

9 Transport and Access

9.1 Introduction

- 9.1.1 This chapter was prepared by i-Transport and presents an assessment of the likely significant effects of the Development on transport and highways during both the construction and completed development stages of the project. Mitigation measures are identified, where appropriate, to avoid, reduce or offset any significant adverse effects identified and/or enhance likely beneficial effects. The nature and significance of the likely residual effects are then reported. An assessment of the cumulative effects of the project with other cumulative developments (as identified in Chapter 3 and Appendix 3.4) is also presented.
- 9.1.2 The Development is assessed against two overarching scenarios: Core Scenario, which includes the North Hemel Site in isolation with committed developments; and a Cumulative Scenario which includes SADC/DBC Local Plan Sites (inclusive of North Hemel and East Hemel Hempstead).
- 9.1.3 The traffic data used to assess the implications of the Development across all scenarios has been derived from the Hemel Hempstead Paramics model. This is a microsimulation-based local model owned by HCC and operated by SLR. The study area consists of Hemel Hempstead and the surrounding suburbs.
- 9.1.4 The chapter is supported by the following appendices:
- Appendix 9.1: Transport Assessment (TA);
 - Appendix 9.2: Framework Travel Plan (FTP); and
 - Appendix 9.3: Framework Construction Traffic Management Plan (CTMP).

Competence

- 9.1.5 This Transport and Access Chapter was written by Will Fowler and Tom Haslam. Will Fowler is a Senior Transport Planner with 6 years' experience. He has provided transport support for many planning applications primarily in London and the home counties and has written ES chapters for projects including Church Street, City of Westminster, Barnsbury Estate, London Borough of Islington and Newtown Works, Ashford.
- 9.1.6 Tom Haslam is an Associate Transport Planner and Chartered Engineer with 12 years' experience in transport planning, highway engineering and traffic engineering. Tom has gained experience in both public and private sectors and has been involved with the delivery of a wide range of development projects across a mix of uses and scales. This includes similar large scale residential-led developments, including Beam Park, Dagenham.

9.2 Legislation, Planning Policy and Guidance

- 9.2.1 The following sections provide a summary of the legislation, planning policy and guidance that is of relevance to this assessment and the Development. For a detailed review, please refer to Appendix 9.1.

Planning Policy Context

National

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

- National Planning Policy Framework (2025)¹.

Regional

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

- Hertfordshire's Local Transport Plan (2018 – 2031)².

Local

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

- Draft SADC Local Plan – Draft Local Plan 2041 ('Emerging Local Plan')³.

Guidance

9.2.5 The following guidance is relevant to the Development:

- Planning Practice Guidance (PPG) (Live Document)⁴;
- HCC Highways Place and Movement Planning and Design Guide⁵;
- HGC Framework Plan⁶;
- HGC Strategic Design Code⁷; and
- HGC 2050 Transport Vision & Strategy⁸.

9.3 Assessment Methodology

Consultation

EIA Scoping Opinion

9.3.1 A request for a Scoping Opinion was submitted by the Applicant to SADC on 27 March 2025. The Scoping Report accompanied the request (Appendix 3.2). The Scoping Opinion (Appendix 3.3) was issued by SADC on 23 May which included comments from statutory consultees. Table 9.1 summarises key comments raised by consultees of relevance to this assessment during the EIA Scoping study and how the assessment responded to them.

Table 9.1: EIA Scoping Response Summary

Consultee and Comment	Response
<i>SADC Scoping Opinion (23 May 2025)</i>	
The comments of the Highway Authority and National Highways must be fully taken into account.	The comments from National Highways (NH) are presented in this table below have been considered through the assessment.
It is also advised that a Residential Travel Plan (RTP) is submitted with the application.	The application is outline only; therefore a Framework Travel Plan (FTP) has been included as part of the Application and is appended (Appendix 9.2).
The Public Rights of Way team recommend that the team review the current Right of Way network, Rights of Way Infrastructure Plan and pending Rights of Way applications.	A review of the current Public Right of Way (PRoW), Rights of Way Infrastructure Plan and pending Rights of Way applications has been included in the Baseline Conditions Section. A qualitative assessment on the impact of the Development on the PRoW network has also been undertaken.
The CTMP should also address the control of potential vibration arising from construction traffic, including remedy of road defects on the construction traffic route, which might give rise to elevated levels of vibration.	This is considered within the CTMP which is included in Appendix 9.3.
The recent DCO for Luton Airport must also be assessed with regards to potential cumulative effects with regards to transport/traffic.	The TA, EIA documents and accompanying traffic modelling for the London Luton Airport Expansion DCO has been reviewed and it is concluded that it would not have a material impact on the local highway network. The review of the London Luton Airport Expansion is detailed at from Para. 9.3.24.
<i>National Highways (25 April 2025)</i>	
Whilst specific locations are not referenced, the Strategic Road Network (SRN) is included in the potential impact receptors. National Highways would request modelling be undertaken on any SRN junction which has an increase of 30 two-way trips. The Transport Assessment Flow diagrams should show all SRN junctions.	M1 Junction 8 is included within the Paramics model extent. M1 Junction 9 is situated outside the extent of the Paramics model, standalone junction modelling has therefore been undertaken for this junction, full details of this are included within the TA (Appendix 9.1).
<i>HCC Highways (17 April 2025)</i>	
It is recommended that a TA is prepared in alignment with pre-application advice that can be provided by HCC and also in compliance with HCC's Local Transport Plan 4 (LTP4) (May 2018).	Extensive pre-application engagement with SADC as the local planning authority and HCC as the local highway authority has been undertaken and principles agreed over a range of transport matters. The LTP4 forms an

Consultee and Comment	Response
	important component of the policy and guidance (as set out in 9.2.3) used to design and develop the scheme and is referred to in the TA.
Pre-Application Consultation	
9.3.2	In addition to the consultation undertaken via the EIA Scoping process, consultation was also undertaken throughout the pre-application period with SADC and HCC across a range of highways matters. Most pertinent to the context of the EIA is the Trip Generation and Modelling workshop that was took place 8 July 2025.
9.3.3	A technical note (ITL16207-004 TN) was shared with SADC and HCC which outlined the trip generation methodology used to determine the impacts assessed in this Chapter.
9.3.4	Key points from the discussions with SADC and HCC can be summarised as follows: ▪ HCC agreed to the proposed modelling approach and scenarios including Core (without East Hemel) and Cumulative (with East Hemel); ▪ It was agreed that MSOA 005 rather than MSOA 013 would be used to derive the baseline mode share for external employment trips; ▪ HCC confirmed that the route through East Hemel will be an open route between B487 and A414, with access for all (although possibly some HGV bans); ▪ It was confirmed that in the Cumulative scenario, the trips between North Hemel and East Hemel will be accounted for in the modelling. This is particularly important for movements associated with secondary school and employment; ▪ HCC confirmed agreement with the modelling approach outlined in ITL16207-004 TN; ▪ HCC queried level of employment in East Hemel assumed for internalisation. It was confirmed that i-Transport would review the modelled employment trips to East Hemel. This has since been undertaken and outlined in Section 4.2 of ITL16207-004 TN which demonstrates 27% of workplaces may be taken up by residents at East Hemel and North Hemel; ▪ It was agreed that the 60% HGC and 40% wider Hemel Hempstead sustainable mode targets set by HGC will be a guide target, rather than aiming to the nearest percentage; and ▪ The area for highway network assessment to be undertaken is to be based on existing Paramics model area extents, agreed by HCC.
9.3.5	Detailed engagement with the applicant of the East Hemel development and their transport consultants has been undertaken, primarily to determine suitable access arrangements that would serve both Sites, as well as appropriate active travel infrastructure interventions.

Summary of Assessment Scope

9.3.6	The scope of the assessment within this chapter is limited to the following potential impacts and assessment of effects:
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Construction

9.3.7 For the construction phase of the Development, the following potential effects have been assessed:

- The impact of light and heavy vehicles on relevant links across the assessment criteria.

Completed Development

9.3.8 For the completed development, the following potential effects have been assessed:

- The impact of light and heavy vehicles on relevant links across the assessment criteria; and
- The impact of the Development on local active travel and public transport infrastructure.

9.3.9 The IEMA Guidelines⁹ identify the main transport effects that could arise from the construction and operation of new developments. These effects relate to the following:

- Severance of communities;
- Road vehicle driver and passenger delay;
- Non-motorised user delay;
- Non-motorised user amenity;
- Fear and intimidation on and by road users;
- Road user and pedestrian safety; and
- Hazardous/ large loads.

9.3.10 The 'dust and dirt' criterion is not considered further within this chapter as it covered within Air Quality Chapter.

Non-Significant Effects

9.3.11 The 'hazardous loads' criterion is also not considered in this assessment, as the construction or operation of the Development will not require the transportation of hazardous loads that would have the potential for a significant effect on receptors.

Hemel Hempstead Paramics Model

9.3.12 The Hemel Hempstead Paramics model is a microsimulation-based local model owned by HCC and operated by SLR. The study area consists of Hemel Hempstead and the surrounding suburbs capturing the key routes between the M1, A414, A41, A4146 and A4147. The flows are based off survey data and the COMET model which covers the whole of Hertfordshire in detail, extending to a lesser degree into the neighbouring districts of Essex, Bedfordshire, Cambridgeshire, Greater London.

9.3.13 The Paramics model is available to assess developments and access arrangements in more detail than the strategic COMET model. There are two future year baseline scenarios which formed the baseline of the assessments of the Development considered in this EIA:

- 2041 Hemel Hempstead Reference Case - which includes all developments built out plus additional sites already in the planning system and transport schemes with a high level of certainty; and
- 2041 Hemel Hempstead Local Plan Case - which includes the reference case plus the proposed site allocations included within the SADC and DBC Draft Local Plans.

9.3.14 The Paramics model offers the following outputs (listed below) which have been used to assess the development impacts across all relevant assessment criteria:

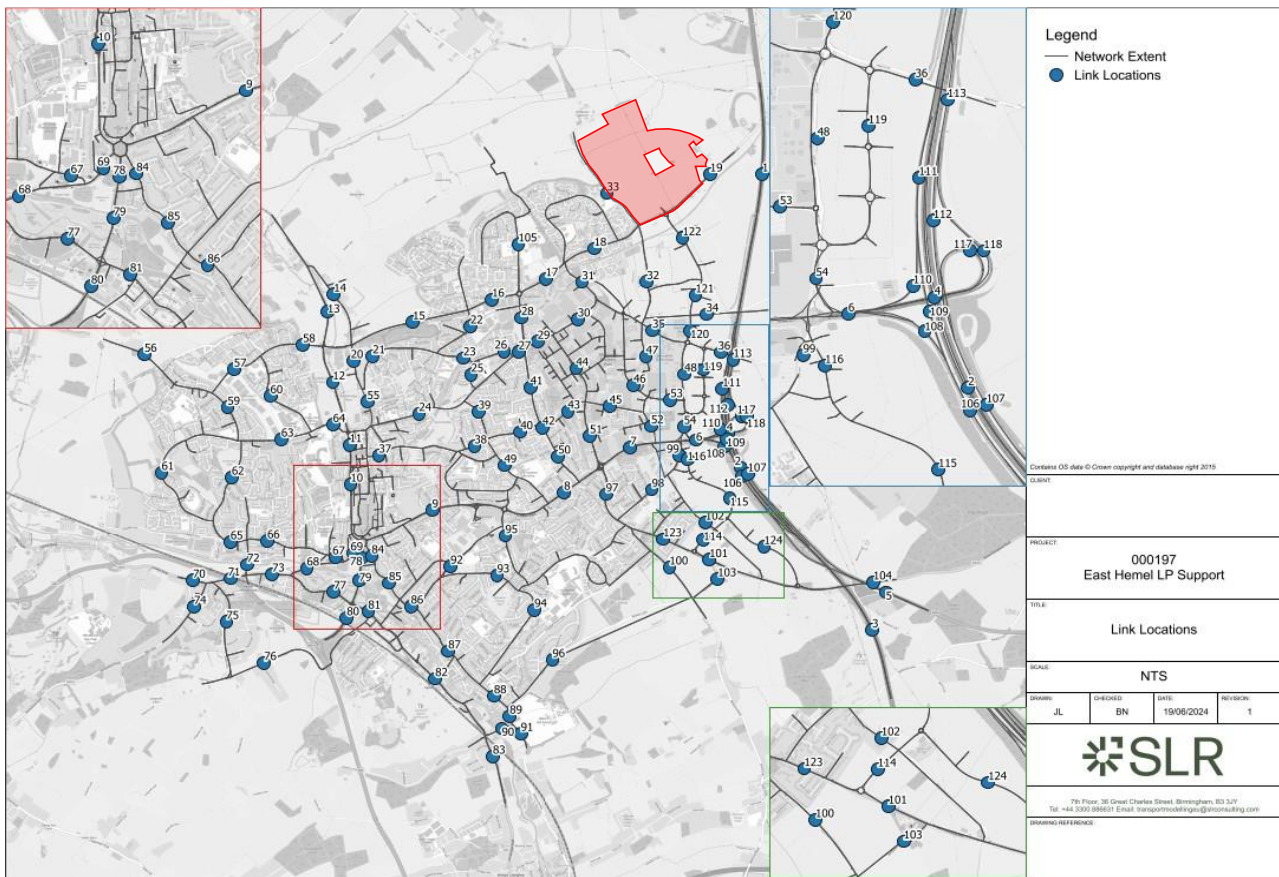
- Traffic flows (for all vehicles and HGVs);
- Journey delays; and
- Junction queues.

