the transport impact of the following committed developments should be reviewed:

- Northwood Secondary School Expansion (12850/APP/2014/4492);
- Northwood University Technical College (12850/APP/2013/1810);
- The London School of Theology (10112/APP/2013/1837);
- St Helen School Extension (7402/APP/2014/2761);
- Northwood College Educational Foundation (2082/APP/2014/600); and
- Frithwood Primary School (22044/APP/2012/1253).

However, following the issue of the LBH pre-application advice the Highways Department advised that upon review they only considered Northwood Secondary School Expansion and Northwood University Technical College notable committed developments.

Upon reviewing the TAs submitted as part of the planning applications for the expansion of Northwood Secondary School and Heathrow Aviation Engineering – University Technical College it became apparent that it is unlikely that any additional trips associated with the developments would route through Green Lane.

The distribution information provided within the TAs suggested that a small proportion of the pupils reside north-west of Northwood Station i.e. they would need to travel eastbound towards Northwood to reach the developments. Upon viewing the highway network it is clear that any trips travelling towards the developments from the west would do so strategically on the A404 Rickmansworth Road / Pinner Road which is where the developments are assessed from. It is a reasonable assumption that none of these trips would use Green Lane and therefore no allow for traffic associated with the expansion of Northwood Secondary School and Heathrow Aviation Engineering – University Technical College has been made.

It is important to note that the addition of both committed development together with background traffic growth within an assessment would provide an excessively robust assessment of the highway network as committed development is included in national traffic growth forecasts which have been calculated for the local Hillingdon area. Applying both committed development traffic and background traffic growth will result in an element of double counting of the traffic estimates for future years. Therefore, only TEMPRO background traffic growth factors have been applied for highway capacity modelling.

This approach should be seen as robust as Department for Transport (DfT) count sites located within the vicinity of the site have shown that traffic flows have remained fairly uniform over the last 5 years. These DfT count sites (count point IDs) are:

- 7049 – A404 Rickmansworth Road (between A4180 and A4125); and
- 8049 – A4125 Watford Road (between A4040 and Local Authority boundary).

Table 6-3 - Annual Average Daily Traffic Flows (2010 - 2014)

Year	AADF - Total Vehicles	Annual % Change
2010	32,759	-
2011	32,677	-0.3%
2012	32,105	-1.8%
2013	32,420	1.0%
2014	32,576	0.5%
	Average % Change per Year	-0.5%

Table 6-3 summarises the data for these count sites and demonstrates that the combined total vehicle flows (Annual Average Daily Flow (AADF)) at these sites have remained much the same since 2005 and have decreased on average by 0.5% per year.

6.3 Highway Capacity Assessment

Due to the number of time periods and assessment years being modelled the results will be presented for each time period in a single table so that an easier comparison between assessment years and junction layouts can be made.

The following definitions have been provided to explain the data that is shown in the summary tables:

- **PCU** is a passenger car unit i.e. 1 car = 1 PCU. Larger vehicles such as Heavy Goods Vehicles (HGV) are given higher equivalent values to account for their physical size;
- **Degree of Saturation** is a measure of how close the approach is to capacity and is the ratio of flow to capacity e.g. a value of 100% means the junction capacity is reached.
- **PRC** is the practical reserve capacity of the junction, and is a measure of how much additional traffic can pass through the junction whilst maintaining a maximum degree of saturation of 90%
- **Mean Maximum Queue** is the maximum queue in PCU in a typical cycle averaged over all cycles.

Table 6-4 (overleaf) summarises the highway capacity modelling results for the AM Peak (0800 - 0900).

Table 6-4 - AM Peak Hour Summary Modelling Results

Scenario	Junction Layout	Approach	Degree of Saturation	Mean Maximum Queue	Delay per PCU (sec)	PRC %
2015 Base (Observed)	Existing Layout	Green Lane (W)	88.6%	16	55s	+1.6%
		Green Lane (E)	87.1%	17	49s	
		Eastbury Rd	82.4%	11	58s	
		Station Approach	21.8%	1	46s	
		Maxwell Rd - Rbt	93.3%	11	78s	-5.5%
		Green Lane (W)- Rbt	95.0%	7	47s	
		Halloway Rd	79.8%	2	58s	+12.7%
2020 Opening Year	Existing Layout	Green Lane (W)	92.2%	18	64s	-7.6%
		Green Lane (E)	96.8%	24	80s	
		Eastbury Rd	92.5%	15	81s	
		Station Approach	23.6%	2	46s	
		Maxwell Rd - Rbt	111.7%	40	274s	-24.1%
		Green Lane (W)- Rbt	104.0%	59	129s	
		Halloway Rd	95.7%	4	129s	-6.4%
2020 Opening Year + Development	Proposed Layout	Green Lane (W)	80.4%	15	38s	-7.0%
		Green Lane (E)	86.0%	19	43s	
		Eastbury Rd	96.3%	17	101s	
		Central Way	21.4%	2	37s	
		Maxwell Rd - Rbt	102.5%	32	145s	-13.9%
		Green Lane (W)- Rbt	99.1%	19	71s	
		Halloway Rd	97.3%	7	142s	-8.1%
2025 Opening Year plus 5 + Development	Proposed Layout	Green Lane (W)	79.1%	15	36s	-20.3%
		Green Lane (E)	88.3%	20	45s	
		Eastbury Rd	108.3%	33	235s	
		Central Way	23.7%	2	38s	
		Maxwell Rd - Rbt	115.0%	49	311s	-27.8%
		Green Lane (W)- Rbt	106.5%	69	164s	
		Halloway Rd	115.4%	22	353s	-28.2%

AM PEAK (0800 – 0900)

2015 Base Assessment – Existing Layout

Table 6-4 indicates that in the '2015 Base – Existing Layout' assessment the modelled highway network as a whole is close to capacity as the majority of the approach roads are close to 90% saturation with notable queue lengths on all approaches with the exception of Station Approach and Hallowell Road.

The Green Lane / Station Approach / Eastbury Road signalised junction currently operates just within capacity with a PRC of 1.6%. The Green Lane (W) and (E) are the most saturated approaches with degree of saturation of 88.6% and 87.1% and queues of 16 and 17 PCUs respectively. Eastbury Road is slightly less saturated (82.4%) and has a reasonable queue of 11 PCUs. Station Approach has a low degree of saturation (21.8%) which is due to the low level of traffic using this road.

The Green Lane / Maxwell Road mini roundabout currently operates over capacity with a PRC of -5.5%. Both the Green Lane (W) and Maxwell Road approaches of the roundabout have a degree of saturation in excess of 90% and queues of 7 and 11 PCUs respectively.

The Green Lane / Hallowell Road priority junction operates within capacity with a PRC of 12.7%. The Hallowell Road approach has a degree of saturation of 79.8% and experiences a queue of 2 PCUs.

2020 Opening Year Assessment – Existing Layout

Table 6-4 indicates that in the '2020 Opening Year – Existing Layout' assessment the modelled highway network as a whole is predicted to operate over capacity as all of the approach roads, with the exception of Station Approach, have a degree of saturation in excess of 90%.

The Green Lane / Station Approach / Eastbury Road signalised junction is predicted to operate over capacity with a PRC of -7.6%. The degree of saturation of Green Lane (E), Green Lane (W) and Eastbury Road all increase by approximately 10%. The Green Lane (E) approach continues to be the most saturated with a degree of saturation of 96.8%. and a queues of 24 PCUs. Queues increased on all approaches with Green Lane (E) suffering the largest increase of 7 PCUs.

The Green Lane / Maxwell Road mini roundabout is predicted to continue operate over capacity with a PRC of -24.1% which is a significant decrease in capacity compared to the '2015 Base – Existing Layout' assessment. Both the Green Lane (W) and Maxwell Road approaches of the roundabout have a degree of saturation in excess of 100% and hugely increased queues of 59 and 40 PCUs respectively.

The Green Lane / Hallowell Road priority junction is predicted to operate over capacity with a PRC of -6.4%. The Hallowell Road approach has a degree of saturation of 95.7% and a predicted queue of 4 PCUs.

2020 Opening Year Assessment + Development Flows – Proposed Layout

Table 6-4 indicates that in the '2020 Opening Year + Development Flows' assessment with the proposed junction layout the modelled highway network as a whole is predicted to operate over capacity as four of the seven approach roads have a degree of saturation in excess of 90%.

The Green Lane / Central Way / Eastbury Road signalised junction is predicted to operate over capacity with a PRC of -7.0% which is a 0.6% increase in capacity in comparison to the '2020 – Opening Year' assessment of the existing junction layout with no development flows. The degree of saturation of Green Lane (E) and Green Lane (W) all decrease by approximately 10% back in line with the 2015 results. The queue lengths on these approaches also decrease to similar lengths shown in the '2015 Base' assessment. The Eastbury Road approach continues to have a degree of saturation in excess of 90% with a queue length similar to that shown in the '2020 Opening Year Assessment – Existing Layout'.

The Green Lane / Maxwell Road mini roundabout is predicted to continue operate over capacity with a PRC of -13.9% which is an increase in capacity compared to the '2020 Opening Year – Existing Layout' assessment. Both the Green Lane (W) and Maxwell Road approaches of the roundabout have improved degrees of saturation although still remain in excess of 90% with Green Lane (W) brought below 100%. The predicted queue lengths on the Maxwell Road approach are reduced by 8 PCUs with the Green Lane (W) approach queue length significantly reduced by 40 PCUs.

The Green Lane / Hallowell Road priority junction is predicted to operate over capacity with a PRC of -8.1% which is marginally worse than in the '2020 Opening Year – Existing Layout' assessment. The Hallowell Road approach has a degree of saturation of 97.3% and a predicted queue of 7 PCUs.

In summary, the results indicate that the proposed junction layout mitigates the impacts of any additional traffic that is likely to be generated due to the proposed development. Whilst the modelled highway network operates over capacity, the proposed junction layout allows the network to operate notably better than if no development or junction improvements are delivered.

2025 Opening Year plus 5 Years Assessment + Development Flows – Proposed Layout

Table 6-4 indicates that in the '2020 Opening Year + Development Flows' assessment with the proposed junction layout the modelled highway network as a whole is predicted to operate significantly over capacity as four of the seven approaches have a degree of saturation in excess of 100%. This is due to the large increase in background traffic growth that has been estimated by TEMPRO.

Table 6-5 - School Peak Hour Summary Modelling Results

Scenario	Junction Layout	Approach	Degree of Saturation	Mean Maximum Queue	Delay per PCU (sec)	PRC %
2015 (Base) Observed	Existing Layout	Green Lane (W)	74.0%	12	37s	+15.0%
		Green Lane (E)	78.3%	13	39s	
		Eastbury Rd	71.3%	7	53s	
		Station Approach	42.3%	3	53s	
		Maxwell Rd - Rbt	81.9%	7	42s	-0.1%
		Green Lane (W)- Rbt	90.1%	4	31s	
		Halloway Rd	64.9%	1	31s	+38.6%
2020 Base	Existing Layout	Green Lane (W)	80.8%	14	41s	+1.8%
		Green Lane (E)	88.4%	16	51s	
		Eastbury Rd	78.4%	9	59s	
		Station Approach	46.5%	3	55s	
		Maxwell Rd - Rbt	100.0%	26	130s	-12.0%
		Green Lane (W)- Rbt	100.8%	48	90s	
		Halloway Rd	77.8%	2	51s	+15.7%
2020 Base + Development	Proposed Layout	Green Lane (W)	74.9%	13	32s	-2.0%
		Green Lane (E)	77.0%	15	32s	
		Eastbury Rd	91.8%	12	92s	
		Central Way	42.4%	3	45s	
		Maxwell Rd - Rbt	93.2%	9	74s	-7.7%
		Green Lane (W)- Rbt	97.0%	9	57s	
		Halloway Rd	80.9%	2	58s	+11.2%
2025 Base + Development	Proposed Layout	Green Lane (W)	73.5%	13	30s	-25.1%
		Green Lane (E)	80.2%	16	33s	
		Eastbury Rd	112.6%	30	307s	
		Central Way	50.8%	4	50s	
		Maxwell Rd - Rbt	108.9%	37	234s	-21.0%
		Green Lane (W)- Rbt	106.5%	67	164s	
		Halloway Rd	96.9%	6	135s	-7.6%

SCHOOL PEAK (1530 – 1630)

2015 Base Assessment – Existing Layout

Table 6-5 indicates that in the '2015 Base – Existing Layout' assessment the modelled highway network as a whole operating within capacity as the majority of the approach roads have a degree of saturation below 80%. There are moderate queue lengths on the Green Lane approaches with small queues on all other approaches.

The Green Lane / Station Approach / Eastbury Road signalised junction currently operates within capacity with a PRC of 15.0%. The Green Lane (W) and (E) are the most saturated approaches with degree of saturation of 74.0% and 78.3% and queues of 12 and 13 PCUs respectively. Eastbury Road is slightly less saturated (71.3%) and has a small queue of 7 PCUs. Station Approach has a low degree of saturation (42.3%) which is due to the low level of traffic using this road.

The Green Lane / Maxwell Road mini roundabout currently operates just over capacity with a PRC of -0.1%. The Green Lane (W) approach has a degree of saturation in excess of 90% and queues of 4 PCUs. The Maxwell Road approach has a moderate degree of saturation (81.9%) and queues of 7 PCUs.

The Green Lane / Hallowell Road priority junction operates with a large amount of spare capacity with a PRC of 38.6%. The Hallowell Road approach has a degree of saturation of 64.9% and experiences a queue of 1 PCU.

2020 Opening Year Assessment – Existing Layout

Table 6-5 indicates that in the '2020 Opening Year – Existing Layout' assessment the modelled highway network as a whole is predicted to operate at capacity as the Green Lane approaches near closer to a degree of saturation of 90% whilst two of the seven approaches have degrees of saturation in excess of 100%.

The Green Lane / Station Approach / Eastbury Road signalised junction is predicted to operate just within capacity with a PRC of 1.8%. The degree of saturation of Green Lane (E), Green Lane (W) and Eastbury Road all increase by approximately 7–10 %. The Green Lane (E) approach continues to be the most saturated with a degree of saturation of 88.4% and a queue of 16 PCUs. Queues also increased on the Green Lane (E) approach by 3 PCUs to a total length of 16 PCUs.

The Green Lane / Maxwell Road mini roundabout is predicted to continue operate over capacity with a PRC of -12.0% which is decrease in capacity compared to the '2015 Base – Existing Layout' assessment of 11.9%. Both the Maxwell Road and Green Lane (W) approaches of the roundabout have a degree of saturation in excess of 100% and queues of 26 and 48 PCUs respectively.

The Green Lane / Hallowell Road priority junction is predicted to continue operating within capacity with a PRC of 15.7%. The Hallowell Road approach has a degree of saturation of 77.8% and a predicted queue of 2 PCUs.

2020 Opening Year Assessment + Development Flows – Proposed Layout

Table 6-5 indicates that in the '2020 Opening Year + Development Flows' assessment with the proposed junction layout the modelled highway network as a whole is predicted to operate at capacity as three of the seven approaches have a degree of saturation in excess of 90%.

The Green Lane / Central Way / Eastbury Road signalised junction is predicted to operate over capacity with a PRC of -2.0% which is marginally worse in in comparison to the '2020 Opening Year – Existing Layout' assessment of the existing junction layout with no development flows. The degree of saturation of Green Lane (W) and Green Lane (E) both decrease by 5.9% and 11.4% respectively which is in line with the 2015 results. The queue lengths on these approaches remain the same as in the '2020 Opening Year' assessment. The Eastbury Road approach has a degree of saturation which increases above 90% and an increased queue length of an additional 3 PCUs.

The Green Lane / Maxwell Road mini roundabout is predicted to continue operate over capacity with a PRC of -7.7% which is an increase in capacity compared to the '2020 Opening Year – Existing Layout' assessment of 4.3%. Both the Green Lane (W) and Maxwell Road approaches of the roundabout have improved degrees of saturation which are brought below 100%. The predicted queue lengths on the Maxwell Road and Green Lane (W) approaches are reduced significantly by 17 and 41 PCUs respectively.

The Green Lane / Hallowell Road priority junction is predicted to operate within capacity with a PRC of 11.2% which is decrease in PRC of 4.5% compared to the '2020 Opening Year – Existing Layout' assessment. The Hallowell Road approach has a degree of saturation of 80.9% and a predicted queue of 2 PCUs.

In summary, the results indicate that the proposed junction layout mitigates the impacts of any additional traffic that is likely to be generated due to the proposed development. Although the results suggest that individual the junctions do not operate as well in terms of PRC, the predicted degree of saturation and queue lengths are significantly lower than with no improvement scheme. Therefore it is concluded that the proposed junction layout allows the network to operate notably better than if no development or junction improvements are delivered.

2025 Opening Year plus 5 Years Assessment + Development Flows – Proposed Layout

Table 6-5 indicates that in the '2020 Opening Year + Development Flows' assessment with the proposed junction layout the modelled highway network as a whole is predicted to operate over capacity as three of the seven approaches have a degree of saturation in excess of 100%. This is due to the large increase in background traffic growth that has been estimated by TEMPRO.

Table 6-6 - PM Peak Hour Summary Modelling Results

Scenario	Junction Layout	Approach	Degree of Saturation	Mean Maximum Queue	Delay per PCU (sec)	PRC %
2015 Base (Observed)	Existing Layout	Green Lane (W)	82.0%	15	41s	+9.8%
		Green Lane (E)	74.1%	12	36s	
		Eastbury Rd	60.2%	6	50s	
		Station Approach	51.7%	3	56s	
		Maxwell Rd - Rbt	76.1%	6	33s	-4.1%
		Green Lane (W)- Rbt	93.7%	6	39s	
		Halloway Rd	49.8%	1	22s	+80.6%
2020 Opening Year	Existing Layout	Green Lane (W)	86.9%	17	46s	+3.6%
		Green Lane (E)	81.1%	14	41s	
		Eastbury Rd	65.6%	6	52s	
		Station Approach	56.3%	4	58s	
		Maxwell Rd - Rbt	90.5%	9	68s	-15.0%
		Green Lane (W)- Rbt	103.5%	59	121s	
		Halloway Rd	58.3%	1	28s	+54.3%
2020 Opening Year + Development	Proposed Layout	Green Lane (W)	82.4%	17	36s	+9.2%
		Green Lane (E)	71.5%	13	29s	
		Eastbury Rd	73.1%	7	59s	
		Central Way	56.5%	4	51s	
		Maxwell Rd - Rbt	86.2%	7	48s	-13.0%
		Green Lane (W)- Rbt	101.7%	58	95s	
		Halloway Rd	63.8%	1	34s	+41.0%
2025 Opening Year plus 5 + Development	Proposed Layout	Green Lane (W)	82.8%	17	36s	+1.4%
		Green Lane (E)	76.8%	15	31s	
		Eastbury Rd	78.8%	8	65s	
		Central Way	59.9%	5	52s	
		Maxwell Rd - Rbt	100.0%	27	123s	-22.9%
		Green Lane (W)- Rbt	110.6%	85	222s	
		Halloway Rd	73.8%	1	48s	+21.9%

PM PEAK (1700 – 1800)

2015 Base Assessment – Existing Layout

Table 6-6 indicates that in the '2015 Base – Existing Layout' assessment the modelled highway network as a whole operating within capacity as the majority of the approach roads have a degree of saturation below 80%.There are moderate queue lengths on the Green Lane approaches with small queues on all other approaches.

The Green Lane / Station Approach / Eastbury Road signalised junction currently operates within capacity with a PRC of 9.8%. The Green Lane (W) and (E) are the most saturated approaches with degree of saturation of 82.0% and 74.1% and queues of 15 and 12 PCUs respectively. Eastbury Road is slightly less saturated (60.2%) and has a small queue of 6 PCUs. Station Approach has a low degree of saturation (51.7%) which is due to the low level of traffic using this road.

