

Client:
Richborough

Project:
**Land North of Little Green Lane
Croxley Green**

Project No:
T24544
Report Title:
Transport Assessment

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Date:	26/06/2025

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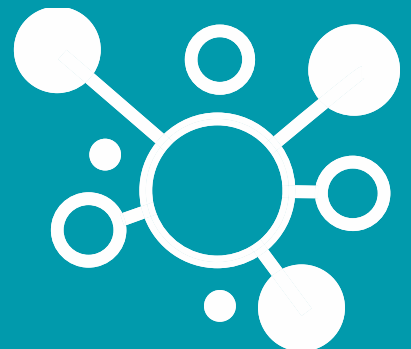


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1.0 Introduction

Background

- 1.1 Hub Transport Planning Ltd has been commissioned by Richborough to provide transport advice for a proposed residential-led development off Little Green Lane, Croxley Green.
- 1.2 This report supports an Outline application for construction of up to 600 residential dwellings (Use Class C3(a)), a 5-bedroom property for children's social care and supported living (Use Class C3(b)). Two vehicular access points from Little Green Lane and further pedestrian/cycleway accesses. A one-form entry primary school (Use Class F1(a)) (plus expansion land for a two-form entry primary school). A mixed-use local centre including provision for NHS health and social care services (Use Class E(e)), community building (Use Class F2), retail and café provision (Use Class E(a-c)), car parking and associated infrastructure. A country park, areas for play and recreation, allotments, a community orchard and landscaping with associated infrastructure including sustainable urban drainage systems. (All matters are reserved except for vehicular access).
- 1.3 This report responds to feedback from various transport authorities/bodies in relation to the previous planning application for development on the site, including the emphasis of the vision-led approach to the development providing a high sustainable transport/placemaking approach to movement around the site and off-site. The site location is shown on **Figure 1.1**.

Structure of the Report

- 1.4 This report is intended to determine the relevant highway issues and indicate potential solutions, with reference to the impact of the proposed development site.
- 1.5 Following this introduction, the report is set out as follows:
 - Section 2.0 – Policy Review;
 - Section 3.0 – Background Information
 - Section 4.0 – Development Proposals;
 - Section 5.0 – Traffic Generation, Distribution and Assignment;
 - Section 6.0 – Traffic Impact and Capacity Analysis;
 - Section 7.0 – Sensitivity Testing;
 - Section 8.0 – Summary and Conclusion.

Limitations of the Report

- 1.6 This report has been undertaken at the request of Richborough, thus should not be entrusted to any third party without written permission from Hub Transport Planning Ltd. However, should any information contained within this report be used by any unauthorised third party, it is done so entirely at their own risk and shall not be the responsibility of Hub Transport Planning Ltd.
- 1.7 This report has been compiled using data from a number of external sources (such as TRICS, traffic count data and public transport websites); these sources are considered trustworthy and therefore the data provided is considered accurate and relevant at the time of preparing this report.

2.0 Policy Review

Introduction

2.1 This section summarises the relevant transport policy documents against which the development proposals are considered at a national, regional, and local level. The most relevant policy documents relating to this site are detailed below:

- National Planning Policy Framework (December 2024)
- Hertfordshire Local Transport Plan 4 (2018 – 2032)
- Supporting documents & Strategies to Hertfordshire LTP 4 includes: *An Active Travel Strategy for Hertfordshire (2023 – 2031)*
- Local Cycling and Walking Infrastructure and Delivery Plan (2021)
- Core Strategy Adopted Oct 2011: Local Development Framework (2011 – 2026)
- Site Allocations Development Map (SADMAP) (2011 - 2026)
- Local Development Framework: Core Strategy Adopted (2011 - 2026)

National Planning Policy

2.2 The latest National Planning Policy Framework (NPPF) was published in December 2024 and sets out the Government's Planning Policies and how these are expected to be applied.

2.3 In relation to transport, the NPPF states at paragraph 110 that:

'The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making.'

2.4 When considering the effects the development may have on the local transport network, the NPPF paragraphs 115 and 116 state that:

'In assessing sites that may be allocated for development in plans, or specific applications for development, it should be ensured that:

- a) sustainable transport modes are prioritised taking account of the vision for the site, the type of development and its location;*
- b) safe and suitable access to the site can be achieved for all users;*
- c) the design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance, including the National Design Guide and the National Model Design Code48; and*

d) any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree through a vision-led approach.'

And;

'Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network, following mitigation, would be severe, taking into account all reasonable future scenarios.'

2.5 The NPPF further advises in paragraph 117 that:

'Within this context, applications for development should:

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

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

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

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

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

2.6 In relation to parking policy, paragraph 112 of the NPPF states that:

'If setting local parking standards for residential and non-residential development, policies should take into account:

a) the accessibility of the development;

b) the type, mix and use of development;

c) the availability of and opportunities for public transport;

d) local car ownership levels; and

e) the need to ensure an adequate provision of spaces for charging plug-in and other ultra-low emission vehicles.'

Hertfordshire Local Transport Plan (2018 – 2031)

2.7 The Hertfordshire Local Transport Plan in its 4th iteration sets out the key plans on how transport can help deliver a positive future vision of Hertfordshire by providing for safe and efficient travel and balancing a car-based approach to multi modal travel up until the year 2031. Key policies which are relevant to this TA are discussed in further detail below:

Policy 1: Transport User Hierarchy

To support the creation of built environments that encourage greater and safer use of sustainable transport modes, the county council will, in the design of any scheme and development of any transport strategy, consider in the following order

- Opportunities to reduce travel demand and the need to travel*
- Vulnerable road user needs (such as pedestrians and cyclists)*
- Passenger transport user needs*
- Powered two wheeler (mopeds and motorbikes) user needs*
- Other motor vehicle user needs*

Policy 2: Influencing land use planning

The county council will encourage the location of new development in areas served by, or with the potential to be served by, high quality passenger transport facilities so they can form a real alternative to the car, and where key services can be accessed by walking and cycling.

Policy 3: Travel Plans and Behaviour Change The county council will encourage the widespread adoption of travel plans through:

- a) Working in partnership with large employers, businesses and other organisations to develop travel plans and implement Smarter Choices measures.*
- b) Seeking the development, implementation and monitoring of travel plans as part of the planning process for new developments.*
- c) Supporting school travel plans, and working closely with parents, pupils, teachers and local residents to deliver a network of more sustainable transport links to school. The application of personalised travel planning techniques, marketing and other behavioural change initiatives will be considered when delivering physical transport improvements to maximise the potential to achieve modal shift*

Policy 5: Development Management The county council will to work with development promoters and the district and borough councils to:

- a) Ensure the location and design of proposals reflect the LTP Transport User Hierarchy and encourage movement by sustainable transport modes and reduced travel demand.*
- b) Ensure access arrangements are safe, suitable for all people, built to an adequate standard and adhere to the county council's Highway Design Standards.*
- c) Consider the adoption of access roads and internal road layouts where they comply with the appropriate adoption requirements and will offer demonstrable utility to the wider public. Where internal roads are not adopted the county council will expect suitable private management arrangements to be in place.*
- d) Secure developer mitigation measures to limit the impacts of development on the transport network, and resist development where the residual cumulative impact of development is considered to be severe.*

- e) *Require a travel plan for developments according to the requirements of 'Hertfordshire's Travel Plan Guidance'.*
- f) *Only consider new accesses onto primary and main distributor roads where special circumstances can be demonstrated in favour of the proposals.*
- g) *Resist development that would either severely affect the rural or residential character of a road or other right of way, or which would severely affect safety on rural roads, local roads and rights of way especially for vulnerable road users. This should include other routes which are important for sustainable transport or leisure.*

Policy 6: Accessibility - The county council will seek to increase the ease with which people, particularly disadvantaged groups, can access key services, by:

- a) *Working in partnership with key stakeholders such as bus and rail operators, community transport operators, the voluntary sector and public service providers.*
- b) *Supporting transport services which could include providing resource for bus and other transport services.*
- c) *Addressing the barriers to accessibility particularly regarding active modes and for people with impaired mobility.*
- d) *Promoting travel options and facilitating accessible travel information provision, including open data initiatives.*
- e) *Improving travel choices and options, including support for the provision of shared mobility initiatives*

Policy 7: Active Travel - Walking The county council will seek to encourage and promote walking by:

- a) *Implementing measures to increase the priority of pedestrians relative to motor vehicles, especially in town centres, and creating walking friendly town and neighbourhood centres.*
- b) *Delivering infrastructure to provide safer access to key services, and pedestrian facilities to enable and encourage walking.*
- c) *Identifying and promoting networks of pedestrian priority routes.*
- d) *Promoting walking as a mode of travel and for recreational enjoyment.*
- e) *Supporting the implementation of the Rights of Way Improvement Plan.*

Policy 8. Active Travel - Cycling The county council aims to deliver a step change in cycling, through:

- a) *Infrastructure improvements, especially within major urban areas to enable and encourage more cycling.*
- b) *Implementing measures to increase the priority of cyclists relative to motor vehicles.*
- c) *Improved safety for users including delivery of formal and informal cycle training schemes.*

- d) *Supporting promotion campaigns to inform, educate, reassure and encourage cycling provision and education, such as Bikeability.*
- e) *Facilitating provision of secure cycle parking.*

Policy 9: Buses The county council will promote and support bus services to encourage reduced car use by:

- a) *Supporting the delivery of infrastructure including bus priority measures, focussed on a core bus network, and by minimising bus service disruption from road congestion and the effects of road works.*
- b) *Providing and maintaining all bus stops, and other bus related highway infrastructure, to a consistent quality and standard across the county.*
- c) *Utilising new powers afforded to local authorities through the Bus Services Act 2017 as appropriate.*
- d) *Reviewing, procuring and supporting cost effective and efficient bus services to improve accessibility and respond to existing and potential passenger needs. Review existing services and take account of enhanced security provision.*
- e) *Working with a wide range of partners through the Intalink Quality Partnership to achieve improvements in facilities and services to improve the end to end journey by multi-modal interchange, accessibility, security and the journey experience.*
- f) *Working with partners to develop appropriate passenger fares, encourage the development of smart ticketing and to improve the provision and accuracy of passenger information.*
- g) *Working with partners to promote bus services as an option for work and school journeys, and promote and publicise the passenger transport network through a variety of media.*

Policy 18: Transport Safety and Security

The county council will seek to improve the perception of safety and security on Hertfordshire's transport system where this could deter people from travelling, particularly by active modes and passenger transport. This includes ensuring the county's transport system is resilient and prepared for instances of major alert.

Policy 19: Emissions reduction

The county council will reduce levels of harmful emissions by:

- a) *Promoting a change in people's travel behaviour to encourage a modal shift in journeys from cars to walking, cycling and passenger transport.*

2.8 In terms of land use planning, page 33 of the LTP states how transport is pivotal for new settlements:

- *"Would need to be served by high capacity passenger transport such as rail or bus rapid transit using existing network or extensions to this with good links to London and other key locations.*
- *Risk that without an established employment base in close proximity, settlement will become a dormitory and generate large amounts of out-commuting.*
- *Significant additional highway capacity would be required to provide connection to the strategic network and minimise growth in congestion.*

- *Case for a new east west highway connection would be strengthened to reduce pressure on the A414.*
- *Opportunity to plan for sustainable forms of travel in advance of development.*
- *Green field/Green Belt impacts of new housing and new transport infrastructure."*

2.9 It is also worth noting that the transport proposals map shown on page 101 of LTP 4 suggests cycleway improvements from in and around Croxley Green, such plans are not shown in detail.

2.10 As well as the Hertfordshire LTP, there are a number of supporting strategies which are used in conjunction with the main Local Transport Plan document. These can be seen below.

LTP Supporting Strategy: An Active Travel Strategy for Hertfordshire

The Active Travel Strategy builds on LTP 4, when making mention of numerous policies regarding active travel such as policy 1. The overall vision is *"to create places where walking, wheeling and other forms of active travel are safe and so convenient that they become the natural choice for short trips."* The strategy builds on LTP Policy 1 of Transport User Hierarchy, with Figure 12 stating the key principles of growth and transport plans which include:

- *"Improved walking links within towns including new crossings on busy roads*
- *Improved road junctions to reduce delays on key roads and reduce rat-running on quieter roads*
- *Improved bus services and priority for buses at junctions*
- *Improved cycle links within and between towns, and cycle parking facilities at key locations*
- *Improved walking, cycling and bus connections to railway stations"*

Local Cycling and Walking Infrastructure and Delivery Plan (2021)

2.11 The Local Cycling and Walking Infrastructure and Delivery Plan (LCWIP) is a plan which sets out the strategic outlines for making cycling and walking the natural choices for journeys.

The key outputs of LCWIPs are:

- *"A network plan for walking and cycling which identifies preferred routes and core zones for further development*
- *A prioritised programme of infrastructure improvements for future investment*
- *A report which sets out the underlying analysis carried out and provides a narrative which supports the identified improvements and network"*

2.12 Proposed schemes for Three Rivers District and Croxley are set out in Table 3.4 of the document which states the improvements which are yet to be complete in Croxley Green. These are as follows:

"TR7 - A412 Watford to Croxley Green station. Improve cyclist facilities between Watford and Croxley Green

TR8 - A412 Rickmansworth to Croxley Green Station. Improve cyclist facilities between Rickmansworth and Croxley Green

The integration of these proposals into the LCWIP network is considered in stages 3 and 4 of the LCWIP"

SADMAP (adopted Nov 2011 - 2026)

- 2.13 The Site Allocations document sets out the vision and objective for the area's spatial development by identifying core strategy objectives until 2026, to support the delivery of the Core Strategy and Community Strategy. *The core spatial "strategy sets out that all development sites will be identified having regard to a criteria based approach, taking into account whether development of the site:*

- *Will be accessible to public transport, services and facilities"*

The Core Strategy Place Shaping Policies set out that of the District's housing requirements over the plan period:

- *"Approximately 60% should be provided in the Key Centres (South Oxhey, Croxley Green, Abbots Langley, Chorleywood, Leavesden and Garston and Mill End),*

Core Strategy policy CP8 requires all development to provide, or make adequate contribution towards infrastructure and services

Core Strategy policy CP2 states that in identifying sites for future development, the Site Allocations document will set out an indicative phasing strategy for the development of sites.