Study Area

9.3.15 The study area is encompassed within the Hemel Hempstead Paramics model. The extent of the study area is shown on Figure 9.1. The link locations refer to the road links where flow information is outputted from the model. The majority of the assessment criteria considered in this EIA Chapter refers to the anticipated changes in AADT or AAWT flows across links resulting from the Development or the construction phase, measured against a future baseline. Only the links that pass the IEMA thresholds for consideration as outlined in Para.9.3.29 will be assessed in this EIA Chapter. It is confirmed that no links beyond the study area exceed the IEMA thresholds for consideration.

9.3.16 The links assessed in the Paramics Model are demonstrated in Figure 9.1.

Figure 9.1: Links Assessed in the Paramics Model



9.3.17 Although the link flows across links presented in Figure 9.1 are the most pertinent output for defining effects of the operational and construction phases. The Paramics model also provides outputs for queueing and journey times. Where relevant, the model results for these outputs are referred to in order to provide a more informed link analysis across the relevant assessment criteria. Figure 9.2 and Figure 9.3 respectively demonstrate the junctions considered for the queue analysis and routes for the journey time analysis.

Figure 9.2: Queuing at Junctions Assessed in the Paramics Model

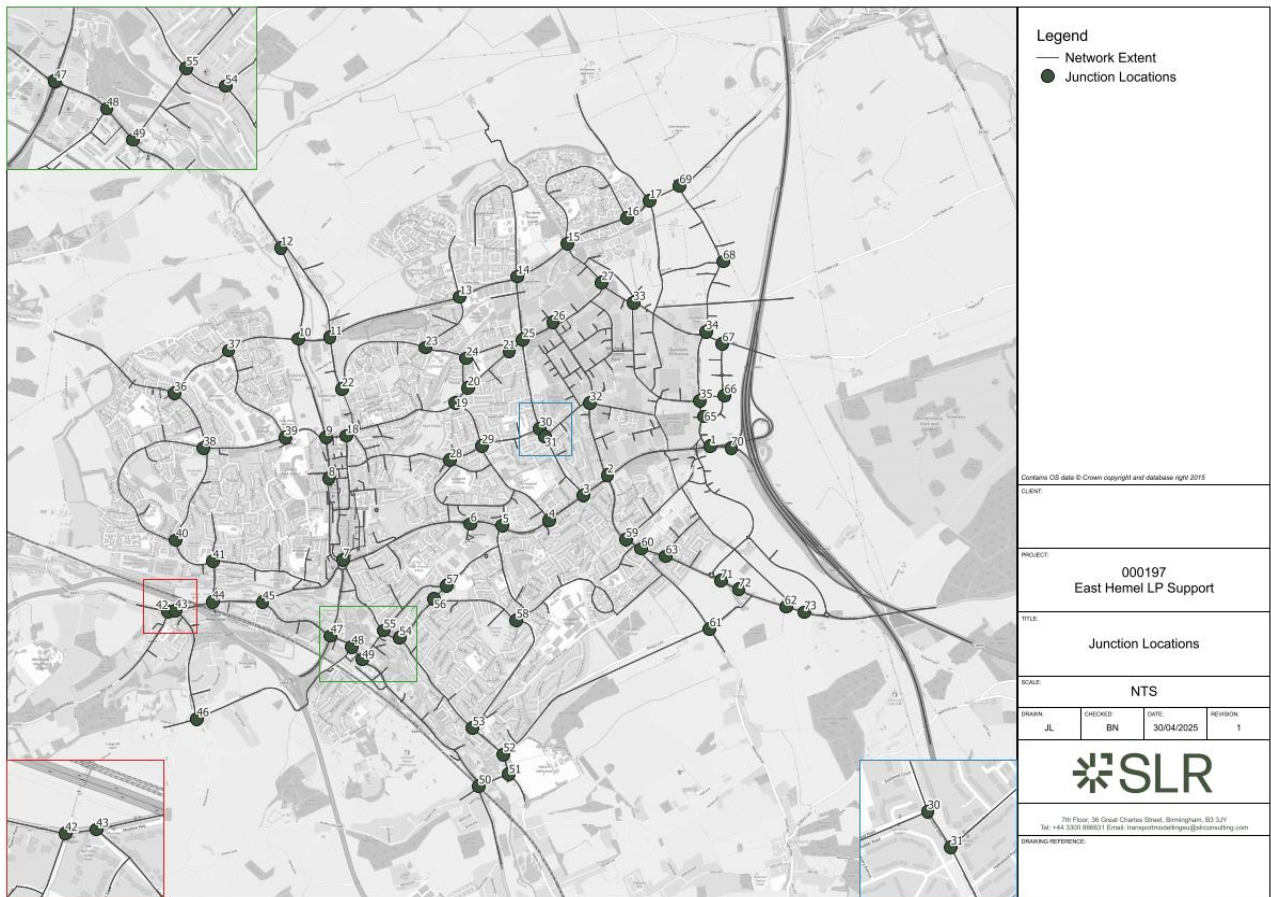
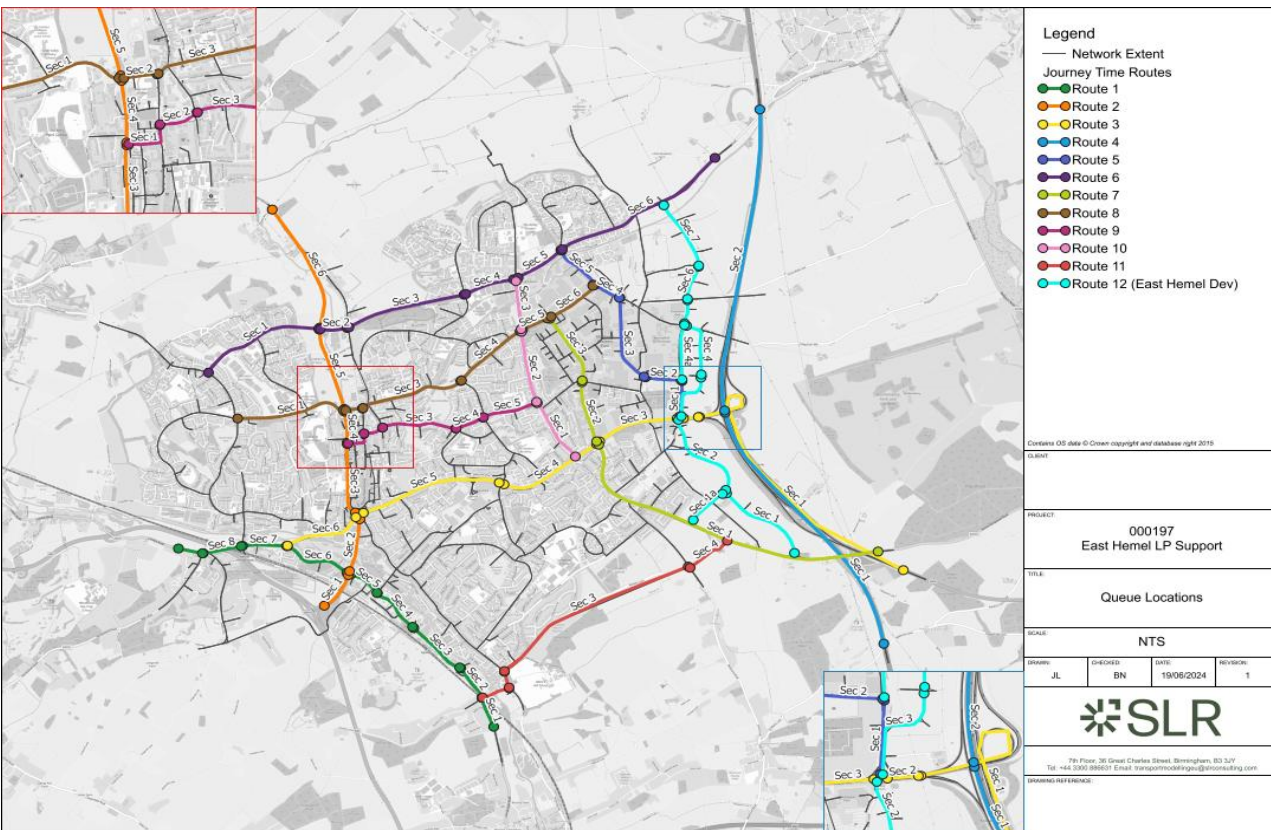


Figure 9.3: Route Journey Times Assessed in the Paramics Model



Baseline Characterisation Approach

9.3.18 For the purposes of this assessment, there is one existing baseline and two future baseline scenarios:

- 2024 Baseline;
- 2041 Reference Case; and
- 2041 Local Plan Case.

9.3.19 Table 9.2 summarises the baseline scenarios.

Table 9.2: Summary of Baseline Scenarios

Ref	Baseline	Details
1	2024 Baseline	Based on traffic survey data from 2019, factored to 2024 using TEMPro.
2	2041 Reference Case	The benchmark scenario, inclusive of all consented and allocated sites (except for HGC and its supporting infrastructure).
3	2041 Local Plan Case	As per the above plus DBC and SADC Draft Local Plan allocations, including East Hemel Hempstead (EHH). This also includes the Breakspear Way junction improvement and STC (Breakspear Phase I and II).

Existing Baseline

9.3.20 The 2024 Baseline Paramics outputs are based on surveyed traffic flow data collected at junctions and road segments. It is understood most of the data was collected in 2019 and factored accordingly.

9.3.21 Beyond deriving the 2024 flows, the approach to defining the baseline conditions within the study area for the assessment involved a combination of desk-based research and site surveys, as set out below.

Desk Study

9.3.22 The baseline conditions for the study area were informed by a review of the following information sources:

- An analysis of Personal Injury Collision data for the most recent three-year period, obtained from HCC, undertaken for all roads within the agreed study area established in the TA which has been submitted alongside the planning application;
- An assessment of existing travel behaviours for the area using Census 2011 data and information from the Hertfordshire Traffic and Transport Data Report 2023;
- A review of the emerging local plan evidence bases including the SADC Draft Infrastructure Delivery Plan and allocated sites to determine appropriate interventions and growth to assume in the Paramics model scenarios;

- A spreadsheet model developed to understand the public transport and active travel demand for prospective residents of the Development. The methodology and results of this assessment is included at Chapter 6 of the TA;
- An assessment of the existing public transport and active travel connectivity of the Site as well as possible interventions to improve connections to important destinations;
- Review of collision clusters across considered links;
- Review of local PROWs; and
- Consultation with SADC and HCC.

Field Study

- A site visit to review the existing pedestrian, cycle and public transport networks.

Future Baseline

Cumulative Schemes

- 9.3.23 The cumulative schemes that have been agreed with SADC for assessment have been reviewed to determine their potential to interact cumulatively with the Development during the construction and completed phases. Table 9.3 presents a summary of this screening exercise and identifies those that have been taken forward for the Cumulative Scenario as well as identifies the future year assessment scenarios they were included in. Those sites consented by SADC and DBC are included in both the 2041 Reference Case and 2041 Local Plan Case scenarios whilst SADC and DBC draft allocations are not yet consented so therefore are only included in the 2041 Local Plan Case scenario.
- 9.3.24 Through correspondence with SLR, it was determined that the majority of the cumulative schemes included in Table 9.3 below are included in the future year model baseline. There are however a number of sites that were scoped into the EIA assessment although do not by default feature in the future baseline Paramics model scenarios. These sites are included in the table below in ***bold italics*** and their associated flows have been derived from their accompanying transport assessments and have been input into the Paramics model by SLR upon request.