The Green Lane / Maxwell Road mini roundabout currently operates over capacity with a PRC of -4.1%. The Green Lane (W) approach has a degree of saturation in excess of 90% and queues of 6 PCUs. The Maxwell Road approach has a moderate degree of saturation (76.1%) and queues of 6 PCUs.

The Green Lane / Hallowell Road priority junction operates with a large amount of spare capacity with a PRC of 80.6%. The Hallowell Road approach has a degree of saturation of 49.8% and experiences a queue of 1 PCU.

2020 Opening Year Assessment – Existing Layout

Table 6-6 indicates that in the '2020 Opening Year – Existing Layout' assessment the modelled highway network as a whole is predicted to operate close to capacity as the Green Lane approaches near closer to a degree of saturation of 90%.

The Green Lane / Station Approach / Eastbury Road signalised junction is predicted to operate just within capacity with a PRC of 3.6%. The degree of saturation of Green Lane (E), Green Lane (W) and Eastbury Road all increase by approximately 5%. The Green Lane (W) approach continues to be the most saturated with a degree of saturation of 86.9% and a queue of 17 PCUs. Queues also increased on the Green Lane (E) approach by 2 PCUs to a total length of 14 PCUs.

The Green Lane / Maxwell Road mini roundabout is predicted to continue operate over capacity with a PRC of -15.0% which is decrease in capacity compared to the '2015 Base – Existing Layout' assessment of 10.9%. The Maxwell Road approach of the roundabout has a degree of saturation in excess of 90% and the Green Lane (W) approach has a degree of saturation exceeding 100%.

The Green Lane / Hallowell Road priority junction is predicted to continue operating within capacity with a PRC of 54.3%. The Hallowell Road approach has a degree of saturation of 58.3% and a predicted queue of 1 PCU.

2020 Opening Year Assessment + Development Flows – Proposed Layout

Table 6-6 indicates that in the '2020 Opening Year + Development Flows' assessment with the proposed junction layout the modelled highway network as a whole is predicted to operate within capacity as only one approach road is has a degree of saturation in excess of 90%.

The Green Lane / Central Way / Eastbury Road signalised junction is predicted to operate within capacity with a PRC of 9.2% which is a 5.6% increase in capacity in comparison to the '2020 Opening Year – Existing Layout' assessment of the existing junction layout with no development flows. The degree of saturation of Green Lane (W) and Green Lane (E) both decrease by 4.5% and 9.6% respectively which is in line with the 2015 results. The queue lengths on these approaches remain the same as in the '2020 Opening Year' assessment. The Eastbury Road approach has a slightly increased degree of saturation and an increased queue length of 1 PCU.

The Green Lane / Maxwell Road mini roundabout is predicted to continue operate over capacity with a PRC of -13.0% which is an increase in capacity compared to the '2020 Opening Year – Existing Layout' assessment of 2.0%. Both the Green Lane (W) and Maxwell Road approaches of the roundabout have improved degrees of saturation. The Maxwell Road approach is brought below 90% although the Green Lane (W) approach remains just above 100%. The predicted queue lengths on the Maxwell Road and Green Lane (W) approaches are reduced by 2 and 1 PCU respectively.

The Green Lane / Hallowell Road priority junction is predicted to operate within capacity with a PRC of 41.0% which is approximately a 10% decrease in PRC compared to the '2020 Opening Year – Existing Layout' assessment. The Hallowell Road approach has a degree of saturation of 63.8% and a predicted queue of 1 PCU.

In summary, the results indicate that the proposed junction layout mitigates the impacts of any additional traffic that is likely to be generated due to the proposed development. The results suggest that modelled highway network will operate within capacity as all but one approach operates below 90% degree of saturation. The proposed junction layout allows the network to operate notably better than if no development or junction improvements are delivered.

2025 Opening Year plus 5 Years Assessment + Development Flows – Proposed Layout

Table 6-6 indicates that in the '2020 Opening Year + Development Flows' assessment with the proposed junction layout the modelled highway network as a whole is predicted to operate at capacity as two of the seven approaches have a degree of saturation in excess of 100%. This is due to the large increase in background traffic growth that has been estimated by TEMPRO.

Table 6-7 - Saturday Peak Hour Summary Modelling Results

Scenario	Junction Layout	Approach	Degree of Saturation	Mean Maximum Queue	Delay per PCU (sec)	PRC %
2015 Base (Observed)	Existing Layout	Green Lane (W)	72.2%	11	33s	+24.7%
		Green Lane (E)	69.9%	10	32s	
		Eastbury Rd	47.2%	4	43s	
		Station Approach	54.7%	2	60s	
		Maxwell Rd - Rbt	78.4%	7	25s	+0.9%
		Green Lane (W)- Rbt	89.2%	4	30s	
		Halloway Rd	50.1%	1	20s	+79.5%
2020 Opening Year	Existing Layout	Green Lane (W)	79.1%	13	36s	+13.7%
		Green Lane (E)	77.3%	12	36s	
		Eastbury Rd	51.8%	4	44s	
		Station Approach	50.2%	2	62s	
		Maxwell Rd - Rbt	91.8%	11	57s	-11.2%
		Green Lane (W)- Rbt	100.0%	42	84s	
		Halloway Rd	59.1%	1	26s	+52.3%
2020 Opening Year + Development	Proposed Layout	Green Lane (W)	72.7%	12	28s	+23.7%
		Green Lane (E)	67.5%	12	26s	
		Eastbury Rd	68.2%	5	58s	
		Central Way	41.6%	3	46s	
		Maxwell Rd - Rbt	88.0%	8	40s	-9.2%
		Green Lane (W)- Rbt	98.3%	18	67s	
		Halloway Rd	63.4%	1	30s	+41.9%
2025 Opening Year plus 5 + Development	Proposed Layout	Green Lane (W)	74.1%	13	29s	+21.4%
		Green Lane (E)	73.0%	13	28s	
		Eastbury Rd	73.9%	6	62s	
		Central Way	44.3%	3	47s	
		Maxwell Rd - Rbt	100.6%	33	111s	-20.3%
		Green Lane (W)- Rbt	108.3%	64	190s	
		Halloway Rd	73.8%	1	44s	+21.9%

SATURDAY PEAK (1200 – 1300)

2015 Base Assessment – Existing Layout

Table 6-7 indicates that in the '2015 Base – Existing Layout' assessment the modelled highway network as a whole operating within capacity as the majority of the approach roads have a degree of saturation below 80%.There are moderate queue lengths on the Green Lane approaches with small queues on all other approaches.

The Green Lane / Station Approach / Eastbury Road signalised junction currently operates within capacity with a PRC of 24.7%. The Green Lane (W) and (E) are the most saturated approaches with degree of saturation of 72.2% and 69.9% and queues of 11 and 10 PCUs respectively. Eastbury Road is less saturated (47.2%) and has a small queue of 4 PCUs. Station Approach has a low degree of saturation (54.7%) which is due to the low level of traffic using this road.

The Green Lane / Maxwell Road mini roundabout currently operates at capacity with a PRC of 0.9%. The Green Lane (W) approach has a degree of saturation just below 90% and queues of 4 PCUs. The Maxwell Road approach has a moderate degree of saturation (78.4%) and queues of 7 PCUs.

The Green Lane / Hallowell Road priority junction operates with a large amount of spare capacity with a PRC of 79.5%. The Hallowell Road approach has a degree of saturation of 50.1% and experiences a queue of 1 PCU.

2020 Opening Year Assessment – Existing Layout

Table 6-7 indicates that in the '2020 Opening Year – Existing Layout' assessment the modelled highway network as a whole is predicted to operate within capacity although two of the seven approaches have degrees of saturation in excess of 90%.

The Green Lane / Station Approach / Eastbury Road signalised junction is predicted to operate within capacity with a PRC of 13.7%. The degree of saturation of Green Lane (E), Green Lane (W) and Eastbury Road all increase by approximately 7-10%. The Green Lane (W) approach continues to be the most saturated with a degree of saturation of 79.1% and a queue of 13 PCUs. Queues also increased on the Green Lane (E) approach by 2 PCUs to a total length of 12 PCUs.

The Green Lane / Maxwell Road mini roundabout is predicted to operate over capacity with a PRC of -11.2% which is decrease in capacity compared to the '2015 Base – Existing Layout' assessment of 11.9%. The Maxwell Road approach of the roundabout has a degree of saturation in excess of 100% and queues of 42 PCUs. The Green Lane (W) approach has a degree of saturation exceeding 91.8% and queues of 11 PCUs.

The Green Lane / Hallowell Road priority junction is predicted to continue operating within capacity with a PRC of 52.3%. The Hallowell Road approach has a degree of saturation of 59.1% and a predicted queue of 1 PCU.

2020 Opening Year Assessment + Development Flows – Proposed Layout

Table 6-7 indicates that in the '2020 Opening Year + Development Flows' assessment with the proposed junction layout the modelled highway network as a whole is predicted to operate within capacity as only one approach road is has a degree of saturation in excess of 90%.

The Green Lane / Central Way / Eastbury Road signalised junction is predicted to operate within capacity with a PRC of 23.7% which is a 10% increase in capacity in comparison to the '2020 Opening Year – Existing Layout' assessment of the existing junction layout with no development flows. The degree of saturation of Green Lane (W) and Green Lane (E) both decrease by 6.4% and 9.8% respectively which is in line with the 2015 results. The queue lengths on these approaches remain the same as in the '2020 Opening Year' assessment. The Eastbury Road approach has an increased degree of saturation and an increased queue length of 1 PCU.

The Green Lane / Maxwell Road mini roundabout is predicted to continue operate over capacity with a PRC of -9.2% which is an increase in capacity compared to the '2020 Opening Year – Existing Layout' assessment of 2.0%. Both the Green Lane (W) and Maxwell Road approaches of the roundabout have improved degrees of saturation. The Maxwell Road approach is brought below 90% although the Green Lane (W) approach remains just above 100%. The predicted queue lengths on the Maxwell Road and Green Lane (W) approaches are reduced by 3 and 24 PCUs respectively.

The Green Lane / Hallowell Road priority junction is predicted to operate within capacity with a PRC of 41.9% which is approximately a 10% decrease in PRC compared to the '2020 Opening Year – Existing Layout' assessment. The Hallowell Road approach has a degree of saturation of 63.4% and a predicted queue of 1 PCU.

In summary, the results indicate that the proposed junction layout mitigates the impacts of any additional traffic that is likely to be generated due to the proposed development. The results suggest that modelled highway network will operate within capacity as all but one approach operates below 90% degree of saturation. The proposed junction layout allows the network to operate notably better than if no development or junction improvements are delivered.

2025 Opening Year plus 5 Years Assessment + Development Flows – Proposed Layout

Table 6-7 indicates that in the '2020 Opening Year + Development Flows' assessment with the proposed junction layout the modelled highway network as a whole is predicted to operate at capacity as two of the seven approaches have a degree of saturation in excess of 100%. This is due to the large increase in background traffic growth that has been estimated by TEMPRO.

6.4 Highway Capacity Validation

To ensure that the modelling results provide an accurate representation of the existing operation of the junction, and therefore the future operation of the junction, the models have been calibrated against observed data.

Tables 6-8 and 6-9 (overleaf) show the observed and modelled degree of saturation and queue length data respectively.

Further validation data and calibration model outputs are shown in Appendix I.

Table 6-8 - Observed v Modelled Degree of Saturation

Arm	AM Peak		School Peak		PM Peak		Saturday Peak	
	Observed	Modelled	Observed	Modelled	Observed	Modelled	Observed	Modelled
Green Lane (West)	85.0%	88.6%	73.0%	74.0%	80.0%	82.0%	75.0%	72.2%
Eastbury Road	86.0%	82.4%	74.0%	71.3%	65.0%	60.2%	50.0%	47.2%
Green Lane (East)	83.0%	87.1%	75.0%	78.3%	75.0%	74.1%	67.0%	70.0%
Station Approach	-	21.8%	-	42.3%	-	51.7%	-	45.7%

Table 6-9 - Observed v Modelled Queues

Arm	AM Peak		School Peak		PM Peak		Saturday Peak	
	Observed	Modelled	Observed	Modelled	Observed	Modelled	Observed	Modelled
Green Lane (West)	9.0	16.2	8.6	12.0	8.6	14.9	7.1	11.0
Eastbury Road	11.6	11.2	8.3	7.4	5.3	5.5	2.8	3.8
Green Lane (East)	15.0	16.6	13.9	12.8	7.1	12.1	7.4	10.4
Station Approach	1.3	1.4	2.3	2.5	2.8	3.2	1.0	2.0

The data shown in Tables 6-8 and 6-9 shows that the majority of modelled values are higher than those that were observed.

6.5 Public Transport Impacts

London Underground

TfL has provided London Underground's RODS data (Rolling Origin and Destination Survey) which provides an understanding of how utilised Northwood Station is and how many passengers travel in each direction on the Metropolitan Line. The existing directional splits have been used to determine how passengers associated with the proposed development are likely to travel.

Table 6-10 - Estimated London Underground Impacts

Scenario	Boarding or Alighting	Direction	AM Peak	PM Peak
			0800 - 0900	1700 - 1800
Existing	Boarding	Northbound	6	16
		Southbound	743	261
	Alighting	Northbound	312	368
		Southbound	37	11
Additional Trips	Boarding	Northbound	0	1
		Southbound	16	24
	Alighting	Northbound	4	34
		Southbound	0	1
% Increase	Boarding	Northbound	2.1%	9.1%
		Southbound	2.1%	9.1%
	Alighting	Northbound	1.2%	9.2%
		Southbound	1.2%	9.2%

Table 6-10 shows it is estimated that there will be 20 additional during the AM peak and 60 during the PM Peak. Due to the tidal nature of the distribution the majority of these trips travel southbound in the AM peak and return northbound in the PM peak. The percentage increase in all direction is under 10% and should therefore be considered negligible.

Buses

TfL has provided their most recent BODS data (Bus Passenger Origin-Destination Survey) which provides an understanding of how utilised a service is and how many passengers travel in each direction across a day. This data has been used to determine how passengers associated with the proposed development are likely to travel.

Route 282

390 passengers boarded or alighted at Northwood Station, towards Mt Vernon Hospital.

39 additional passengers are estimated to board or alight at Northwood Station, towards Mt Vernon Hospital.

333 passengers boarded or alighted at Northwood station, towards Ealing Hospital.

34 additional passengers are estimated to board or alight at Northwood station, towards Ealing Hospital.

Existing Total: 723

Estimated Total: 796 (73 additional passengers)

Route 331

451 passengers boarded or alighted at Northwood station, towards Ruislip.

46 additional passengers estimated to board or alight at Northwood Station, towards Ruislip.

387 passengers boarded or alighted at Northwood station, towards Uxbridge.

39 additional passengers estimated to board or alight at Northwood Station, towards Uxbridge.

Existing Total: 838

Estimated Total: 923 (85 additional passengers)

Route H11

346 passengers boarded or alighted at Northwood station, towards Mt Vernon Hospital.

35 additional passengers estimated to board or alight at Northwood Station, towards Mt Vernon Hospital.

351 passengers boarded or alighted at Northwood station, towards Harrow bus station.

35 additional passengers estimated to board or alight at Northwood Station, towards Harrow bus station.

Existing Total: 696

Estimated Total: 766 (70 additional passengers)

The data provided shows that is estimated that there will be a total of 228 additional bus passengers across a day split almost equally across the 3 services that are provided in the vicinity of the proposed development. This is approximately an increase of 10% and should therefore be considered negligible.

7 Mitigation Measures

It is very likely that the proposed development will generate impacts during construction and throughout its lifetime unless these are mitigated against. The following measures are proposed to alleviate the potential impacts that may be generated by the proposed development.

7.1 Junction Improvement Scheme

To facilitate four of TfL's key objectives the way the site is currently accessed will be fundamentally changed. These objectives are:

- Improve accessibility for all users around the station;
- Improve the interchange at this transport hub between London Underground trains, buses, vehicle users, pedestrians and cyclists;
- Provide a new public space in the form of a piazza; and
- Provide new commercial uses which will improve and contribute towards the vitality and viability of the existing centre.

To achieve these objectives Station Approach will be removed from the highway network and existing buildings along its length will be demolished to create an area to provide a new public space in the form of a piazza. The new public space will be level which is a vast improvement upon the moderate slope that exists on Station Approach.

The proposed development will provide a new vehicular access located approximately 45 metres east of the existing junction between Green Lane and Station Approach which is currently where the north-south footpath known as Central Way is located. Central Way will be upgraded to a fully operational road suitable for all vehicle types (including pedestrians and cyclists) that will provide the sole access point for vehicles to the site. However, it should be noted that the proposed development has been design in such a way to encourage pedestrians to permeate through the site via the piazza and away from Central Way.

In removing Station Approach from its current location with the existing signalised crossroads and replacing it with Central Way the proposed development will convert the junction into a signalised staggered crossroads between Green Lane / Eastbury Road / Central Way. The area between the staggered arms of the cross roads i.e. Central Way and Eastbury Road, will be used to implement a right turn lane. This lane will be used by existing users of the Northwood Station Car Park as well as new residents and visitors to the proposed retail. By provided a separate right turn lane it allows right-turners to wait for gaps in traffic (or a green light) without blocking straight ahead eastbound trips along Green Lane.

The removal of Station Approach also facilitates the provision of a new bus stop at the northern end of the public realm which creates an interchange for London Underground and bus users. The eastbound bus stop opposite Central Way will be moved east by approximately 25 metres to allow a larger waiting area around the stop and to facilitate a better turning movement out of Central Way.

In addition, the north-east corner of the junction between Green Lane and Eastbury Road i.e. north of Green Lane and east of Eastbury Road, will be built out to create a wider waiting area for pedestrians before they cross the road to Northwood Station and the Town Centre. The current waiting area is narrow and abutted by a small wall which is not safe given the that this corner is heavily used by school children at peak times.

Where possible all pedestrian crossing locations have been shortened to reduce the time it takes pedestrians to cross and to reduce the amount of time per cycle that green time is lost for vehicular movements.

The proposed junction layout is shown in Appendix J but can also be viewed in context of the proposed development within the proposed masterplan which is shown in Appendix A.

Safety Audit

A safety audit will be undertaken on the proposed junction improvement scheme. The safety audit required is a Stage 1 Audit: Design.

7.2 Framework Travel Plan

The Framework Travel Plan (FTP) will provide an outline of sustainable travel measures tailored to the use of the site along with a plan of implementation of measures and monitoring the impact Travel Plans have on the travel behaviour of the site occupants.

The FTP will reflect the March 2011 Travel TfL Travel Plan Guidance. Given the mix of uses proposed, the FTP will outline the principles for the overarching, site wide travel plan to which the travel plans for the individual uses will need to comply.

The FTP is shown in Appendix L.

7.3 Framework Construction Logistics Plan

As defined on the TfL planning webpage '*a Construction Logistics Plan is the equivalent of a workplace travel plan for a specific construction site. It provides a framework to better manage all types of freight vehicle movement to and from construction sites. Having a management plan will improve the safety and reliability of deliveries to a site, reduce congestion and minimise the environmental impact*'.

The Transport Assessment will include a Framework Construction and Logistics Plan (FCLP). This will outline the measures that will be considered in order to ensure that the construction of the site and the subsequent servicing of the operational development, is undertaken in an efficient but sustainable way.

The FCLP is shown in Appendix M.

7.4 Framework Delivery and Servicing Plan

A Delivery and Servicing Plan (DSP) provides a framework to make sure that freight vehicle activity to and from the development works effectively. A DSP helps occupants of the development (residential but more specifically retail) to manage deliveries to reduce the number of trips, particularly during peak hours. It will also identify where safe and legal loading can take place.