POLICY SA1: HOUSING SITE ALLOCATIONS

- *Permission will not be granted for development resulting in a net loss of housing unless conversion to other uses is necessary to provide a small-scale facility and provided the surrounding residential area is not significantly adversely affected.*
- *Allocated housing sites will be safeguarded for housing development.*
- *Sites should be developed at an overall capacity which accords generally with the dwelling capacity given for that site.*
- *Proposals for the development of sites should have regard to the phasing strategy for the site, Core Strategy Policy CP2 and the latest monitoring information on housing supply which may result in alteration to the indicative phasing of sites through the Annual Monitoring Report. The earlier release of identified housing sites will only be considered if:*
 - i. *The Annual Monitoring Report projects that there will not be a five year supply of land for housing*
 - ii. *The sites can realistically be delivered in the short-term*
 - iii. *It can be clearly demonstrated that the early release of sites will achieve significant benefits in terms of sustainability and other objectives of the Core Strategy*
 - iv. *It does not unduly impact on other sites coming forward in accordance with the Spatial Strategy.*
- *In the case of sites not being required in the plan period to 2026 sites will be safeguarded for future development beyond the plan period.*
- *Development of identified housing sites should provide affordable housing in accordance with Core Strategy policy CP4*

Education Allocations

The Core Strategy sets out that the Council will support improved provision of, and access to, services and facilities to meet future demands, including through the expansion of existing schools and/or provision of new schools to meet identified needs. It is noted that needs for education are not constrained by District boundaries.

Local Development Framework: Core Strategy Adopted (Oct 2011 - 2026)

- 2.14 The Local Development Framework: Core Strategy sets out the vision over the next 15 year period 2011-2026 and beyond, with the overarching vision of the District to remain a prosperous, safe and healthy place where people want, and are able to, live and work." There are a number of core policies and spatial strategies created in relation to new development. Those relevant to the TA are mentioned in further detail below.

Chapter 3: Spatial Vision

The priorities for the future are:

- a) To provide growth required to support local communities and provide for their needs in the most sustainable way possible*
- b) To locate growth in the most sustainable locations in terms of access to services and transport networks and impact on the environment*
- c) To improve access to housing and affordable housing for communities across the whole District*
- d) To provide opportunities for local employment and maintain the vitality and viability of existing centres across the District, reducing the need to travel*
- e) To promote sustainable transport options to improve access for all communities and reduce dependence on the car*
- f) To support growth with appropriate investment in infrastructure to ensure that new and existing communities can access services that they require*

S6 To facilitate the provision of services and infrastructure to meet the needs of existing development and new development by working on cross-boundary issues with adjoining authorities, service providers and the development industry

S7 To deliver improved and more integrated transport systems and reduce the need to travel by locating development in accessible locations

S12. To promote safety and security as a high priority in the design of new developments in order to create attractive and safe places in which to live, work and play

Core Policy 2 (CP2) Housing Supply:

The Council will identify sufficient land for housing in the District to meet the Three Rivers housing target of 180 dwellings per year until 2026.

Housing provision will be made primarily from within the existing urban area (approximately 75% of total housing development between 2001-2026) and also from housing sites at the most sustainable locations on the edge of existing settlements, in the Green Belt (approximately 25% of total supply between 2001-2026).

Applications will be considered on a case by case basis having regard to: i. The location of the proposed development, taking into account the Spatial Strategy ii. The sustainability of the development and its contribution to meeting local housing needs iii. Infrastructure requirements and the impact on the delivery of allocated housing sites iv. Monitoring information relating to housing supply and the Three Rivers housing targets.

CP6 Employment and Economic Development

The Council will support development that:

- h) Reduces the need to travel by promoting mixed-use development, including 'livework' units (where these can be demonstrated to be appropriate), and homeworking, whilst taking into account the need to protect existing residential amenities.*

The sustainable growth of the Three Rivers economy will be supported by:

- k) Ensuring that employment uses are accessible through a range of transport modes including by public transport*

CP8: Infrastructure and Planning Obligations:

Development will provide, or make adequate contribution towards, infrastructure and services to:

- a) Make a positive contribution to safeguarding or creating sustainable, linked communities*
- b) Offset the loss of any infrastructure through compensatory provision*
- c) Meet ongoing maintenance costs where appropriate. In relation to utilities infrastructure (water supply, waste water capacity, electricity supply and gas supply), developers will be required to demonstrate that:*
- d) Either adequate capacity exists on and off sites to serve development and that development would not lead to problems for existing users, or*
- e) Extra capacity can be provided in time to serve the development which will ensure that the environment and the amenities of local residents are not adversely affected. This may require developers to fund appropriate improvements where there are capacity problems and no improvements are programmed by the statutory undertaker. These should be completed before occupation of the development.*

Infrastructure provision will take full account of the Council's priorities for infrastructure, services and facilities, including those identified in the Infrastructure Delivery Plan and Infrastructure Delivery Schedule. This will contribute to the infrastructure necessary to support growth in the area.

CP10: Transport and Travel

The Council will promote transport measures identified in the Infrastructure Delivery Plan in partnership with Hertfordshire County Council, the Highways Agency and transport providers. Development proposals will be expected to contribute to the delivery of transport and travel measures identified as necessary for the development, either on-site as part of the development or through contributions to off-site provision as appropriate. Provision for interchange and access by public transport, walking and cycling will be regarded as particularly important. Every opportunity will need to be taken to integrate means of travel. The following transport 53 and travel measures will be supported at appropriate locations across the District, and development will need to consider the provision of measures and facilities that encourage integration including:

- a) Secure cycle parking*
- b) A safe network for pedestrians*
- c) Taxi ranks*
- d) A layout to enable convenient access for buses*
- e) Provision of covered waiting facilities*
- f) Improvements to transport hubs within and including the provision of Mobi-Hubs where appropriate*
- g) Links to and from the Grand Union Canal towpath*
- h) Links to and from railway stations.*

The transfer of road freight to railways and canals in the District will be supported in principle, subject to the provision of a full Transport Assessment and the provisions of all other relevant local, regional or national policies, including an assessment of impact on the environment and amenity.

Development proposals

All development should be designed and located to minimise the impacts of travel by motor vehicle on the District. In particular, major development will be expected to be located in areas highly accessible by the most sustainable modes of transport, and to people of all abilities in a socially inclusive and safe manner, in accordance with the user hierarchy below. Priority will be given in the following order:

- I. Pedestrians, particularly people with restricted mobility*
- II. Cyclists and where appropriate, horse riders*
- III. Public transport (including taxis)*
- IV. All forms of motor vehicles.*

Development will need to demonstrate that:

- i) It provides a safe and adequate means of access*

- j) *It is appropriate in scale to the existing transport infrastructure, including public transport and, where necessary, infrastructure can be improved*
- k) *It is integrated with the wider network of transport routes, including public rights of way and cycle paths where appropriate*
- l) *It makes adequate provision for all users, including car and other vehicle parking, giving priority to people with mobility difficulties, pedestrians, cyclists and equestrians*
- m) *It includes, where appropriate, provision for public transport either within the scheme or through contributions*
- n) *The impact of the proposal on transport has been fully assessed; for major development this should be done through a comprehensive Transport Assessment detailing the measures that will be used to reduce impacts*
- o) *The proposal is accompanied by a draft Green Travel Plan for prospective users and employees of the development for all major development*

Chapter 4

The Plan sets out other Place-Shaping policies which assess how each settlement within the district is expected to contribute to the future of the district.

PSP2: Development in the Key Centres (South Oxhey, Croxley Green, Abbots Langley, Chorleywood, Leavesden and Garston and Mill End)

- a) *Focus future development predominantly on sites within the urban area, on previously developed land*
- b) *Provide approximately 60% of the District's housing requirements over the Plan period to include approximately 45% of affordable housing as informed by the Strategic Housing Market Assessment (2010), Development Economics Study (2009) and Strategic Housing Land Availability Assessment Update (2010)*
- e) *Maintain and enhance primary and secondary shopping frontages within Abbots Langley, Chorleywood and South Oxhey District Shopping Centres and the Local Shopping Centre at Croxley Green to meet needs from existing and new housing development and to enable Key Centres to be sufficient in meeting local daily needs*

2.15 DM13 of the Development Management Policies Local Development Document deals with parking, and Appendix 5 of that document sets out parking standards. The policy indicates:

- a) *Development should make provision for parking in accordance with the parking standards and, the zone based reductions set out in Appendix 5 until such time as set standards are revised.*
- b) *The Council will encourage the delivery of infrastructure to support the use of low carbon transport.*

2.16 The reasoned justification for the policy is that it; *"seeks to strike the balance between providing sufficient parking to meet the operational requirements of development whilst at the same time encouraging a range of sustainable transport options."*

3.0 Background Information

Site Location and Existing Transport Network

- 3.1 An illustrative masterplan for the site is included as **Appendix A**. To the north of the site are open fields and woodland and to the east the site Rousebarn Lane leads to Chandler's Cross to the northwest. Little Green Lane lies to the south of the site and a footpath (Whippendell Walk 3 – FPs 63 & 18) runs along the western boundary of the site.
- 3.2 Little Green Lane is a relatively narrow and lightly trafficked lane that passes along the southern frontage of the site. The lane fluctuates in width, with the easternmost section being approximately 4.5m wide with a 1.8m footway on the southern side of Little Green Lane. The carriageway on the lane then narrows to about 3.0m at a point west of Durrants Drive and then widens again to approximately 4.0m.
- 3.3 The lane rises sharply between Rousebarn Lane and a point halfway between Canterbury Way and Links Way. It then continues to rise in a westward direction on a gentler incline past this point.
- 3.4 Little Green Lane is relatively lightly trafficked giving access to dwellings off the southern part of Rousebarn Lane and West Herts Golf Club which is also accessed off Rousebarn Lane.
- 3.5 Access roads to Little Green Lane are relatively wide, with the carriageway of the residential access roads of Durrants Drive and Links Way generally measuring about 7.3m in width.
- 3.6 To the south of Links Way and Durrants Drive is Baldwins Lane. Links Way gives way to Baldwins Lane by means of a priority junction with ghost island provision for the right turn to Links Way. The junction of Baldwins Lane and Durrants Drive is formed by a mini-roundabout. Both Links Way and Durrants Drive will form the vehicular access routes to the proposed development off Little Green Lane.
- 3.7 Much of the length of Baldwins Lane is traffic-calmed using speed control cushions and raised table junctions. Several pedestrian crossings are also located along Baldwins Lane including one to the east of Links Way.

Highway Network Observations and Traffic Conditions

Manor Way/Baldwins Lane/Repton Way Mini-Roundabout

- 3.8 This four-arm mini-roundabout junction was generally observed operating within capacity during the AM peak period. Occasional queues of one or two vehicles were observed on Manor Road but these queues were generally short-lived. These observations are borne out by the queue survey data which indicates limited queuing in either peak hour.

Durrants Drive/Baldwins Lane Mini-Roundabout

- 3.9 This three-arm raised table junction was observed to be operating within capacity. On occasion limited queues of one or two vehicles were observed although these cleared quickly. During the majority of the AM peak the junction was clear of queuing. These observations are borne out by the queue survey data which indicates limited queuing in either peak hour.
- 3.10 It is noted that the visibility is limited looking to the right from the roundabout entry from Durrants Drive. As a result, traffic cautiously enters from this direction and, on occasion, this can lead to vehicles on the other two

arms also waiting on entry unsure as to right of way. This leads to short periods when the main road assumes right of way over the side road.

Links Way/Baldwins Lane priority T-junction

- 3.11 This priority T-junction has a short ghost-island right turn provision (back-to-back right turn lanes with Winton Drive). The junction was generally observed operating well within capacity with only occasional limited queues on Links Way. The observations are borne out by the queue survey data which indicates limited queuing in either peak hour.

Committed Developments

Killingdown Farm, Little Green Lane, Croxley Green (Ref 24/0774/DIS, with the previous reference 20/1881/FUL)

- 3.12 The committed development of Killingdown Farm consists of the demolition of existing buildings for residential development comprising of two-storey houses and three-storey blocks of flats, with a total of 160 dwellings. Planning permission was granted on 27th June 2024.

Grove Court, Grove Crescent, Croxley Green (Ref 24/1679/NMA, with the previous reference 20/0467/FUL)

- 3.13 The committed development of Grove Court consists of the demolition of existing 27 flats and the construction of 42 new flats in two 2-4 storey blocks associated with parking and landscaping. Planning permission was granted on the 20th February 2024.

Traffic Data

- 3.14 A series of Classified Turning Counts (CTCs) were undertaken on Thursday 27th June 2024 across the surrounding highway network, at the following junctions;

- Little Green Lane (NE)/ Durrants Drive/ Little Green Lane (SW)
- Little Green Lane (NE)/ Links Way/ Little Green Lane (SW)
- Little Green Lane (SE)/ Lincoln Drive/Little Green Lane (NW)
- Little Green Lane (NE)/ Norwich Way/ Little Green Lane (SW)
- Little Green Lane (NE)/ Canterbury Way/ Little Green Lane (SW)
- Baldwins Lane (W)/ Links Way/ Baldwins Lane (E)
- A412 Watford Road (W)/New Road/ A412 Watford Road (E)
- A412 Watford Road (W)/Winton Drive/ A412 Watford Road (E)
- A412 Watford Road (W)/Winton Approach/ A412 Watford Road (E)
- A412 Rickmansworth Rd (E)/ Hagden Lane/ Rickmansworth Rd (W)/ Metropolitan Station Approach

- 3.15 As well the above junctions, CTCs were also taken at the following roundabouts;

- Manor Way/ Baldwins Lane (E) /Repton Way/Baldwins Lane (W)
- Durrants Drive/ Baldwins Lane (E)/ Baldwins Lane (W)
- Rickmansworth Road (NE)/ Ascot Road/ Rickmansworth Road (SW)
- Raven Close/ Whippendell Road/ Ascot Road (SE)/ Ascot Road (S)/ Ascot Road

3.16 The CTC data is included as **Appendix B** along with the queuing data summaries that accompanied them.

3.17 Automatic Traffic Counts (ATCs) have been undertaken over a 7-day period between 22nd-28th of June 2024 at the following locations:

- Little Green Lane; midway between Norwich Way and Durrants Drive
- Little Green Lane; northeast of Canterbury Way
- Links Way
- Canterbury Way
- Durrants Drive
- Lincoln Drive
- Baldwins Lane; west of Lancing Way and east of Repton Way
- The Green; south of Copthorne Road and north of Old Barn Lane
- Aldenham Road; north of the A4008 Chalk Hill
- Lower High Street; north of the A4125 Eastbury Road

3.18 The ATC data is included as **Appendix C**. As part of the consultation process, HCC asked that we also include a traffic count of the Links Way/Baldwins Lane/Winton Drive staggered crossroads. Peak hour traffic counts were undertaken at this junction on 7th May 2025 and is also included in **Appendix C**.