Table 9.3: List of Cumulative Schemes

No.	Planning Ref.	Location	Assessment Scenario Included in
<i>St Albans City and District Council – Planning Consents</i>			
1	5/2016/2845	Land Between Three Cherry Trees Lane and Cherry Tree Lane, Hemel Hempstead Phase 2 - Spencers Park Phase 2 West Outline planning application to include up to 600 dwellings (C3), land for primary school (D1), land for local centre uses (A1, A3, A4, A5, D1, D2), land for up to 7,500 square metres of employment uses (B1, B2, B8), landscaping, open space and play area.	2041 Reference Case and 2041 Local Plan Case

No.	Planning Ref.	Location	Assessment Scenario Included in
2	5/2021/3631	Land At Gaddesden Lane, Redbourn Construction of up to 300 new homes including 35% affordable new homes, new landscaping, public open space and associated infrastructure works.	2041 Reference Case and 2041 Local Plan Case
3	5/2024//2171	Land to East of Hemel Hempstead, Hemel Hempstead Road, Redbourn (SADC Site Allocations H2, H3, H4) Construction of up to 4,000 new dwellings (to include 40% affordable housing, 5 extra-care facilities each comprising 70-80 self-contained units, 3 nursing homes (each of 70-80 beds) and 16 supporting living units); up to 53ha of employment.	2041 Local Plan Case
4	5/2025/1946	Land Between Redbourn Bypass Scoping Opinion - Mixed use development comprising approximately 1,000 new homes, a primary school, care home facility, community buildings, employment space and green infrastructure including SANG provision.	Scoped out (as detailed in para.9.3.28)
Dacorum Borough Council – Planning Consents			
5	21/03793/MOA	Land off Green Lane, Hemel Hempstead Hybrid application for redevelopment of the Site in 4 plots to provide up to 26,640 sqm of new commercial floorspace.	2041 Reference Case and 2041 Local Plan Case
6	22/03812/MFA	Land at Eastman Way, Atlas Copco, Hemel Hempstead Industrial Estate, Swallowdale Lane, Hemel Hempstead Demolition of existing building and redevelopment of the Site to provide a commercial building (Flexible uses within Class E (g)(iii), B2 and/or B8 of the Use Class Order (including ancillary office provision)), with associated enabling works, access, parking, landscaping, and infrastructure.	2041 Reference Case and 2041 Local Plan Case
7	4/03266/18/MF	LA3, Land at West Hemel Hempstead Hybrid planning application for mixed use proposed development at west Hemel Hempstead, pursuant to Policy LA3 of the adopted Site allocations development plan	2041 Reference Case and 2041 Local Plan Case

No.	Planning Ref.	Location	Assessment Scenario Included in
		document (2017) to provide for up to 1,100 dwellings (with up to 40% affordable housing).	
8	21/04556/MFA	Plots 1 & 2 Maylands Avenue, Hemel Hempstead Construction of 234 apartments and 1,486 sqm of commercial floor space, provided in three main buildings ranging from 5 to 9 storeys on two podiums, with associated car parking, landscaping, amenity space and service areas.	2041 Reference Case and 2041 Local Plan Case
9	19/02749/MOA	Land at Marchmont Farm, Piccotts End Lane, Hemel Hempstead Outline planning for up to 350 dwellings, land for 5 gypsy & traveller pitches. Vehicular access from A4147, public open space including extension to Margaret Lloyd Park and associated landscaping, infrastructure and drainage. Detailed approval for access arrangements	2041 Reference Case and 2041 Local Plan Case
10	21/04508/MOA	Land West of Leighton Buzzard Road and North of Galley Hill Leighton Buzzard Road, Hemel Hempstead Construction of up to 390 dwellings (C3 Use), including up to 40% affordable housing and 5% self-build, a residential care home for up to 70-beds (C2 use), along with associated landscaping and open space with access from Leighton Buzzard Road.	2041 Reference Case and 2041 Local Plan Case

SADC Site Allocations

B3	West Redbourn	Residential-led scheme of approximately 545 units and a new 2FE Primary school.	2041 Reference Case and 2041 Local Plan Case
M6	South of Harpenden Lane, Redbourn	Residential-led scheme of approximately 68 units.	2041 Reference Case and 2041 Local Plan Case

Dacorum Borough Council Draft Site Allocations (Draft DBC Local Plan)

No.	Planning Ref.	Location	Assessment Scenario Included in
Hm01	North Hemel Hempstead Growth Area	Around 1,500 dwellings by 2041, with up to 3,500 additional homes (to include provision for older people) to be delivered beyond the plan period subject to masterplanning; three 3FE and one 2FE primary schools (including nursery provision on three); and one 8FE secondary school. Gypsy and Traveller Site for 8 pitches.	2041 Local Plan Case
Hm03	Hemel Hempstead Hospital	Around 450 dwellings (to include provision for older people), subject to master planning and a 3FE primary school (including nursery provision).	2041 Local Plan Case
Hm04	Paradise	Around 350 dwellings, subject to masterplanning with Class E and F1 uses at ground floor level where viable.	2041 Local Plan Case
Hm06	Riverside	Around 500 Homes subject to masterplanning with main town centre uses appropriate at ground floor level and expansion of the car park.	2041 Local Plan Case
Hm13	Polehanger Lane	Around 750 homes including provision for older people, subject to master planning. A neighbourhood centre to include a community building. A 2FE Primary school (including nursery provision). Suitable Alternative Natural Greenspace (16ha).	2041 Local Plan Case
Other Sites			
DCO	London Luton Airport Expansion		Scoped out (as detailed in para.9.3.26)

9.3.25 It should be noted that these cumulative developments were included based on their proximity to the Site and their propensity to impact links local to the Site. Additional sites to those listed in the above table have been included within the scenarios modelled in Paramics, given the model's coverage of the whole of Hemel Hempstead. These are detailed within SLR's Paramics Model Development Inclusion Document included as an Appendix to the Transport Assessment (Appendix 9.1).

9.3.26 With regards the London Luton Airport Expansion, the Transport Assessment, EIA documents and accompanying traffic modelling has been reviewed. The southernmost link modelled as part of the assessment was the M1 between Junctions 9 and 10. The worst-case increase in trips along this link is 1.5% for northbound vehicles and 1.8% for southbound (Table B.3 in "7.02 Transport Assessment Appendices - Part 2 of 3 (Appendix F)"). During the construction scenario, there is 0.2% increase in two-way trips along the link (Table 18.10 in "5.01 Environmental Statement Chapter 18 Traffic and Transportation").

- 9.3.27 It is anticipated that the majority of the 1.5-1.8% increase in trips along the M1 corridor associated with the airport expansion would route beyond Hemel Hempstead rather than onto links considered within the Hemel Hempstead model. It was therefore concluded that the London Luton Airport Expansion would not be included as committed development.
- 9.3.28 An EIA Scoping Report was submitted in October 2025 for a mixed-use development comprising approximately 1,000 new homes, a primary school, care home facility, community buildings and employment space at Land Between Redbourn Bypass, Dunstable Road and Harpenden Lane, Redbourn, Hertfordshire. Given this site is not allocated in the existing or emerging SADC Local Plan, nor has a planning application been submitted, it has been scoped out of this assessment.

Assessment Method

- 9.3.29 This EIA chapter seeks to assess the potential environmental impacts of traffic generated by the Development during the construction and operation phases. The assessment provides detail on the anticipated traffic flows to and from the Site
- 9.3.30 The assessment of individual environmental elements will be carried out in accordance with the 'Guidelines for the Environmental Assessment of Road Traffic' and 'LA 104 Environmental Assessment and Monitoring'. These documents are appropriate tools for the appraisal of environmental impacts of transport and access, and they identify appropriate standards for assessment.
- 9.3.31 As per IEMA (2023) guidelines, the scope of links includes roads which may experience higher traffic temporarily or indefinitely as a result of the Development.
- 9.3.32 The IEMA Guidelines suggest two broad rules to identify the appropriate extent of the highways assessment area, which are as follows:
- Rule 1: Include highway links where traffic flows will increase by more than 30% (or the number of heavy good vehicles will increase by more than 30%); and
 - Rule 2: Include any other specifically sensitive areas where traffic flows have increased by 10% or more.
- 9.3.33 Increases in traffic flows below 10% are not generally considered to be material in environmental terms, given that daily variations in background traffic flow may also vary by this amount. As such, where the predicted increases in traffic flows are lower than the above thresholds, the IEMA Guidelines suggest that the significance of the effects should be stated to be 'Negligible', and therefore further assessment as part of the EIA would not be warranted.
- 9.3.34 Therefore, whilst the study area includes all links on the Site's surrounding local and strategic road network that are likely to be subject to daily traffic flow changes as a result of the Development's construction or operation, a full assessment has only been undertaken on those links which satisfy the conditions set out in the rules above.
- 9.3.35 The receptors that have been identified for assessment of the Development have been determined based on professional judgement; this has taken into account their relative importance for all road users, and their existing characteristics such as the presence (or absence) of pedestrian facilities.

9.3.36 The assessment scenarios assessed within this Chapter are presented in Table 9.4.

Table 9.4: Summary of Future Assessment Scenarios

Ref	Scenario	Details
4	2041 Core Scenario	Considers the impact of the Development against the 2041 Reference Case.
5	2041 Cumulative Scenario	Considers the impact of the Development against the 2041 Local Plan Case.
6	2041 Construction	Considers the impact of the peak construction period against the 2041 Reference Case.

2041 Construction Phase Scenario

9.3.37 The indicative programme for construction works is approximately 13 years, with works assumed to commence in 2028 and complete by 2041. The peak year of construction is assumed to be 2033. The transport effects of the Development during the construction phases are considered through the key transportation issues and include the following:

- Vehicle routing;
- Demolition and construction traffic impact;
- Pedestrian and cycle impact; and
- Public transport impact.

9.3.38 With regards the construction assessment baseline, IEMA Guidelines recommend...

“...that the environmental assessment should be undertaken at the construction/decommissioning phase, year of opening of the project or the first full year of its operation.”

9.3.39 This is because...

“...the natural increase of traffic will generally have the effect of diluting the environmental impact of a project.”

9.3.40 The 2041 Reference Case has therefore been assumed as the baseline that the construction impacts will be assessed against. This is a realistic assumption as it is unlikely that the Local Plan infrastructure interventions will be developed by the time construction is underway. The 2041 Reference Case also presents a worst case in terms of Development impacts as there is less traffic on the network than the 2041 Local Plan Case, thereby the construction traffic represents a higher proportion.

Construction Trip Generation

9.3.41 The number of construction related vehicle movements have been derived from a survey undertaken during the construction of a new residential led mixed use development at The Steadings, Cirencester. The subject site comprises Phase 1A parcel of a large residential led mixed-use development (including up to 2,350 residential dwellings, 9.1 hectares of

employment land, a primary school, a neighbourhood centre as well as community facilities and public open space.

9.3.42 A total of 22 plots were under construction on-site at the time of the survey with the rate of construction in line with a buildout rate of 1 per week, i.e. approximately 50 dwellings per year.

9.3.43 The average daily AAWT during the peak construction phase is summarised in Table 9.5.

Table 9.5: Peak AAWT Construction Movements

AAWT	Arr	Dep	Two-Way
No. Cars	26	26	52
No. LGV	70	70	140
No. Plant	11	11	22
No. HGV	32	32	64
Total vehicle movements	139	139	278

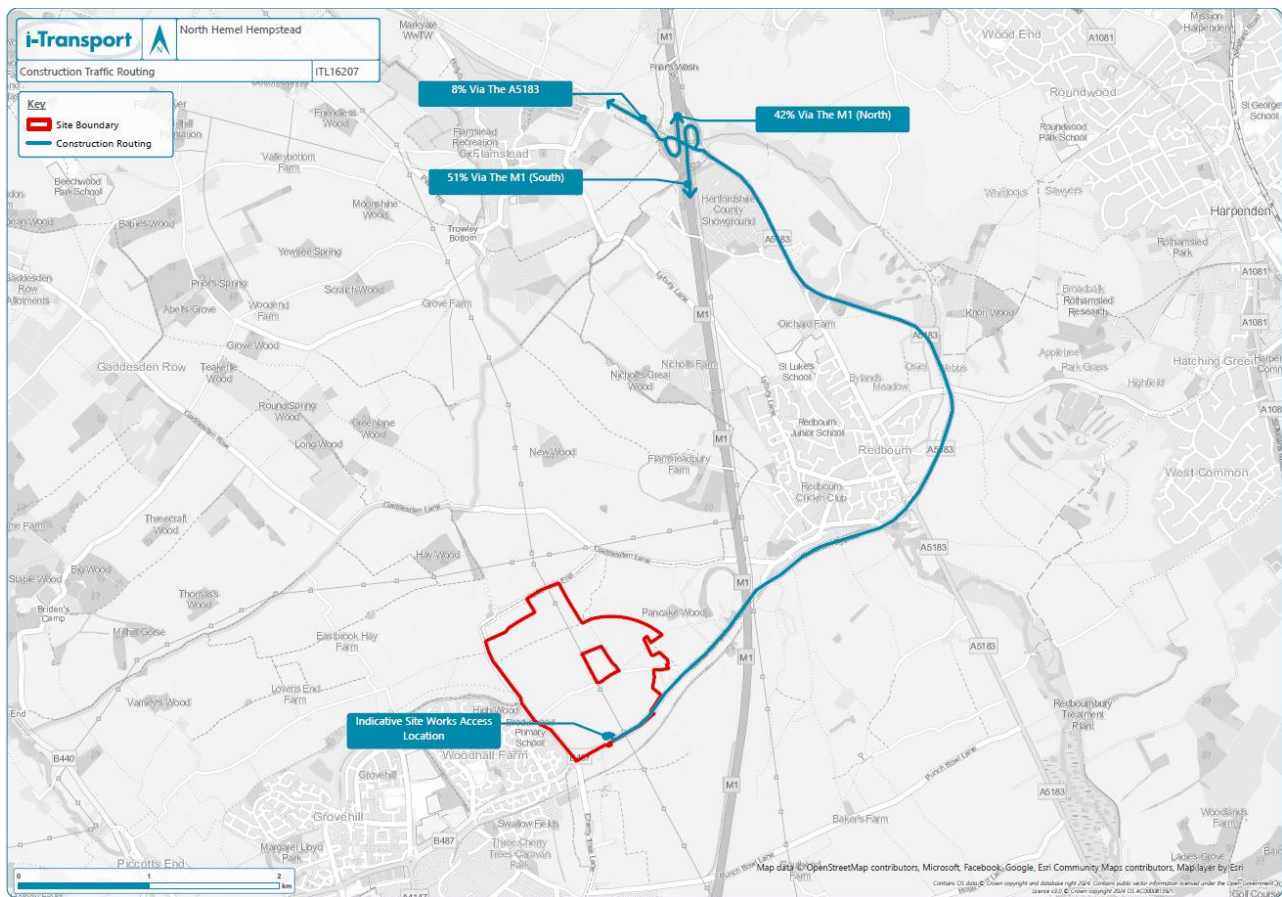
Construction Vehicle Routing

9.3.44 Outputs from the COMET model have been used to determine the construction vehicle distribution. Large construction vehicles, i.e. OGV1, OGV2 and Plant are anticipated to all route to/from M1 J9 via B487 Redbourn Road, at which point they would distribute along the M1 North, M1 South and A5183 with the proportion split shown in Table 9.6. Proposed construction HGV routing, as defined by the Framework CTMP, is shown on Figure 9.4.