The main aims of the DSP will be to consolidate deliveries so fewer journeys are needed and to ensure the use of more sustainable delivery methods.

The FDSP is shown in Appendix N.

7.5 Framework Car Park Management Plan

The Car Park Management Plan (CPMP) section will outline the proposed parking management strategy for the mix of uses proposed for the development. The site will need to carefully manage the parking requirements for commuters, shoppers, and residents of the new development. Discussion will be held with London Borough of Hillingdon (LBH) to determine whether residents will be eligible to apply for a parking permit within the surrounding streets.

The CPMP will set down how the parking spaces provided will be allocated and how visitor demand for both residential and retail uses and disabled parking will be dealt with.

The FTP will address the car parking requirements and stipulate how the proposed parking is to be divided between the different land uses. The level of disabled parking will be determined against London Plan which states that a minimum of 6% of parking spaces should be designated to blue badge holders. However, the proposed development will provide 10% disabled parking to be shared between blue and brown badge holders. Furthermore, 20% of all residential spaces will be for electric vehicles with an additional 20% passive provision for electric vehicles in the future.

The FCPMP is shown in Appendix O.

8 Summary and Conclusions

Buro Happold (BH) has been commissioned by Transport for London (TfL) to undertake a Transport Assessment (TA) in support of a hybrid planning application for the redevelopment of TFL Landholdings at Northwood, London, HA6 2QB.

The purpose of this TA is to enable all stakeholders, including the public, to assess the proposed development the extent of the potential impacts it may have upon the transport network.

The hybrid planning application for comprehensive redevelopment of the site comprising full planning permission involving demolition of existing buildings to provide 93 residential units (C3) and associated car parking, 1,440 sq.m retail (A1-A5), a new operational station (Sui Generis) with step free access and associated car parking for the station; new bus interchange, and a new piazza. Outline planning consent for up to 34 residential units, car parking (all matters reserved apart from access) and refurbishment works to existing retail units along Station Approach.

The site is located on the junction of Green Lane (B469) and Eastbury Road within the London Borough of Hillingdon (LBH).

The site comprises land north and south of Green Lane including part of the highway. The area of land north of Green Lane comprises a parade of single storey retail units located over the railway bridge with a two storey adjoining unit on the Corner of Eastbury Road. The northern part of the site is bounded by the Eastbury Surgery to the north; Green Lane to the south; Eastbury Road to the east and the retail units on the bridge to the west.

The majority of the site lies south of Green Lane, in Northwood and comprises the existing London Underground station and a mix of A-Class uses, residential flats, a light industrial use, dental practice and area of surface car parking. The southern part of the site is bounded by Green Lane to the north; the London Underground compound to the south; the railway line to the east; and the rear boundaries of the Northwood Central Club, St John's United Reformed Church and residential properties fronting Hallowell Road to the west.

The site currently comprises the existing Northwood London Underground Station and a mix of A-Class uses, 14 residential flats, a light industrial use, dental practice and area of surface car parking.

The site is currently accessed via Station Approach by all modes which is a vehicle dominated and moderately sloping road that is difficult for the elderly and disabled to use.

Northwood has good highway connections with key primary routes that broadly connect Northwood to the north (A4125), east (A404), south (A4180) and west (A404). The B469 secondary route, which gives access to Northwood Underground Station also forms Northwood's 'high-street'. The B469 connects to the A404 in the west and the A4125 in the east, and although it does provide a through route between these two primary roads, its main function is a local collector.

Traffic counts were undertaken on Thursday 10th September 2015 between 0700 – 1000 and 1500 – 1900 and on Saturday 12th September between 1100 – 1400 at the following junctions:

- Green Lane / Station Approach / Eastbury Road signalised junction;
- Green Lane / Maxwell Road mini roundabout; and
- Green Lane / Hallowell Road priority junction.

These traffic surveys were used to identify the peak hours that should be modelled as part of a junction capacity assessment. As part of these surveys queue length data was also collected to assist in the validation of junction capacity modelling.

There have been five accidents (no fatalities) during the 36 months preceding 31st May 2015 and that all accidents were only slight accidents recorded, no accidents resulting in fatal or serious injury. Two accidents occurred on Green Lane (B469), two on Eastbury Road and one on Station Approach.

Parking Occupancy and Length of Stay surveys were undertaken during July (Thursday 22nd – Saturday 24th) and September (Thursday 10th – Saturday 12th) to identify the existing level of non-private parking supply and demand within Northwood.

There are 3 main off-street car parks within Northwood which are:

- Northwood Station Car Park (Public – TfL/NCP) – 191 spaces;
- Green Lane Car Park (Public – LBH) – 149 spaces; and
- Waitrose Car Park (Private) – 191 spaces.

Note: NCP has a contract with TfL to provide 175 parking space.

The road leading in to Northwood Station Car Park, Station Approach, prohibits parking. However, the highway is not 'adopted' by the highway authority and this has not been enforced. Due to the lack of enforcement, unregulated parking occurs on a regular basis. Similarly, the existing bus turnaround facility located between Station Approach and Northwood Station Car Park is also subject to frequent unregulated parking. These spaces do not form part of NCP's existing contract with TfL and given that parking is unregulated and not charge at a daily tariff it is often fully occupied.

The results of the off-street parking surveys demonstrated that there is sufficient spare capacity with Northwood during the day and evening to accommodate any additional demand generated by the proposed development. This included the assumption that all unregulated parking that may be displaced by the proposed development is also accommodated.

A one off on-street parking beat survey was undertaken on Thursday 10Th September 2015 between 13:00 and 14:00 which is the time when the parking occupancy reaches its peak within Northwood Town Centre.

The results of the on-street parking survey showed that public parking i.e. Pay & Display is 58% occupied at the peak time for Northwood Town Centre. This survey suggests that there would typically be approximately 30 parking spaces vacant which is a similar level of parking to the amount of unregulated parking that occurs on Station Approach and in the Bus Turnaround.

The PTAL rating for the northern half of the site is 3; this indicates a moderate level of public transport accessibility. However, the southern half of the site falls to PTAL of 2 (with a small area a PTAL of 1) which indicates a poor level of public transport accessibility respectively.

The TIM output for public transport journeys from the site in the AM peak shows that the majority of Central London can be travelled to in under 60 minutes. In the PM peak, the output is similar to the AM peak as the site can be travelled to by most of Central London in under 60 minutes.

There is a good pedestrian provision within the vicinity of the site that facilities movement between the site and the existing town centre (War Memorial). The site is linked to the town centre via a wide footway to the west on the southern edge of Green Lane. At the Green Lane / Maxwell Road junction there is a zebra crossing to facilitate a safe pedestrian crossing location. The wide footway on Green Lane continues east towards St Helen's School where there is an informal crossing located just east of the junction with Hallowell Road.

The existing Northwood Station Car Park will be provided in a basement underneath the piazza across two levels of parking that will comprise of both public and private parking. A lift will be provided that connects the basement car parking to the pizza so that step-free access can be made between the two.

The proposed development will provide a new vehicular access located approximately 45 metres east of the existing junction between Green Lane and Station Approach which is currently where the north-south footpath known as Central Way is located. Central Way will be upgraded to a fully operational road suitable for all vehicle types (including pedestrians and cyclists) that will provide the sole access point for vehicles to the site. However, it should be noted that the proposed development has been design in such a way to encourage pedestrians to permeate through the site via the piazza and away from Central Way.

The site will be accessed by all vehicles via Central Way which will form an arm of a signalised staggered crossroads junction between Green Lane / Eastbury Road / Central Way. Central Way will provide a vehicular access that runs through the entirety of the site along the eastern boundary from Green Lane through to the TfL compound located at the southern end of the site. However, access to the compound will be restricted for TfL's use only and will not be accessible to the public.

Vehicles undertaking a collection of refuse or delivery and servicing activity for the apartments or retail will travel southbound along Central Way towards the turnaround facility before performing a U-turn and travelling northbound towards the pick-up/drop-off area on the western side of Central Way. Pick-up/drop-off activity will be prohibited between 10:00 and 15:00 to allow Central Way to be used for refuse collection or delivery and servicing activity.

The proposed development has been designed to increase pedestrian permeability through the site and to encourage non-motorised transport to use the piazza as opposed to Central Way. Pedestrians and cyclists will have use Central Way to access the site although it is envisaged that this will be primarily used by residents and visitors to the southern end of the site. The proposed development provides a large area of public realm running through the centre of the site in a north-south direction that will be attractive to pedestrians and cyclists. It provides a wide and vehicle-free route to the relocated station and connects to the existing east-west link between the existing footbridge over the rail lines and the alleyway located south of St John's Church.

In accordance with the London Plan the proposed development will ensure that 20% of all residential parking spaces (both active and passive) will provide an electric charging point to encourage the uptake of electric vehicles. Furthermore, 10% of all parking spaces for commercial use (both active and passive) will also provide an electric charging point. The location of these spaces will be subject to further discussion with LBH and TfL and can be controlled by planning condition.

The proposed development will provide 180 public parking spaces of which 17 will be designated for disabled users. This is an increase of 13 disabled parking spaces (which will be available for blue and brown badge holders) compared to the existing provision which is four parking spaces. This increase in disabled parking provision is to reflect the likely increase of disabled and elderly user demand due to the implementation of step-free access at the new Northwood Station.

The proposed development will provide a formal pick-up and drop-off area located on the western edge of Central Way that will be able to accommodate up to five large cars. Taxis will also use this area but they will be limited to no more than two vehicles at any one time. Taxis will be required to store within the car park circulation and will be called by the taxi kiosk when a fare is ready to be collected at the pick-up/drop-off. The size of this area has been informed by the data collected for pick-up and drop-off activity on Station Approach.

Pick-up and drop-off activity will be prohibited in the designated area on Central Way between 10:00 and 15:00 to allow refuse collection and delivery and servicing activities to be undertaken. During this time pick-up and drop-off activity will occur within the circulation of the basement car park which allows people to be dropped off nearby the lift that provides a direct link between the car park and the piazza. However, it should be noted that pick-up/drop-off activity within the basement car park is permitted at any time.

The proposed development will provide 118 residential parking spaces across the site for 127 residential units at a ratio of 0.93 spaces per dwelling. 10% of all residential parking will be dedicated for disabled users (blue and brown badge holders).

There is currently a provision of 13 cycle parking spaces at Northwood station. The proposed development will increase this to 28 cycle parking spaces which will be located in a convenient, secure and covered area approximately 10 m south of the station entrance

The proposed development will provide 54 retail cycle parking spaces which will be located within the public piazza and 226 residential cycle parking spaces which will be located within the basement for the apartments and on-plot for the townhouses.

LBH Highway Officers suggested that to estimate the likely number of trips generated by the proposed development that the trip rates agreed and used within the recently approved (December 2014) development of the Former ARLA Food Depot Development, Victoria Road, Ruislip (66819/APP/2014/1600) should be used to forecast the transport impacts of the proposed development.

The total multi-modal trip generation for the proposed development estimates that the site is likely to generate 20 two way car driver trips in the AM peak, 86 two way car driver trips in the PM peak and 71 two way car driver trip in the Saturday peak. There will be a considerable number of walking trips generated by the site, especially in the PM and Saturday peaks. This is mainly attributed to the retail use and is likely to be part of another trip purpose i.e. from another shop in the Town Centre or between Northwood Station and a home address.

The distribution of vehicular trips to and from the proposed development is determined by using the existing turning movements. Traffic counts were undertaken on Thursday 10th September 2015 between 0700 – 1000 and 1500 – 1900 and on Saturday 12th September between 1100 – 1400.

To assess the likely impact of the proposed development upon the surrounding highway network it is proposed that junction capacity modelling is undertaken on the following junctions as part of a small network using LinSig v3:

- Green Lane / Station Approach / Eastbury Road signalised junction;
- Green Lane / Maxwell Road mini roundabout; and
- Green Lane / Hallowell Road priority junction.

The assessment will undertake junction capacity assessments of the following peak hours which were identified using traffic flow data collected on Thursday 10th September and Saturday 12th September:

- AM Peak (0800 – 0900);
- School Peak (1500 – 1600);
- PM Peak (1700 – 1800); and
- Saturday Peak (1200 – 1300).

These assessment periods will be modelled in the following assessment years which have been specified by LBH Highway Officers:

- Base Year (2015);
- Opening Year (2020) – Without Development;
- Opening Year (2020) – With Development; and
- Opening Year plus 5 Years (2025) – With Development.

In summary, the results indicate that for all time periods i.e. AM, PM, School and Saturday peaks, that the proposed junction layout mitigates the impacts of any additional traffic that is likely to be generated due to the proposed development. In some cases the modelled highway network operates over capacity, however, the proposed junction layout allows the network to operate notably better than if no development or junction improvements are delivered.

It is estimated that the proposed development will generate an additional 20 London Underground trips during the AM peak and 60 during the PM Peak. Due to the tidal nature of the distribution the majority of these trips travel southbound in the AM peak and return northbound in the PM peak. The percentage increase in all direction is under 10% and should therefore be considered negligible.

Is estimated that the proposed development will generate a total of 228 additional bus passengers across a day split almost equally across the 3 services that are provided in the vicinity of the proposed development. This is approximately an increase of 10% and should therefore be considered negligible.

To conclude, this TA has demonstrated that the proposed development will not have any significant impacts upon the transport network and in some cases, i.e. the highway network, the proposed development will implement mitigation measures that improve conditions within Northwood.

Appendix A Proposed Masterplan (Fletcher Priest Architects)

NOTES
Fletcher Priest Architects is a Limited Liability Partnership registered in England and Wales (OC336568) at the below address. ≡ this drawing is to be read in conjunction with the design risk assesment prepared by fpa. ≡ this drawing is to be read in conjunction with other drawings and specification produced by fpa and other members of the design team. ≡ all dimensions are in millimeters unless otherwise stated. ≡ do not scale this drawing. ≡ any discrepancies in dimensions are to be reported to the architect. ≡ all information subject to detail site survey.

KEY

TfL Ownership Boundary (32,092.5m²)

Site Boundary (19,108m²)

REV	DESCRIPTION	BY	CHK	DATE
A	GA FREEZE	AH	LR	16.10.15
-	DRAFT ISSUE	AH	LR	25.09.15

FOR INFORMATION

NORTH

TRANSPORT FOR LONDON
NORTHWOOD

05 SITE
Location Plan
Proposed

DRAWING NUMBER / REVISION
A 1323 GA 0501 A

SCALE
1:750 @A1 / 1:1500 @A3

DATE / DRAWN BY / CHECKED BY
31.07.2015 AH / LR

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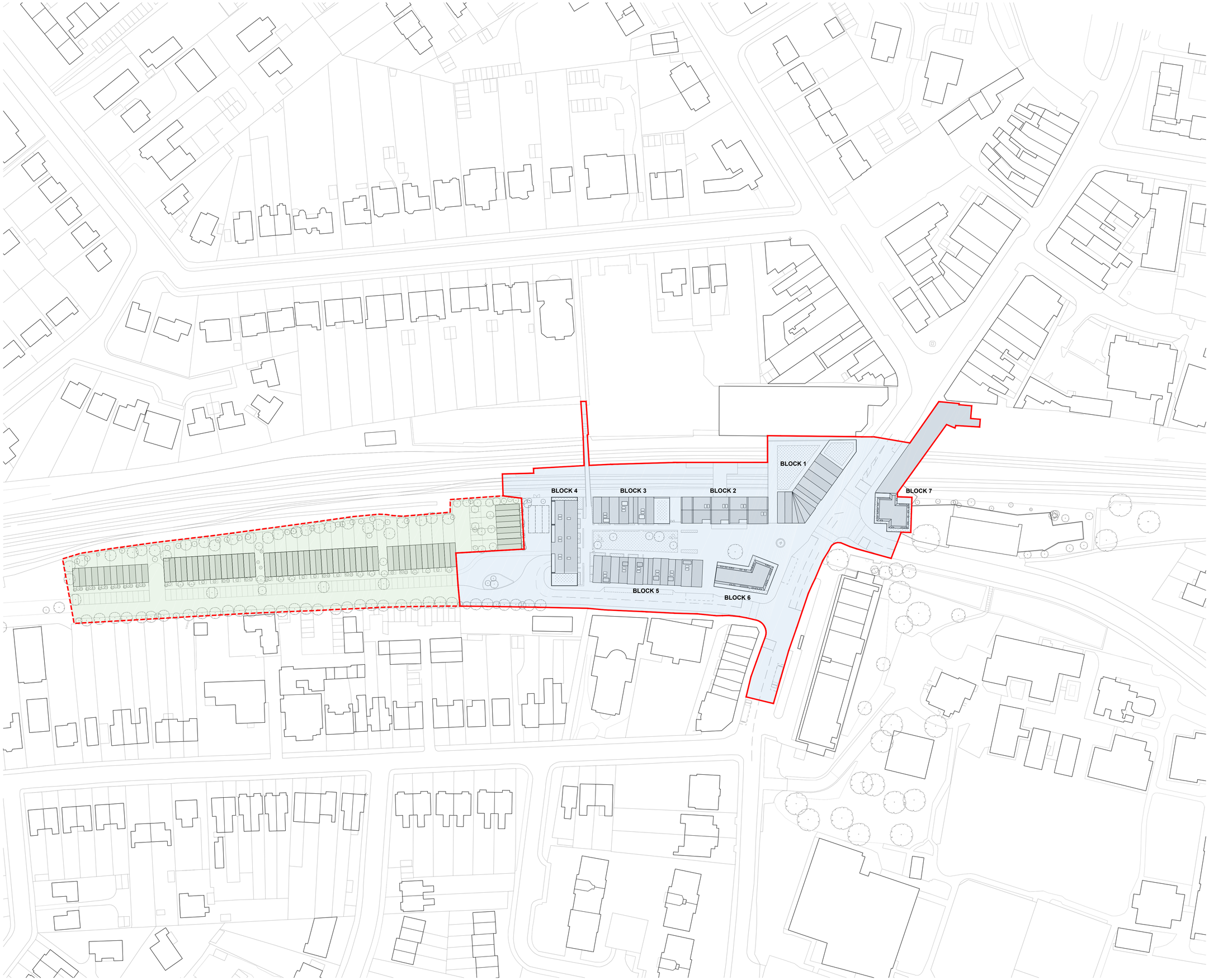

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KEY

ZONE A - Detail Application (12,194.4m²)

ZONE B - Outline Application (6,193.6m²)

REV	DESCRIPTION	BY	CHK	DATE
A	GA FREEZE	AH	LR	16.10.15
-	DRAFT ISSUE	AH	LR	25.09.15

FOR INFORMATION

NORTH

TRANSPORT FOR LONDON
NORTHWOOD

05 SITE
Location Plan
Application Boundaries

DRAWING NUMBER / REVISION
A 1323 GA 0502 A

SCALE
1:750 @A1 / 1:1500 @A3

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31.07.2015 AH / LR

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KEY:

- Site Boundary
- Residential
- Retail
- Station
- Single Parking
- Car Stackers
- Disabled Parking
- Cycle Store
- Refuse Store

TOTAL CAR SPACES - 126
(61 Commuter / 17 Accessible / 48 Residential)

IN ABEYANCE, STRUCTURES/SERVICES TO BE COORDINATED WITH BH.