3.19 Traffic flow diagrams showing the 2024 baseline flows and PCUs can be seen in **Figures 3.1 to 3.4**.

Accident Data

3.20 An initial review of Personal Injury Accident (PIA) data along the site frontage and within the immediate vicinity of the site has been undertaken using the DfT Road Safety Data database from 2019 to 2023. The map indicating the extent of the study area, and the location of the accidents are provided in **Appendix D** and the data is summarised in **Table 1**.

3.21 Following consultation from the highway authorities, the scope of the accident data has been widened to include the Strategic Road Network (SRN) which includes junctions 18 and 19 of the M25 as well as junction 5 of the M1.

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Table 1 - DfT Accident Data Summary (2019 – 2023)

Location	Severity			
	Slight	Serious	Fatal	Total
Junctions				
Baldwins Lane/ Durrants Drive mini roundabout	1	-	-	1
Baldwin's Lane/ Manor Way/ Repton Way roundabout	3	-	-	3
Baldwin's Lane/Winton Drive	2	-	-	2
Baldwin's Lane/ The Green	1	-	-	1
The Green/ Loudwater Lane	1	-	-	1
The Green/ New Road	2	-	-	2
Watford Road/A412/The Green mini roundabout	1	-	-	1
Watford Road/ Yorke Road	1	-	-	1
Watford Road/ Dickinson Square	1	-	-	1
A412 Watford Road/ Winton Approach	1	-	-	1
A412 Watford Road/ Baldwins Lane/ Rickmansworth Road roundabout	1	1	-	2
A412 Rickmansworth Road/ Hagden Lane	-	2	-	2
A412 Rickmansworth Road/ Shepherds Road	-	1	-	1
A412 Rickmansworth Road/ Cassiobury Park Avenue	-	1	-	1

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A412 Rickmansworth Road/ Cassiobury Drive	-	1	-	1
A412 Rickmansworth Road/ A4178 Cassio Road	3	-	-	3
A412 Rickmansworth Road/ Rosslyn Road	2	-	-	2
St Albans Road/A411 Beechen Grove/ Rickmansworth Road/ The Avenue roundabout	16	1	-	17
The Avenue/ Hemsptead Road/ Hyde Road roundabout	5	1	-	6
Hagden Lane/Whippendell Road	4	-	-	4
Sarrat Road/ Redhall Lane	-	1	-	1
Sarrat Road/ York House School	1	-	-	1
Rousebarn Lane/ Lodge End Road	1	-	-	1
Cassiobury Drive/ The Gardens	3	-	-	3
Cassiobury Drive/ Stratford Way	1	-	-	1
Hempstead Road/ Stratford Way	1	-	-	1
Hemsptead Road/ Langley Way	2	2	-	4
Hempstead Way/ Courtlands Drive	2	1	1	4
Chorleywood Road/ Valley Road	1	-	-	1

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Chorleywood Road/ Loudwater Lane	2	-	-	2
Chorleywood Road/ The Clump	1	-	-	1
M25 Junction 18	10	3	-	13
M25 Junction 19	12	3	-	15
M1 Junction 5: Berrygrove Interchange	27	7	-	34
Links				
Baldwin's Lane	6	-	-	6
A412 Watford Road	7	2	-	9
A412 Rickmansworth Road (west of Hagden Lane, east of Baldwins Lane)	4	-	-	5
A412 Rickmansworth Road (east of Hagden Lane, west of Metropolitan Approach)	5	2	-	7
Hagden Lane	-	2	-	2
New Road	1	-	-	1
Raven Close	-	1	-	1
Ascot Road (south of the A412 roundabout)	2	-	-	2
Hempstead Road (north of the Avenue roundabout, south of Hunton Cross Spur)	5	2	-	7
Chorleywood Road (east of M25 junction 18)	1	2	-	3
Sarrat Road	-	-	1	1
Redhall Lane	2	-	-	2
Rousebarn Lane	2	1	-	3
Cassiobury Drive	2	-	-	2
Total				
All Accidents	146	37	2	186

- 3.22 Accident data has been retrieved across a wider extent than in previous submissions and stretches as far as 3.65km (as the crow flies) to include the Strategic Road Network (SRN) including M1 junction 5, and M25 junctions 18 and 19.
- 3.23 Further information on the detail of the fatality on Sarratt Road has been retrieved using the Crashmap website. The fatal accident occurred on Sunday May 14, 2023, and was a result of a vehicle turning right from Sarratt Road into Redhall Lane and colliding with a cyclist.
- 3.24 The other fatal incident recorded in this period occurred along Hempstead Road and was a result of a van travelling along the left-hand bend and hitting a pedestrian over the age of 75 who was crossing the carriageway. Further details of the accident reports from Crashmap can be seen in **Appendix D**.
- 3.25 Though the incidents are unfortunate, there is no evidence to suggest that the incidents occurred as a result of issues relating to highway network or junction design.
- 3.26 Not surprisingly, the busiest junctions, including the motorway junctions, have experienced the highest number of injury accidents, with M1 J5 (Berrygrove) having had 34 PIAs recorded in a recent 5-year period.
- 3.27 We investigate forecast traffic impact at various junctions later in this report where we conclude that development traffic impact at the busiest junctions will be minimal. Therefore, although all personal injury accidents are regrettable, the data does not indicate any undue cause for concern in terms of the number and severity of accidents observed on the highway network. In particular, it is concluded that the traffic associated with the proposed development would not have an unacceptable impact on highway safety.

4.0 Development Proposals

Site Access

- 4.1 Drawings **T24544.001 Rev D** and **T24544.002 Rev D** detail the proposed vehicular site access junction layouts from Durrants Drive and Links Way. At each access there is a proposed change in priority, with Little Green Lane giving way to traffic and active travellers accessing and egressing the proposal site.
- 4.2 Drawings **T24544.003 Rev D** and **T24544.004 Rev D** show the proposed site access junctions in a wider context, along with a proposed shared footway/cycleway link along Links Way, Dover Way, and Canterbury Way.
- 4.3 On Durrants Drive, the observed 85th percentile speeds were 25.0mph northbound and 24.2mph southbound. On Links Way, the observed 85th percentile speeds were 32.9mph northbound and 31.2mph southbound.
- 4.4 The proposals for access include raised tables at each of the entry junctions to the site, designed to keep speeds at or around 20mph.
- 4.5 The local highway authority expressed concerns regarding the southern radii of the junction between Little Green Lane and Durrants Drive being overrun and requested that future designs consider this issue. The revised design in **Drawing T24544.001 Rev D** shows the realignment of the Little Green Lane carriageway to ease the radii to ensure that the verge is not overrun.
- 4.6 A site access strategy has been developed in consultation with the LHA. In order to facilitate bus access, it is intended that the existing width of Durrants Drive will be maintained, with buses entering the site from Durrants Drive completing a loop around the primary street network and exiting the site along Durrants Drive. Durrants Drive will have priority over Little Green Lane.
- 4.7 The development will support a dedicated bus service, which will serve the site via Durrants Drive and will provide sheltering, timetabling and dropped kerb crossings, where deemed necessary and practical. More information regarding this service has been provided in the Active Travel Audit provided in **Appendix E** and later in text of this report.
- 4.8 General vehicular access to the development will be via the access junctions from Durrants Drive and Links Way.
- 4.9 The proposed junction layouts offer opportunities for pedestrians and cyclists to cross the carriageway safely and conveniently, with the raised table design ensuring active travel users are prioritised over vehicle movements on the minor arms.
- 4.10 Cyclists will be encouraged to arrive on-site via a new shared footway/cycleway link on the western side of Links Way as far as Dover Way, where the cycleway turns along this street before turning northwards towards the site on Canterbury Way. The shared footway and cycleway enables an active travel connection between the site and Baldwins Lane which would improve access for future, and existing, residents to amenities such as local shops, community facilities, and the Croxley Danes secondary school.
- 4.11 The shared footway/cycleway will be widened into the existing carriageway, where necessary, to achieve a minimum 3.0m width and will pass directly into the site with priority over Little Green Lane.
- 4.12 With regards to the shared use paths, ATE stated, “ATE does not generally support shared-use paths unless they meet limited exceptions in LTN 1/20. The proposed route interacts with driveways, creating potential conflicts with both vehicles and pedestrians and ultimately amounts to conversion of a footpath. Moreover, it appears

pavement parking is prevalent along this route, however no detail on how this will be managed is provided. Alternative measures should be considered, including managing pavement parking, enhancing placemaking and introducing traffic calming which reduces conflicts, to ensure this route is attractive to all users."

- 4.13 The development shared use footway/cycleway proposals have been designed in line with section 8.2.8 of LTN 1/20, which states "A fully shared surface is preferable to creating sub-standard widths for both pedestrians and cyclists where the available width is 3.0m or less. This allows users to walk or cycle side by side and negotiate the space when passing." The document also states, "Off-carriageway cycling provision may either be physically segregated from pedestrian facilities or a common surface may be shared."
- 4.14 The site access has therefore been designed in line with the minimum width required for shared use routes provided in Table 6.3 of the LTN 1/20 document. Given that "cyclists alter their behaviour according to the density of pedestrians", and that pedestrian trips are predicted to be far less than the 300 highlighted in page 66 of the LTN 1/20 design guidance (trip rates are indicated in **Section 5.0** of this report), it is considered that the shared footway will not create any significant conflict between active travel users and therefore, the shared footway/cycleway should be deemed as acceptable.
- 4.15 In relation to pavement parking, given that dwellings along the route have sufficient off-street parking available on driveways there is very little reason for drivers to be parking in this illegal manner. Appropriate signage will be in place to advise of the new footway/cycleway and additional signage will be provided to indicate that vehicles should not be parked part on/part off the carriageway. Once the footway/cycleway is in place we would recommend a period of enforcement be undertaken to ensure compliance.

Internal Layout

- 4.16 The internal layout of the proposed development has been designed in accordance with the guidelines of Manual for Streets 1 and 2.
- 4.17 Sufficient car parking for the site will be provided in accordance with Three Rivers District Councils parking standards to provide on-plot parking spaces and secure cycle storage for residents of the development site, and to provide suitable levels of parking for staff at the school and at the local centre.
- 4.18 The draft illustrative layout indicates that the local centre will sit towards the frontage of Little Green Lane providing easy access for future residents and existing residents of the residential estate to the south. The school lies to the east of the local centre.
- 4.19 The primary route network is proposed to be of sufficient width to take two-way bus travel at a carriageway width of 6.75m. A combined footway/cycleway is provided alongside the primary street network.

Active and Sustainable Travel Proposals

- 4.20 In addition to this report, active travel route audits have been completed, with the Active Travel Audit report included as **Appendix E** of this report. The document highlights local facilities in and around the vicinity of the development site and highlights existing and potential sustainable and active travel measures. The active travel audit highlights routes which will act as alternative routes towards transport interchanges and local facilities.
- 4.21 The report also indicates that certain routes are only ever to be considered as recreational routes suitable only as secondary routes; in part because parts of the routes are not deemed suitable for upgrade to allow cycling use and in part because they are not suitable for 24-hour, 365 days use.

- 4.22 The report includes the walk distances to various facilities and transport interchanges from the proposal site. It also includes a summary of available footpath connections and sustainable transport connections. A summary of the Local Walking and Cycle Infrastructure Plan (LCWIP) is included along with the proposed interventions in that plan. The report indicates that a Beryl Bikes scheme will be included at the focal point of the development and acknowledges the proposals for a new footway/cycleway towards Baldwins Lane and Croxley Danes School.
- 4.23 The report sets out existing public transport availability and indicates that a new route will be provided to support sustainable travel from the site to key local facilities and transport interchanges. The bus will be supported by stops and shelters on site and by stops along Durrants Drive to encourage use by residents of the existing residential estate to the south.
- 4.24 ATE has asked for more detailed audits of the specific routes from the site. A summary of these findings are provided below.

Route to Croxley Station

- 4.25 The initial part of this route is through residential estates to the south using the existing footway network, for example Durrants Drive, or the planned footway/cycleway network.
- 4.26 There is an informal crossing of the speed calmed Baldwins Lane before proceeding along a footpath of 1.0m-1.5m in width, where cyclists will be encouraged to dismount with improved signage.
- 4.27 The alternative route for pedestrians adds very little to the walk time to Croxley station and for cyclists, who would need to dismount, the alternative route will prove quicker.
- 4.28 Beyond the footpath legible active travel signage is provide along quiet routes towards Croxley Station.

Alternative Route to Watford Station via Rousebarn Lane

- 4.29 The initial part of the route along Rousebarn Lane southwards is fronted by housing, lit, overlooked and alongside a lightly trafficked route. The route passes the access to the golf course.
- 4.30 The route then heads east and narrows to become a rural lane. The lane is unlit, rises sharply, and has steeply bank verges with not footways. Pedestrians and cyclists travel in the carriageway. The route then drops sharply towards the Grand Union Canal.
- 4.31 The part of the route described above offers little opportunity for improvement. Widening to provide footways/cycleways or additional carriageway width and lighting, would require significant vegetation removal and civil engineering works that would totally alter the nature of the route. Signage could be provided to encourage increased use in daylight conditions.
- 4.32 The route continues over the canal bridge and onwards between the fishery and the River Gade along a tarmacked, non-vehicular route, which is subject to seasonal flooding, towards a bridge over the River Gade and onwards via footways and cycle routes towards Watford Station. The route is suitable for pedestrian use, and cycle use with caution, in daylight conditions and subject to seasonal weather conditions.
- 4.33 The nature of much of this route is recreational and the route is considered only as a secondary route towards Watford Station and beyond. Improved signage of the route from the site and Rousebarn Lane will be provided.

Route through Cassiobury Park via West Hertfordshire Golf Club

- 4.34 This is a recreational route that has suitable signage along it. We do not envisage any improvements along this route and, indeed, physical improvements through the wooded areas would totally change the nature of the route and any suggestions for physical interventions across the golf course are likely to be resisted.
- 4.35 The route will be suitably signed from the development.