Table 9.6: HGV Turning Proportions at M1 Junction 9

Route	Proportion of Large Construction Vehicles
M1 North	42%
M1 South	51%
A5183	8%

Figure 9.4: Construction HGV Routing



9.3.45 With regards to the light construction vehicles, i.e. cars and LGVs, these have been distributed onto the network using the assignment in the Paramics microsimulation that was also assumed for the operational vehicle trips.

Construction Impacts

9.3.46 The assessment of construction trips across all links in the study area included in SLR's Paramics Model Development Inclusion Document demonstrates that the temporary uplift in total vehicles or HGVs during the construction scenario does not exceed 30% and thus in accordance with IEMA guidance (i.e. *"the number of heavy good vehicles will increase by more than 30%"*), does not warrant further investigation.

2041 Completed Development Scenarios

9.3.47 As identified in Table 9.4, the Development is assessed against two overarching scenarios: Core, which will include the Site in isolation with committed development; and, Cumulative which will include SADC/ DBC Draft Local Plan site allocations.

9.3.48 The potential effects of the Development have been determined by comparing the future baseline without the Development and future baseline with the Development.

Completed Development Operational Trip Generation, Internalisation and Mode Share

9.3.49 The total person trip generation remains consistent between the Core and Cumulative Scenario. It is the wider context of the scenarios that influences the internalisation and mode share of each scenario.

9.3.50 Table 9.7 demonstrates the total person trip rates and resultant trip generation for the Development, based on the full Development build-out of 1,500 homes and Table 9.8 shows the trip generation for the proposed primary school. This trip generation is presented across the three-hour morning and evening peak periods.

Table 9.7: Total person trip rates and trip generation

	AM Peak Period 07:00-10:00			PM Peak Period 16:00-19:00		
	<i>Arr.</i>	<i>Dep.</i>	<i>Two-way</i>	<i>Arr.</i>	<i>Dep.</i>	<i>Two-way</i>
Trip Rate	0.507	1.600	2.107	1.519	0.740	2.259
Trip Generation (1,500 homes)	761	2,400	3,161	2,279	1,110	3,389

Table 9.8: Primary school trip generation

	AM Peak Period 07:00-10:00			PM Peak Period 16:00-19:00		
	<i>Arr.</i>	<i>Dep.</i>	<i>Two-way</i>	<i>Arr.</i>	<i>Dep.</i>	<i>Two-way</i>
Pupil	630	0	630	0	32	32
Parent	315	315	630	16	16	32
Staff	43	0	43	0	43	43

9.3.51 The Development includes a local centre, primary school, leisure and recreational journeys, a significant proportion of day-to-day trips are therefore expected to be internalised. Although the Development does not include employment or a secondary school, these uses are expected to be delivered and available within the wider HGC area as part of the neighbouring East Hemel development. This attraction of employment trips to East Hemel is considered in the Cumulative Scenario. In the Core Scenario, there are existing schools and employment opportunities in the local area. A proportion of internalisation has been determined across all trip purposes accordingly for both the Core and Cumulative Scenarios. This is presented in detail in the TA.

9.3.52 In terms of determining the mode share, the Hertfordshire County Travel Survey (2022)¹⁰ has been referred to for trips under 1 mile (internal trips) assuming some minor adjustments. Whilst mode shares for external trips have been derived and adjusted from various sources including TRICS, Census 2011 and Hertfordshire Traffic and Transport Data Report (2022). The methodology and assumptions and calculations for the mode share are presented in more detail in the TA.

Table 9.9: Core Scenario Multi-modal Trip Generation

Total	AM (0800-0900)			PM (1700-1800)		
	<i>In</i>	<i>Out</i>	<i>Tot</i>	<i>In</i>	<i>Out</i>	<i>Tot</i>
<i>External</i>						
Walk	115	222	336	97	47	144
Cycle	17	43	60	32	16	48

Total	AM (0800-0900)			PM (1700-1800)		
	<i>In</i>	<i>Out</i>	<i>Tot</i>	<i>In</i>	<i>Out</i>	<i>Tot</i>
Bus	34	97	131	55	27	81
Train	8	24	32	14	7	21
Car Driver	101	290	391	294	141	434
Car Passenger	59	99	158	60	29	89
<i>Internal</i>						
Walk	772	69	841	215	98	313
Cycle	15	2	17	7	3	11
Bus	17	2	19	6	3	8
Train	0	0	0	0	0	0
Car Driver	87	10	97	32	15	47
Car Passenger	2	6	9	20	9	29

Table 9.10: Cumulative Scenario Multi-modal Trip Generation

Total	AM (0800-0900)			PM (1700-1800)		
	<i>In</i>	<i>Out</i>	<i>Tot</i>	<i>In</i>	<i>Out</i>	<i>Tot</i>
<i>External</i>						
Walk	64	86	149	71	35	106
Cycle	11	26	37	26	12	38
Bus	16	47	64	42	20	62
Train	4	12	15	11	5	17
Car Driver	72	203	275	252	121	373
Car Passenger	36	40	76	50	24	74
<i>Internal</i>						
Walk	887	643	1530	295	137	433
Cycle	16	12	29	9	4	14
Bus	22	22	44	8	4	12
Train	0	0	0	0	0	0
Car Driver	91	50	140	40	19	59
Car Passenger	8	22	30	26	12	38

9.3.53 The 2041 Core Scenario Development flows account for the standalone context of the Site. The Development flows are therefore higher than the 2041 Cumulative Scenario given this scenario does not consider the opportunities for a higher proportion of active travel trips that would result from the delivery of Local Plan allocations close by, namely East Hemel.

- 9.3.54 The above vehicle trip generation is distributed and assigned to the network by the Paramics model. The impacts of the Development trips on the modelled network are demonstrated in the following sections for the Core and Cumulative scenarios.

Core Scenario Impact

- 9.3.55 SLR's Paramics Model Development Inclusion Document demonstrates the impact of the Development in the Core Scenario across all the links in the study area.
- 9.3.56 Table 9.11 demonstrates the links that qualify for further consideration as the increase in vehicles resulting from the Development in the context of the future reference case scenario, exceed 10%. The Magnitude of Impacts of the Development flows on these links are assessed in the Assessment of Effects section of the Chapter.

Table 9.11: Links Requiring Further Assessment – Core Scenario

Link Ref	Location
32	Cherry Tree Lane
35	Three Cherry Trees Lane (E of Buncefield Lane)
48	Green Lane (N of Boundary Way)

Cumulative Scenario Impact

- 9.3.57 SLR's Paramics Model Development Inclusion Document demonstrates the impact of the Development in the Cumulative Scenario across all the links in the study area.
- 9.3.58 Table 9.12 demonstrates the links that qualify for further consideration as the increase in vehicles resulting from the Development in the context of the future reference case scenario, exceed 10%. The Magnitude of Impacts of the Development flows on these links are assessed in the Assessment of Effects section of the Chapter.

Table 9.12: Links Requiring Further Assessment – Cumulative Scenario

Link Ref	Location
119	North Green Lane Bypass
120	Scheme Road North S
121	Scheme Road North Central
122	Scheme Road North N

Assessment Criteria

Methodology for Defining Effects

- 9.4.1 The potential environmental effects in relation to transport mainly arise from increases in traffic flows and HGV movements along the adjacent highway links during operational and construction periods.
- 9.4.2 The assessment has been undertaken in accordance with relevant policies and guidance, including the IEMA Guidelines, and as such the criteria established above are considered appropriate to assess whether the potential transport effects of the Development will be significant. As outlined above, the potential effects have been assessed with reference to quantitative criteria unless it is appropriate to consider the effect in a qualitative manner, or it is not possible to undertake a quantitative assessment. Where qualitative assessment criteria are applied, a professional judgement will be made and any relevant assumptions or uncertainties identified.
- 9.4.3 The scale of effect on a receptor, will be determined by combining the predicted magnitude of the impact with the sensitivity of the receptor under consideration.
- 9.4.4 Further details of the approach to the assessment in respect of sensitivity, magnitude and the various aspects of the assessment (i.e. Severance of communities; Road vehicle driver and passenger delay; Non-motorised user delay; Non-motorised user amenity; Fear and intimidation on and by road users; Road user and pedestrian safety) is provided below.

Sensitivity of Receptor

- 9.4.5 Receptor sensitivity descriptors are set out in Table 9.13.

Table 9.13: Receptor Sensitivity Descriptors

Value (Sensitivity)	Descriptor
High	High importance and rarity, and limited potential for substitution. Includes receptors of greatest sensitivity to traffic flows: schools, colleges, playgrounds, accident black spots (with reference to appropriate accident data), retirement homes, and urban / residential roads without footways that are used by pedestrians
Medium	Medium importance and rarity, and limited potential for substitution. Receptors sensitive to traffic flow include: congested junctions, doctors' surgeries, hospitals,

Value (Sensitivity)	Descriptor
	shopping areas with roadside frontage, roads with narrow footways, unsegregated cycleways, community centres, parks, and recreation facilities
Low	Low importance and rarity. Receptors with some sensitivity to traffic flow include: places of worship, public open space, nature conservation areas, listed buildings, tourist attractions, and residential areas with adequate footway provision
Negligible	Very low importance and rarity, and local scale. Receptors include with low sensitivity to traffic flows and those sufficiently distant from affected roads and junctions

Magnitude of Impact

Severance

- 9.4.6 The IEMA Guidelines states that *“Severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery”*, whilst DMRB LA 112 Rev 1 ‘Population and human health’ defined severance as *“The extent to which members of communities are able (or not able) to move around their community and access services / facilities”*
- 9.4.7 It is acknowledged within the Guidelines that the measurement and prediction of severance is “extremely difficult” and that *“there are no predicative formulae which give simple relationships between traffic factors and levels of severance”*, however, the Guidance tentatively suggests that *“Changes in traffic flow of 30%, 60% and 90% are regarded as producing ‘slight’, ‘moderate’ and ‘substantial’ changes in severance respectively”*.
- 9.4.8 The assessment of severance in this ES chapter pays full regard to specific local conditions, in particular the location of pedestrian routes to key local facilities, and whether or not crossing facilities are provided.
- 9.4.9 Table 9.14 sets out the Magnitude of Impact descriptors typically used in the severance assessment.

Table 9.14: Severance Magnitude of Impact Descriptors

Impact Magnitude	Descriptor
High	90% or greater change in traffic flow
Medium	60% to 89% change in traffic flow
Low	30% to 59% change in traffic flow
Negligible	Less than 30% change in traffic flow

Driver Delay

- 9.4.10 Para. 4.33 of the IEMA Guidelines states that *“Traffic delays to non-development traffic can occur at several points on the network surrounding the Site including: at the Site entrance, on the highways passing the Site, at other key intersections or / and at side roads where the ability to find gaps in traffic may be reduced, thereby lengthening delays”*.

- 9.4.11 Values for delay due to these elements can be determined through the use of ‘industry-standard’ junction modelling software packages (the ARCADY and PICADY modules of TRL’s Junctions 10 program), or other suitable programs. The IEMA Guidelines further state that *“These delays are only likely to be significant when the traffic on the network surrounding the proposed development is already at, or close to, the capacity of the system”*.

Table 9.15: Driver Delay Magnitude of Impact Descriptors

Impact Magnitude	Descriptor
High	Average vehicle delay changes of more than 60 seconds as a result of the Development during the peak hour periods
Medium	Average vehicle delay changes of 30 – 60 seconds as a result of the Development during the peak hour periods
Low	Average vehicle delay changes of 20 – 30 seconds as a result of the Development during the peak hour periods
Negligible	Average vehicle delay changes of less than 20 seconds as a result of the Development during the peak hour periods

Pedestrian/Cycle Delay and Amenity

- 9.4.12 Pedestrian delays for a particular walking journey can be increased by changes to traffic flows and can affect the ability of pedestrians to crossroads. This will therefore affect an individual’s desire to make particular journeys on foot.
- 9.4.13 Para. 4.35 of the IEMA Guidelines states that *“Changes in the volume, composition or speed of traffic may affect the ability of people to cross roads”*, dependent on the *“level of pedestrian activity and the general visibility and physical conditions”* at the Site.
- 9.4.14 For the purposes of this assessment, the scale of magnitude set out in Table 9.16 will be used to categorise and assess the impact on non-motorised user delay, with the characteristics of the link-receptor and professional judgement taken into consideration.