REV	DESCRIPTION	BY	CHK	DATE
B	GA FREEZE	AH	LR	16.10.15
A	GA FREEZE	AH	LR	09.10.15
-	DRAFT ISSUE	AH	LR	25.09.15

FOR INFORMATION

NORTH

TRANSPORT FOR LONDON
NORTHWOOD

20 GA PLANS
Zones A Blocks 1-7
Lower Ground 2 Floor Plan

DRAWING NUMBER / REVISION
A 1323 GA 2000 B

SCALE
1:250 @A1 / 1:500 @A3

DATE / DRAWN BY / CHECKED BY
31.07.2015 RE / LR

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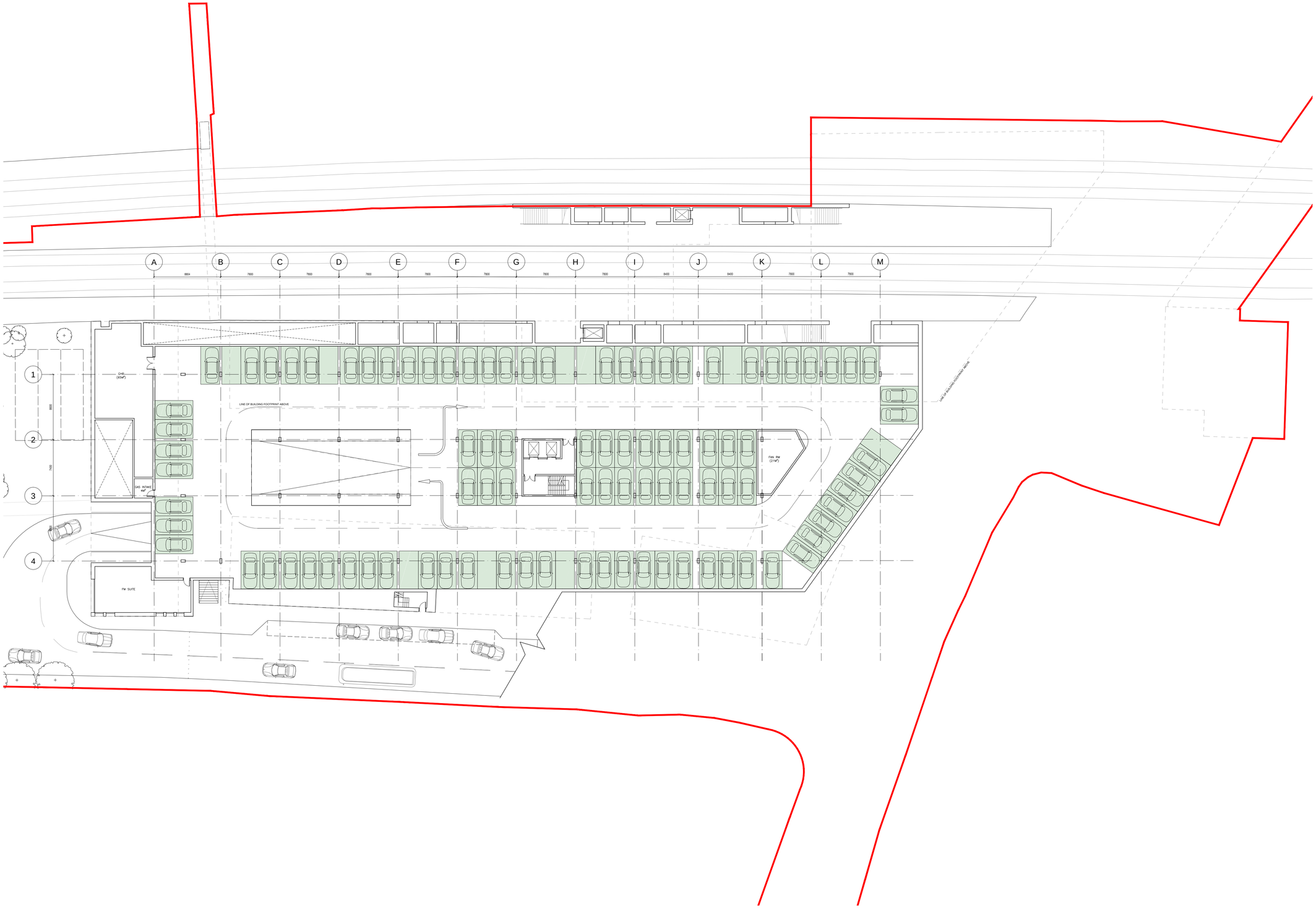

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KEY:

- Site Boundary
- Residential
- Retail
- Station
- Single Parking
- Car Stackers
- Disabled Parking
- Cycle Store
- Refuse Store

TOTAL CAR SPACES - 126
(61 Commuter / 17 Accessible / 48 Residential)

IN ABEYANCE, STRUCTURES/SERVICES TO BE COORDINATED WITH BH.

REV	DESCRIPTION	BY	CHK	DATE
B	GA FREEZE	AH	LR	16.10.15
A	GA FREEZE	AH	LR	09.10.15
-	DRAFT ISSUE	AH	LR	25.09.15

FOR INFORMATION

NORTH

TRANSPORT FOR LONDON
NORTHWOOD

20 GA PLANS
Zone A Blocks 1-7
Lower Ground 1 Floor Plan

DRAWING NUMBER / REVISION
A 1323 GA 2001 B

SCALE
1:250 @A1 / 1:500 @A3

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31.07.2015 RE / LR

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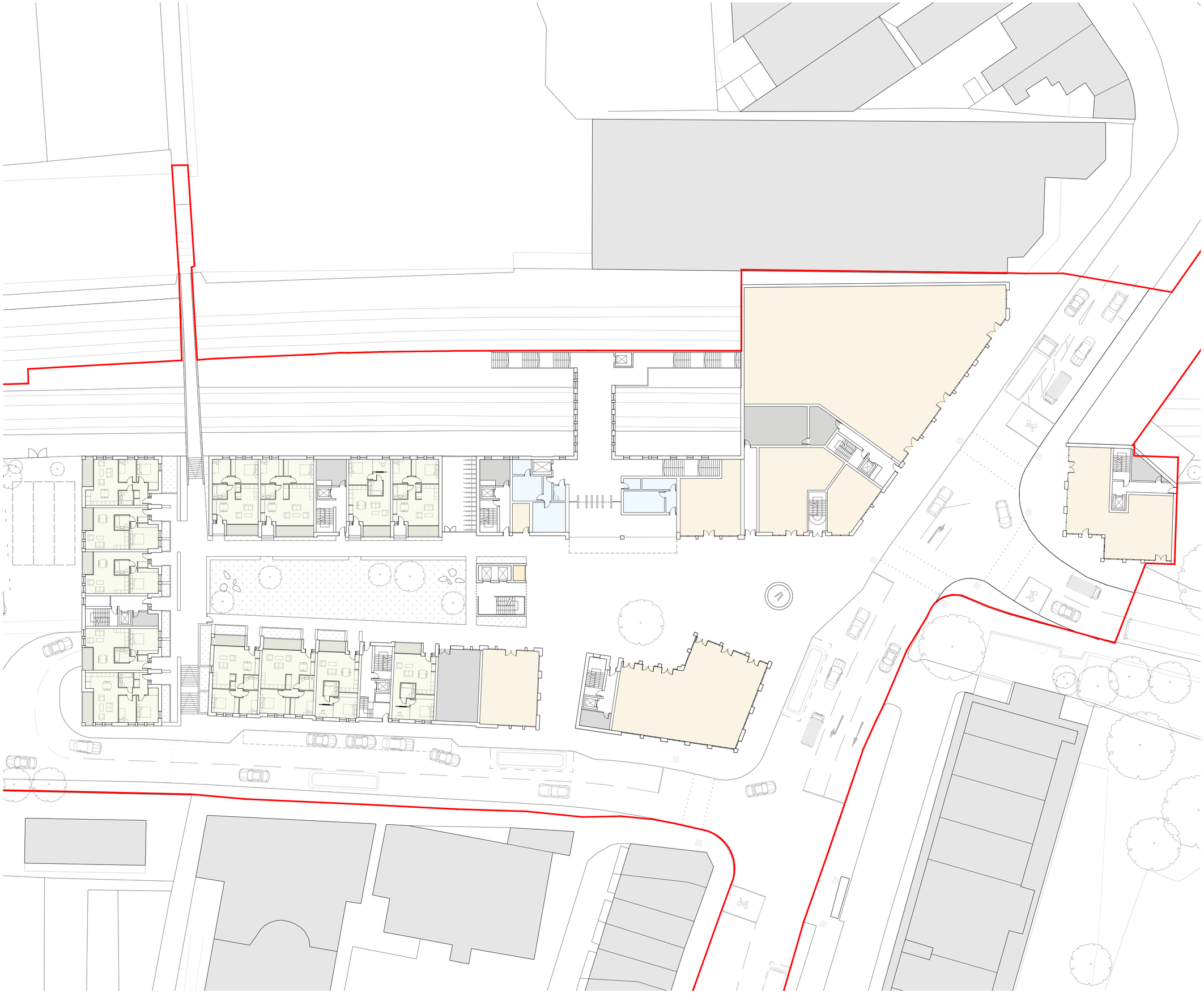

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- Residential
- Retail
- Station
- Single Parking
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- Refuse Store

REV	DESCRIPTION	BY	CHK	DATE
B	GA FREEZE	AH	LR	16.10.15
A	GA FREEZE	AH	LR	09.10.15
.	DRAFT ISSUE	AH	LR	25.09.15

FOR INFORMATION

NORTH

TRANSPORT FOR LONDON
NORTHWOOD

20 GA PLANS
Zone A Blocks 1-7
Ground Floor Plan

DRAWING NUMBER / REVISION
A 1323 GA 2002 B

SCALE
1:250 @A1 / 1:500 @A3

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31.07.2015 AH / LR

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- Station
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- Refuse Store

REV	DESCRIPTION	BY	CHK	DATE
B	GA FREEZE	AH	LR	16.10.15
A	GA FREEZE	AH	LR	09.10.15
.	DRAFT ISSUE	AH	LR	25.09.15

FOR INFORMATION

NORTH

TRANSPORT FOR LONDON
NORTHWOOD

20 GA PLANS
Zone A Blocks 1-7
First Floor Plan

DRAWING NUMBER / REVISION
A 1323 GA 2003 B

SCALE
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31.07.2015 AH / LR

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- Refuse Store

REV	DESCRIPTION	BY	CHK	DATE
B	GA FREEZE	AH	LR	16.10.15
A	GA FREEZE	AH	LR	09.10.15
.	DRAFT ISSUE	AH	LR	25.09.15

FOR INFORMATION

NORTH

TRANSPORT FOR LONDON
NORTHWOOD

20 GA PLANS
Zone A Blocks 1-7
Second Floor Plan

DRAWING NUMBER / REVISION
A 1323 GA 2004 B

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B	GA FREEZE	AH	LR	16.10.15
A	GA FREEZE	AH	LR	09.10.15
.	DRAFT ISSUE	AH	LR	25.09.15

FOR INFORMATION

NORTH

TRANSPORT FOR LONDON
NORTHWOOD

20 GA PLANS
Zone A Blocks 1-7
Third Floor Plan

DRAWING NUMBER / REVISION
A 1323 GA 2005 B

SCALE
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.	DRAFT ISSUE	AH	LR	25.09.15

FOR INFORMATION

NORTH

TRANSPORT FOR LONDON
NORTHWOOD

20 GA PLANS
Zone A Blocks 1-7
Fourth Floor Plan

DRAWING NUMBER / REVISION
A 1323 GA 2006 B

SCALE
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KEY:

- Site Boundary
- Residential
- Retail
- Station
- Single Parking
- Car Stackers
- Disabled Parking
- Cycle Store
- Refuse Store

REV	DESCRIPTION	BY	CHK	DATE
B	GA FREEZE	AH	LR	16.10.15
A	GA FREEZE	AH	LR	09.10.15
.	DRAFT ISSUE	AH	LR	25.09.15

FOR INFORMATION

NORTH

TRANSPORT FOR LONDON
NORTHWOOD

20 GA PLANS
Zone A Blocks 1-7
Roof Plan

DRAWING NUMBER / REVISION
A 1323 GA 2007 B

SCALE
1:250 @A1 / 1:500 @A3

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31.07.2015 AH / LR

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Appendix L Framework Travel Plan

BUROHAPPOLD ENGINEERING

TfL Landholdings at Northwood

Framework Travel Plan

034233

26 October 2015

Revision 02

Revision	Description	Issued by	Date	Checked
00	FIRST DRAFT ISSUE	DJ	14.10.2015	GP
01	SECOND DRAFT ISSUE (REVISED FOLLOWING COMMENTS)	DJ	19.10.2015	GP
02	FINAL ISSUE	DJ	26.10.2015	GP

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author	**Richard Evans**
date	**26.10.15**
approved	**Gerry Prodohl**
signature	
date	**26.10.15**

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1 Introduction

1.1 Background

BuroHappold Engineering has been commissioned by Transport for London (TfL) to prepare a Framework Travel Plan in support of the planning application for the proposed redevelopment of TfL Landholdings at Northwood, London, HA6 2QB.

1.2 Site Location

The site is located on the junction of Green Lane (B469) and Eastbury Road within the London Borough of Hillingdon (LBH).

The site comprises land north and south of Green Lane including part of the highway. The area of land north of Green Lane comprises a parade of single storey retail units located over the railway bridge with a two storey adjoining unit on the Corner of Eastbury Road. The northern part of the site is bounded by the Eastbury Surgery to the north; Green Lane to the south; Eastbury Road to the east and the retail units on the bridge to the west. The site is 1.91 ha.

The majority of the site lies south of Green Lane, in Northwood and comprises the existing London Underground (LU) station and a mix of A-Class uses, residential flats, a light industrial use, and area of surface car parking. The southern part of the site is bounded by Green Lane to the north; the London Underground compound to the south; the railway line to the east; and the rear boundaries of the Northwood Central Club, St John's United Reformed Church and residential properties fronting Hallowell Road to the west.

2 Development Proposals

The development is a mix of residential and retail and consists of the following:

- 127 residential units comprising:
  - 32 x 1 bed apartments
  - 56 x 2 bed apartments
  - 5 x 3 bed apartments
  - 34 x townhouses (3/4 bed)

- 1,440 sqm A1-A5 retail space.

The site is accessed via Central Way which forms a left in/left out priority junction with B469 Green Lane.

Vehicular Parking

The proposed scheme provides parking spaces to be distributed between residents and public. Car parking spaces will be provided in varying sizes to allow for variations in car sizes.

The total parking provision is as follows:

- 298 parking spaces comprising:
  - 48 spaces for apartments (93 units)
  - 70 spaces for town houses (34 units)
  - 0.93 spaces per dwelling across the site.
  - 180 public spaces (14 disabled – shared between blue and brown badge)
- pick-up/drop off Central Way – space for five vehicles. Area will also be used by taxis but limited to two spaces of the total five spaces;
- overspill pick-up/drop-off and taxi activity to be undertaken on the circulation of basement car park. Lifts provide direct access to the public piazza;
- pick-up/drop-off on Central Way prohibited between 10am and 3pm to allow for delivery and servicing activity for residents and retail.

The site is currently situated within a controlled parking zone (CPZ), which has existing restrictions which prohibits parking between 1pm and 2pm, unless a residential parking permit is owned by the user. This CPZ will remain in the future.

There is no on-street parking provided within the development and there is proposed to be double yellow lines throughout.

Cycle Parking

All residential and station cycle parking will be located in a secure, convenient and covered location. Long term cycle parking will be located in the basement and short term cycle parking will be located in the public realm. A total of 306 cycling parking spaces will be provided and will be broken down as follows:

- residential – 224 spaces, in the basement;
- station - 28 spaces (existing provision of 13 spaces), on the ground floor, adjacent to the station; and
- retail – 54 spaces, in the public realm.

3 Policy and Best Practice

Introduction

This section provides a review of the key national, regional and local policy documents relevant to travel planning for the proposed development.

The National Planning Policy Framework (NPPF) and subsequent National Planning Policy Guidance (NPPG) provide guidance on national policy. Strategic Policy is provided by The London Plan, Mayor's Transport Strategy and Transport for London's (TfL's) Travel Planning Guidance. The London Borough of Hillingdon (LBH) Local Plan and WestTrans provides local guidance.

National Planning Policy Framework (Revision - March 2012)

The NPPF states that plans should protect and exploit opportunities for the use of sustainable transport modes and a key tool for this is the creation of a Travel Plan. All developments which generate significant amounts of movement should be required to provide a Travel Plan.

National Planning Policy Guidance (Revision - March 2014)

The NPPG can be seen as an update to the NPPF and defines Travel Plans as 'long-term management strategies for integrating proposals for sustainable travel into the planning process. They are based on evidence of the anticipated transport impacts of development and set measures to promote and encourage sustainable travel.'

Travel Plans, together with Transport Assessments, are used to assess and mitigate the negative transport impacts of development; and hence, to promote sustainable development. NPPG identifies Travel Plans as a key tool to identify opportunities for the effective promotion and delivery of sustainable transport. All developments which generate significant amounts of movement should be required to provide a Travel Plan.

Mayor's Transport Strategy (2010)

The Mayor's Transport Strategy highlights the importance of travel planning and smarter travel initiates to promote the range of health and environmental benefits of walking, particularly in schools, workplaces and in deprived areas where the cost of public transport may be a barrier to travel.

Proposal 62 states:

> *'The Mayor, through TfL, working with London boroughs, developers and other stakeholders will promote walking and its benefits through information campaigns, events to raise the profile of walking, and smarter travel initiatives such as school and workplace Travel Plans.'*

The London Plan (March 2015 – Further Alterations)

The London Plan is the overall strategic plan for London, setting out an integrated economic, environmental, transport and social framework for the development of London over the next 20–25 years.

The Plan's objectives pertaining to Travel Plans are as follows:

- to ensure that London is a city where everyone can access jobs, opportunities and facilities with an efficient and effective transport system that actively encourages walking and cycling and makes better use of the Thames; and
- to improve the environment locally and globally, so that London becomes a world leader and is at the forefront of policies to tackle climate change, reduce pollution, develop a low carbon economy and consume fewer resources and use them more effectively.

TfL Travel Planning Guidance (November 2013)

This guidance supersedes the last guidance on travel planning – 'Travel Planning for New Development in London: Incorporating Deliveries and Servicing' (2012). It states that two forms of Travel Plan can be submitted for developments; a Travel Plan Statement and Full Travel Plan.

The guidance sets out the thresholds for the requirements of Travel Plans in relation to land uses. However, the proposed development will follow the policies set out in the LBH policies as explained below.

LBH Local Plan Part 1 (November 2012)

The LBH Local Plan Part 1 sets out the local policies aimed at promoting sustainable forms of transport with the aim of improving quality of life and reducing private car dependency.

> *Policy T1: Accessible Local Destinations states that 'all development should encourage access by sustainable modes and include good cycling and walking provision'. And this will be achieved through 'travel planning'.*

LBH Local Plan Part 2 (*emerging*)

The Council has prepared a draft of Part 2 of the Local Plan. It was published for public comment in the period of 22nd September - 4th November 2014. On 24 September 2015, Cabinet gave approval to undertake further consultation on proposed changes to the proposed submission version of the Local Plan Part 2. This is due to take place from 26th October – 6th December 2015. Following the consultation, the Local Plan Part 2 documents and comments received will be submitted to the Secretary of State for Communities and Local Government for public examination.