LCWIP Interventions

- 4.36 Opportunities to improve active and sustainable travel in Croxley Green and the surrounding areas have been highlighted in the Watford and Three Rivers Local Cycling and Walking Infrastructure Plan (LCWIP) which has been included as an attachment within the active travel audit in **Appendix E**. The plan includes upgrades and key interventions to cycle infrastructure, including to cycle priority enhancements along the A412 corridor towards Watford, known as Route 2 in the scheme. Further details of the LCWIP interventions for Route 2 can be seen on Page 178 of the General Public Services and Community Engagement Committee Agenda Report which was released on the 1st July 2025. Route 2, from Croxley to Rickmansworth has been ranked first in terms of prioritisation. It is important to note that though the committee report is more recent, it does not supersede the previous appendices of the LCWIP which have been attached to the active travel audit in **Appendix E**.
- 4.37 A brief summary of the potential interventions includes:
- Various junctions on the A412 between Whippendell Road and Watford cycle routes 6 and 17 to give safe continuation of the cycle track over the mouth of each junction.
 - Two-way cycle track on the north side of the A412 between Gade Avenue and Cassio Road.
 - Improvement of A412/Metropolitan Station Approach/Hagden Lane signals to give additional priority to peds/cycles.
 - Additional signalled crossings at A412/Ascot Road roundabout.
 - Crossings along the Baldwins Lane/Watford Road roundabout should demand require this improvement.
 - Two-way cycle track on the south side of the A412 between Baldwins Lane and Ascot Road roundabouts and to continue westwards along the A412 past Croxley Station and The Green.
 - Upgrade of crossing of A412 at Winton Approach to a signal crossing with further crossings of the A412 and priority over side roads.
 - A priority crossing along the A412 Watford Rd where the A412 Watford Rd meets Frankland Road, near Croxley Station
- 4.38 The interventions above are only one small part of the overall LCWIP and we can see that the proposal for a shared footway/cycleway from the development site towards Croxley Dames School and Baldwins Lane goes some way towards creating a suitable active travel link towards the A412 proposals.
- 4.39 We investigate traffic impacts at various junctions along the A412 corridor where the LCWIP interventions are planned. As will be seen later in this report highway improvements are not planned as part of the development proposals but, in line with the vision to ensure that the site provides everyday facilities and that movements to/from the site are undertaken as sustainably as possible, contributions to the LCWIP proposals will be provided.

4.40 The proposed development will further support these objectives by delivering clear, effective connections that promote active and sustainable travel choices for both future residents and the wider community. Contributions to be made from the developer are set to include the following, amongst others;

- Shared footway and cycleway provision alongside the site access and within the site.
- Contributions towards surrounding active travel links, such as the signage of routes.
- The provision of Beryl Bikes docking stations on site.
- The introduction of a dedicated bus service within and surrounding the site, including to key destinations such as Rickmansworth, Watford Station, Croxley Station, and Watford Junction.
- Potential contribution to planned step-free access at Croxley station.
- Designated car-pooling parking provision.

Car Parking

4.41 Car parking at dwellings outside of the local centre will be provided as per the residential car parking guidelines in the current local plan.

4.42 **Table 2** provides the level of parking to be provided for the proposals within the development Square.

Table 2 – Parking Spaces in Development Square

Use	Proposed	LP Requirement	Emerging LP Requirement
Retail 400 sqm	14	14	14
Retail 165 sqm	6	6	6
Pharmacy 206 sqm	7	7	7
Medical Centre 1,000 sqm	15	15	15
Community Hub 430 sqm	48	48	48
Unallocated spaces adjacent to Medical Centre	4	-	-
Residential 1-bed apartments (#24)	22	42	22
Residential 2-bed apartments (#28)	40	56	40
Total	156	188	152

4.43 The level of car parking proposed at the local centre totals 156 spaces. The number exceeds the emerging LP requirement and allows for four unallocated spaces, two of which are likely to be allocated to the proposed Car Club.

4.44 Retail car parking will include time limits along with ANPR enforcement to ensure the allocated parking spaces are used appropriately and to ensure that residents park in their designated residential parking area and not within the retail car park.

4.45 The justification for the proposed level of parking is further strengthened by the introduction of the bus service and the provision of Beryl Bikes on site, both of which enhance active and sustainable travel options to and from

the development. Together, these measures support a balanced and sustainable approach to transport, thereby justifying the proposed parking provision in the context of the development. It is therefore considered that the proposed level of parking spaces is justified based on the development proposals.

- 4.46 The main purpose of the provision of the local centre on the proposal site is to serve the needs of the development. Any such trips to the local centre from the development will predominantly be undertaken by walk or cycle.
- 4.47 Of course, the facilities will be open to all users, but we expect the majority of users to be local to the development and a high proportion to be undertaking trips to the facilities on foot or by cycle. The trip rates for each land use are discussed in further detail in **Section 5** of this report.
- 4.48 From the outset of the design process, the emphasis has been on putting active travel modes first, followed by public transport. To that end, footway/cycleway infrastructure has been carefully planned around the site, including a cycle track alongside the primary vehicle route. Cycle infrastructure is proposed to extend from the site across Little Green Lane and via Canterbury Way, Dover Way, and Links Way to the wider cycleway network present on Baldwins Lane and the A412.
- 4.49 The proposal site is to be served by the 22 dedicated bus service, which will benefit residents of the residential areas to the south as well as further afield. This too will tend to reduce use of the car for travel to facilities on the site and thus minimise parking demand.
- 4.50 We note that the adopted parking standards offer flexibility in discounting by parking area. The residential development to the south of Little Green Lane is in Zone 4. The advice in Appendix 5 of the standards can be found here: <https://www.planvu.co.uk/trdc/written/dmp/cpt22.php>, and indicates that:

"The standards for car parking (except for C3 Residential) may be adjusted according to which zone the proposed development is located in (zones are indicated in the map on page 82)."
- 4.51 Viewing the proposals as a logical extension to the existing development south of Little Green Lane and the proximity to a Zone 4 area where 75%-100% of the indicative demand based standard applies to non-residential uses, we note that applying the 75% figure to the non-residential use standards from the Local Plan would result in a reduction of 24 spaces i.e. a 164 parking space requirement overall.
- 4.52 The community hub parking in Durrants Square (48 spaces), will not be assigned to any particular use. This proposal offers the ability of uses to efficiently share parking and therefore minimise the amount of space taken up by parking in the development.
- 4.53 For example, one would expect the greatest demand for the retail uses during the day when use of the community hub might be lighter than would otherwise be the case in the evening. Conversely, use of community hub may be highest in the evening when one would expect retail use to be lower.
- 4.54 Overall, the planned parking levels at the local centre are therefore considered to be both suitable and efficient and appropriate from a place-making perspective.
- 4.55 ATE has suggested that pavement parking could create potential conflicts with active travel users. In order to discourage footway parking on Durrants Drive, Drawing T24544.005 shows the potential for vehicular parking in the current verges of Durrants Drive. The drawings show 14 car parking spaces immediately fronting 59-63 Durrants Drive and 13 parking bays and two disabled parking bays on the opposing verge.

- 4.56 At most, the proposed parking provision shows 29 bays in the southern side of Durrants Drive, and four bays which overhang slightly along the paved footway within the verge to the north, which fronts 85 Durrants Drive, where alternative footway provision is available.

Cycle Parking

- 4.57 Cycle parking within the local centre will be applied as per the cycle parking standards. These include;
- Retail 1 short term space per 150sqm plus 1 long-term pace for 10 staff
 - Residential 1 long term space per unit where no garage provided
 - Residential (flats) 1 space per 2 units
 - Community Hall 1 short-term space per 200sqm 1 long-term m space per 10 staff on duty
 - Surgery 1 short-term space per consulting room 1 long-term space per 10 staff on duty
- 4.58 All other uses on site will also adhere to local guidance on cycle parking provision.
- 4.59 With regards to cycle parking, ATE stated, “It is understood that cycle parking provision will comply with local standards. *“Thought should also be given LTN 1/20 standards. Parking should be as convenient as car parking with unobstructed access to secure facilities provided by the developer. The need for further cycle parking provision should be explored at Croxley Underground Station.”*
- 4.60 Cycle parking standards are to align with Appendix 5 of the Three River’s Adopted Development Management Policies Local Development Document. The standard of provision is set out by Use Class. The emerging Local Plan recognises as part of its draft Sustainable Transport and Travel Policy at paragraph 15.17 that “*Cycling is also an essential component of sustainability and the support of healthy lifestyles, as well as providing an affordable means of access to local destinations and opportunity for leisure and recreation... Providing sufficient, convenient and secure cycle parking, with a particular priority at key destinations such as town centres and railway stations is also important, as well as end-of-trip facilities for cyclists*”. The details of cycle parking are envisaged to be reserved by condition following the grant of any future reserved matters application(s).
- 4.61 With regard to cycle parking at Croxley Station, according to TfL’s station footfall documents for 2024/25, annual usage for Croxley Station was 645,525. (TfL.co.uk). Therefore, on average (excluding Sundays), an estimated 2062 people use Croxley Station on a daily basis.
- 4.62 According to Table 11.1 of the guidance, one parking space is required per 200 daily users at a major interchange; therefore, 11 cycle parking spaces are required. At present, there are more than triple this level of spaces provided, with 32 facilities for bicycle storage as well as an additional five cycle parking bays associated with the Beryl Bikes scheme. On-site observations after the morning peak hour indicate that spare cycle spaces are available.
- 4.63 The level of spaces required at the station, according to standards, will significantly exceed any additional forecast demand from the development, and certainly there will remain sufficient cycle parking available at the station with respect to the standards.
- 4.64 As such, unless TfL advises otherwise on existing and likely future demand, the existing provision is considered sufficient and capable of accommodating cycle parking, having been assessed against LTN 1/20 standards.

5.0 Traffic Generation, Distribution and Assignment

Traffic Generation

- 5.1 The proposed development is a residential-led development for 600 dwellings, a local centre, a 1FE primary school plus expansion land, and other uses as set out at Paragraph 1.2 of this report.
- 5.2 The traffic generation for the proposed residential aspect of the development has been derived using the TRICS (7.11.4) database and has been forecasted in accordance with the TRICS Good Practice Guide.

Residential Trip Rates

- 5.3 In the previous TA affiliated with the proposed development, two sets of trip rates were obtained, based on a 50/50 split of affordable and market housing. Since then, HCC requested the exclusion of a site surveyed due to low levels of parking and therefore potentially lowered trip rates. HCC commented, *"This site should be deselected, and the trip rate calculations and all the supporting information should be updated to reflect the revised flows."*
- 5.4 In addition to the comments made by HCC, ATE requested revised trip generation in their response to the TA, commenting that; *"Expected trip rates for walking, wheeling, and cycling journeys are not clearly provided in the Transport Assessment (TA) and appear to focus solely on vehicle trips. Trip rates should be provided for active modes as all-day trips rather than being restricted to peak hours. The trip generation for active modes should consider all onsite uses, not just residential elements."*
- 5.5 Therefore, an initial revised trip generation exercise was undertaken to obtain multi-modal trip rates under the previous forecasting parameters, whilst excluding the one site as per HCC's request. This resulted in the sample only containing one affordable site. As this would not be reflective of the proposed development, the TRICS parameters have been reviewed in order to be more representative of the proposed development site and include more surveyed sites.
- 5.6 Revised residential trip rates were acquired using the mixed private/affordable dwellings (Class 3M) subcategory within TRICS. This conforms to the TRICS user guide which states that the 3M category should be used where *"Housing developments where less than 75% of units are privately owned, and less than 75% of units are non-privately owned,"* which is the case for the proposed development.
- 5.7 The following parameters have been used within the TRICS assessment for the residential dwellings:
- Regions – United Kingdom (excl. Northern Ireland and Greater London)
 - Units – 208 - 544
 - Data Range – 01/01/2016 to 26/06/24
 - Days – Weekdays
 - Locations – Suburban Area, Neighbourhood centre, Edge of Town
- 5.8 All TRICS outputs included in this report can be seen in **Appendix F**, with the residential trip results summarised in **Table 3** below.

Table 3 – TRICS Generation (Mixed Tenure Residential Dwellings)

Peak Period	Trip Rate (per dwelling)		Trips (600 dwellings)		Total
	In	Out	In	Out	
AM	0.143	0.381	86	229	315
PM	0.333	0.173	200	104	304

NB: AM peak is 08:00-09:00, PM peak is 17:00-18:00; trips have been rounded

- 5.9 The forecast traffic generation of the residential elements is 315 vehicular movements in the AM peak; 304 in the evening peak, equating to just over 5 vehicular movements per minute.
- 5.10 Given the internal street layout of the site and balance of residential development across it, the traffic arrivals and departures at the site are likely to be split equally across Links Way and Durrants Drive; i.e. approximately an additional 2 vehicular movements per minute during peak hours along each of the proposed points of access along Durrants Drive and Links Way.
- 5.11 In discussions with HCC, it has been agreed that the great majority of movements to/from school will be local in nature and that traffic movements associated with the school will be limited.
- 5.12 Similarly, the majority of traffic movements to/from the local centre are likely to be undertaken by those from the development or from residents just to the south of the development, and likely to be undertaken by active travel modes. Therefore, no additional traffic has been added for these development proposals.
- 5.13 Regarding the above 2 points (5.11 and 5.12), National Highways has stated that they “accept that this is an outline application and the trip impact from the non-residential uses of the proposed development on the SRN are likely to be minor. However, as the anticipated trips from the residential uses alone are already relatively high, we require this additional information to understand the full potential traffic impact of the proposed development, particularly given the proposed country park and play space uses may generate a significant number of external vehicle trips. **We request that the additional information is provided, including the anticipated trips generated from the non-residential uses of the proposed development with internalisation factors applied, and justification for the proposed internalisation factors.**”
- 5.14 Therefore, trips for each land use have been looked at in further detail and are discussed below.

Active Travel Trips

- 5.15 In response to the comments provided by ATE quoted in **paragraph 5.4** of this report, active travel trips by walking and cycling have been explored in further detail, having obtained multimodal residential trip rates using the TRICS database.

Table 4 – Active Travel Trips forecasted using TRICS

Mode	Peak Period	Trip Rate (per dwelling)		Trips		Total
		In	Out	In	Out	
Cycle	AM	0.003	0.013	2	8	10
	PM	0.011	0.005	7	3	10
Walk	AM	0.029	0.120	17	72	89
	PM	0.044	0.034	26	20	46

NB: AM peak is 08:00-09:00, PM peak is 17:00-18:00; trips have been rounded

- 5.16 The forecast active travel trip generation equates to 99 trips in the AM peak; 10 of which are cycle trips and 89 are pedestrian trips. This number is lower in the evening peak, equating to 56 trips; 10 of which are cycle trips and 46 are on foot. This equates to just under 2 active travel trips per minute in the AM peak and just under 1 active travel trip per minute in the PM peak period.
- 5.17 Of course, we do not see these forecasts as targets. The development is proposing significant active travel improvements along with a new bus service to provide links to nearby facilities, centres and transport interchanges. In addition, the proposal site is providing a number of facilities on site that will be used by residents on a day-to-day and weekly basis which will also help to offset car trips that might otherwise be taken.
- 5.18 We can therefore sensibly expect the approach to result in up to 15% reduction in vehicle trip rates that might otherwise have been realised.