Table 9.16: Non-motorised User Delay and Amenity Magnitude of Impact Descriptors

Impact Magnitude	Descriptor
High	Link subject to a two-way traffic flow of more than 5,600 vehicles per hour
Medium	Link subject to a two-way flow of 3,500 – 5,600 vehicles per hour
Low	Link subject to a two-way flow of 1,400 – 3,000 vehicles per hour
Negligible	Link subject to a two-way flow of less than 1,400 vehicles per hour

- 9.4.15 Pedestrian amenity is broadly defined as the *“relative pleasantness of a journey”*, and it is affected by traffic flow, traffic composition, and pavement width / separation from traffic. Based on qualitative factors, pedestrian amenity can be assessed with reference to the levels of connectivity, safety, crossing facilities, lighting, barriers, and attractiveness.

- 9.4.16 The IEMA Guidelines suggest a tentative threshold for judging the significance of changes in pedestrian amenity where traffic flow (or its lorry component) is halved or doubled.
- 9.4.17 For the purposes of this assessment, if this is not met the Magnitude of Impact can be described as 'Negligible'.

Fear and Intimidation

- 9.4.18 The impact on levels of fear and intimidation is dependent upon the volume of traffic, its Heavy Goods Vehicles (HGV) composition, the proximity to people, and / or the lack of protection caused by such factors as narrow pavement widths.
- 9.4.19 The IEMA 2023 guidelines suggest thresholds based on 18-hour daily flow and vehicle speeds.

Table 9.17: Fear and Intimidation Magnitude of Impact Descriptors

Magnitude	Average Hourly Two-Way Traffic Flow Over 18-Hour Day	Total 18-Hour HGV Flows	Average Vehicle Speed Over 18-Hour Day (mph)	Degree Of Hazard Score
High	> 1,800	> 3,000	> 40	30
Medium	1,200 – 1,800	2,000 – 3,000	30 – 40	20
Low	600 – 1,200	1,000 – 2,000	20 – 30	10
Negligible	< 600	< 1,000	< 20	0

- 9.4.20 It should, however, be reasserted that whilst quantitative thresholds are suggested, the experience of road users is dependent on qualitative factors such as the availability of pedestrian facilities. These thresholds also do not take into consideration how change in traffic flow is perceived by road users; for example, a small rise in flows on a link already experiencing higher traffic volumes is unlikely to correspond with higher levels of fear and intimidation as it is likely to be in line with the existing perception of the road.
- 9.4.21 In light of this, the guidance relating to the percentage change in traffic flow will additionally be utilised to understand higher trafficked roads (those with 'Medium' or 'High' baseline levels) where the perception of the road and therefore the levels of fear and intimidation is unlikely to be impacted. If the additional traffic is in line with the existing perception of the area, i.e., a 'Negligible' increase in traffic flow, the impact will be described as 'Negligible'.

Accidents and Safety

- 9.4.22 The IEMA Guidelines suggest that *“Professional judgement will be needed to assess the implications of local circumstances, or factors which may elevate or lessen risks of accidents, e.g. junction conflicts”*.
- 9.4.23 For the purposes of this assessment, links where no inherent highway safety issues were identified in the Baseline scenario are described as having a 'Negligible' magnitude. Where a professional review of the Development and potential traffic impact suggests that there

will be no effect on highway safety in the area, the impact magnitude will be described as 'Negligible'.

- 9.4.24 Table 9.18 sets out the criteria which shall be used to assess the impact of the Development on accidents and highway safety.

Table 9.18: Accidents and Safety Magnitude of Impact Descriptors

Impact Magnitude	Descriptor
High	Expected change in accident risk of 15%+
Medium	Expected change in accident risk of 10 – 14%
Low	Expected change in accident risk of 5 – 9%
Negligible	Expected change in accident risk of less than 5%

- 9.4.25 Cumulative Schemes and local improvement schemes have additionally been reviewed and factored into the assessment of accidents and safety.

Assessing Significance

- 9.4.26 Table 9.19 sets out the matrix approach to determining the scale of effect. Determining the scale of transport and access effects requires professional judgement therefore the matrix includes a degree of flexibility when considering the magnitude of an impact in the context of the sensitivity of the receptor. The following criteria is applied to the effects:

- 'Moderate' or 'major' are deemed to be 'significant';
- 'Minor' are considered to be 'not significant', although they may be a matter of local concern; and
- 'Negligible' effects are considered to be 'not significant'.

- 9.4.27 The assessment of significance considers the future transport conditions (without Development) as a baseline and provides a prediction of the future effect on the transport network for the construction and operation phases of the Development.

- 9.4.28 The nature of the effects may be either adverse (negative) or beneficial (positive).

- 9.4.29 The effect of significance is to be derived from measures of the magnitude (or scale) of the change and the sensitivity (or importance) of the receptors affected. Categories of sensitivity and magnitude will be defined and assessed to determine the significance of the effect following the principles set out by the IEMA Guidelines.

Table 9.19: Significance of Effect Matrix

Sensitivity / Value of Receptor	Magnitude of Impact			
	High	Medium	Low	Negligible
High	Major	Major / Moderate	Moderate	Negligible
Medium	Major / Moderate	Moderate	Moderate / Minor	Negligible
Low	Moderate	Moderate / Minor	Minor	Negligible

Sensitivity / Value of Receptor	Magnitude of Impact			
	High	Medium	Low	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Assumptions and Limitations

9.4.30 In undertaking the traffic and transport assessment of the Site and wider surrounding area, several assumptions have been applied, however, these comprise the standard assumptions and limitations inherent to assessments of this nature. As such they are not considered to affect the validity of the results. The following assumptions and limitations have informed this assessment:

- The future baseline link flows presented in this EIA do not correspond with those referenced in the TA. This is because the Paramics model outputs used in the EIA consider an extended scope of cumulative development schemes, as agreed during the EIA scoping exercise and detailed in Table 9.2;
- Paramics does not simulate dynamic route choice based on congestion or real-time conditions, which can limit its realism in complex networks;
- The Sustainable Transport Corridor (STC) (referred to in this chapter as 'The Scheme Road') forms the spine road of the Site. The Site access is represented as a node in the Paramics model, rather than a link included within the assessment. Within the Site, the highest flows along the STC will be at the Eastern Junction where all general traffic accesses the Site. Flows at this point are 749 two-way vehicle trips between 07:00-10:00 and 929 two-way vehicles between 16:00-19:00. Flows will reduce north beyond this point as vehicles access the respective development parcels. In the Cumulative Scenario, the STC continues south through East Hemel providing a connection to M1 Junction 8. This has been assessed within the traffic and transport link assessment and are included as links 119, 120, 121 and 122; and
- In the Core Scenario, the Paramics model assumes the Site access is a minor arm on B487 Hemel Hempstead Road. In the Cumulative Scenario, a crossroad junction is shared with East Hemel allowing the north-south alignment of the STC. The details of the proposed access arrangements across both the Core and Cumulative Scenarios are included in the TA. The 'trigger points' associated with the delivery of the STC are to be agreed through reserved matters applications.

9.5 Baseline Conditions

Existing Baseline

9.5.1 The Site is in the Redbourn ward within SADC to the east of the town of Hemel Hempstead. The Site is predominantly used for agriculture, and employment associated with this use is likely to be low. There is also currently very low demand for social infrastructure (e.g. schools and healthcare) as there is only a single residential property within the centre of the Site (although outside the planning application boundary). The Site is not known to currently offer any recreation, or leisure uses other than the use of PROWs.

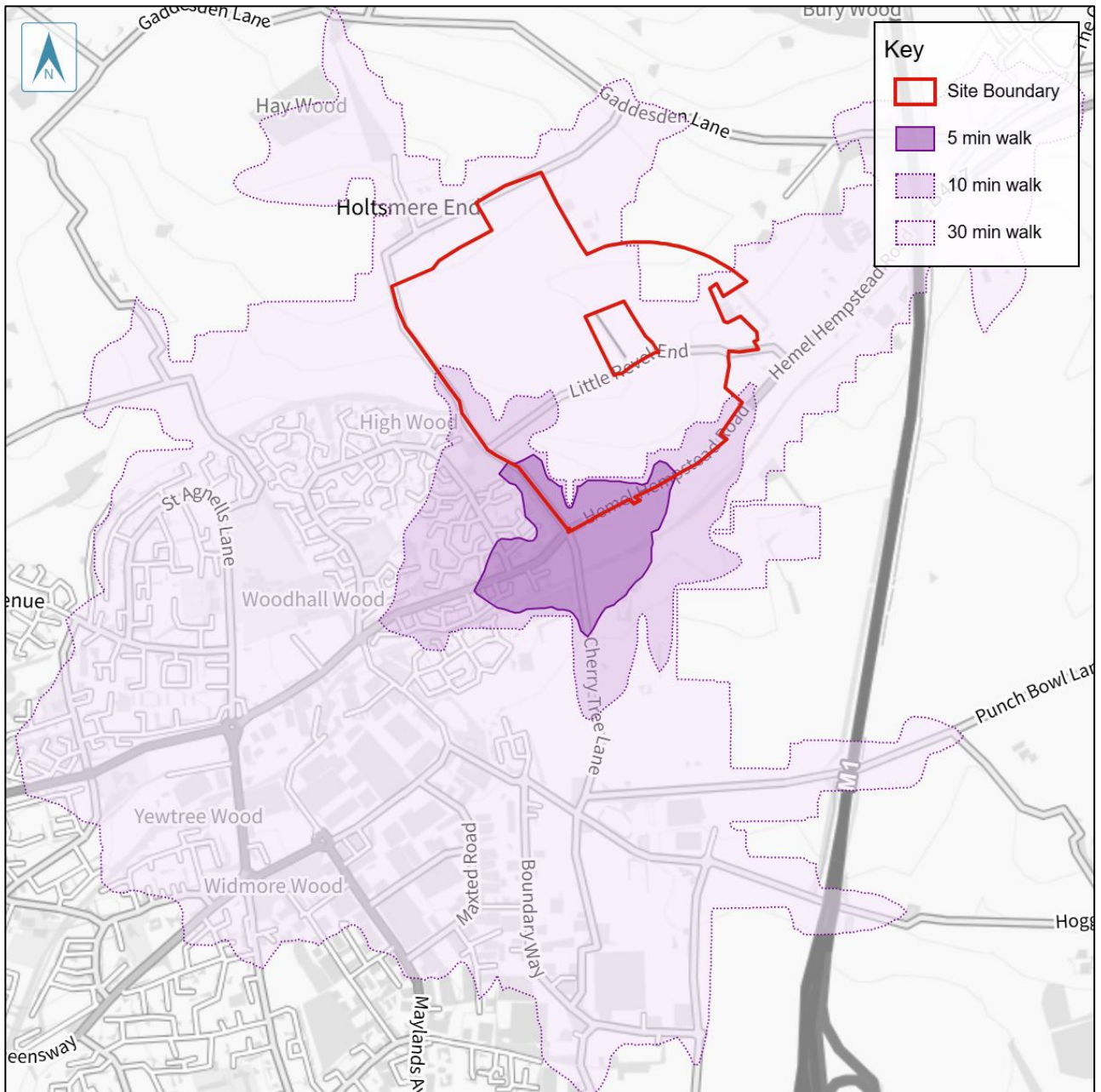
Walking

9.5.2 The Site is located to the north-east of Hemel Hempstead town centre, with B487 Hemel Hempstead Road forming the southern boundary and main access route into the Site. East

of the Site, the road is predominantly rural with limited footways. Beyond the Site to the west, the road becomes more urban in character with footways connecting to the existing local network.