The LBH Local Plan Part 2 currently states that:

> *'Travel Plans should follow the guidelines and good practice issued by Transport for London. The plans should demonstrate how measures will be implemented, such as new local bus stops and cycle ways with cycle storage, and soft measures such as discounts on season tickets or by providing advice on individual journey planning. These measures should be integrated into the marketing and occupation of the development, with remedial measures implemented if outcomes are not achieved.'*

Policy DMT1: Managing Transport Impacts states that:

> *'Transport Assessments/Statements and Travel Plans /Local Level Travel Plans are required with development proposals so that transport impacts can be identified and addressed.'*

WestTrans

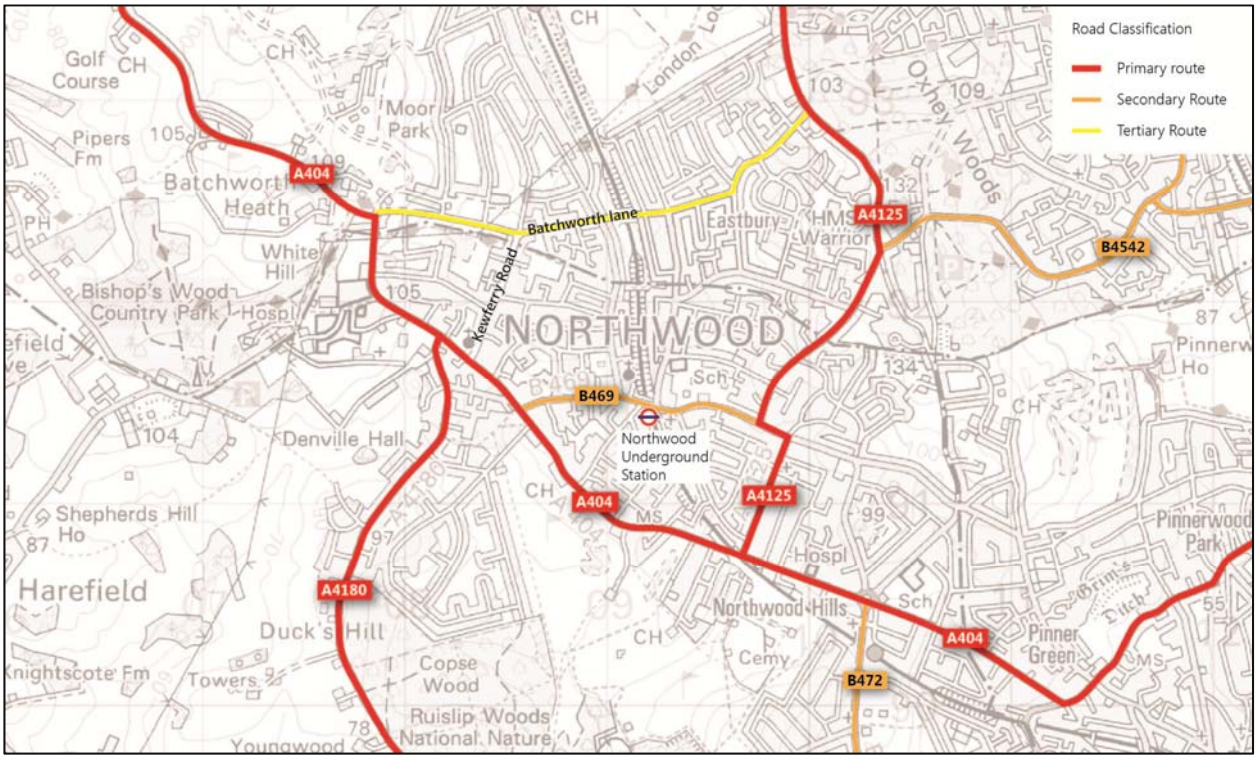
WestTrans is the collaboration of six west London boroughs to ensure that Travel Plans throughout the boroughs work together in promoting sustainable forms of transport to improve quality of life and reduce the reliance on car travel. The Travel Plan will be developed and monitored in accordance with WestTrans guidance.

4 Site Assessment

4.1 Highway Network

Figure 4-1 shows the primary and secondary routes in the Northwood area. The key primary routes broadly connect Northwood to the north (A4125), east (A404), south (A4180) and west (A404). The B469 secondary route, which gives access to Northwood Underground Station also forms Northwood's 'high-street'. The B469 connects to the A404 in the west and the A4125 in the east, and although it does provide a through route between these two primary roads, its main function is a local collector.

Figure 4-1 Local Highway Network



Considering non-local traffic travelling in an east/west direction, the A404 is the most direct route, and likely to be used by the majority of traffic. Traffic movements between the A404 in the west and the Oxhey area served by the B4542 is likely to avoid the town centre and travel via Batchworth Lane (no traffic restrictions) and the A4125, this is a shorter and quicker route than the alternative through the town centre.

Traffic travelling in a north/south direction between the A4180 (south) and the A4125 (north) is most likely to travel via the A404, and Batchworth Lane, being the directed route. Alternatively vehicles can also use Kewferry Road to reduce the trip length; however this route takes the same amount of time and may be unsuitable for larger vehicles. It is very unlikely that vehicles would choose to travel through the town centre as this is both a longer and slower route.

Traffic between the B472 in the south and any of the roads in the north will travel via the A404 or the A4125, hence avoiding the B469 via the town centre.

Traffic movement between the A4180 in the south and the A4125/B4542 in the north-east is likely to travel via the B469 as this provides the shortest route. This is the only non-local traffic movement that is likely to use the B469. The B4542 is a local collector and leads only to the Oxhey area, it is therefore likely that a very small number of vehicles will be making the movement between the A4180 and the B4542.

To conclude, although the B469 provides a connection between two primary routes (A404 and A4125), when the convenience of this link is explored in more detail it becomes apparent that for the majority of non-local traffic movements, the B469 will not from part of the quickest or shortest route. To this end it is likely that the majority of traffic on the B469 will be local traffic travelling to and from origins/destinations along this route.

4.2 Parking

Off-Street

There are currently three main off-street car parks within Northwood which are:

- Northwood Station Car Park (Public) – 191 spaces;
- Green Lane Car Park (Public) – 149 spaces; and
- Waitrose Car Park (Private) – 191 spaces.

Note: NCP has a contract with TfL to provide 175 parking spaces.

The road leading in to Northwood Station Car Park, Station Approach, prohibits parking. However, this has not been enforced and unregulated parking occurs on a regular basis. Similarly, the existing bus turnaround facility located between Station Approach and Northwood Station Car Park is also subject to frequent unregulated parking. As these fall outside of NCP's existing contract, with TfL and given parking is unregulated (and not charged a daily tariff), this is often full.

Station Approach has kerbside space for 14 cars and the Bus Turnaround can accommodate up to 26 cars. However, these numbers are regularly exceeded as is demonstrated in the results of the survey.

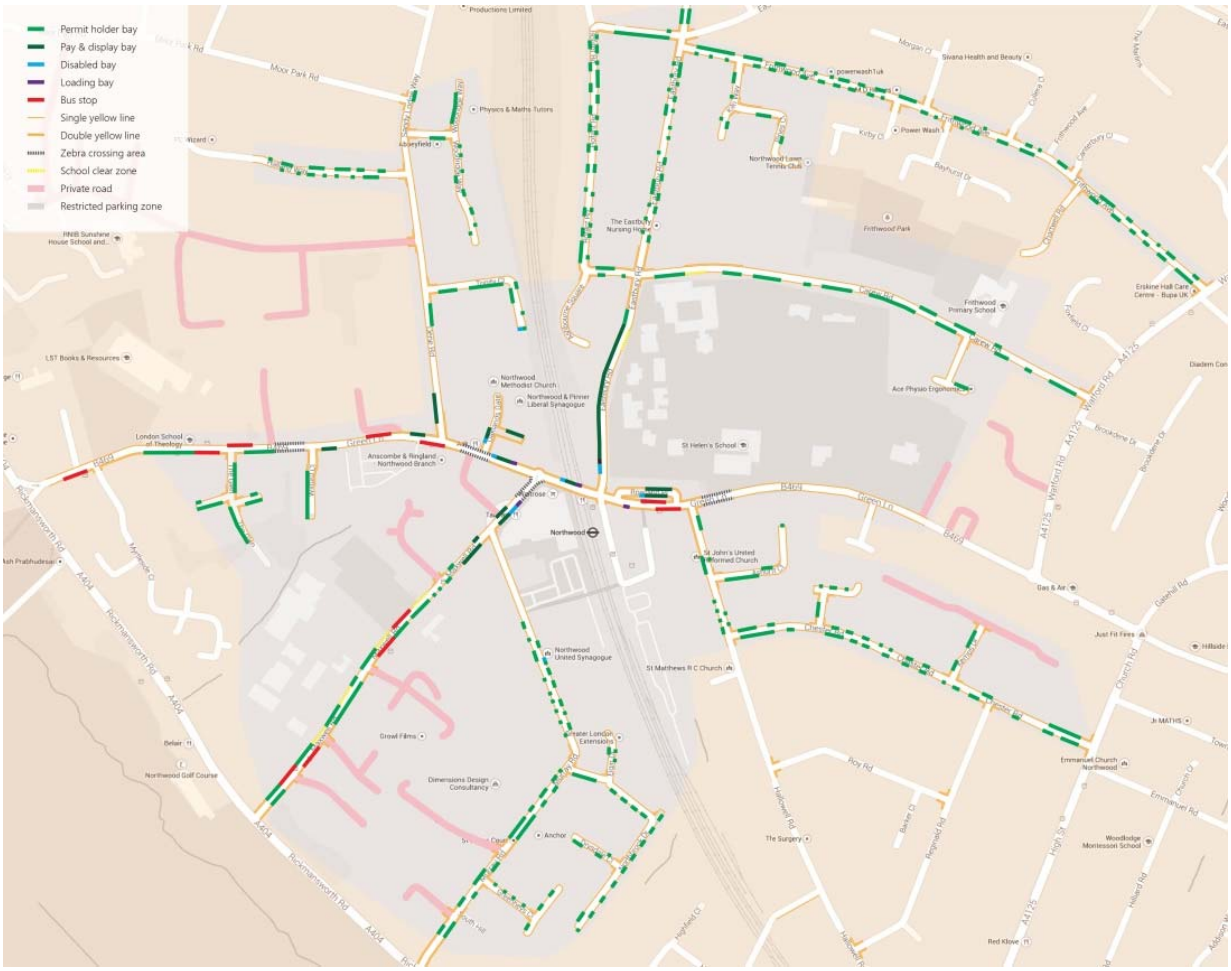
For the purposes of this assessment, only the public off-street parking supply will be analysed as that is the supply that will be available to those visiting the proposed development (with the exception of residents of the proposed development who will have a separate parking provision). An assessment of the unregulated off-street parking will also be included will be displaced as part of the proposed development and may choose to relocate to the public car parks.

To validate the parking survey data NCP (National Car Parks), who operate the Northwood Station Car Park, provided an annual profile of parking occupancy data. The data showed that the annual average peak occupancy was 145 vehicles parked which is an occupancy of 76% which is slightly lower than average of the parking survey data average for July and September.

On-Street

The site is currently situated within a controlled parking zone (CPZ), which has existing restrictions which prohibits parking between 13:00 and 14:00, unless a residential parking permit is owned by the user. This CPZ will remain in the future. Figure 4-2 below shows the current parking restrictions in place surrounding the site. It shows that single and double yellow lines exist throughout the area and numerous permit holder bays exist on the surrounding residential streets. Pay and display bays also exist on the surrounding site, such as on Rowland Place, Eastbury Road and Maxwell Road, which supports the existing retail in Northwood town centre.

Figure 4-2 Existing Parking Restrictions



Existing Pay & Display Provision (within 200m of the site)

Table 4-1 below shows the results of a parking survey undertaken for the existing pay and display car parks within 200m of the site. The survey results show a wide range of occupancy during the peak time, with between 39% and 100% of spaces being occupied. Refer to Appendix E for the full set of parking results.

Table 4-1 Parking Survey Results

Road Name	Available Spaces	Occupied Spaces	Occupancy
Eastbury Road	28	11	39%
Green Lane	8	7	88%
Rowland Place	14	9	64%
Maxwell Road	19	10	53%
Oaklands Gate	7	7	100%
Total	76	44	58%

Note: Snapshot survey taken at peak time (13:30 – 14:30)

4.3 Public Transport

Public Transport Accessibility Level (PTAL)

Transport for London's webptal website (http://www.webptals.org.uk) was used to determine the public transport accessibility level (PTAL) of the site. PTALs are a measure of the accessibility of a point to the public transport network, taking into account walk access times and service availability.

An accessibility index (AI) is calculated based upon the following elements:

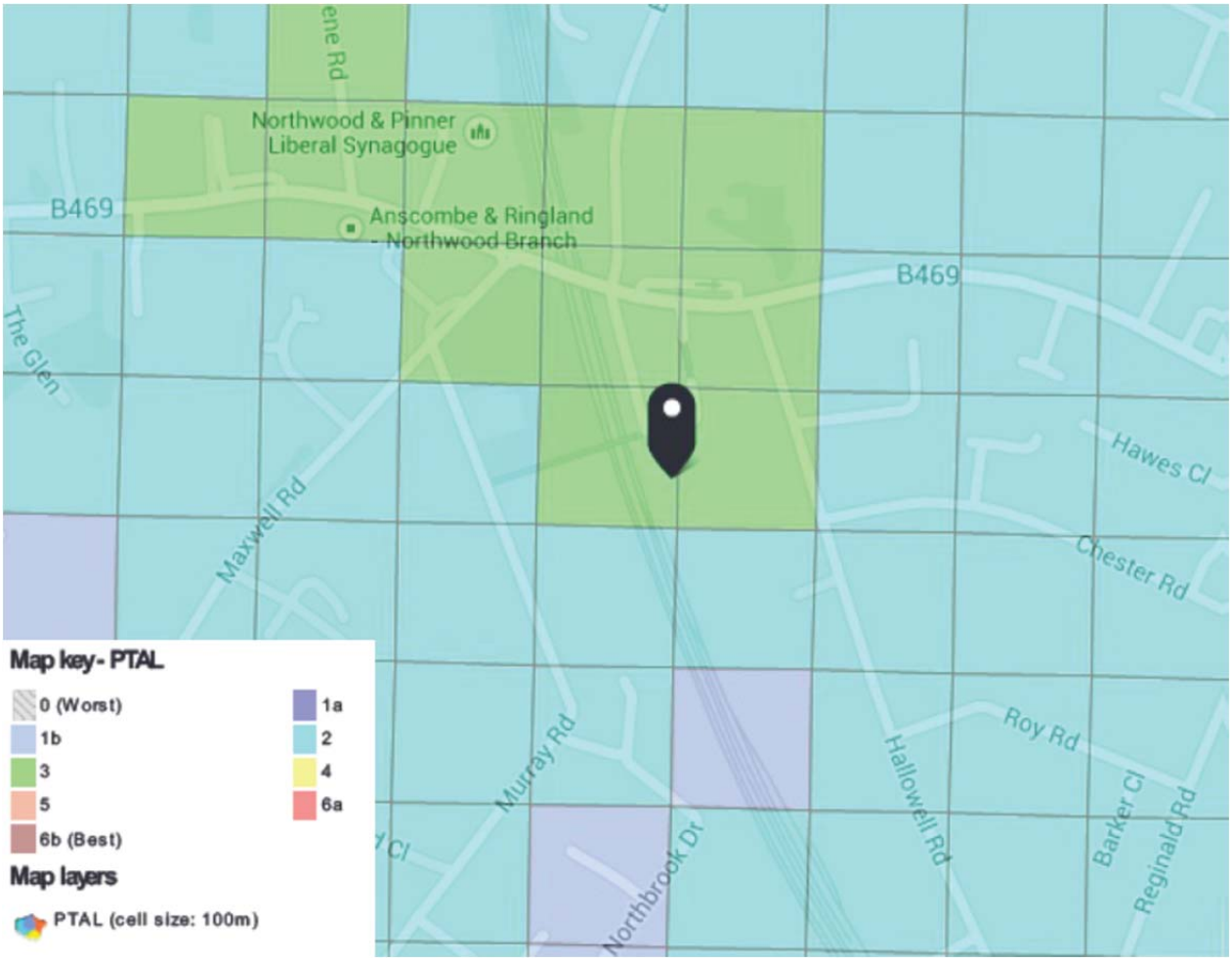
- The distance between the point of interest (POI) and the nearest bus stops, rail and underground stations, etc. (termed 'service access points', or SAPs); only SAPs within a certain distance of the POI are included (640 m for bus stops and 960 m for rail stations, which correspond to a walking time of 8 minutes and 12 minutes respectively at the standard assumed walking speed of 80m/min);
- The service level (i.e. frequency of bus/trains on the route), which allows assessment of a notional average waiting time; and
- A weighting factor for each route, to simulate the enhanced reliability and attractiveness of a route with a higher frequency over other routes.

This Accessibility Index (AI) can then be converted to a PTAL score which can range from 1a to 6b, where a score of 1a indicates a "very poor" level of accessibility and 6b indicates an "excellent" accessibility level.

The methodology does not consider the speed or usefulness of the accessible services, whether they are crowded or difficult to board, or the ease of interchange, but does provide a simple, standardise way of generally examining the level of access to public transport services in a particular location.

The PTAL rating for the northern half of the site is 3; this indicates a moderate level of public transport accessibility. However, the southern half of the site falls to PTAL of 2 (with a small area a PTAL of 1) which indicates a poor level of public transport accessibility respectively. Figure 4-3 overleaf illustrates that PTAL levels across the site and the surrounding area.

Figure 4-3 PTAL Map (http://www.webptals.org.uk)



TfL's WebCAT (Web-based Connectivity Assessment Toolkit) is a toolkit that is used to assess the accessibility connectivity of a site with regards to public transport. The TIM (Time Mapping) feature generates the average journey times to and from a site using all modes of public transport or bus only.

TIM outputs have been extracted for the site to demonstrate the average journey times in the AM and PM peak to any location within London.

Figure 4-5 shows the TIM output for public transport journeys from the site in the AM peak. This output shows that the majority of central London can be accessed in under 60 minutes.