School Trips

- 5.19 National Highways provided comments that *“The trip generation provided in the TA does not include any other aspect of the proposed development, including the expected trips generated from the primary school use, or the mixed use local centre with NHS health and social care facilities, retail and café provision, or the country park and outdoor play / recreation areas.”*
- 5.20 Following National Highways' response regarding the trip rates submitted previously, the DfE pupil yield dashboard has been used to attain trip rates for the proposed school on site; the most recent data is from 2021/2022. This results in the following pupil yields for the Three Rivers district;
- Primary School = 0.25 per dwelling
- 5.21 On this basis, there is a demand for 150 primary school places by residents of the proposed development when fully constructed and occupied.
- 5.22 The 1FE school will have a total of 210 places available. As the demand for those from the proposed development is expected to be 150, 60 pupils are expected to journey to the site. An assumption of pupils travelling with caregivers, and of 1.2 pupils per group, has been used to calculate journey numbers. On this basis, it is expected that 50 school-related groups of people travelling will arrive from off-site. The modal split of these journeys has been explored in further detail below using the Temprow 8.1 software to extract journey purpose information for all journey purposes individually.
- 5.23 The full output for the educational trips derived from Temprow can be seen in **Appendix G** and **Table 5** below.

Table 5 – Education-related journeys Via Various Modes (Tempo Three Rivers 003)

Mode	2030 Trips AM peak		2030 Trips PM peak	
	In	In (%)	Out	Out (%)
Walk	267	22%	64	19%
Cycle	16	1%	4	1%
Car	218	18%	102	31%
Car Passenger	542	44%	123	37%
Bus/Coach	174	14%	35	11%
Rail/Underground	8	1%	2	1%
Combined Modes	1,227	100%	330	100%

- 5.24 As indicated in **Table 5**, many education-specific journeys are likely to be made via sustainable modes of transport; with the Tempo data suggesting only 18% of education-related journeys are via car driving in the morning peak hour, which is slightly higher during the evening peak. In comparison, 22% of education-related journeys are undertaken via walk mode in the AM peak and 19% in the PM peak. Of course, we do not envisage any significant number education related trips associated with a primary school in the PM peak.
- 5.25 **Table 6** shows the resultant forecast of inbound education trips as a result of the presence of the primary school on site.

Table 6 – Educational Trips to the Proposed Development

Peak Period	Total inbound education-related journeys	Inbound Tempo Modal Split (car)	Inbound Educational Car Trips
AM	50	18%	9

- 5.26 As identified above, it is envisaged that the 1FE primary school will internalise the majority of primary school trips from the site.
- 5.27 The TRICS based trip rates will already include car-based trips to/from residential developments for education purposes. We have made no reductions to forecast trips to account for these trips i.e. the forecasts here are considered robust.

Local Centre Trips

- 5.28 Using the area coverage stated in section 4.36 and **Table 2** of this report, the floor area of the proposed local centre is set to be a total area of approximately 2,201m². Therefore, trip rates have been obtained with this in mind and can be seen in **Table 7**.

Table 7 - TRICS Output – Local Centre (TRICS)

Time Period	Trip Rate (per 100m ²)		Trips (2201m ² coverage)		Total
	In	Out	In	Out	
07:00 – 08:00	0.392	0.314	9	7	16
08:00 – 09:00	2.236	1.687	49	37	86
09:00 – 10:00	2.982	2.746	66	60	126
16:00 - 17:00	2.942	2.628	65	58	123
17:00 - 18:00	2.903	3.648	64	80	144
18:00 - 19:00	2.982	3.217	66	71	137

- 5.29 The local centre trips calculated via TRICS suggest that the site is forecast to generate 86 two-way vehicle trips during the AM peak (08:00 – 09:00) and 144 two-way vehicle trips during the PM peak (17:00 – 18:00). This equates to just under 2 trips per minute in the morning peak and just over 2 vehicular trips per minute in the evening peak hour.
- 5.30 The trip rates, and subsequent trip forecasts, indicated by TRICS include larger, more attractive local centres. They also include local centres that lie along major arterial routes – unlike the proposed local centre on this site that will primarily serve the development and the residential estate to the south.
- 5.31 Given that there are larger local centres which could be deemed as more attractive along Baldwins Lane, New Road, and the A412 Watford Road, it has been assumed that the majority of trips for the proposed local centre will be internal to site or very local to the site, with the majority undertaken by active travel modes.
- 5.32 We have, however, for the purposes of robustness, made some allowance for off-site vehicle trips that may visit the retail area of the site. The local journey purpose split has also been obtained using the Temprow 8.1 software and can be seen in **Appendix G** and **Table 8**.

Table 8 – Journey Purpose Via Combined Modes (Temprow Three Rivers 003)

Mode	2030 Trips AM Peak			
	In	Out	In (%)	Out (%)
Work	624	1,155	50%	56%
Employers Business	80	162	6%	8%
Education	153	220	12%	11%
Shopping	95	216	8%	10%
Personal Business	38	125	3%	6%
Recreation/Social	17	65	1%	3%
Visiting Friends and Relatives	18	27	1%	1%
Mode	2030 Trips PM Peak			
	In	Out	In (%)	Out (%)
Work	881	507	43%	32%
Employers Business	138	82	7%	5%

Education	102	77	5%	5%
Shopping	273	201	13%	13%
Personal Business	135	100	7%	6%
Recreation/Social	107	138	5%	9%
Visiting Friends and Relatives	172	162	8%	10%

5.33 **Table 8** indicates that 10% of car driver journeys are primarily shopping trips in the AM peak, and 13% of car driver journeys are in the evening peak.

5.34 Forecast shopping trips from the proposed development have been calculated and can be seen in **Table 9** below.

Table 9 – Primary purpose Shopping Trips from the Residential Development

Peak Period	Shopping Trips (Tempo Modal Split)	Residential Trips for entire development	Total Shopping Trips out of Resi Development
AM	10%	229	23
PM	13%	104	13

5.35 The forecasts indicate that perhaps up to 23 trips during the morning peak hour and 13 trips during the evening peak hour might be undertaken by vehicle. The local centre trips in **Table 7** which were obtained using TRICS are higher due to the fact that surveys of many local centre are likely to be part of a longer journey to another primary destination (passby or diverted). On this basis, the journeys associated with the local centre are considered very unlikely to change the traffic generation on the road network beyond the site and the residential estate to the south.

5.36 We have allowed that a level of trips to the medical centre on the proposal site might be expected to be undertaken by car from off-site locations, including patients and medical professionals. Therefore, we have assumed that at most, approximately 15% of traffic will arrive externally for the medical centre use. As a result, using **Table 8** above, the site is forecast to generate 13 two-way vehicle trips during the AM peak (08:00 – 09:00) and 21 two-way vehicle trips during the PM peak (17:00 – 18:00), related to non-residential uses.

Traffic Distribution and Assignment

5.37 In consultation with HCC, it was agreed that traffic distribution/assignment would be considered on the basis of Mobile Network Data (MND) held by the authority and via Select Link Analysis (SLA) from Hertfordshire's COMET strategic traffic model.

5.38 Ultimately the MND data is useful as an indicator of the destinations for all modes of travel but was not broken down by mode and therefore proved less dependable for the purposes of distribution and, ultimately, assignment of vehicles. For example, London is a big draw for movement, but it is likely that a considerable level of this movement is accounted for by sustainable travel modes.

5.39 However, the SLA data relates entirely to vehicular traffic and has been utilised to directly inform vehicle assignment to the network factoring up the trips forecast by the SLA from the Hertfordshire COMET model on a pro rata basis for each peak hour.

- 5.40 The development assignment and traffic flows has been calculated using Figures 10 and 11 of the Hertfordshire Traffic Flow Distribution Analysis document, which indicates the level of traffic entering and departing zone 4562 – the zone used as a proxy for the proposed development, across both peaks in the 2014 model.
- 5.41 The resultant development assignment percentages are shown in **Figure 5.1** and **Figure 5.2**, with the initial split of traffic being 50/50 at the site access points of Durrants Drive and Links Way. This has been forecasted through using HCC's Traffic Flow Distribution Analysis forecasted from the Comet Model.
- 5.42 **Figures 5.3** and **5.4** show the Select Link Analysis (SLA) arrivals, whilst **Figures 5.5** and **5.6** show the SLA departures across both peak periods within the base year.
- 5.43 **Figures 5.7** and **5.8** show the resultant development traffic flows based on the sum of the arrivals and departures from the Select Link Analysis data.
- 5.44 As such, during the morning peak period, it can be seen that 61% of all traffic is to/from the west, with the remaining 39% from/to the east. This varies during the evening peak period where 69% of traffic heads is to/from the west and 31% of all traffic from the development is to/from the east.
- 5.45 The resultant assignment using the Select Link Analysis flows for the morning peak period and evening peak, respectively, were as follows:
- Links Way:
 - East to Baldwins Lane (E) = 20% / 16%
 - West to Baldwins Lane (W) = 30% / 34%
 - Baldwins Lane (W):
 - North to Links Way = 28% / 21%
 - East to Baldwins Lane (E) = 20% / 16%
 - Baldwins Lane (E):
 - North to Links Way = 22% / 29%
 - West to Baldwins Lane (W) = 22% / 29%
 - A412 Watford Road / Baldwins Lane Roundabout:
 - Baldwins Lane:
 - East to A412 Watford Rd (E) = 34% / 27%
 - South to A412 Watford Rd (SW) = 4% / 3%
 - A412 Watford Rd (E):
 - West to Baldwins Lane = 37% / 30%
 - A412 Watford Rd (SW):
 - West to Baldwins Lane = 5% / 3%
 - A412 Watford Road/ Winton Approach:
 - North to A412 Watford Road = 1% / 1%
 - South to A412 Watford Road = 1% / 0%

- A412 Rickmansworth Road/ Ascot Road roundabout:
 - A412 Rickmansworth Road (E):
 - A412 Rickmansworth Road (W) = 17% / 17%
 - A412 Rickmansworth Road (W):
 - A412 Rickmansworth Road (E) = 14% / 12%
 - Ascot Road = 20% / 13%
- Ascot Road, Whippendell Road roundabout:
 - Ascot Rd (N):
 - Whippendell Road = 3% / 5%
 - Ascot Road (S) Exit Only = 17% / 8%
 - Whippendell Road :
 - Ascot Road (N) = 10% / 14%
 - Ascot Road (S):
 - Ascot Road (N) = 10% / 17%

- 5.46 As indicated earlier in the report, there are two committed developments in close proximity to the proposed development site, with Killingdown Farm lying to the south of Little Green Lane. This development consists of 160 dwellings; including houses and 3-storey blocks of flats. Killingdown Farm is forecast to generate 75 trips in the AM peak and 70 trips in the PM peak.
- 5.47 The remaining committed development is Grove Court which lies to the northeast of Grove Crescent and comprises of the demolition and replacement of the flats with 42 apartments. The transport statement affiliated with this development states an approximation of 9 2-way trips in the AM peak hour and 10 2-way in the PM peak hour.
- 5.48 In terms of assignment values, where data was missing for both committed developments, the proposed developments' assignment values were applied to the relevant committed development flows given. The resultant assignment for Killingdown Farm can be seen in **Figures 5.9** and **5.10**, with Grove Court's assignment in **Figures 5.11** and **5.12**.
- 5.49 The anticipated traffic of each committed development can be seen in **Figures 5.13 to 5.16**, with Killingdown Farm traffic indicated in **Figures 5.13 – 5.14** and Grove Court's traffic shown in **Figures 5.15 – 5.16**.
- 5.50 As well as the distribution and assignment retrieved from the select link analysis, assignment data has been extended to a wider scope in line with the comments made by National Highways, which were as follows;

“National Highways request that the trip distribution/assignment exercise is extended to the nearby SRN junctions and provided for review before further comments are made. This should be presented as turning movements for the sensitive weekday AM and PM peak hours.”

“National Highways is interested whether there would be any adverse safety implications or material increase in queues and delays on the SRN as a result of the proposed development, in this case on the M25 J18 and 19, and the M1 J5.”

5.51 This revised TA includes traffic forecasts at the Strategic Road Network (SRN) and includes the M25 junctions; 18, 19 and 20 as well as the M1 junction 5. The assignment values and journey to work data obtained from NOMIS can be seen in **Appendix H**. The resulting assignment which reaches the SRN for the outbound journeys is as follows:

- M25 Junction 18:
 - Northbound = 5%
 - Southbound = 16%
- M25 Junction 20:
 - Northbound = 5%
- M1 Junction 5:
 - Northbound = 5%
 - Southbound = 9%

5.52 The following indicates the assignment for the inbound journeys:

- M25 Junction 18:
 - Northbound = 2%
 - Southbound = 11%
- M25 Junction 20:
 - Northbound = 8%
- M1 Junction 5:
 - Northbound = 5%
 - Southbound = 9%

5.53 The resultant assignment of traffic related to the proposed development at the Strategic Road Network (SRN) locations for the inbound and outbound journeys across both peak periods can be seen in **Table 10** below.

Table 10 – Distribution across Strategic Road Network (SRN)

Time Period	M25 Junction 18 Northbound	M25 Junction 18 Southbound	M25 Junction 20 Northbound	M1 Junction 5 Northbound	M1 Junction 5 Southbound
	Inbound				
08:00 – 09:00	5	34	24	15	15
17:00 - 18:00	5	33	23	27	26
Time Period	M25 Junction 18 Northbound	M25 Junction 18 Southbound	M25 Junction 20 Northbound	M1 Junction 5 Northbound	M1 Junction 5 Southbound
	Outbound				
08:00 – 09:00	16	50	16	15	29
17:00 - 18:00	15	49	16	15	28

- 5.54 The assignment forecasts summarised in **Table 10** demonstrates that although development traffic is forecast to reach junctions on the SRN, the volumes involved are modest and unlikely to materially impact the performance of the highway network, and as National Highways have stated *“the trip impact from the non-residential uses of the proposed development on the SRN are likely to be minor.”* We would suggest that very few, if any, trips associated with the non-residential uses on the site will be travelling via the SRN.
- 5.55 Analysis using the Google routing tool indicates that northbound traffic tends to access the M25 via Junction 20 directly, rather than travelling southbound to reach Junction 18 and then heading towards Junction 19. Traffic destined for M25 Junction 20 is routed via Durrants Drive, Baldwins Lane (westbound), The Green (A412), Sarratt Road, Redhall Lane, and Langlebury Lane before reaching the motorway.
- 5.56 Based on routeing patterns and the low percentage of development traffic anticipated to pass through M25 Junction 19, it is considered highly unlikely that this junction will experience any material impact. Northbound traffic is expected to favour M25 Junction 20, while southbound trips are more evenly distributed between M25 Junction 18 and M1 Junction 5, as supported by the assignment forecasts in **Table 10**.
- 5.57 Overall, the revised analysis directly addresses National Highways’ request by providing a more comprehensive view of how traffic might use the SRN. The low forecast assignment levels indicated above, as well as the PIA data shown in **Table 1** of the report, suggest no significant safety implications or capacity impacts are expected on the M25 or M1 junctions as a result of the proposed development.