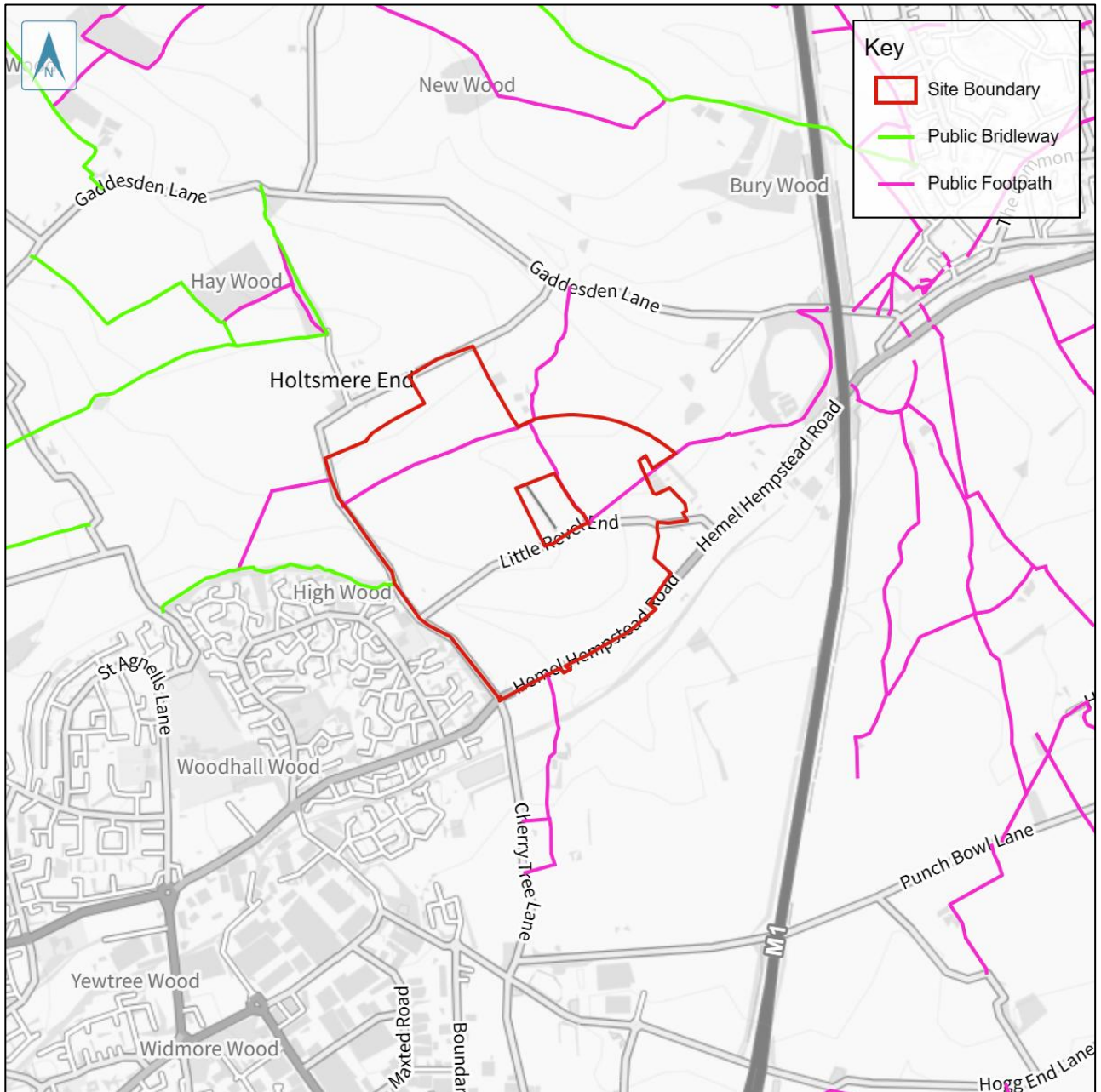
- 9.5.3 There is currently a narrow footway on the northern side of the B487 Hemel Hempstead Road, adjacent to the southern boundary of the Site. At the junction of the B487 with Holtsmere End Lane/Cherry Tree Lane, the footway relocates to the southern side of the carriageway towards the west. The southern footway terminates at Phoenix Walk to the west, before recommencing shortly after to provide continuous provision from Brockwood Drive to the centre of Hemel Hempstead.
- 9.5.4 Cherry Tree Lane has a partial footway provision along its eastern side, linking to the Nickey Line (disused railway), some 200m to the south. The Nickey Line is a traffic free direct pedestrian and cycle link running parallel to the B487 and towards the northern part of the Hemel Hempstead Industrial Estate and on towards Hemel Hempstead town centre. It connects Harpenden, Redbourn, and Hemel Hempstead, passing through a tunnel beneath the M1 and offers a non-vehicular route to the Hemel Hempstead town centre, providing access to various local amenities along the way.
- 9.5.5 There is a wide highway verge on the northern side of the B487 west of Holtsmere End Lane to Shenley Road. No formal crossing points are provided across the B487 at any point between the Site and Shenley Road. A formal uncontrolled crossing is provided just west of the Shenley Road junction.
- 9.5.6 West of Shenley Road, footways are provided on both sides of the carriageway, and there are frequent formal controlled and uncontrolled crossing points.
- 9.5.7 Figure 9.5 demonstrates the existing walking time isochrones from the south western Site access.

Figure 9.5: Walking Time Isochrones from the south western Site Access



9.5.8 There are several PRow within vicinity of the Site that provide connectivity between key local facilities and services as well as leisure routes. This includes bridleways and byways as shown on Figure 9.6.

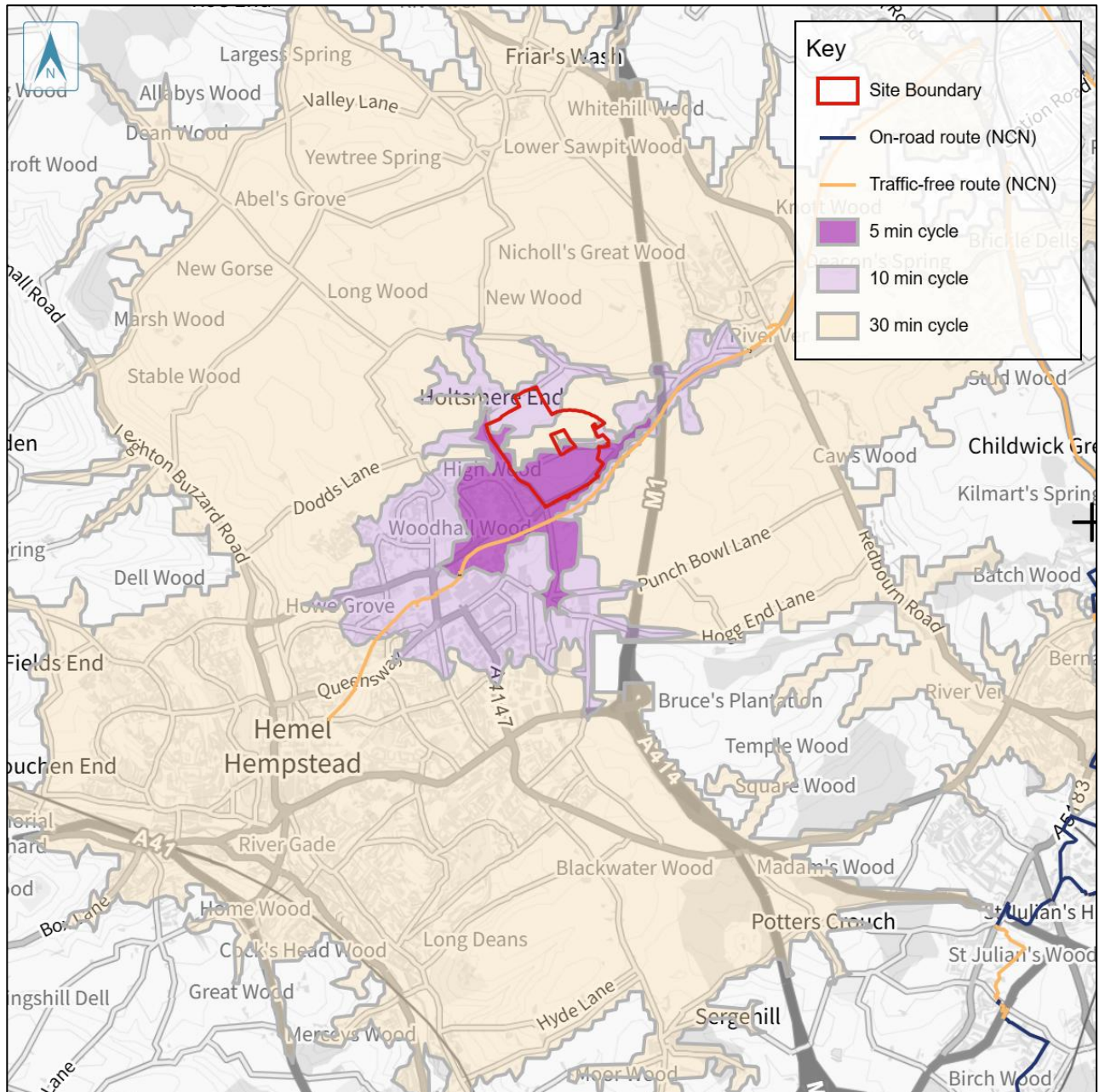
Figure 9.6: Local PRow Network



Cycling

- 9.5.9 The Nickey Line, as shown on Figure 9.7, is located circa 200m to the south which is a key local walking and cycling route following the path of a former railway connecting Harpenden, Redbourn, and Hemel Hempstead. It offers a non-vehicular route to the town centre, providing access to various amenities along the way.

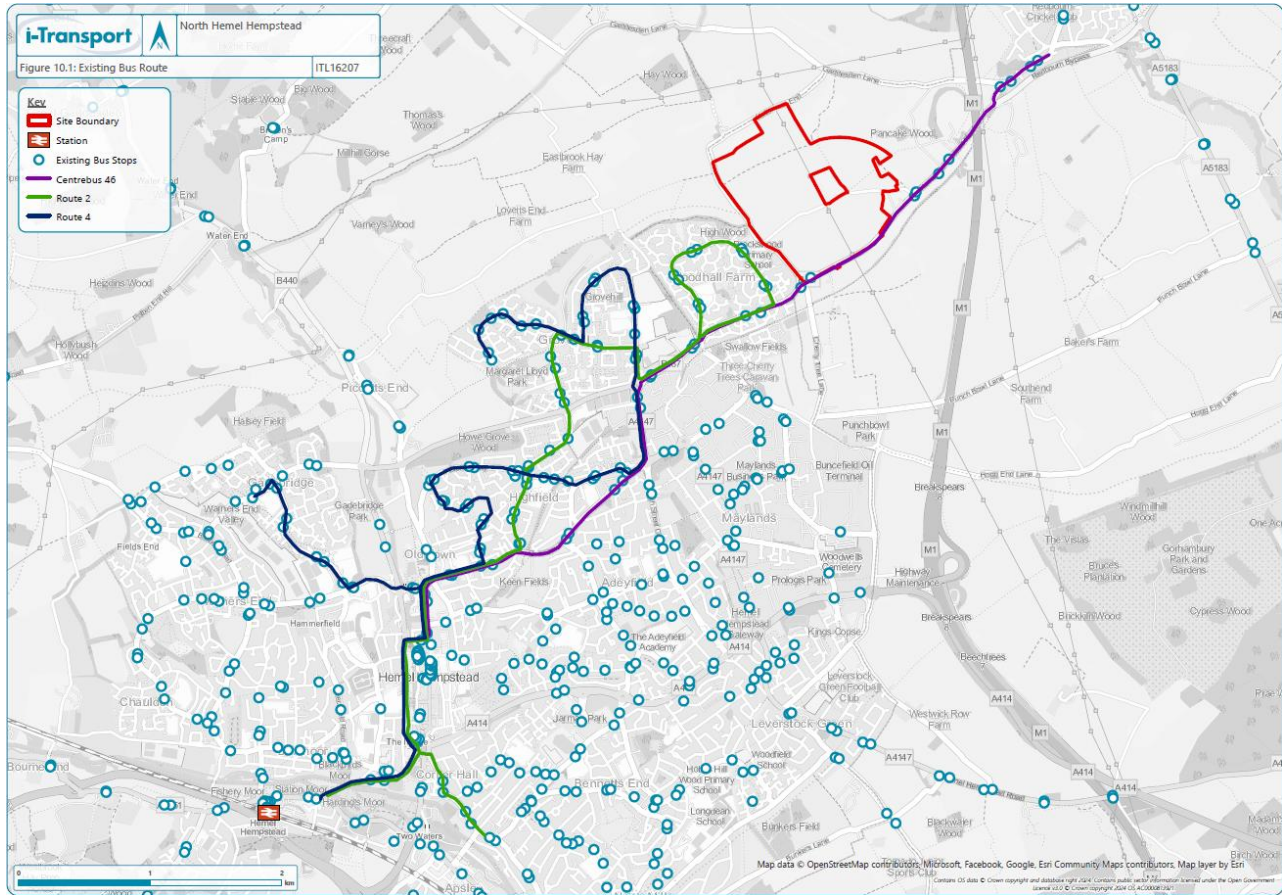
Figure 9.7: Local Cycle Network



Bus

9.5.10 Simple flag only bus stops are located along B487 Redbourn Road directly on the south-west corner of the Site. Existing bus routes serving near the Site are shown on Figure 9.8.