Figure 4-5 - AM TIM Output

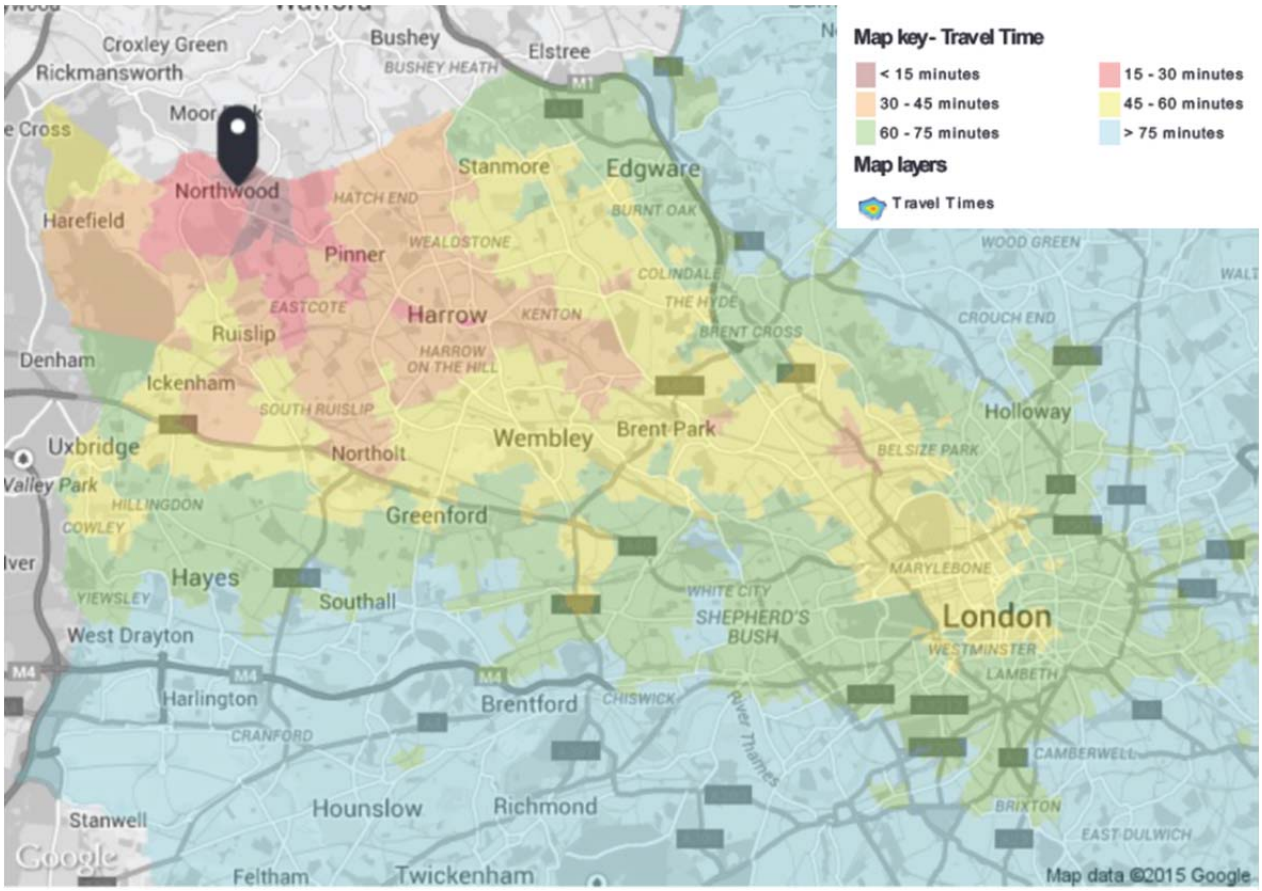
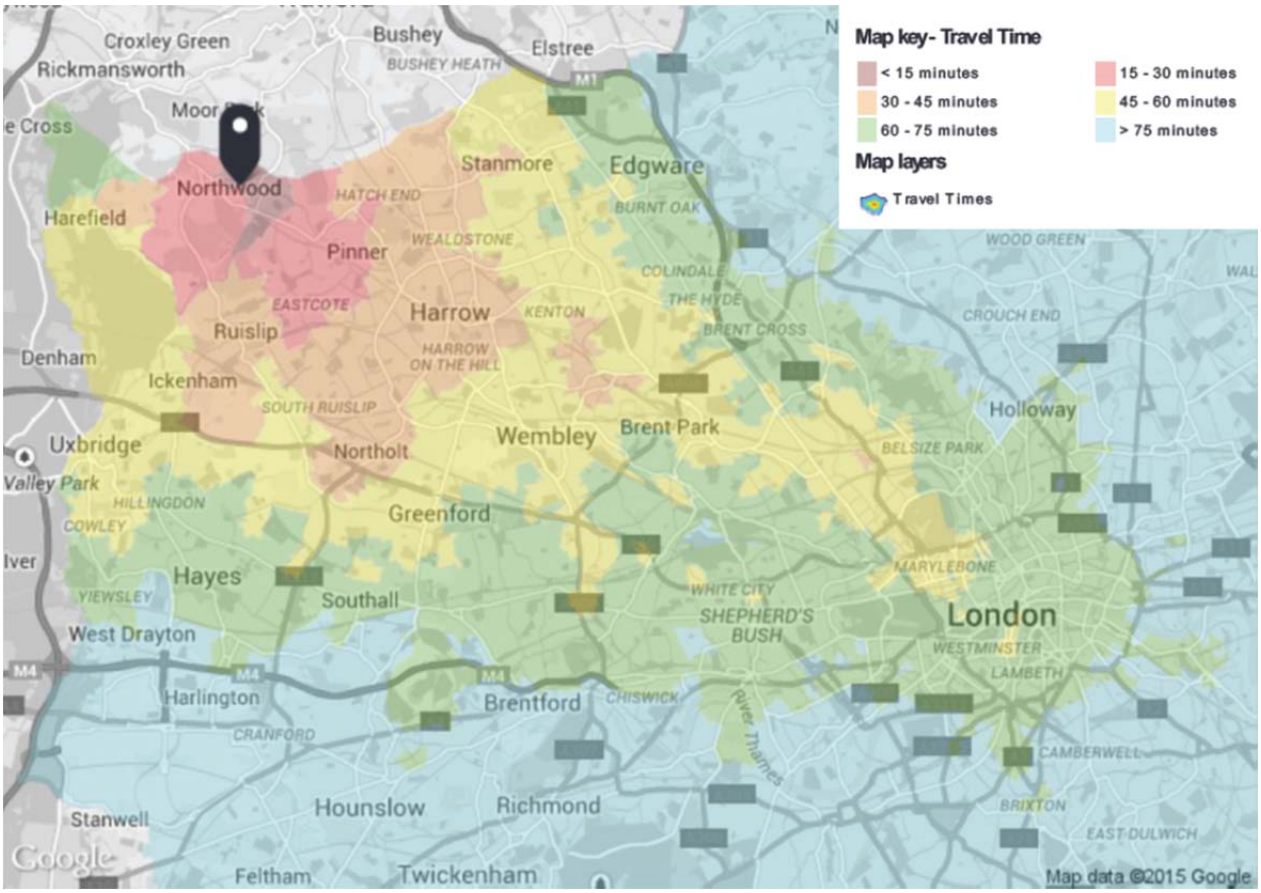


Figure 4-6 shows the TIM output for public transport journeys to the site in the PM peak. This output is similar to the AM peak as the site can be travelled to by most of Central London in under 60 minutes.

Figure 4-6 PM TIM Output (WebCAT)



London Underground

Northwood is a LU station on the Watford branch of the Metropolitan line. The LU station is currently located on the south-west corner of the junction between Green Lane and Station Approach. The line serves as the sole continuous link between the town of Northwood and central London.

The station is located on a four-track section of the Metropolitan line. The two platforms are on the slow lines. There are no platforms on the fast lines because fast services do not stop at this station.

In the northbound direction the station is served by trains to Watford, Amersham and Chesham. In the southbound direction services run to Baker Street and to Aldgate. Table 4-2 (overleaf) provides the frequency information for Metropolitan Line services to/from Northwood Station in the AM and PM peak.

Table 4-2 Metropolitan Line Frequency

Direction	0800 - 0900	0700 - 1000	1000 - 1600	1700 - 1800	1600 - 1900
Towards Amersham, Chesham and Watford	11	36	48	9	26
Towards Aldgate	9	28	49	11	32

RODS Data

TfL has provided London Underground's RODS data (Rolling Origin and Destination Survey) for 2014 which provides an understanding of how utilised Northwood Station is and how many passengers travel in each direction on the Metropolitan Line during the AM and PM peaks. This is summarised in Table 4-3 below.

Table 4-3 RODS Data

Boarding or Alighting	Direction	AM		PM	
		0800 - 0900	1600 - 1900	1700 - 1800	0700 - 1000
Boarding	Northbound	24	6	46	16
	Southbound	1,846	743	854	261
Alighting	Northbound	653	312	1,114	368
	Southbound	81	37	38	11

The RODS data shows that the flow in to and out of Northwood Station is tidal with the majority of trips out of Northwood in the morning heading southbound towards central London and the City. In the evening the opposite occurs as commuters return home from work.

Buses

Northwood is served by four bus routes which are the 331, 282, H11 and 8 (Non-TfL). As shown in

Figure 4-7 (overleaf) all of these routes serve Northwood Underground Station.

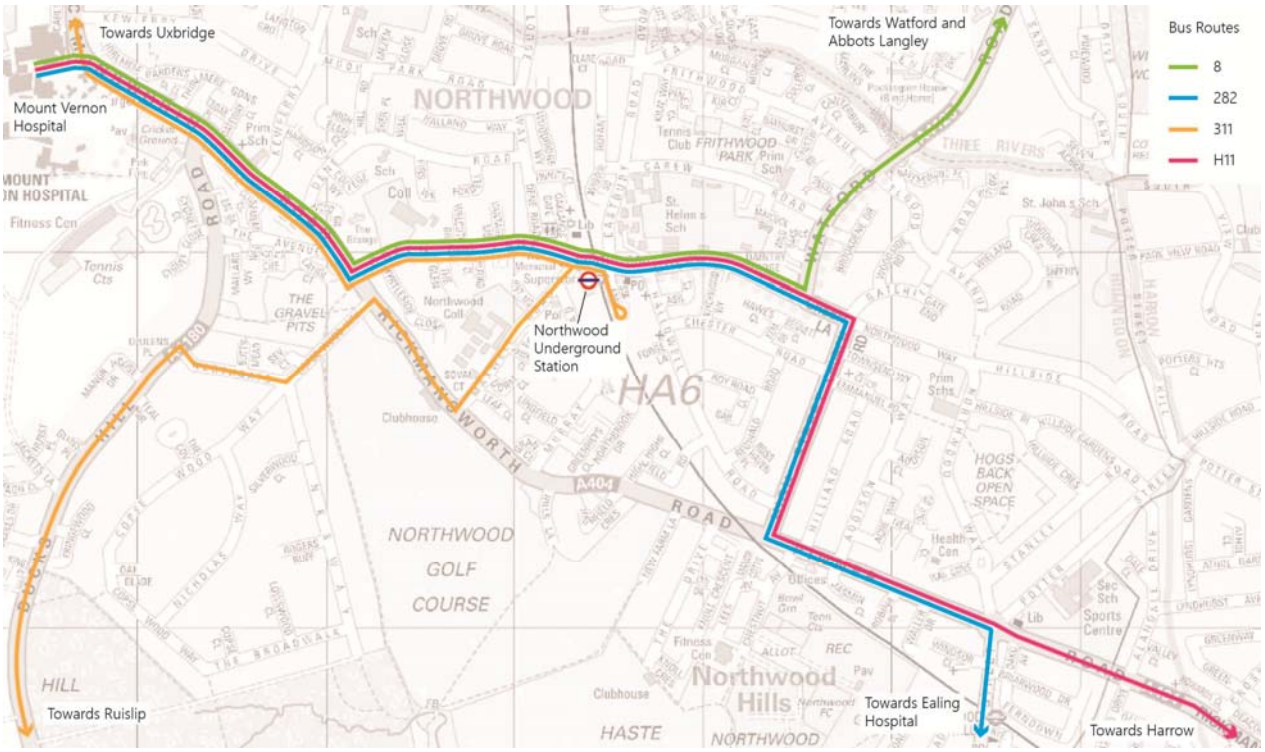
The 282, H11 and 8 services terminate at Mount Vernon Hospital which is located just under one mile to the west of Northwood Underground Station. The 8 service provides a link to Watford and Abbots Langley in the north, the headway for this service is 30-60 minutes. The 282 service provides a link to Ealing Hospital in the south, the headway for this service is 10-15 minutes. The H11 service provides a link to Harrow in the East, the headway for this service is 15-20 minutes.

The 331 service provides links to Uxbridge (via Harefield) and Ruislip. The headway for this service is 20-30 minutes. Table 4-4 (overleaf) summarises the bus route frequencies.

Table 4-4 Bus Route and Frequency

Service	Route	0800 - 0900	0700 - 1000	1000 - 1600	1700 - 1800	1600 - 1900
331	Towards Mount Vermon Hospital	6	17	30	5	15
	Towards Ealing Hospital	5	16	30	5	15
282	Towards Mount Vermon Hospital	4	13	24	4	12
	Towards Harrow	4	12	24	4	12
H11	Towards Uxbridge	3	9	18	3	9
	Towards Ruislip	3	9	18	3	9
8	Towards Harrow	1	5	12	2	6
	Towards Watford and Abbots Langley	2	6	12	2	5

Figure 4-7 Bus Network Plan



BODS Data

TfL has provided their most recent BODS data (Bus Passenger Origin-Destination Survey) which provides an understanding of how utilised a service is and how many passengers travel in each direction.

Route 282 – Surveyed 16 Nov 2012 (Friday)

390 passengers boarded or alighted at Northwood station, towards Mt Vernon Hospital.

333 passengers boarded or alighted at Northwood station, towards Ealing Hospital.

Total: 723

Route 331 – Surveyed 22 Mar 2013 (Friday)

451 passengers boarded or alighted at Northwood station, towards Ruislip.

387 passengers boarded or alighted at Northwood station, towards Uxbridge.

Total: 838

Route H11 – Surveyed 26 Sept 2014 (Friday)

346 passengers boarded or alighted at Northwood station, towards Mt Vernon Hospital.

351 passengers boarded or alighted at Northwood station, towards Harrow bus station.

Total: 696

The BODS data shows that all three TfL operated buses have very similar levels of use and equal directional travel splits. BODS data is not available for Route 8 as this bus is not operated by TfL.

4.4 Walking and Cycling

Walking

There is a good pedestrian provision within the vicinity of the site that facilities movement between the site and the existing town centre. The site is linked to the town centre via a wide footway to the west on the southern edge of Green Lane. At the Green Lane/Maxwell Road junction there is a zebra crossing to facilitate a safe pedestrian crossing location. The wide footway on Green Lane continues east towards St Helen's School where there is an informal crossing located just east of the junction with Hallowell Road.

At the existing signalised crossroads between Green Lane/Station Approach and Eastbury Road there are pedestrian crossing on all arms which operate under an all-red stage.

Approximately 100 metres in to the site south of Green Lane at the end of Station Approach is an existing east-west link which runs between Hallowell Road and the Waitrose Supermarket Car Park. The link between Hallowell Road and Station Approach is made via an alleyway that runs south of the St John's Church. The link between Station Approach and the Waitrose Supermarket Car Park is made via a bridge over the railway line.

Cycling

There are no signposted cycle routes within the immediate vicinity of the site. However, the existing signalised junction does provide advanced stop lines for cyclists which will be maintained as part of the proposed development.

5 Travel Surveys

5.1 Baseline Surveys

It is not possible at this stage to collect trip or modal split surveys from the site as the proposed development is yet to be completed and occupied. Therefore, the mode share values shown in Table 5-1 are taken from TRICS and TRAVL data for a comparable site. Further information on these trip rates and selected sites is available in the Transport Assessment.

It is proposed that baseline surveys are conducted when 75% of residential and retail units are occupied or within six months of occupation. This will allow for an accurate baseline to be set and for a comparison to be made against the data presented in Table 5-1. For the purposes of making this a robust Travel Plan this data can be used as an indicative baseline as it is the most representative data available for comparable trip making for the land uses.

Once initial travel surveys have been undertaken, amendments can then be made with LBH where necessary to reflect any anomalies with the findings. Subsequent surveys will then be required as set out in Chapter 9.

Table 5-1 TRICS and TRAVL data – mode share

Method of Travel	Residential	Retail
Bus	16%	3%
Car Driver	27%	17%
Car Passenger	9%	26%
Motorcycle	1%	-
Cycle	4%	2%
Underground	27%	10%
Walk	16%	42%
Total	100%	100%

6 Objectives and Targets

6.1 Introduction

This Chapter sets out the overarching Objectives and Targets of the Travel Plan for the site.

The objectives are supported by a set of quantified SMART (Specific, Measurable, Achievable, Realistic and Timed) Targets so that progress towards achieving them can be measured.

6.2 Objectives

The objective of this Travel Plan is 'to encourage residents and visitors of the site to travel using sustainable modes'.

To support the realisation of this overarching objective, the following sub-objectives have been set out:

- ensure the site is accessible to all and responds to the needs of vulnerable groups e.g. those with mobility problems;
- increase awareness of the Travel Plan and its measures;
- encourage greater use of sustainable transport modes, particularly cycling and walking for those in car-free units;
- encourage the most efficient use of cars and other vehicles;
- reduce the need to travel overall and/or in peak times;
- promote smarter living practices that reduce the need to travel overall or in the peak periods;
- influence the travel behaviour of visitors; and
- improve the health of residents and minimise the development impacts on the environment.

The Travel Plan objectives for the retail component are to:

- reduce the number of staff arriving on site by car by promoting, enhancing and providing information on public transport, walking and cycling and encouraging car sharing with a view to increasing the modal share of alternative modes; and
- reduce the number of single occupancy car journeys associated with retail travel by staff and customers.

6.3 Targets

Comprehensive and TRICS (TRAVL) compliant surveys will be conducted when 75% of the new buildings are occupied or within six months of occupation.

The targets will be reviewed once the baseline travel survey of residents is completed. The baseline data from the surveys will provide a better understanding about what is achievable and what measures best suit the site. It has been assumed that the baseline data is accurate and that the Year 1 data will be the same.

The aim of the mode share targets over the next five years are to:

- reduce single car occupancy;
- continue to encourage the existing high level of public transport use; and
- increase walking and cycling.

7 Travel Plan Management

7.1 Introduction

This chapter outlines the management strategy for measures that will be put in place to achieve the objectives of the Travel Plan and measures that should be introduced immediately to enable it to run smoothly before occupation of the proposed development.

7.2 Ownership and Management

The ownership and management of the Travel Plan will ultimately lay with the developer of the development site but will be managed by the development management team which will be provided by a recognised service provider.

7.3 Appointment of Travel Plan Coordinator

The first stage of the Travel Plan implementation will need to be the appointment of a Travel Plan Coordinator (TPC) for the development. The management team will be responsible for appointing the TPC, who will be part of the site management structure, prior to occupation of the proposed development on site. Full details of the appointed TPC will be submitted to the local planning authority within three months of first occupation.

Appointed TPC Name:	TBC
Contact No:	TBC
E-mail:	TBC

The TPC will be the first point of contact for LBH regarding the implementation of the Travel Plan and/or any other issues relating to the Travel Plan.

The TPC will use the results of the initial travel survey to ensure that the proposed targets are appropriate and coordinate their implementation on site.

7.4 Management

The TPC will be appointed and in place prior to occupation of the development in order to collect and prepare the required information for the proposed development. This will ensure that the measures and objectives outlined in the Travel Plan are implemented prior to first occupation of the development, and that sustainable travel patterns are established from the outset.

The TPC will be the main point of contact for site users regarding travel choices. The TPC will be responsible for promoting the measures set out to achieve the objectives and targets of the Travel Plan. These initiatives will be reviewed with reference to findings of the travel survey. The TPC will also be responsible for liaising with LBH.

7.5 Marketing and Communication

It is important that the marketing campaign for the Travel Plan makes it clear that the Travel Plan is not anti-car, but rather seeks to promote sustainable travel and encourage people to think about their travel choices.

The target audience for the Travel Plan will be residents, staff and visitors at the development. It is important that all aspects of the Travel Plan be effectively communicated to all those accessing the proposed development site. This could be achieved through posters in entrance halls, which will highlight transport information and keep residents informed of any changes to the Travel Plan.

Upon occupation, residents will be provided with a Travel Plan Pack, which will include plans illustrating local walking and cycling routes, and locations of public transport facilities. The Travel Plan Pack will also include a copy of the Travel Plan as well as timetables of public transport services available in the vicinity of the proposed development site.

8 Measures

8.1 Introduction

This section outlines a package of measures and initiatives designed to achieve the objectives of this Travel Plan. The package is designed to offer flexibility of implementation – some of the measures require immediate implementation, whereas others could be implemented in stages or continuously over the lifetime of the plan.

Furthermore, an Action Plan providing timescales and responsibilities for required actions is presented within this chapter.

8.2 Measures

A number of measures and initiatives will be utilised to encourage sustainable travel choices amongst residents and visitors of the site. These will aim to reduce unnecessary travel and reduce reliance on private car use by influencing travel behaviour in favour of walking, cycling and public transport from the outset.

Site-wide

The following measures aim to achieve the objectives and targets of the Travel Plan at a side-wide level:

- display of general public transport information on notice boards, showing public transport timetables and maps illustrating public transport locations as well as walk and cycle routes in the surrounding area of the site; and
- a dedicated Travel Plan webpage to promote the Travel Plan and the information described above.

Residential

The following measures aim to achieve the objectives and targets of the Travel Plan with regards to the residential use:

- inform residents of the site about changes to the public transport provision by e-mail and on the dedicated Travel Plan website;
- encourage the use of active modes of travel, through offering residents a visit from the TPC who will provide information on sustainable alternative routes to resident's individual travel routes
- encourage residents to sign up to a car club by providing reduced membership vouchers for up to two adults of one household for the first three month of joining;
- provision of secure and sheltered cycle parking spaces; and
- provision of Travel Plan Pack to supplement the above and include the following:
    - Contact details of TPC; and
    - Information regarding public transport, walking and cycling routes.