Construction Traffic

- 5.58 With regard to construction traffic, National Highways stated that *“a construction traffic impact assessment is carried out and provided for review, to allow us to understand the potential impact of construction HGVs and workforce traffic on our network, particularly during the peak construction period. A Framework Construction Traffic Management Plan (FCTMP) should also be provided to mitigate any potential impacts identified.”*
- 5.59 To consider potential impacts due to construction, the maximum flow associated with construction activities has been estimated based on the data shown in **Table 12**. These are coarse estimates of traffic based on experiences elsewhere.
- 5.60 The theoretical worst-case scenario would be the simultaneous construction of the residential aspect of the development, the local centre and the medical centre proposed onsite, and therefore, the peak traffic flow in this scenario would be where peak activity phases of all these construction activities coincide i.e. if the dwellings, medical centre, retail areas, and school are constructed at the same time.

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Table 11 – Construction Traffic from the proposed development

Phase	Activity	Team	People	Light vehicles per day	Resultant trips	Heavy vehicles per day
1	Management	Manager	1	1.0	2.0	
		Administration	1	1.0	2.0	
1	Enabling works	Foreman	1	0.7	1.3	
		Driver	2	1.3	2.7	
		Banksman	1	0.7	1.3	
		Labourer	2	1.3	2.7	
		HGV deliveries				4
Phase 1 Total			8	6	12	4
2	Management	Manager	1	1.0	2.0	
		Administration	1	1.0	2.0	
2	Road Construction	Foreman	1	0.7	1.3	
		Driver	2	1.3	2.7	
		Banksman	1	0.7	1.3	
		Labourer	2	1.3	2.7	
		HGV deliveries				4
2	Utilities works	Foreman	1	0.7	1.3	
		Driver	1	0.7	1.3	
		Banksman	1	0.7	1.3	
		Labourer	1	0.7	1.3	
		HGV deliveries				2
	House Building	Foreman	1	0.7	1.3	
		Labourer	15	10.0	20.0	
		HGV deliveries				5
2a	Medical Centre	Foreman	1	0.7	1.3	
		Labourer	10	10.0	20.0	
		HGV deliveries				5
2b	Local Centre	Foreman	1	0.7	1.3	
		Labourer	10	6.7	13.3	
		HGV deliveries				2
2c	School Building	Foreman	1	0.7	1.3	
		Labourer	15	10.0	20.0	
		HGV deliveries				3
Phase 2 Total			71	48	96	21
3	Management	Manager	1	1.0	2.0	
		Administration	1	1.0	2.0	
3a	Finishing works – Commercial/Retail	Foreman	1	0.7	1.3	
		Labourer	2	1.3	2.7	
		HGV deliveries				0.5
3b	Finishing works – Local Centre/Care Home	Foreman	1	0.7	1.3	
		Labourer	1	0.7	1.3	
		HGV deliveries				0.5
3c	Finishing works – Housing	Foreman	1	0.7	1.3	
		Labourer	2	1.3	2.7	
		HGV deliveries				0.5
3d	Finishing works – School	Foreman	1	0.7	1.3	
		Labourer	1	0.7	1.3	
		HGV deliveries				0.5
3e	Finishing works – highways and landscaping	Foreman	1	0.7	1.3	
		Driver	1	0.7	1.3	
Phase 3 Total			17	12	24	3

- 5.2 As such, the resulting worst case vehicular trip generation and HGV generation for the concurrent phases is shown in **Table 12** below.

Table 12 – Maximum Daily Construction Traffic Trip Generation

Scenario	Two-way Daily Traffic Movements	
	All Vehicles (including HGVs)	HGVs
Proposed Development	63	12

NB: AM peak is 08:00-09:00, PM peak is 17:00-18:00; trips have been rounded

- 5.3 These figures are noted as representing daily activity and will be predominantly occurring outside peak hours on the local network. Such a peak in activity would also occur over a limited duration where phases of construction ran in parallel and coincided with other phases coming forward. On this basis, there is considered to be negligible impact of this additional traffic generated as a result of construction activities. As the impact is negligible, no significant effects arise from construction activities.
- 5.4 With regards to the FCTMP, this would be conditioned as part of any permission on the site. The FCTMP will adhere to route planning and detailed scheduling whilst addressing parking measures to avoid the potential impact of construction traffic on highway users.

6.0 Traffic Impact and Assessment

Introduction

- 6.1 This section sets out the results of the junction modelling capacity assessments on the local highway network.
- 6.2 As indicated, the traffic generation of the proposed development would result in an additional 314 vehicle trips in the morning peak and 304 during the PM peak; equating to at most, around 5 vehicle trips per in either peak hour.

Traffic Growth

- 6.3 Initial baseline traffic data was collected from the surrounding highway network by both CTCs and ATCs in June 2024.
- 6.4 Regarding the Baldwins Lane/Links Way junction, HCC commented;
- “The assessment should model the junctions as a staggered crossroad and the pedestrian crossing by the school should be included in the assessment, as this will create delays along major road especially in the AM Peak. New traffic survey and pedestrian counts will be required for this updated analysis to address this point.”*
- 6.5 Therefore, new counts were undertaken on the 7th of May 2025, at Baldwins Lane/Links Way/Winton Drive and this junction has been modelled as a staggered crossroads, in line with the above comments.
- 6.6 The future assessment year is 2030, six years hence from base data collection. Growth factors for Three Rivers 003 have been applied to the baseline traffic data to 2030; these growth factors have been obtained from TEMPro and adjusted by the NTM, and are as follows;
- 2024 to 2030 AM Peak = 1.0526
 - 2024 to 2030 PM Peak = 1.0536
- (Note: these factors also applied to the data collected at Links Way/Baldwins Lane/Winton Drive in 2025).
- 6.7 The assessments consider the junction operation at the base year of 2024 and at a future year of 2033. The following assessment scenarios were completed:
- 2024 Surveyed Base
 - 2030 Future Year Base
 - 2030 + Committed Development
 - 2030 + Committed Developed + Proposed Development
- 6.8 The 2030 base year traffic flow forecasts are indicated on **Figures 6.1 - 6.2**.
- 6.9 The future year traffic flows across the surrounding highway network with committed development traffic are set out in **Figures 6.3 and 6.4** and **Figures 6.5 and 6.6** show the future year forecasts including the Richborough proposed development traffic.

Junction Capacity Assessments

- 6.10 In order to assess the impact that the development will have on the surrounding highway network, a series of junctions have been assessed using the Junctions 11 software package.
- 6.11 HCC expressed concerns over the geometries of certain junctions and stated to “*provide drawings showing the geometry measurements.*” The drawings have used the measurement tool within the Junctions 11 programme and have since been embedded within the Junctions 11 file outputs for the following junctions/roundabouts, which were requested:
- Little Green Lane (NE) / Links Way / Little Green Lane (SW) site access junction
 - A412 Watford Road (W) / New Road / A412 Watford Road (E) junction
 - Winton Approach / Watford Road junction
 - Manor Way / Baldwins Lane / Repton Way mini roundabout
 - A412 Watford Road (E) / Sea Cadets / A412 Watford Road (S) / Baldwins Lane / Car Planet roundabout
 - A412 Rickmansworth Road / Ascot Round roundabout linked to Raven Close / Whippendell Road / Ascot Road roundabout
- 6.12 The full output file for the site access junction of Little Green Lane/Durrants Drive, showing the geometry and capacity calculations are included in **Appendix I. Table 13** demonstrates that this site access junction is forecasted to operate with negligible queues and delays, and with significant spare capacity in both peak hours.

Table 13 – Site Access Junction – Little Green Lane (NE) /Durrants Drive/ Little Green Lane (SW) PICADY

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue	Delay (s)	RFC	Queue	Delay (s)
2030 Base + Committed + Development						
Little Green Lane (NE)	0.08	0	11	0.05	0	8
Site Access	0.00	0	0	0.00	0	0
Little Green Lane (SW)	0.10	0	10	0.07	0	9
Durrants Drive	0.01	0	7	0.00	0	6

- 6.13 The full output file for the site access junction of Little Green Lane/Links Way, showing the geometry and capacity calculations is included in **Appendix J** and is summarised in **Table 14** below.

Table 14 – Site Access Junction – Little Green Lane (NE) / Links Way / Little Green Lane (SW) PICADY

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue	Delay (s)	RFC	Queue	Delay (s)
2030 Base + Committed + Development						
Little Green Lane (NE)	0.10	0	11	0.05	0	7
Site Access	0.00	0	0	0.00	0	0
Little Green Lane (SW)	0.09	0	11	0.05	0	9
Links Way	0.07	0	9	0.06	0	6

- 6.14 **Table 14** demonstrates that this site access junction is also forecast to operate with negligible queues and delays, and with significant spare capacity in both peak hours.
- 6.15 HCC commented with regards to the previous modelling of the Links Way junction and stated *"The interaction of the Winton Drive junction which is located 30m east of Links Way has the potential to create additional delays along Baldwin Lane, the road markings along the major arm have been modified so that the Winton Drive has a longer right turn storage capacity at the junction. The assessment should model the junctions as a staggered crossroad and the pedestrian crossing by the school should be included in the assessment, as this will create delays along the major road especially in the AM Peak. New traffic survey and pedestrian counts will be required for this updated analysis to address this point."*
- 6.16 Therefore, the Baldwins Lane/Links Way/Winton Drive junction has been treated and modelled as a stagger, with the revised counts as stated in section 6.5 of the report, accounting for the interaction with Winton Drive.
- 6.17 The full output file for the Links Way/Baldwins Lane (E)/Winton Drive/Baldwins Lane (W) junction capacity analysis, showing the geometry and capacity calculations are included in **Appendix K** and the results are summarised in **Table 15** below.

Table 15 – Links Way/Baldwins Lane(E) /Winton Drive/Baldwins Lane (W) PICADY

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue	Delay (s)	RFC	Queue	Delay (s)
2024 Surveyed Base						
Winton Drive LT	0.22	0	15	0.18	0	13
Winton Drive RT	0.57	1	26	0.36	1	23
Baldwins Lane (E)	0.37	1	11	0.59	2	12
Baldwins Lane (E) RT	0.41	0	12	0.62	1	13
Links Way LT	0.22	0	10	0.17	0	9
Links Way RT	0.11	0	13	0.09	0	14
Baldwins Lane (W) RT	0.04	0	7	0.07	0	10
2030 Base						
Winton Drive LT	0.26	0	17	0.19	0	14
Winton Drive RT	0.62	2	31	0.36	1	23
Baldwins Lane (E)	0.39	1	12	0.55	2	10
Baldwins Lane (E) RT	0.43	0	12	0.56	0	11
Links Way	0.24	0	10	0.18	0	9
Baldwins Lane RT	0.12	0	14	0.09	0	14
Winton Drive LT	0.04	0	7	0.06	0	9
2030 Base + Committed						
Winton Drive LT	0.27	0	18	0.19	0	14
Winton Drive RT	0.63	2	33	0.37	1	24
Baldwins Lane (E)	0.40	1	12	0.57	2	11
Baldwins Lane (E) RT	0.44	0	12	0.57	0	11
Links Way	0.24	0	10	0.18	0	9
Baldwins Lane RT	0.12	0	14	0.09	0	14

Winton Drive LT	0.04	0	7	0.07	0	10
2030 Base + Committed + Development						
Winton Drive LT	0.32	1	23	0.24	0	18
Winton Drive RT	0.70	2	45	0.45	1	34
Baldwins Lane (E)	0.43	1	13	0.66	3	13
Baldwins Lane (E) RT	0.49	0	14	0.66	1	14
Links Way	0.39	1	15	0.25	0	11
Baldwins Lane RT	0.39	1	23	0.27	0	21
Winton Drive LT	0.04	0	7	0.07	0	11

- 6.18 **Table 15** demonstrates that the Baldwins Lane/Links Way/Winton Drive staggered junction is forecast to operate with negligible queues and delays, and with significant spare capacity in both peak hours.
- 6.19 Although there is a delay of 45 seconds in the future year with all development, the analysis demonstrates that the addition of the proposed residential development has no noticeable impact on the operation of the junction, with the RFC of 0.70.
- 6.20 The full output file for the junction of New Road/A412 Watford Road, showing the geometry and capacity calculations, is included in **Appendix L** and the results are summarised in **Table 16** below.

Table 16 – A412 Watford Road (W)/New Road/ A412 Watford Road (E) PICADY

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue	Delay (s)	RFC	Queue	Delay (s)
2024 Surveyed Base						
New Road	0.31	1	12	0.40	1	15
A412 Watford Road	0.48	2	9	0.53	2	9
2030 Base						
New Road	0.33	1	13	0.43	1	17
A412 Watford Road	0.53	2	10	0.59	3	10
2030 Base + Committed						
New Road	0.33	1	13	0.43	1	17
A412 Watford Road	0.53	2	10	0.59	3	10
2030 Base + Committed + Development						
New Road	0.33	1	13	0.43	1	17
A412 Watford Road	0.53	2	10	0.59	3	10

- 6.21 **Table 16** demonstrates that the A412/New Road junction is forecast to operate with negligible queues and delays, and with significant spare capacity in both peak hours.
- 6.22 The analysis demonstrates that the addition of the proposed residential development has no noticeable impact on the operation of the junction, with very little development traffic assigned via this junction.

- 6.23 The full output file for the Winton Drive/A412 Watford Road junction, showing the geometry and capacity calculations, is included in **Appendix M** and the results are summarised in **Table 17** below.

Table 17 – Winton Drive/A412 Watford Road PICADY

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue	Delay (s)	RFC	Queue	Delay (s)
2024 Surveyed Base						
Winton Drive	0.29	0	16	0.24	0	15
A412 Watford Road	0.03	0	4	0.07	0	4
2030 Base						
Winton Drive	0.32	1	18	0.27	0	17
A412 Watford Road	0.03	0	4	0.08	0	4
2030 Base + Committed						
Winton Drive	0.32	1	18	0.27	0	17
A412 Watford Road	0.03	0	4	0.08	0	4
2030 Base + Committed + Development						
Winton Drive	0.32	1	18	0.27	0	17
A412 Watford Road	0.03	0	4	0.08	0	4

- 6.24 **Table 17** demonstrates that the A412/Winton Drive junction is forecasted to operate with negligible queues and delays, and with significant spare capacity in both peak hours.
- 6.25 The analysis demonstrates that the addition of the proposed residential development has no noticeable impact on the operation of the junction, with very little traffic assigned via this junction.
- 6.26 The full output file for the junction of Winton Approach/A412 Watford Road, showing the geometry and capacity calculations, is included in **Appendix N** and the results are summarised in **Table 18** below.