Figure 9.8: Existing Local Bus Accessibility



Rail

- 9.5.11 Both Apsley and Hemel Hempstead station are located circa 7km to the south west of the Site. Forming part of the West Midlands Railway line, the stations offer good, regular services between London Euston (30 minutes) as well as Watford (13 minutes), Northampton and Milton Keynes (33 minutes).
- 9.5.12 The Site is located approximately 1km north of the Maylands Business Parks, offering a prime employment opportunity for future residents of North Hemel. This area is easily accessible from the Site by various non-car means and currently employs over 18,000 people. As part of the Herts Enviro-Tech Enterprise Zone, it is expected to expand by an additional 10,000 jobs in the future. This makes it a significant employment hub, providing a great opportunity to situate new homes close to jobs, with sustainable access options that will limit impact on the highway network.
- 9.5.13 There are many amenities, particularly within the neighbouring Woodhall Farm Estate, all within easy walking distance of the Site boundary including:
- Supermarket: Sainsbury's, 800m;
 - Secondary School: Astley Cooper, approximately 2km;
 - Community Centre: 800m; and
 - Medical Centre: Woodhall Farm, 850m.
- 9.5.14 Additionally, Grovehill to the west offers more facilities within easy cycling distance of the Site. In the future, the adjacent East Hemel development would also provide easy access to a new secondary school and expanded employment areas, likely becoming popular destinations.

2041 Reference Case (Core Scenario)

- 9.5.15 Outlined below are the infrastructure interventions that are committed to come forward by 2041 and are included in the modelled 2041 Reference Case (Core Scenario) scenario.
- Three Cherry Trees Lane junction signalisation;
 - New Link Between Boundary Way and Wood Lane End; and
 - Closure of existing narrow country lanes within the industrial area of Cherry Trees Lane, Buncefield Lane (north) and Buncefield Lane (south) to through traffic.
- 9.5.16 For the Core Scenario, which considers the Development in a standalone context without Local Plan inclusions, a suite of interventions has been identified to encourage active/sustainable travel, these include interventions to improve cycle connectivity between the Site and Hemel Hempstead town centre as well as local bus services. These are detailed in the 'Embedded Mitigation' section.

2041 Local Plan Case (Cumulative Scenario)

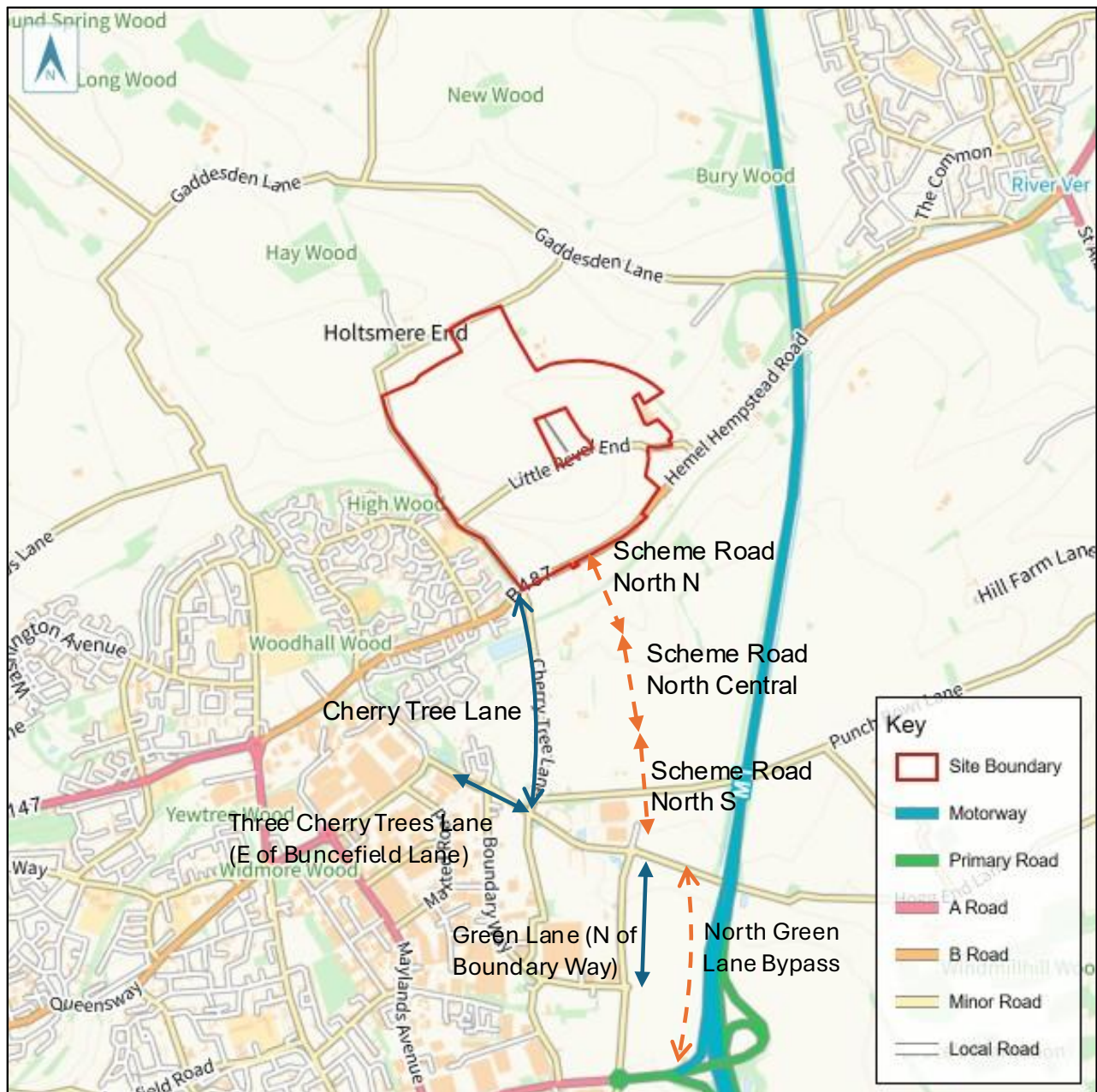
- 9.5.17 Outlined below are the infrastructure interventions that are included in the modelled 2041 Local Plan Case (Cumulative Scenario). Note, the Core Scenario interventions outlined above are also included within this scenario.

- New spine road from Hemel Hempstead Road to the A414;
- Addition of right flare on Lawn Lane East and Signal Optimisation at the Durrants Hill/Lawn Lane junction;
- M1 Junction 8 – Major reconfiguration to provide direct access into Maylands (Breakspear Signal Scheme);
- M1 dedicated coach service Luton to Hemel Hempstead;
- New high frequency bus service along A414 corridor;
- Northbound bus lane on Maylands Avenue;
- Restrict Lawn Lane access at northern end to bus and cycle only;
- Southbound bus lane on Leighton Buzzard Road north from Development;
- B487 Redbourn Road/Three Cherry Trees Lane/Shenley Road - partial signalisation scheme;
- B487 Redbourn Road/ Link Road/ St Agnells Lane – partial signalisation scheme;
- Link Road/Cambrian Way - widening roundabout exit arms to allow two lane throughput for east-west and west-east movement;
- Leighton Buzzard Road/Combe Street - replacement of the existing min-roundabout with a signal junction;
- Maylands Avenue/Maxted Road - junction signalised;
- Cherry Tree Lane Quietway;
- Punchbowl Lane Quietway;
- Hogg End Lane Quietway;
- Bunkers Lane Quietway;
- Reduced speed limits on A4147 adjacent to the access junctions and extending to M1 overbridge (East Hemel southern access);
- Reduced speed limits on B487 adjacent to the access junctions and extending to approx. M1 underpass. (North Hemel access);
- Reduced speed limits on Leighton Buzzard Road corridor to the north of the Link Road roundabout;
- Introduction of 20mph speed limit on Fishery Road;
- A4251/ A4146 Station Road roundabout conversion into signalised junction;
- 20mph speed limit along Marlowes and reduction from two to one lane between Hillfield Road and Midland Road; and
- A414/ Maylands Avenue – partial signalisation.

Summary of Receptors and Sensitivity

- 9.5.18 The links identified as being potentially impacted by operational flows across the Core (blue) and Cumulative Scenarios (orange) are shown on Figure 9.9 and are described in terms of their designated sensitivity in this section.

Figure 9.9: Links to be Assessed in Operational Scenarios



Cherry Tree Lane

- 9.5.19 At the Site's south west corner, this two-way road is narrow, with only occasional informal passing places. Its edges are poorly maintained, and two-way conflicting vehicle movements have resulted in deterioration of its layout. Whilst there is a continuous footway along its eastern side (except for a short stretch at its most northern end), the road's narrow width and lack of passing places means that vehicles frequently mount the footway to pass.
- 9.5.20 Whilst this route provides the most direct route from the Site to the industrial area and onward links from the A414/M1, any significant increase in traffic flow using this route should be discouraged on highway safety grounds.
- 9.5.21 CrashMap reveals there have been no recorded accidents along Cherry Tree Lane in the last 5 years.

- 9.5.22 This link does not provide access to any receptors that may be considered sensitive meaning the sensitivity classification is 'negligible'.
- 9.5.23 With the further build out of HGC (as considered in the Cumulative Scenario), Cherry Tree Lane is proposed to become part of the Green Loop which will be restricted to active travel movements only. Thus, any uplift in vehicle trips along this road resulting from the Development will be temporary and ultimately rerouted via alternative roads and the STC through East Hemel.

Three Cherry Trees Lane (East of Buncefield Lane)

- 9.5.24 This is the next available route from the Site towards the Maylands industrial area and onward links. It joins the B487 Redbourn Road via a four-arm roundabout. It is a 30mph two-way road throughout. Whilst its northern end is relatively narrow, two-way vehicular movements are possible although slightly restricted below the Nickey Line bridge. Further south, a 2m (6' 6") width restriction is in place and then a new traffic signal-controlled junction to Admiral Avenue introduces a change in the character of the road to one more akin to an industrial area, with wide road and footways available throughout the remainder of the industrial estate to the south.
- 9.5.25 This link section of Three Cherry Trees Lane has been improved in recent years to facilitate the Beaumont Manor residential development it provides access to. These interventions included active travel infrastructure and capacity improvements.
- 9.5.26 CrashMap reveals there has been 1 recorded 'slight' accident along Three Cherry Trees Lane (E of Buncefield Lane) in the previous 5 years.
- 9.5.27 This link does not provide access to any receptors that may be considered sensitive meaning the sensitivity classification for this link is 'negligible'.

Green Lane (N of Boundary Way)

- 9.5.28 Green Lane routes from Phoenix Gateway Roundabout on the Breakspear Way corridor to the south to the Three Cherry Trees Lane / Hogg End / Green Lane Roundabout to the north. Green Lane will border the East Hemel Site to the west.
- 9.5.29 It supports a large proportion of operational traffic associated with local industrial uses including to Buncefield Oil Depot and Prologis Park, a modern industrial estate.
- 9.5.30 This road is classified as being a 'medium' sensitivity link given the importance of Buncefield Oil Depot.
- 9.5.31 CrashMap reveals there has been 1 'serious accident' along Green Lane (N of Boundary Way) in the previous 5 years.
- 9.5.32 It should be noted that the increase in vehicles along this link resulting from the Development will be temporary given the STC south from the Site access through East Hemel to the Breakspear Way corridor will support these movements instead.

Scheme Road and Green Lane Bypass

- 9.5.33 The Scheme Road refers to the STC that will be operational in the Cumulative Scenario. A major part of HGC's Vision focuses on the delivery of the STC which extends between

Leighton Buzzard Road to the west and Breakspear Way (and beyond) to the south. Through the Site, the STC alignment crosses in a north-south direction, continuing south towards East Hemel crossing Hemel Hempstead Road.

- 9.5.34 The STC will be designed to facilitate and prioritise sustainable modes of travel including walking, cycling and bus movements. This route will accommodate a large proportion of Development vehicle movements to the south through East Hemel, accessing Breakspear Way and the M1. This will help alleviate flows along the existing routes through the Maylands estate, including those links relevant to the Core scenario described above.
- 9.5.35 The links along the STC (Scheme Road) will provide access to residential areas, local centre and primary school within the Site, as well as residential areas, secondary school and employment to the south, warranting a 'medium' sensitivity classification.

Summary of Receptor Sensitivities

- 9.5.36 Table 9.20 provides a summary of the receptor sensitivity.

Table 9.20: Summary of Receptor Sensitivity

Receptor	Sensitivity (Value)	Rationale
<i>Core Scenario</i>		
Cherry Tree Lane	Negligible	Rural in nature, very low importance and rarity, and local scale, pedestrian facilities available, does not provide access to any receptors that can be considered sensitive.
Three Cherry Trees Lane (E of Buncefield Lane)	Negligible	Provides access to residential development and some light industrial uses. Good pedestrian and cycle infrastructure implemented in relation to recent Beaumont Manor residential development. Does not provide access to any receptors that can be considered sensitive.
Green Lane (N of Boundary Way)	Medium	Provides access to Buncefield Oil Depot.
<i>Cumulative Scenario</i>		
North Green Lane Bypass	Medium	Forming sections of the STC that will support general traffic from the Site to the Breakspear Way corridor and M1, through East Hemel. Will have excellent pedestrian and cycle amenity. Will provide access to residential areas, a secondary school, primary school, neighbourhood centre amenities and employment land.
Scheme Road North S	Medium	
Scheme Road North Central	Medium	
Scheme Road North N	Medium	

- 9.5.37 With regards the Core Scenario links, the sensitivity of these receptors is not anticipated to change up to the future scenarios, although trip vehicle movements along these links are anticipated to reduce following the STC that is considered in the Cumulative Scenario.