Retail

It is important that the Travel Plan has full support of the retail staff. Explaining the benefits and promoting sustainable alternatives will encourage their use. The following measures aim to achieve the objectives and targets of the Travel Plan with regards to the retail use:

- travel Plan Information Pack distributed to each staff member upon employment;

- two travel information boards will be provided at each premises; at the customer entrance and the staff entrance. These boards will provide information regarding available public transport and pedestrian and cycle routes;
- special events shall be promoted, such as National Car Free Day, National Cycle to Work Day, National Bike Week and Walk to Work Week;
- dedicated car club parking spaces, which will be publically accessible; and
- provision of secure and sheltered cycle parking spaces.

The Travel Plan will be developed and monitored in accordance with WestTrans guidance.

8.3 Action Plan

The following Table comprises the action plan for the proposed development which will be implemented at the commencement of year one unless the results of the first travel survey suggest adjustments should be made.

Table 8-1 Action Plan

Initiative / Measure	Task / Action	Designated Person	Target Date
Travel Plan Coordinator (TPC)	Appointment of TPC	Management	Prior to completion of development
Travel Plan information pack to be provided to all residential and retail units	Organise Travel Plan Pack	TPC	Upon opening the site and buildings become occupied
Travel Plan posters in common areas	Install and keep up-to-date detailing the RTP, latest events and future events	TPC	On-going
Travel Plan Webpage	Organise a page on the developments website dedicated to promoting the Travel Plan to residents, staff and visitors and ensure its maintenance	TPC	Within three month of occupation
Promote benefits of walking and cycling	Promote the benefits of active travel via the dedicated Travel Plan website	TPC	Within three month of occupation
Increase cycling	Provide additional secure cycle storage space if demand exceeds supply	Management / TPC	On-going
Promote Car Sharing	Promote the benefits of active travel via the dedicated Travel Plan website	TPC	Upon operating of dedicated RTP website
	Offer Individual travel advice to residents, staff and customers	TPC	Within three month of occupation

9 Monitoring and Review

9.1 Introduction

This chapter describes how the Travel Plan will be monitored and reviewed in its lifetime. Furthermore, details are provided regarding the funding of the Travel Plan.

9.2 Monitoring

As the site is not yet occupied it is not possible to identify an accurate baseline mode split. However, the data presented in Chapter 5 of this report, provides an initial baseline, which will need to be reviewed upon completion of the first travel surveys.

This Travel Plan will be reviewed within the first six months of occupation with targets and full action plan to take account of the residential travel survey results.

Future residential travel surveys will be carried out on a bi-annual basis to monitor the effectiveness of the initiatives and to enable initiatives and targets to be adjusted accordingly. The Travel Plan Coordinator will carry out the travel surveys for residents, staff and customers, which will cover the following:

- trip purpose travelling to and from the site;
- modal choice of those accessing the site; and
- measures which will encourage use of alternate modes of transport.

Table 9-1 presents the plans and timescales for the monitoring and review of the Travel Plan.

Table 9-1 Monitoring Actions and Timescales

Action	Timescale
Baseline travel survey residents, staff and customers	Within six months of occupancy
Update of Travel Plan following baseline surveys	Following baseline travel surveys
Future resident, staff and customers travel surveys	3rd and 5th year
Feedback to the management company and residents of the development	Quarterly
Undertake a comprehensive strategic review of all aspects of the Travel Plan (including the Objectives, Targets, the Action Plan and the monitoring programme)	Following baseline surveys (six months), 3rd and 5th year

9.3 Review

The Travel Plan Coordinator will be responsible for the review of residential travel surveys and any additional feedback received from residents, staff and customers on transport related matters. The information received will help to develop the Travel Plan. The results of the travel surveys will be used by TfL and LBH for the purpose of monitoring travel patterns.

9.4 Funding

The developer of the site will be responsible to provide sufficient funding to allow the Travel Plan Coordinator to set new measures and continue with the monitoring programme of the Travel Plan.

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Appendix M Framework Construction and Logistics Plan

BUROHAPPOLD ENGINEERING

TfL Landholdings at Northwood

Framework Construction and Logistics Plan

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Contents

1 Introduction

BuroHappold Engineering has been instructed by Transport for London (TfL) to provide highways and transportation planning advice and to prepare a Framework Construction and Logistics Plan (FCLP) for the proposed development at TfL Landholdings at Northwood.

The proposed development includes:

- demolition of existing buildings to provide 93 residential units (C3) and associated car parking;
- 1,440 sqm new retail (A1-A5);
- new operational station (Sui Generis) with step free access and associated car parking with 180 public spaces;
- new bus interchange;
- new piazza;
- outline planning consent for up to 34 residential units and car parking (all matters reserved apart from access); and
- refurbishment works to existing retail units along Station Approach.

The FCLP will be implemented to ensure that the construction of the proposed development and the subsequent servicing of the operational development is undertaken in an efficient but sustainable way.

FCLP provide a framework to better manage all types of freight vehicle movement to and from construction sites. A CLP is essentially the equivalent of a workplace travel plan for construction sites. The London Freight Plan highlights CLP as one of four measures to improve freight and servicing in London. The Freight Operators Recognition Scheme (FORS), Delivery and Servicing Plans (DSP) and the Freight Information Portal (FIP) constitute the other three measures.

The 'Building a Better Future for Freight: Construction Logistic Plans' document identifies the benefits of CLP to local authorities and residents, building developers and business and freight operators. In summary, CLP will amongst others:

- *'demonstrate that goods and services can be delivered, and waste removed, in a safe, efficient and environmentally–friendly way;*
- *identify deliveries that could be reduced, re–timed or even consolidated, particularly during busy periods;*
- *help cut congestion on London's roads and ease pressure on the environment;*
- *improve the reliability of deliveries to the site concerned;*
- *reduce the operating costs of building occupants and freight companies; and*
- *reduce the impact of freight activity on local residents.'*

The London Freight Plan (2007) recognises that:

- *'the improvement of the efficiency of the freight sector will help reduce the environmental and social impacts of freight transport in London, particularly the contribution to climate change;*
- *achieving sustainable freight distribution in London will make a real and positive contribution to improving the lives of those who live, work and visit London; and*

- *road network efficiency will be increased by each traffic authority's response to its Network Management Duty, which will include the reduction of freight vehicle Penalty Charge Notice (PCN) hotspots to improve congestion and help reduce CO2 emissions.'*

2 Objectives

The main objective of this FCLP is to minimise the impacts of construction–related vehicle movements and facilitate sustainable construction travel to and from the proposed development.

To support the realisation of this overarching objective, several sub–objectives have been set out. These sub–objectives are:

- to encourage construction workers to travel by non–car modes to the proposed development site;
- to promote smarter operations that reduce the need for construction travel overall or that reduce or eliminate trips particularly those in peak periods;
- to encourage greater use of sustainable freight modes;
- to encourage use of greener vehicles;
- to manage the ongoing development and delivery of the CLP with construction contractors; and
- to encourage the most efficient use of construction freight vehicles.

3 Construction Traffic Flows

It is currently envisaged that construction traffic flows would be limited to no more than 20-30 heavy goods vehicles arriving on site per day. For further information refer to the Air Quality Assessment report. In order to reduce the effect of construction traffic, bulk transit trips (such as muck away and steelwork delivery) will, as far as practicable, be undertaken only during off−peak periods.

It is not anticipated at this stage any lane closures would be required, but if they were to take place they would be minimised and would not occur during peak periods.

Construction vehicles are likely to approach the site from the A404 Rickmansworth Road before turning on to Green Lane and will make the journey to and from the site via the strategic highway network where possible. The site is located within 7 km of the M1 and M25 so it is highly likely that these motorways will be used on a regular basis.

Final details regarding traffic flow alteration and management would be agreed with the London Borough of Hillingdon (LBH) and TfL, if needed, prior to the onset of any works. Any necessary lane closures on the local highway network will avoid peak periods if at all possible, and the relevant authorities (including emergency services) will be notified. The Principal Contractor will co−ordinate all deliveries and collections to and from the site, and ensure that:

- all delivery and collection vehicles are aware of the proposed routing;
- prior to a delivery or collection, hauliers will notify the relevant authorities (TfL Police, Highways Authority etc) in accordance with the Road Vehicles (Authorisation of Special Types) (General) Order 2003 if required;
- liaison will be undertaken with occupants of adjacent buildings to avoid delays to service deliveries due to construction vehicles; and
- deliveries will be made on a 'just in time' basis.

Larger vehicle movements will be scheduled to avoid peak hours on the local road network if at all possible. If an alternative construction traffic route is required this will first be agreed with LBH. All deliveries will be made to the designated areas within the site. If for any reason it is necessary to load and unload outside the site boundary, the details and procedure for this will be agreed in advance with LBH and occupants of local buildings.

4 Staff Travel

Individual contracts (for example waste removal) would incorporate appropriate requirements in respect of environmental management and control (EMP). These would be based upon statutory requirements and the principles of 'good working practice' outlined in the EMP. Potential contractors and sub−contractors would be required to demonstrate how they would achieve the provisions of the EMP, how targets would be met and how potential adverse effects would be prevented, reduced and offset. The EMP will be the subject of further discussions with LBH, and can be controlled by a planning condition.

5 CLP Targets

The CLP targets should align with the objectives and measures set out earlier. Examples of targets that could be developed include:

- a specific percentage, of construction trips to be undertaken during the AM and PM peak hours;
- a specific number of daily construction trips to encourage the consolidation of trips to the site;
- all, or a specific proportion, of servicing and delivery companies used to be a member of FORS; and
- a specific percentage of the proposed development construction vehicles to be 'green' vehicles.

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Appendix N Framework Delivery and Servicing Plan

BUROHAPPOLD ENGINEERING

TfL Landholdings at Northwood

Framework Delivery and Servicing Plan

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author	**Richard Evans**
date	**26.10.15**
approved	**Gerry Prodohl**
signature	
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1 Introduction

BuroHappold Engineering has been instructed by Transport for London (TfL) to provide highways and transportation planning advice and to prepare a Framework Delivery and Servicing Plan (FDSP) for the hybrid application relating to development proposals at TfL Landholdings at Northwood.

The proposed development includes:

- demolition of existing buildings to provide 93 residential units (C3) and associated parking;
- 1,440 sqm of new retail (A1-A5) floorspace;
- new operational station (Sui Generis) with step free access and associated car parking with 180 public spaces;
- new bus interchange;
- new piazza;
- outline planning consent for up to 34 residential units, car parking (all matters reserved apart from access); and
- refurbishment works to existing retail units along Station Approach.

Waste removal, management and recycling for the retail and residential components of the site are also covered as part of the Framework Servicing and Delivery Plan and should be read in conjunction with the Oprational Waste Management Strategy.

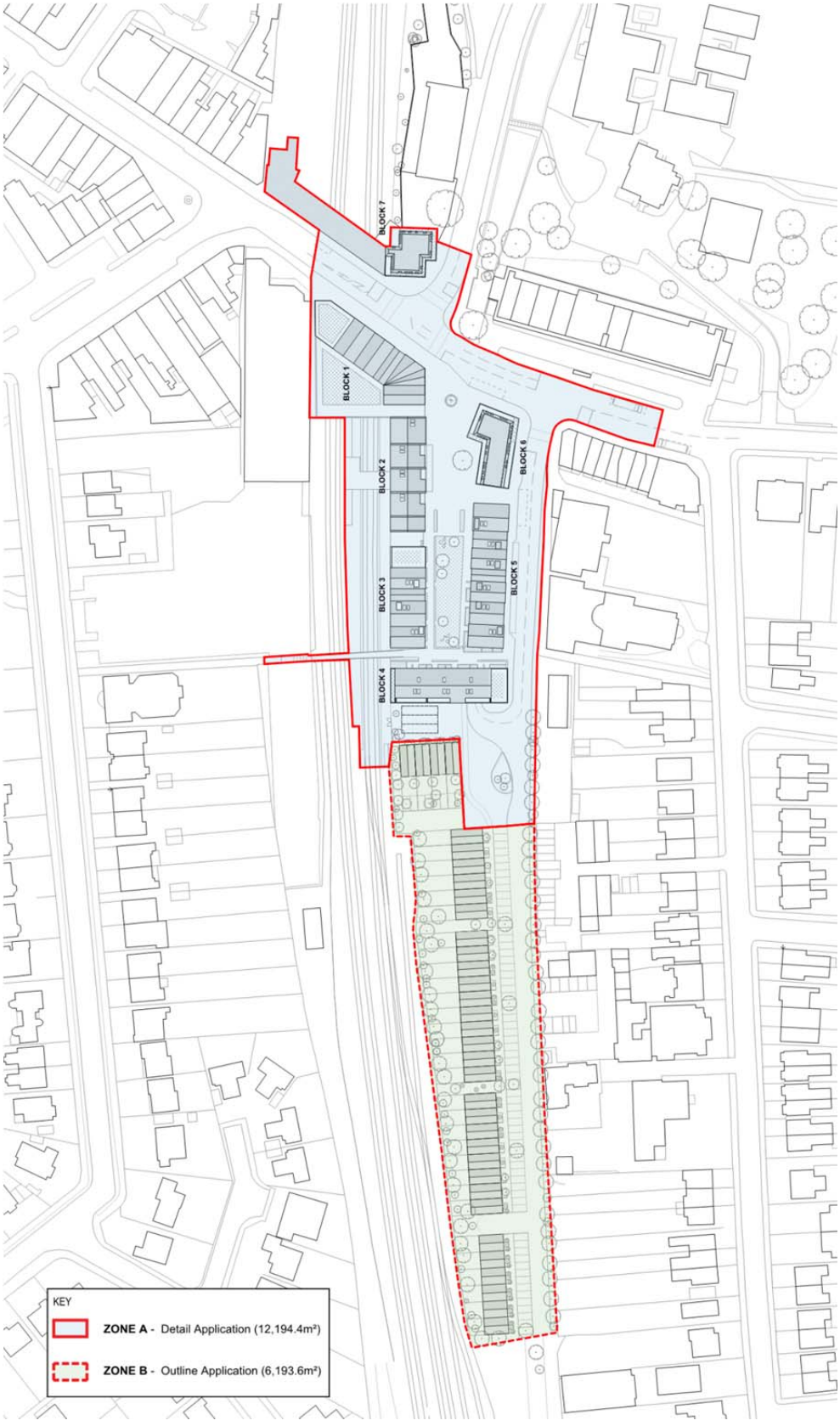
Figure 1-1 (overleaf) shows the outline and detailed areas of the proposed development.

The FDSP will provide a base document for all components of the site, including businesses and retail. It will provide the equivalent of a workplace travel plan for freight and will improve safety, efficiency and reliability of deliveries and collection at the site whilst also reducing congestion and minimising the environmental impact.

The benefits of a Delivery and Servicing Plan include:

- more reliable deliveries with reduced cost and improved security;
- less disruption to the business day and fuel saving; unnecessary deliveries identified;
- less noise and noise pollution;
- opportunities for businesses comply with health and safety legislation; and
- encouraging businesses to select delivery companies who can demonstrate their commitment to best practice guidance, e.g. the Freight Operator Recognition Scheme (FORS).

Figure 1-1 Detailed and Outline Application Areas



2 Delivery Schedule and Routing

The drop-off/pick-up area on Central Way is the location at which all deliveries and servicing for apartments and retail units will occur. It will only be available for servicing, deliveries and waste collection between 10:00 and 15:00 every day. Once the tenants to the retail units are known, options for consolidating the delivery and servicing will be explored. This may reduce the prohibited drop-off/pick-up hours to between 10:00 and 14:00. For further details on how this area will be managed, please refer to the Framework Parking Management Strategy. The maximum dwell time at the area will be 20 minutes, which includes a 15 minute delivery period and 5 minute 'buffer' between deliveries. These servicing hours will be reviewed once all units are occupied and will be revised if necessary to take into account observed requirements. It is assumed that the servicing area can accommodate 5 x transit/small delivery vehicles and up to 3 x 12m rigid lorries.

As a worst case, it is assumed that the retail units are occupied by five restaurants, as these would generate the highest demand in terms of servicing and deliveries. It is estimated that each restaurant may attract up to one rigid lorry every two days in addition to approximately five transit/small van sized deliveries per day. If it is assumed that each restaurant is allocated one hour per day for servicing, with a 20 minute total servicing time per vehicle, this shows that the servicing area can comfortably accommodate demand within the five hour delivery period. This analysis is a conservative first-principles approach which does not assume consolidation between restaurants. Any refinement and consolidation will reduce the servicing requirements. Therefore, the numbers provided above are robust and should be seen as a worst-case.

Deliveries for the townhouses will take place along Central Way. There is a turning head at the end of Central Way that allows all servicing vehicles accessing the site to undertake a three-point turn before exiting back onto Green Lane. A facilities management office is located on Central Way at the southern end of the servicing area and the facilities manager will be responsible in ensuring parking on the road does not impede delivery and servicing for the townhouses.

No-idling policy

Each business on the site will ensure that all service delivery companies used by them are aware of the no-idling policy on the site. Service vehicle operators visiting the site will be required to switch off their engines as soon as possible after arrival, remaining off during unloading and loading procedures. The no-idling policy will apply to all service vehicles unless special dispensation has been provided.

3 Waste Removal, Management and Recycling

For future detail on the waste removal, management and recycling strategy please see the accompanying Waste Management Strategy.

The core principles of the waste strategy for the site will be to reduce the waste produced from their own operations and to recover as much as is practical and ensure the remainder is disposed of responsibly. At the same time, all businesses and residents should be encouraged to recycle where appropriate.

The site's waste strategy includes the following commitments to:

- comply with legislation with regards to Waste Storage and Disposal and Packaging Waste;
- ensure that other companies handling, recovering or disposing of waste on behalf of each business have the necessary authorisation and ensure that waste is taken to an authorised site;
- influence business practices or processes to minimise waste by:
    - Maximising the recycling of product packaging; and
    - Segregating recyclable waste material as much as possible on site.
- separate different types of waste and label waste containers appropriately
- store waste securely in appropriate containers such as containers or labelled bins and cover waste material;
- provide training for staff on waste management to handle different types of waste; and
- provide effective communication for staff concerning waste management by providing signage in staff areas to highlight the environmental and financial benefits of recycling.