Table 18 – Winton Approach/A412 Watford Road PICADY Analysis

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue	Delay (s)	RFC	Queue	Delay (s)
2024 Surveyed Base						
Winton Approach	0.38	1	18	0.22	0	13
A412 Watford Road	0.31	1	6	0.25	1	5
2030 Base						
Winton Approach	0.43	1	20	0.25	0	15
A412 Watford Road	0.35	1	6	0.28	1	5
2030 Base + Committed						
Winton Approach	0.43	1	21	0.24	0	15
A412 Watford Road	0.35	1	6	0.28	1	5
2030 Base + Committed + Development						

Winton Approach	0.43	1	21	0.24	0	15
A412 Watford Road	0.35	1	6	0.28	1	5

- 6.27 **Table 18** demonstrates that the A412/Winton approach junction is forecast to operate with negligible queues and delays, and with significant spare capacity in both peak hours.
- 6.28 The analysis demonstrates that the addition of the proposed residential development has no noticeable impact on the operation of the junction, with very little development traffic assigned via this junction.
- 6.29 As well as the above junctions, the following roundabouts were assessed using the ARCADY module of the Junctions software:
- Manor Way/Baldwins Lane/ Repton Way mini-roundabout
 - A412 Watford Road (E)/ Sea Cadets/ A412 Watford Road (S)/Baldwins Lane/ Car Planet Roundabout
- 6.30 The full output file for the Manor Way/Baldwins Lane/ Repton Way mini-roundabout, showing the geometry and capacity calculations, is included in **Appendix O** and summarised in **Table 19**.

Table 19 – Manor Way/ Baldwins Lane/ Repton Way Mini Roundabout– ARCADY Analysis

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue	Delay (s)	RFC	Queue	Delay (s)
2024 Surveyed Base						
Manor Way	0.33	1	10	0.13	1	7
Baldwins Lane (E)	0.53	1	14	0.86	6	38
Repton Way	0.24	0	7	0.24	0	9
Baldwins Lane (W)	0.82	5	30	0.63	2	14
2030 Base						
Manor Way	0.36	1	11	0.14	1	7
Baldwins Lane (E)	0.57	2	16	0.91	9	54
Repton Way	0.26	0	7	0.27	0	10
Baldwins Lane (W)	0.86	6	38	0.67	2	16
2030 Base + Committed						
Manor Way	0.37	1	11	0.14	0	7
Baldwins Lane (E)	0.58	2	16	0.94	11	69
Repton Way	0.26	0	7	0.27	0	10
Baldwins Lane (W)	0.90	8	47	0.68	2	17
2030 Base + Committed + Development						
Manor Way	0.39	1	12	0.15	0	8
Baldwins Lane (E)	0.83	5	38	1.02	23	122
Repton Way	0.30	1	9	0.28	0	11
Baldwins Lane (W)	0.97	15	80	0.81	4	27

- 6.31 **Table 19** forecasts that traffic at the Manor Way/Baldwins Lane/Repton Way mini-roundabout is approaching capacity in the evening peak of the surveyed base, with queues of approximately 6 vehicles and an RFC value of 0.86. With the addition of future growth and committed development increases in queues and delays are noted on Baldwins Lane (W) in the AM peak hour and Baldwins Lane (E) in the PM peak hour.
- 6.32 The table output suggests that with the proposed development traffic adding to these forecasts future year queues and delays.
- 6.33 However, as RFC values approach 1.00, the results of the modelling should be treated with a significant degree of caution as the junction is operating beyond the modelling capabilities of the ARCADY software.
- 6.34 The cause of the increased delays and queuing at the junction in the future year scenarios appears to be the result of the general increase in traffic growth along Baldwins Lane.
- 6.35 It is worth noting that the error message within the Junctions 11 programme reiterates the above point that the mini-roundabout appears to have unbalanced flows and may behave more like a priority junction, with arms B and D (Baldwins Lane East and Baldwins Lane West) having the predominant flows.
- 6.36 Overall, it is considered that the cumulative traffic impact at this junction is relatively modest and certainly not severe, and the development proposal will not have an unacceptable impact on safety.
- 6.37 The full output file for the A412 Watford Road/Sea Cadets/A412 Watford Road (S)/Baldwins Lane/Car Planet roundabout, showing the geometry and capacity calculations, is included in **Appendix P** and the results are summarised in **Table 20**.

Table 20 – A412 Watford Road (E)/Sea Cadets/ A412 Watford Road (S)/Baldwins Lane/ Car Planet Roundabout–ARCADY Analysis

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue	Delay (s)	RFC	Queue	Delay (s)
2024 Surveyed Base						
A412 Watford Road (E)	0.60	2	5	0.88	8	17
Sea Cadets	0.00	0	0	0.05	0	18
A412 Watford Road (S)	0.88	8	29	0.79	4	20
Baldwins Lane	0.86	6	28	0.40	1	6
Car Planet	0.00	0	0	0.00	0	0
2030 Base						
A412 Watford Road (E)	0.64	2	6	0.93	12	26
Sea Cadets	0.00	0	0	0.06	0	22
A412 Watford Road (S)	0.95	13	49	0.85	6	29
Baldwins Lane	0.93	10	46	0.43	1	7
Car Planet	0.00	0	0	0.00	0	0
2030 Base + Committed						
A412 Watford Road (E)	0.64	2	6	0.93	12	26
Sea Cadets	0.00	0	0	0.06	0	22
A412 Watford Road (S)	0.95	14	51	0.85	6	29

Baldwins Lane	0.95	10	56	0.44	1	7
Car Planet	0.00	0	0	0.00	0	0
2030 Base + Committed + Development						
A412 Watford Road (E)	0.66	2	7	0.96	19	39
Sea Cadets	0.00	0	0	0.08	0	27
A412 Watford Road (S)	0.97	18	62	0.89	8	38
Baldwins Lane	1.05	37	126	0.48	1	7
Car Planet	0.00	0	0	0.00	0	0

- 6.38 The roundabout capacity results summarised in **Table 20** above indicate that it is likely that very little traffic travels to/from Car Planet during the peak hours. Similarly, very little or no traffic appears to travel to/from the Sea Cadets' arm during the morning peak.
- 6.39 **Table 20** indicates within the 2024 surveyed base, there were queues present along the A412 Watford Road (S) and Baldwins Lane during the morning peak. RFC values here exceed the theoretical capacity at 0.85 and again along the A412 Watford Road (E), during the evening peak period but remain under the 1.00 value.
- 6.40 **Table 20** demonstrates that the A412 Watford Road/Car Planet roundabout is forecasted to operate with modest queues and delays, and with spare capacity in both peak hours at 2024 traffic levels.
- 6.41 During the future year scenario with all development, RFC exceeds capacity slightly, at 1.05 along Baldwins Lane, with queues of 37 vehicles. This could be a result of the high flows from the A412 Watford Road (S) turning across Baldwins Lane into A412 Watford Road (E), which results in fewer opportunities for those from Baldwins Lane to join and enter the roundabout, causing delays and queueing.
- 6.42 Similarly, this could be the case for the A412 Watford Road (S) which approaches capacity and has queues of 8 vehicles during the surveyed base year, as flows from the A412 Watford Road (E) turn across the A412 Watford Road (S) into Baldwins Lane resulting in less opportunities for those from the A412 Watford Road (S) to enter the roundabout.
- 6.43 As background traffic flows begin to rise levels of delay are forecast to increase. When development traffic is added at 2030, delays on Baldwins Lane are forecast to increase from 20 seconds in the AM peak hour to 34 seconds. Nevertheless, the junction is operating within capacity parameters that are acceptable and far below any severe classification.
- 6.44 HCC commented on the previous junction modelling at the A412 Rickmansworth Road/Ascot Road/Whippendell roundabout complex and stated the roundabouts *"should be assessed as linked roundabouts, due to the lane configurations the modelling should consider lane simulation mode in ARCADY. The results show queues of between 25 - 41 vehicles in future year scenarios this level of queueing would block back onto the Whippendell Road / Ascot Road roundabout which is another reason why modelling the roundabouts as linked junctions may provide a more accurate assessment of the impacts."*
- 6.45 The two roundabouts listed below were calibrated within the Junctions 11 modelling software when using the advanced mode, so that the model could more accurately reflect the base surveyed queues:
- Junction 1 - A412 Rickmansworth Road/Ascot Road roundabout
 - Junction 2 - Ascot Road/Whippendell Road roundabout

- 6.46 These roundabouts have been calibrated using surveyed queue results. The intercept and capacity adjustments were modified in order that the base year model results more closely matched the observed queuing data in 2024 across Rickmansworth Road. Queueing data has been submitted with the traffic counts as part of **Appendix B**.
- 6.47 The full output file for the A412 Rickmansworth Road/Ascot Road/Whippendell roundabout complex showing the geometry and capacity calculations is included in **Appendix Q** and summary analysis is provided in **Table 21**.

Table 21 – A412 Rickmansworth Road Linked Ascot Road Roundabout – ARCADY

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue	Delay (s)	RFC	Queue	Delay (s)
2024 Base						
1 - A412 Rickmansworth Rd (E)	0.69	5	16	0.44	2	8
1 - Ascot Road (S)	-	1	5	-	2	5
1 - A412 Rickmansworth Rd (W)	0.59	8	19	0.35	2	7
2 – Raven Close	0.14	0	23	0.02	0	9
2 – Whippendell Road	0.98	27	119	0.65	3	12
2 – Ascot Road (S)	0.28	1	6	0.63	3	7
2 – Ascot Road (N)	-	2	6	-	1	6
2030 Base						
1 - A412 Rickmansworth Rd (E)	0.77	6	20	0.48	2	8
1 - Ascot Road (S)	-	1	5	-	3	6
1 - A412 Rickmansworth Rd (W)	0.63	14	31	0.39	2	8
2 – Raven Close	0.18	0	27	0.02	0	9
2 – Whippendell Road	1.09	58	216	0.66	3	14
2 – Ascot Road (S)	0.28	1	6	0.70	4	9
2 – Ascot Road (N)	-	3	6	-	1	6
2030 Base + Committed						
1 - A412 Rickmansworth Rd (E)	0.78	6	19	0.47	2	8
1 - Ascot Road (S)	-	1	5	-	3	6
1 - A412 Rickmansworth Rd (W)	0.63	18	35	0.40	3	8
2 – Raven Close	0.17	0	27	0.03	0	9
2 – Whippendell Road	1.06	66	251	0.69	3	14
2 – Ascot Road (S)	0.29	1	6	0.70	4	9
2 – Ascot Road (N)	-	3	6	-	1	6
2030 Base + Committed + Development						
1 - A412 Rickmansworth Rd (E)	0.82	8	23	0.50	3	9
1 - Ascot Road (S)	-	2	5	-	3	6
1 - A412 Rickmansworth Rd (W)	0.67	31	60	0.40	3	8
2 – Raven Close	0.20	0	27	0.03	0	9
2 – Whippendell Road	1.09	74	284	0.71	4	15
2 – Ascot Road (S)	0.28	1	6	0.71	3	10
2 – Ascot Road (N)	-	3	6	-	1	6

- 6.48 **Table 21** above demonstrates that there are existing issues at the A412 Rickmansworth Road and Ascot Road linked roundabout as can be seen in the surveyed queue data. Notably, there were queues of approximately 23 vehicles along the Whippendell Road, as such, the intercept and capacity adjustments have been altered to more accurately reflect surveyed queuing data and the performance of the roundabout junctions.
- 6.49 It is accepted that there are pre-existing delays and queues at the A412 Rickmansworth Road and Ascot Road roundabouts, which will be exacerbated with future year growth and which the development traffic will impact upon.
- 6.50 It is noted in particular that there are existing issues in the AM peak hour that are exacerbated by increases in background traffic flows and the addition of committed and proposed development traffic. This is seen particularly along the Whippendell Road arm.
- 6.51 Discussions with the LHA have concentrated on the delivery of active and sustainable travel measures to support the development and it is considered that the proposed measures will limit the impact of development traffic at off-site junctions. Nevertheless, discussions will continue with the LHA during the application process and will also include consultation with the local planning authority (LPA) to consider if any further measures are required to mitigate the impact of the development traffic.
- 6.52 For example, we are aware of proposals to improve walking/cycling infrastructure along the A412 corridor and, rather than seek to address any potential traffic impacts at this location, it is proposed that contributions from the development should be concentrated on promoting the LCWIP proposals. After all, the focus of the development has been on providing a residential development with; local facilities on site, improved cycle infrastructure routes and Beryl Bikes provision, a new dedicated bus service serving major interchanges and local/town centres.
- 6.53 It is proposed that discussions will continue to be undertaken with the local planning and highway authorities to consider whether any further measures beyond the active and sustainable measures are required to mitigate the impact of the development traffic.
- 6.54 We have also sought to calibrate the base model of the Durrants Drive/Baldwins Lane Roundabout against observed data. The full output file for the Durrants Drive/Baldwins Lane roundabout showing the geometry and capacity calculations is included in **Appendix R** and a summary is provided in **Table 22**.

Table 22– Durrants Drive/Baldwins Lane Roundabout– ARCADY Analysis

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue	Delay (s)	RFC	Queue	Delay (s)
2024 Base						
Durrants Drive	0.38	1	11	0.22	0	7
Baldwins Lane (E)	0.42	1	7	0.70	3	13
Baldwins Lane (W)	0.82	5	31	0.52	1	13
2030 Base						
Durrants Drive	0.41	1	12	0.24	0	7
Baldwins Lane (E)	0.44	1	8	0.74	3	15
Baldwins Lane (W)	0.86	6	40	0.55	1	14
2030 Base + Committed						
Durrants Drive	0.42	1	13	0.24	0	7

Baldwins Lane (E)	0.45	1	8	0.76	3	16
Baldwins Lane (W)	0.90	8	50	0.57	1	14
2030 Base + Committed + Development						
Durrants Drive	0.66	2	22	0.34	1	9
Baldwins Lane (E)	0.59	1	11	0.89	7	33
Baldwins Lane (W)	1.00	18	102	0.74	3	25

- 6.55 **Table 22** indicates that there are delays along Baldwins Lane within the base year. The modelling has been calibrated using surveyed queue data as the original model output results were markedly different to the queues surveyed. The capacity adjustments were modified to more closely match the observed queuing data in 2024.
- 6.56 **Table 22** demonstrates that Baldwins Lane (W) is approaching capacity in the surveyed base of 2024, with an RFC of 0.82 and a queue of 4. This increases in the future years to 0.90 with the committed development and is at 1.00 RFC in the future year with all development. This could be due to traffic flows from Baldwins Lane (W) being the most prevalent during the morning peak, whilst the flows from Baldwins Lane (E) are the most prominent during the evening peak.
- 6.57 The roundabout is predicted to operate within acceptable parameters of queueing and delay.

Other Potential Network Impacts

A412/Metropolitan Station Approach/Hagden Lane signals

- 6.58 Observations of traffic movements and queuing at this junction indicate a level of queuing beyond that which the cameras were set up to capture. However, on-site observations indicate that queues on the A412 were typically up to 15 vehicles at times during the AM peak hour. It is further noted from on-site observations that queues outside of the peak hours were relatively modest.
- 6.59 The development proposal is predicted to add just 36 two-way traffic movements to the junction during the AM peak hour and 49 in the PM peak hour; an impact of less than one vehicle movement per minute in any peak hour.
- 6.60 The impact of the proposed development at this junction is therefore considered minimal.

7.0 Sensitivity Testing

- 7.1 Section 5 of this report provides forecast vehicle trip rates from the proposed residential development making no allowance for the internalisation of trips related to significant complementary uses to the residential-led development, and the significant active travel and sustainable travel improvements planned for the development which seeks to put the needs of these modes well above those of the private car.
- 7.2 Therefore, to assess the potential impact of potential internalisation of trips as well as active and sustainable travel uptake beyond that which might normally be expected, a sensitivity test was conducted by applying a 15% reduction to development-related vehicular trips. This adjustment was used to remodel key junctions, particularly those forecast to be under stress, providing insight into the benefits on operational capacity which might be realised with the vision-led approach to the development.
- 7.3 The following junctions have been included in this sensitivity test:
- Manor Way/Baldwins Lane/ Repton Way mini roundabout
 - A412 Watford Road (E)/ Sea Cadets/ A412 Watford Road (S)/Baldwins Lane/ Car Planet Roundabout
 - A412 Rickmansworth Road/Ascot Road roundabout linked with the Ascot Road/Whippendell Road roundabout
 - Durrants Drive/Baldwins Lane mini-roundabout
- 7.4 The full output file for the Manor Way/Baldwins Lane/Repton Way mini-roundabout sensitivity test, showing the geometry and capacity calculations, is included in **Appendix O** and summarised in **Table 23**.

Table 23 – Manor Way/ Baldwins Lane/Repton Way Mini Roundabout– ARCADY Analysis (Sensitivity Test)

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue	Delay (s)	RFC	Queue	Delay (s)
2030 Base + Committed + Development Sensitivity Test						
Manor Way	0.39	1	12	0.15	0	8
Baldwins Lane (E)	0.79	4	32	1.01	21	112
Repton Way	0.30	1	9	0.28	0	11
Baldwins Lane (W)	0.96	14	74	0.79	4	25

- 7.5 **Table 23** demonstrates that traffic at the Manor Way/Baldwins Lane/Repton Way mini-roundabout forecasts show slight delays along Baldwins Lane (E) and Baldwins Lane (W), with the RFC value at 1.01 on Baldwins Lane (E) in the evening peak. Baldwins Lane (W) also experiences high demand, nearing capacity at 0.96 RFC in the AM peak.
- 7.6 Under the sensitivity scenario, both arms experience moderate improvements, with shorter delays, most notably along the Baldwins Lane eastern and western arms.
- 7.7 The full output file for the A412 Watford Road/ Sea Cadets/A412 Watford Road (S)/Baldwins Lane/Car Planet roundabout, showing the geometry and capacity calculations, is included in **Appendix P** and summarised in **Table 24**.

Table 24 – A412 Watford Road (E)/ Sea Cadets/A412 Watford Road (S)/Baldwins Lane/ Car Planet Roundabout– ARCADY Analysis (Sensitivity Test)

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue	Delay (s)	RFC	Queue	Delay (s)
2030 Base + Committed + Development Sensitivity Test						
A412 Watford Road (E)	0.66	2	7	0.96	18	37
Sea Cadets	0.00	0	0	0.07	0	27
A412 Watford Road (S)	0.97	17	60	0.89	7	37
Baldwins Lane	1.04	32	112	0.48	1	7
Car Planet	0.00	0	0	0.00	0	0

- 7.8 Referring back to the results indicated in **Table 20** we note that the sensitivity analysis presented in **Table 24** shows that under the sensitivity scenario, the junction is forecast to operate with a delay of 14 seconds per vehicle less on Baldwins Lane in the AM peak hour with five less vehicles in the queue on this arm.
- 7.9 The full output file for the A412 Rickmansworth Road/Ascot Road roundabout showing the geometry and capacity calculations are included in **Appendix Q** and summary analysis is provided in **Table 25**.

Table 25 – A412 Rickmansworth Road Linked Ascot Road Roundabout – ARCADY (Sensitivity Test)

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue	Delay (s)	RFC	Queue	Delay (s)
2030 Base + Committed + Development Sensitivity Test						
1 - A412 Rickmansworth Rd (E)	0.79	7	22	0.50	2	9
1 - Ascot Road (S)	-	1	5	-	3	6
1 - A412 Rickmansworth Rd (W)	0.67	26	52	0.40	3	8
2 – Raven Close	0.20	0	27	0.03	0	9
2 – Whippendell Road	1.09	79	296	0.71	3	14
2 – Ascot Road (S)	0.28	1	6	0.72	4	9
2 – Ascot Road (N)	-	3	6	-	1	6

- 7.10 **Table 25** shows that under the sensitivity scenario, the junction is forecast to operate with slightly improved capacity, with lower delays along the A412 Rickmansworth Road (W) during the morning peak.
- 7.11 The full output file for the Durrants Drive/Baldwins Lane roundabout, showing the geometry and capacity calculations is included in **Appendix R** and a summary of the sensitivity testing at the junction is provided in **Table 26**.

Table 26 – Durrants Drive/ Baldwins Lane Roundabout– ARCADY Analysis (Sensitivity Test)

Approach	AM Peak 08:00-09:00			PM Peak 17:00-18:00		
	RFC	Queue	Delay (s)	RFC	Queue	Delay (s)
2030 Base + Committed + Development						
Durrants Drive	0.63	2	20	0.32	1	9
Baldwins Lane (E)	0.57	1	10	0.87	7	29
Baldwins Lane (W)	0.98	16	92	0.72	3	23

- 7.12 **Table 26** indicates that under the sensitivity scenario, the junction is forecast to operate with a reduced delay (10 seconds less per vehicle) and shorter queues on the Baldwins Lane (W) arm during the morning peak.
- 7.13 The sensitivity testing across the above junctions demonstrates slight improvements in the performance of the network, particularly at the most constrained approaches. The results suggest that current trip generation estimates may be conservative, and even modest reductions in vehicular trips, achievable through the site's sustainable and vision-led approaches can lessen the delay and queuing at junctions, as the refined forecasting shows.

Overall

- 7.14 The planned active and sustainable travel improvements indicate the potential to assist in the mitigation of traffic impacts of future growth and the traffic associated with the proposed development.
- 7.15 Although the proposed active/sustainable travel improvements will benefit those outside of the development, no trip reductions have been applied to background traffic levels in the sensitivity analysis.
- 7.16 Although it is clear that queues and delays will remain on the highway network, the cumulative impact on the road network is not considered severe and neither will it lead to an unacceptable impact on highway safety.
- 7.17 Furthermore, it is considered appropriate that the focus of any mitigation measures proposed, beyond those active/sustainable travel measures to be provided as part of the development, should be focussed on active/sustainable travel measures.
- 7.18 Given that there are a number of active travel measures proposed in the LCWIP along the A412 corridor on which the development impacts, it is considered appropriate that the development contribute to the provision of these measures appropriately via s106 contribution.

8.0 Summary and Conclusion

Summary

- 8.1 This report supports an outline application for construction of up to 600 residential dwellings (Use Class C3(a)), a 5-bedroom property for children's social care and supported living (Use Class C3(b)). Two vehicular access points from Little Green Lane and further pedestrian/cycleway accesses. A one-form entry primary school (Use Class F1(a)) (plus expansion land for a two-form entry primary school). A mixed-use local centre including provision for NHS health and social care services (Use Class E(e)), community building (Use Class F2), retail and café provision (Use Class E(a-c)), car parking and associated infrastructure. A country park, areas for play and recreation, allotments, a community orchard and landscaping with associated infrastructure including sustainable urban drainage systems. (All matters are reserved except for vehicular access.)
- 8.2 A direct footway/cycleway link into the site is to be provided from Canterbury Way, providing access to a proposed cycleway along the frontage of the local centre area. The footway/cycleway runs down Canterbury Way and eastwards along Dover Way to continue on the western side of Links Way towards Baldwins Lane, giving access to the shops and Croxley Danes School at that location.
- 8.3 Vehicular site access is to be provided via the existing Durrants Drive and Links Way residential estate roads. Each road will provide direct access into the site with priority over Little Green Lane. The Durrants Drive carriageway will remain at its current width of approximately 6.8m to allow the entry/exit of buses via this route. A raised table will cover the junction, and it is intended that vehicles and pedestrians from Durrants Drive will have priority over Little Green Lane traffic.
- 8.4 Segregated footway/cycleways are to be provided around the primary access route within the development. The development will make provision for Beryl Bikes within the development focal square.
- 8.5 A dedicated bus service will be secured via s106 contribution to serve the site, also providing benefit to existing residents in the residential estate lying to the south of Little Green Lane. The bus service of half hourly frequency will serve not only residents of the site, but will also directly serve residents of the estate to the south, and improve public transport accessibility for others in the Rickmansworth and Watford areas.
- 8.6 In addition, the development will consider providing a suitable contribution towards the implementation of step-free access at Croxley Underground station. The scale and nature of this contribution remain uncertain, pending further discussions with TfL and additional correspondence to clarify the anticipated demand generated by the proposed site.
- 8.7 The development benefits from having a range of facilities typically used by residents on a day-to-day basis within an easy walk or cycle for residents of the proposal site, including facilities on site such as: 1FE primary school, local centre including; shops, community hall, and doctors' surgery. The site will also provide a country park. A suitable level of parking will be provided for all uses on the proposal site.
- 8.8 Whilst all PIAs are regrettable, the number and severity of accidents in the immediate vicinity of the site does not give any undue cause for concern and the level of traffic associated with the development will not have an unacceptable impact on highway safety.
- 8.9 It has been demonstrated that the development proposal will provide safe and suitable access for all users, including improved active travel and public transport opportunities.

- 8.10 This report addresses comments from various transport authorities relating to the forecast trips from all uses on the site and it is noted that the non-residential uses on the site will not generate significant levels of traffic and that any such traffic is likely to be on the local highway network.
- 8.11 Furthermore, as the primary school onsite is 1FE, it is likely that the majority of trips affiliated with this will also be internally distributed. As a result, the total vehicular trip generation from the proposed development is forecast to generate 315 trips during the morning peak and 304 trips during the evening peak.
- 8.12 The capacity analysis carried out on junctions on the local highway network indicates an impact of the development at certain locations. These impacts will be discussed with HCC and TRDC to consider whether any physical sustainable/highway mitigation measures are required over and above those already identified.

Conclusion

- 8.13 The National Planning Policy Framework (NPPF) states that opportunities to promote sustainable transport modes should be taken up and that safe and suitable access to the site is achievable for all users.
- 8.14 The development is well located to make use of existing infrastructure and, where deemed necessary and practical, will provide transport improvements to mitigate transport impact. The development will promote the use of sustainable modes of transport and the site provides safe and suitable access for all users.
- 8.15 Bearing the above in mind, the NPPF states that:
- 'Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network, following mitigation, would be severe, taking into account all reasonable future scenarios.'*
- 8.16 The assessment work undertaken and detailed in this report demonstrates that, in NPPF terms, the residual cumulative impacts on the road network would not be severe and will not have an unacceptable impact on highway safety.
- 8.17 On the basis of the above, it is concluded that the proposals accord with national, regional and local transport related policies and, as such, it is considered there are no reasons why the proposals should be resisted on traffic or transportation grounds.

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Land off Little Green Lane, Croxley Green

Figures

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Land off Little Green Lane, Croxley Green



Drawings

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Land off Little Green Lane, Croxley Green

Appendix A

Indicative Masterplan

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Land off Little Green Lane, Croxley Green

Appendix B

Classified Turning Count (CTC) Data

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Land off Little Green Lane, Croxley Green

Appendix C

Automatic Traffic Count (ATC) Data

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Appendix D

Personal Injury Accident (PIA) Data

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Appendix E

Active Travel Audit

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Appendix F

TRICS Outputs

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Land off Little Green Lane, Croxley Green

Appendix G

Tempo Outputs

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Land off Little Green Lane, Croxley Green

Appendix H

Journey to Work Data

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Land off Little Green Lane, Croxley Green

Appendix I

Junctions 11 PICADY Output – Site Access Junction – Little Green Lane (NE)/ Durrants Drive/ Little Green Lane (SW)

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Land off Little Green Lane, Croxley Green

Appendix J

Junctions 11 PICADY Output – Little Green Lane (NE)/ Links Way / Little Green Lane (SW)

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Land off Little Green Lane, Croxley Green

Appendix K

Junctions 11 PICADY Output – Baldwins Lane(W)/ Links Way/Baldwins Lane (E)

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Appendix L

Junctions 11 PICADY Output – A412 Watford Road (W)/New Road/ A412 Watford Road(E)

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Appendix M

Junctions 11 PICADY Output – Winton Drive/A412 Watford Road

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Appendix N

Junctions 11 PICADY Output – Winton Approach/A412 Watford Road

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Land off Little Green Lane, Croxley Green

Appendix O

Junctions 11 ARCADY Output – Manor Way/ Baldwins Lane/ Repton Way

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Land off Little Green Lane, Croxley Green

Appendix P

**Junctions 11 ARCADY Output – A412 Watford Road (E)/
Sea Cadets/ A412 Watford Road (S)/Baldwins Lane/ Car
Planet**

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Land off Little Green Lane, Croxley Green

Appendix Q

Junctions 11 ARCADY Output – A412 Rickmansworth Road linked Ascot Road roundabout

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Land off Little Green Lane, Croxley Green

Appendix R

Junctions 11 ARCADY Output – Durrants Drive/ Baldwins Lane Roundabout