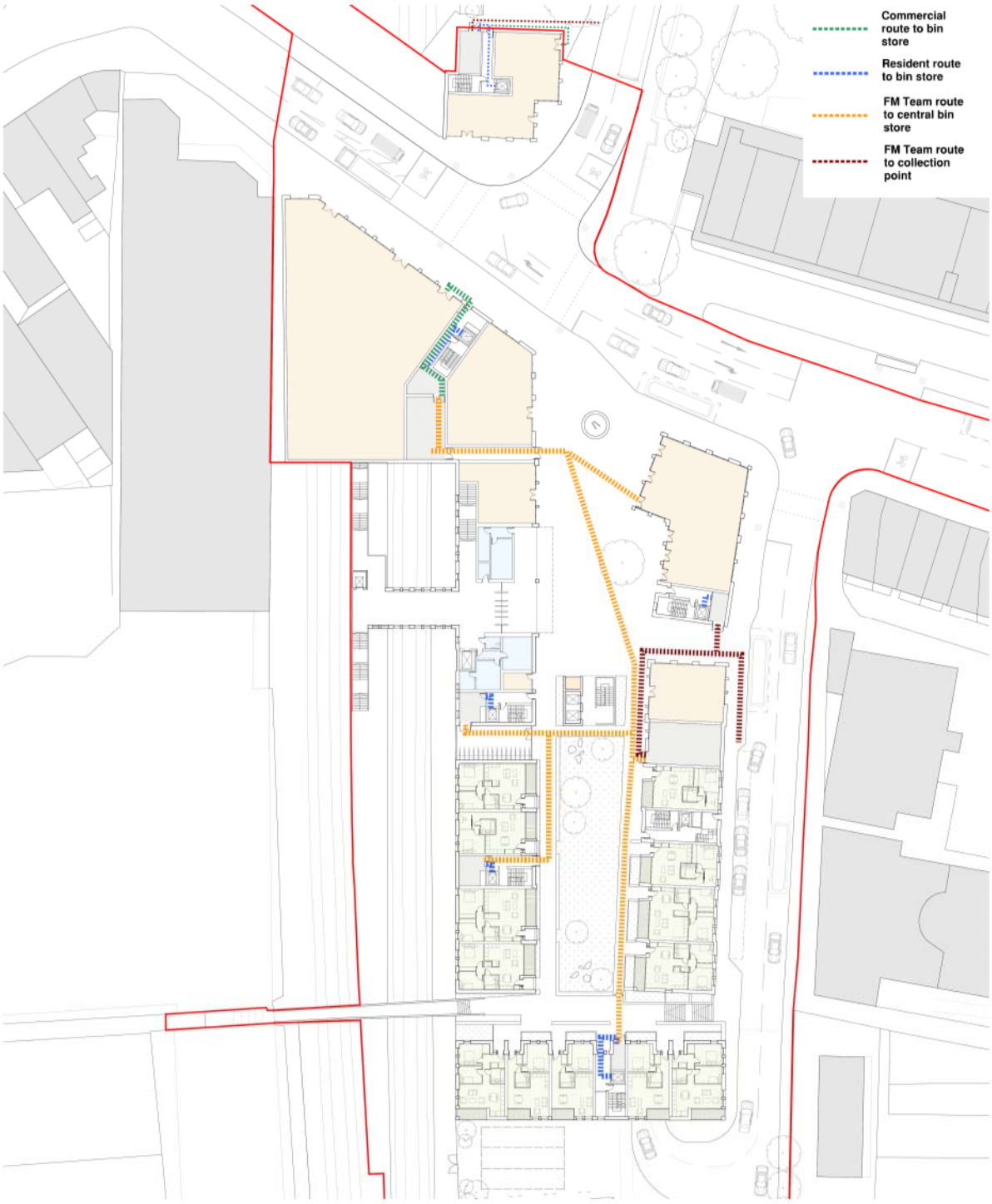
3.1 Residential

Waste collection for all apartment units has been split into two streams; residual and mixed recyclables. It is assumed the collection frequency will be once a week.

The waste generation numbers for apartments show that a total of 12 Eurobins (seven 1,100 L for residual and five 1,100 L for mixed recyclables) are required.

All waste collection from the apartments will take place at the drop off-pick up area between 10:00 and 15:00. Bags will be taken by apartment residents to a communal Eurobin store at ground level of each residential core and placed in the appropriate Eurobins. Communal bin stores in residential cores have been sized to be able to hold a minimum of one residual and one mixed recyclable Eurobin. On collection days, the facilities management team will transport the Eurobins from the residential stores to a central bin store at the east of the site in Block 5, close to the delivery servicing area. This room is located at a distance of less than 10 m from Central Way; the local authority or their appointed waste contractors will access the room from the road and will service all the required Eurobins. The image below shows the waste routes for the apartments.

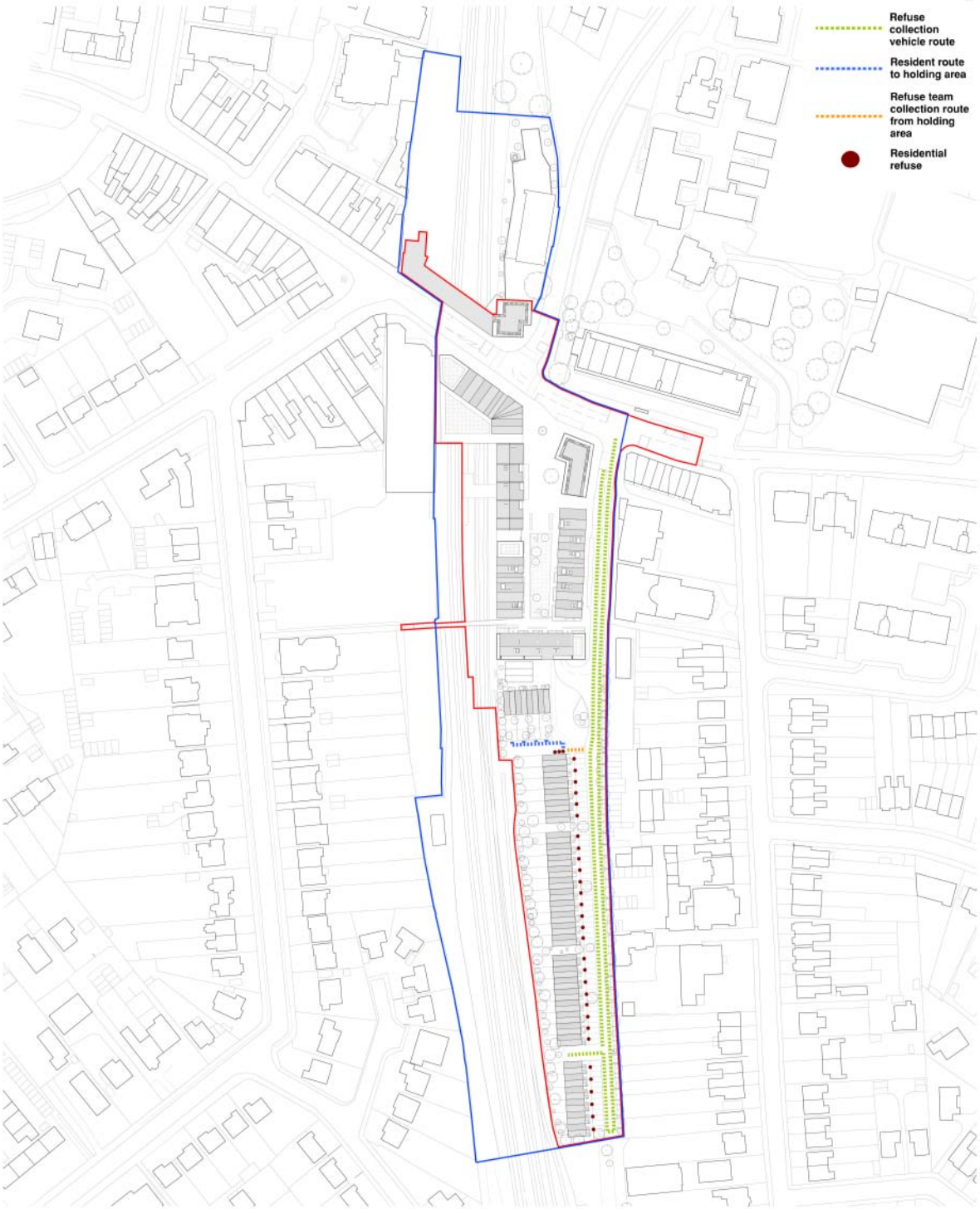
Figure 3-1 Waste Routes for Zone A



Waste collection for all townhouse units has been split into three streams; residual, mixed recyclables and organic waste. It is assumed the collection frequency is once a week. The generation numbers for the townhouses show that a total of four Eurobins for each unit (two 240 L, two 23 L and one heavy duty canvas bag) are required.

Residents are expected to segregate waste into four streams (residual, mixed recycling organic waste and garden waste) within their homes. The bins are located at the front of the homes and on collection day, the local authority or appointed waste contractors collect the waste bags from the bins. The collection team will collect waste from the kerb side and a turning head has been provided at the end of Central Way. The image overleaf shows the waste routes for the townhouse units.

Figure 3-2 Waste Routes for Zone B



3.2 Commercial

Commercial waste will be segregated into three waste streams; organic, mixed recyclable and residual. It is anticipated that a waste collection will be made three times per week. The delivery frequency results in a total of eight Eurobins being required (two 1,100 L for residual, two 1,100 L for mixed recyclables, four 1,100 L for organic waste).

Commercial units have been provided with intermediate storage spaces at ground floor. These are sized to accommodate the number of Eurobins outlined above but have accommodated additional space on the basis of a worst case scenario which will be explored as necessary and when commercial units become occupied. On collection days, the Facilities Management team will transport the Eurobins from the commercial stores to a central bin in Block 5, close to the delivery servicing area. This room is located at a distance of less than 10m from Central Way. The local authority or their appointed waste contractors will access the room from the road and will service the Eurobins.

Waste collection for the commercial units in Eastbury Road will take place at the back-of-house car park access from Eastbury Road.

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Appendix O Framework Car Park Management Plan

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TfL Landholdings at Northwood

Framework Car Parking Management Plan

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1 Introduction

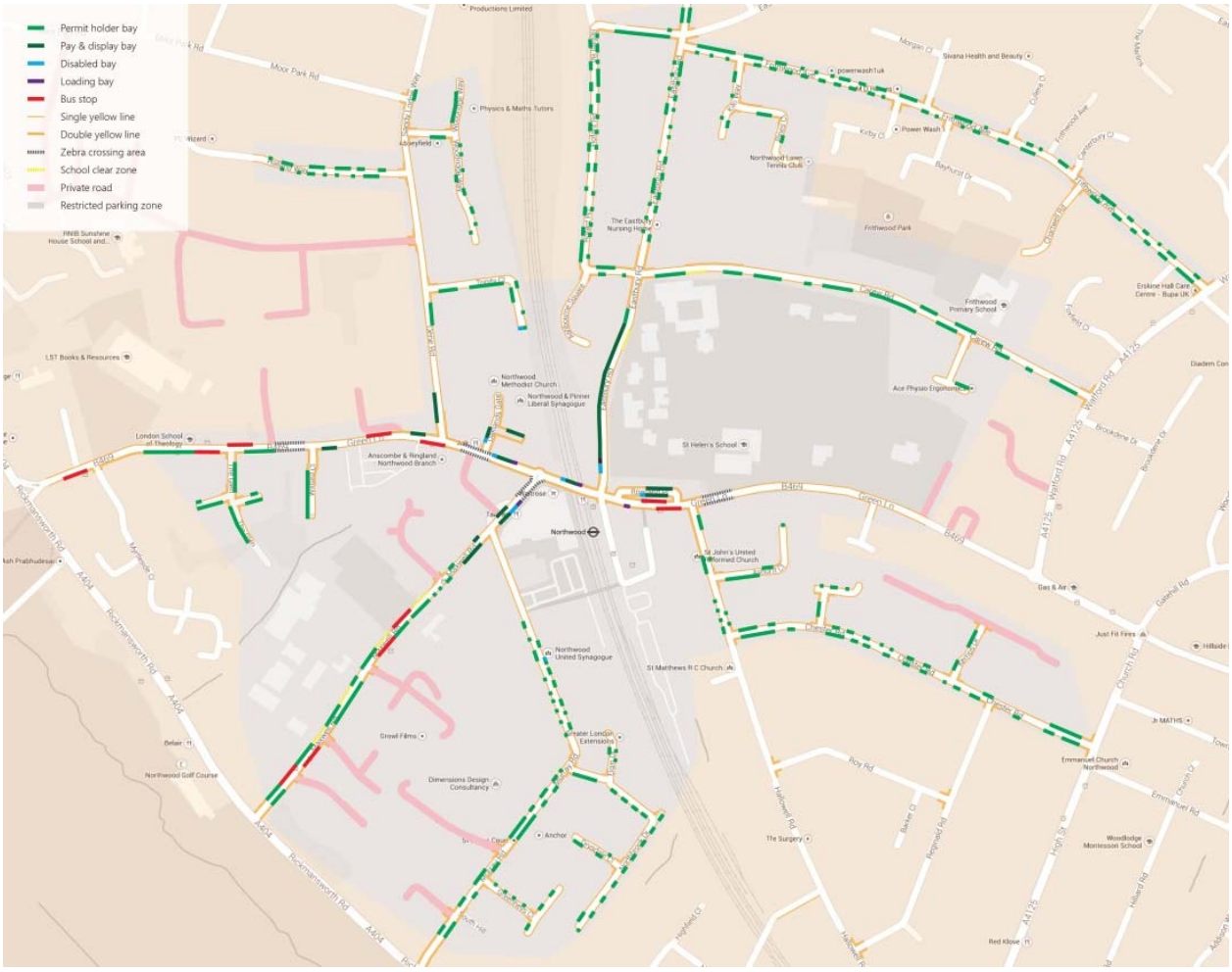
BuroHappold Engineering has been instructed by Transport for London (TfL) to provide highways and transportation planning advice and to prepare a Framework Car Parking Management Plan (FCPMP) for the proposed development at TfL Landholdings at Northwood.

The proposed development includes:

- demolition of existing buildings to provide 93 residential units (C3);
- 1,440 sqm new retail (A1-A5);
- new operational station (Sui Generis) with step free access and associated car parking with 180 public spaces;
- new bus interchange;
- new piazza;
- outline planning consent for up to 34 residential units (all matters reserved apart from access);
- 118 residential car parking spaces; and
- refurbishment works to existing retail units along Station Approach.

The site is currently situated within a controlled parking zone (CPZ), which has existing restrictions that prohibits parking between 13:00 and 14:00, unless a residential parking permit is owned by the user. This CPZ will remain in the future. Figure 1-1 below shows the current parking restrictions in place surrounding the site. It shows that single and double yellow lines are prevalent throughout the area and numerous permit holder bays exist on the surrounding residential streets. Pay and display bays also exist on the surrounding site, such as on Rowland Place, Eastbury Road and Maxwell Road, which supports the existing retail in Northwood town centre.

Figure 1-1 Existing Parking Restrictions



Within the development as a whole, the interacting land uses and parking activity will mean that a parking management plan will be required for both the residential and public parts of the proposed development. This will include a variety of measures that will be adopted to ensure that spaces are used as intended.

Car parking spaces will be provided in accordance with the planning permission. The spaces will be managed differently depending upon whether they are for residents or the public.

The key objectives for the FCPMP for the residential and public parts of the site are

- to ensure all spaces are used as intended; and
- to ensure access to the site is maintained at all times, allowing access for servicing, refuse collection and emergency vehicles.

2 Residential Parking

2.1 Site-wide

There will be a total of 118 parking spaces provided for the 127 residential units on-site, comprising of:

- 48 spaces for apartments (93 units) within the basement; and
- 70 spaces for town houses (34 units) at surface level.

Hence, there will be 0.93 parking spaces per unit across the site.

2.2 Apartments

The 48 parking spaces for the 93 apartments will be located within the basement public car park and will comprise of 24 'stacker spaces', giving a total capacity for 48 cars. To distinguish the residential parking spaces from the public parking spaces, the residential spaces will be marked by a different surface material. The 'stacker' system will be a sufficient deterrent to prevent them being used by the general public and are likely to be fob-operated.

There will be 0.52 parking spaces per apartment.

2.3 Townhouses

The 34 townhouses on Central Way will have a total of 70 parking spaces. There will be 8 spaces allocated on-plot to the units adjacent to the entrance to the public car park and the remaining 62 spaces will be communal and located off-street along the southern end of Central Way. LBH parking standards specify that off-plot/communal parking is provided at 1.5 spaces per unit for residential units; therefore there is a requirement for 45 spaces. 17 spaces are provided above the standard and these may be allocated to the apartments. The property management company will control parking permits to tenants or occupiers on occupation of a residential flat unit as follows:

- a single parking permit will be issued per flat and will not be assigned to an individual;
- parking permits will be issued on proof of residence within the development;
- parking permit issuing will be reviewed on an annual basis. The management company will reserve the right to withdraw a parking permit if necessary; and
- parking permits will be required to be displayed at all times.

In accordance with the London Plan, 20% of residential spaces will have active charging points for electric vehicles and a further 20% will be passive charging points, set aside for future use. The location of these spaces will be the subject of further discussions with LBH and TfL, and can be controlled by planning condition. Figure 2-1 (overleaf) shows an example of electric charging signage.

Figure 2-1 Electric Vehicle Charging Point Signage

2.4 Signage and Enforcement

Double yellow lines are proposed along Central Way to prevent on-street parking and maintain a clear route to the TfL compound.

Signage will be provided at clearly visible locations to inform all users of the parking restrictions in place.

To comply with the British Parking Association (BPA) Code of Practice, the residential parking areas will have car parking signage which will:

- advise motorists that unauthorised parking is not permitted;
- specify the conditions of use of the site;
- specify the circumstances under which vehicles will be removed (e.g. obstructing emergency vehicle access);
- be placed at a prominent locations throughout the site, so that drivers are given the chance to be aware of the risk involved at the time of parking or leaving the vehicle;
- be at least 450x450mm in size;
- say that land is private property and is managed by the operator;
- say how to retrieve a vehicle;
- provide a fee for release of a vehicle Provide a phone number where enquiries may be made; and
- provide the registered company name of the operator.

The image below shows an example of parking restriction signage.

Figure 2-2 Resident Permit Holders Signage

It will be the responsibility of the facilities management company to ensure parking is enforced. Should parking infringements occur, the facilities management company will be responsible for enforcement and the issuing of fines.

A fine will be issued to:

- any vehicle parking in a space that is not clearly displaying the appropriate permit in the windscreen;
- any vehicle without a blue badge parked in a disabled space;
- any vehicle parked outside of a marked parking space or parking across two spaces.

A vehicle will only be removed in circumstances whereby:

- the vehicle has been parked dangerously;
- the vehicle causes an obstruction; or
- the vehicle blocks an emergency access.

3 Public Parking

The 180 spaces for public parking will be located in an off-street basement car park accessed from Central Way. Parking will be provided over two levels and a lift to transport users to and from the public piazza on the ground floor will be provided. The existing car park is managed by National Car Parks (NCP) and a similar operator will be required. The management policy of the car park will be as follows:

- the car park will be operational 24-hours a days;
- the car park will be monitored by CCTV cameras;
- the car park will be monitored by a parking attendant, who would be present on site on a regular basis. The parking attendant will be able to issue a penalty charge for those failing to pay the charge or who park obstructively or park in a disabled space inappropriately.

There will be 17 disabled parking spaces which will be shared between blue badge and brown badges. Brown badges are to anyone who lives in Hillingdon and is aged 65 or over. Holders of blue badges and brown badges will be required to display their respective badges to use these spaces.

In accordance with the London Plan, 10% of public spaces will have active charging points for electric vehicles and a further 10% will be passive charging points, set aside for future use. The image below illustrates an example of off-street electric vehicle bays.

Figure 3-1 Off-street Electric Vehicle Parking Spaces

4 Pick-up/drop-off

The proposed development will provide a formal pick-up and drop-off area located on the western edge of Central Way that will be able to accommodate up to five large cars. Taxis will also use this area but they will be limited to no more than two vehicles at any one time. Taxis will be required to store within the car park circulation and will be called by the taxi kiosk when a fare is ready to be collected at the pick-up/drop-off. The size of this area has been informed by the data collected for pick-up and drop-off activity on Station Approach, which is presented within the Transport Assessment document.

Pick-up and drop-off activity will be prohibited in this area between 10:00 and 15:00 to allow refuse collection and delivery and servicing activities to be undertaken. During this time pick-up and drop-off activity will occur within the circulation of the basement car park which allows people to be dropped off nearby the lift that provides a direct link between the car park and the piazza, providing convenient and safe access to the station and piazza.

Once the tenants to the retail units are known, options for consolidating the delivery and servicing will be explored. This may reduce the prohibited drop-off/pick-up hours to between 10:00 and 14:00.

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