9.6 Embedded Mitigation

9.6.1 Table 9.21 summarised the embedded mitigation measures that have been accounted for within this assessment. As set out in Chapter 3: EIA Methodology, and in line with IEMA guidance, this includes both primary and tertiary mitigation measures.

Table 9.21: Summary of Embedded Mitigation

Embedded Mitigation Measure	Description	How Secured
<i>Construction</i>		
Framework CTMP	A Framework CTMP has been prepared in support of the outline planning application (Appendix 9.3) to minimise disturbance which could potentially arise from traffic generated by the Development. The key elements of the Framework CTMP include: ▪ Routing HGV traffic to the Site via the new Eastern Junction on the B487 and via the SRN to minimise the impact of construction traffic on local communities; ▪ Scheduling of construction traffic movements (equipment and materials), when possible, to avoid the peak traffic periods at the beginning and end of each working day and other sensitive periods, in order to minimise potential disturbance to existing / proposed residents, businesses and other road users; ▪ Ensuring PRowS are maintained open and, where a temporary closure is required, an appropriate diversion is provided; ▪ Wheel cleaning on-site to keep the local highway clear of mud and debris; ▪ Implementation of driver rules; and ▪ Liaison with stakeholders and East Hemel development contractors prior to commencing construction and throughout work on-site. The delivery of highway works will be agreed as part of the S278 technical approval process. This will include agreeing approaches to traffic management, construction programme and phasing.	Planning condition. Section 278 Agreement (highways works).
Outline CEMP	Standard measures would be implemented via the Outline CEMP (Appendix 6.1) to control environmental effects of construction traffic, such as noise, vibration, dust and dirt, on the highway.	Planning condition
<i>Completed Development</i>		
Sustainable Transport Corridor (STC)	HGC's Spatial Vision focuses on the delivery of a STC which extends between Leighton Buzzard Road to the west and Breakspear Way (and beyond) to the south. Through	Connection point for extension beyond Site

Embedded Mitigation Measure	Description	How Secured
	the Site, the STC alignment crosses in a north-south direction, continuing south towards East Hemel crossing Hemel Hempstead Road as shown on the Parameter Plans. The STC will be designed in accordance with HGC Strategic Design Code to prioritise walking, cycling and bus movements. General traffic will be permitted to use the STC on entry to the Site from Hemel Hempstead Road. The STC will be open to general traffic for delivery within the Local Plan period, however it will be designed to safeguard provision for a potential bus gate in the future, with general traffic displaced onto the adjoining primary roads, which will also be designed to accommodate buses.	boundary included within Parameter Plans.
Bus Strategy	A wider bus strategy is being developed for the HGC and will be supported by the Site. This will include a new Orbital bus route through the HGC as well as improvements to existing bus services. The Western Junction will be for buses only. There will be a bus lane on approach to the junction from the east and west and the signals will be demand responsive to minimise any bus delay at the junction.	Section 106 contributions.
Green Routes	HGC Green Loop including Holtsmere End Lane and connections to the Green Loop and Dodds End Lane, as dictated by the Draft Local Plan policy H1. The Green Loop will be an active travel route that allows continuous access through the wider HGC. It is proposed to close the existing junctions to Holtsmere End Lane and Cherry Tree Lane to motorised traffic, which will become part of the Green Loop. Holtsmere End Lane will be closed once alternative access to the existing dwellings north of the Site becomes available. These dwellings will be accessed through the Site once this alternative access becomes available.	Active travel connections to the Green Loop including use of Little Revel End Lane as shown on the Access and Movement Parameter Plan (Appendix 5.1). The closure of Holtsmere End Lane and connection to Cherry Tree Lane to be delivered as off-site highway works via

Embedded Mitigation Measure	Description	How Secured
		contributions to HCC for HCC to prepare a TRO.
Pedestrian and Cycle Connections	Retention and integration of existing PRoWs crossing the Site, and appropriate connections. The Development would also deliver walking routes as part of the SANG/Community Park.	Access and Movement Parameter Plan. Outline LEMP.
Mobility Hub	An integrated Mobility Hub with facilities to encourage and facilitate modes of transport other than the private car will be delivered close to the local centre. The Mobility Hub will offer an access and interchange point for sustainable modes of transport including access to micro mobility, cycling and public transport. It will be located within good access of all homes to encourage use. It will also have sufficient covered and secured cycle stands, including charging of e-bikes and storage of cargo bikes, where appropriate.	Land Use and Green Infrastructure Parameter Plan and Development Specification.
Hemel Hempstead Road Speed Reduction	A speed reduction is proposed from 60 mph to 40 mph on part of Hemel Hempstead Road to cover the extents of the proposed access junctions. The location of the change in speed limit is to be agreed with HCC.	Contributions to HCC for HCC to prepare a TRO
Off-Site Active Travel Interventions	Details of active travel interventions are to be agreed but will focus on improved connections along B487 Redbourn Road towards Hemel Hempstead town centre.	S106 contributions
Off-Site Highways Improvements	Highway improvements are to be agreed.	S106 contributions

9.7 Assessment of Effects - Construction

- 9.7.1 The worst-case proportional impact of construction traffic on assessed links has been assumed by assessing the impact against the 2041 Reference Case. The phasing of the buildout of the Development would not result in the construction effects being above what has been assessed in this Chapter.
- 9.7.2 Construction would generate short term increases in vehicle movements on the highway in the vicinity of the Site. It should also be noted that these increases would not be constant throughout the overall construction period due to the phased nature of the delivery.

- 9.7.3 In accordance with IEMA guidelines, the construction assessment should be undertaken at the construction/decommissioning phase, year of opening of the project or the first full year of its operation to ensure a worst-case assessment (due to the natural increase of traffic generally have the effect of diluting the environmental impact of a project).
- 9.7.4 The assessment of construction trips demonstrated that the temporary uplift in total vehicles or HGVs during the peak Construction scenario does not exceed 30%, as evidenced in SLR's Paramics Model Development Inclusion Document, and thus in accordance with IEMA guidance (i.e. *"the number of heavy good vehicles will increase by more than 30%"*) does not warrant further investigation. No significant adverse effects are expected to arise from construction traffic.

Additional Mitigation, Monitoring and Residual Effects

- 9.7.5 No significant adverse effects were identified and therefore no additional mitigation is required and the residual effects remain as presented above.

9.8 Assessment of Effects - Completed Development

Severance of Communities

- 9.8.1 As demonstrated in Table 9.22 there are a number of considered links that exceed a 30% change in traffic following completion of the Development. These links across the Core and Cumulative Scenarios are therefore considered 'Low' (not significant) with regards severance and are presented in the Table 9.22. All the remaining considered links are 'Negligible' (not significant).

Table 9.22: Severance of Communities

Link	Change in 24hr AADT Total Vehicles	Magnitude of Impact (Significance of Effect)
<i>Core Scenario</i>		
Cherry Tree Lane	45.9%	Low (Negligible)
Three Cherry Trees Lane (E of Buncefield Lane)	33.9%	Low (Negligible)
Green Lane (N of Boundary Way)	32.9%	Low (Negligible)
<i>Cumulative Scenario</i>		
North Green Lane Bypass	14.9%	Negligible (Negligible)
Scheme Road North S	25.2%	Negligible (Negligible)
Scheme Road North Central	34.6%	Low (Negligible)
Scheme Road North N	32.6%	Low (Negligible)

- 9.8.2 It should be noted that Severance refers to perceived division that can occur within a community when it becomes separated by a major traffic artery. With regards to the Core Scenario, Cherry Tree Lane, Three Cherry Trees Lane (E of Buncefield Lane), Green Lane (N of Boundary Way) are minor links of which traffic does increase resulting from the Development, albeit from a relatively low baseline. Vehicle and pedestrian trips along these more minor links are routed along the STC 'Scheme Road' in the Cumulative Scenario which will have a number of crossing points along its extent as well as segregated active travel connections. Use of professional judgement to attribute severity of severance to these links allows the conclusion that effects would be negligible on these links.

Road vehicle driver and passenger delay

- 9.8.3 The IEMA guidance dictates that an average vehicle delay change of less than 20 seconds as a result of the Development during the peak hour periods may be characterised as a negligible impact on Driver Delay.
- 9.8.4 Journey time across 11 routes have been assessed as part of the Paramics modelling. The differences in journey times between the Future Baseline and the Future Baseline with Development scenarios have been extracted for the relevant sections of route. These are presented in Table 9.23. Note that the travel time information is not available for the links assessed in the Core Scenario, thus any changes in journey time delay have been interpreted from changes in link speeds.

Table 9.23: Journey Time Delay

Link	Direction	Increase in journey time (s)		Magnitude of Impact (Significance of Effect)
		Morning Peak Hour	Evening Peak Hour	
Core Scenario				
Cherry Tree Lane	NB	0	0	Negligible (Negligible)
	SB	0	0	
Three Cherry Trees Lane (E of Buncefield Lane)	EB	+4	0	Low (Negligible)
	WB	0	+30	
Green Lane (N of Boundary Way)	NB	0	0	Medium (Moderate)
	SB	0	+44	
Cumulative Scenario				
North Green Lane Bypass	NB	0	0	Negligible (Negligible)
	SB	0	+1	
Scheme Road North S	NB	-1	0	Negligible (Negligible)
	SB	0	0	
Scheme Road North Central	NB	0	0	Negligible (Negligible)
	SB	0	0	
Scheme Road North N	NB	0	+57	Low (Minor)
	SB	0	0	

- 9.8.5 The journey time delay outputs demonstrate that the Development results in an increase of 30 seconds delay westbound along Three Cherry Trees Lane (E of Buncefield Lane) in the evening peak hour, resulting in a 'Low' Magnitude of Impact. This link will be closed in the Cumulative Scenario.
- 9.8.6 The Development results in an increase in journey times along Green Lane (N of Boundary Way) of 44 seconds, representing a 'Medium' Magnitude of Impact. Given the links 'Medium' importance in terms of receptor sensitivity due to providing access to Buncefield Oil Depot, the significance of effect is 'Moderate'. The closure of access to this link from Cherry Tree Lane to the north and the opening of the STC to provide connections south from the Site, will result in little to no Development trips routing along this link. This link is therefore not considered in the Cumulative Scenario as it no longer meets the IEMA thresholds for consideration.
- 9.8.7 In the Cumulative Scenario, the Paramics model indicates the Development results in an increase in delay of 57 seconds northbound along the Scheme Road North N in the evening peak resulting in a 'Medium' Magnitude of Impact. The proposed Eastern Junction at the north of this link has been modelled in LinSig and presented in the TA. This provides detailed junction outputs for queueing and delay across all arms in the Cumulative Scenario and demonstrates it operates within capacity. Specifically, the Scheme Road North N arm has a Degree of Saturation of 77.4% and 75.8% in the morning and evening peak respectively, indicating there is unused capacity at the link during the considered scenario. The 'Medium' Magnitude of Impact demonstrated by the Paramics model has therefore been downgraded to 'Low' Magnitude of Impact to accord with the detailed modelling results of this link.
- 9.8.8 The Development has little to no impact on journey time delays at the other considered links resulting in a 'Negligible' Magnitude of Impact.

Non-Motorised User Delay and Amenity

- 9.8.9 Non-motorised (pedestrian and cycle) amenity is broadly defined as the *"relative pleasantness of a journey"*, and it is affected by traffic flow, traffic composition, and pavement width / separation from traffic and Pedestrian / Cycle Delay is primarily influenced by traffic volumes.
- 9.8.10 The total vehicle and pedestrian/cycle link flow, the increase in vehicle and pedestrian/cycle link flow as well as the existing pedestrian/cycle infrastructure are assessed to determine the impacts on Pedestrian / Cycle Delay and Amenity.
- 9.8.11 In the Core Scenario, pedestrian and cycle connectivity is prioritised within the Site and through connections west along B487 Redbourn Road and towards the Nickey Line which provides a non-vehicular link to the centre of the town passing numerous local facilities and higher order services on the way. Running just to the south of B487 Redbourn Road, it provides a ready-made route for the Site's pedestrians and cyclists alike and is of a high quality. Access to it from the Site would be provided across B487 Hemel Hempstead Road in the form of a new toucan crossing, making its use both safe and convenient for non-car travellers.

- 9.8.12 A strategy has been developed to offer a shared footway/cycle way from the Site along B487 Redbourn Road. The main routes will be west from the Site along B487 Redbourn Road, connecting to Woodhall Farm via Shenley Road. This route will continue west, with a suitable crossing provided to enable an alternative access to the Nickey Line via Hunters Oak offering safe, segregated access to the town centre. This will be in addition to routes along Queensway and Swallowdale Lane.
- 9.8.13 There are several PRowWs within vicinity of the Site that provide connectivity between the Site and key local facilities and services. This includes bridleways and Byways Open to All Traffic (BOAT's) that are suitable for cyclists to make use of. The existing PRow network within the Site will be promoted through masterplanning to encourage use by local people and be retained as attractive routes for leisure walking. Little Revel End within the Site will be converted to a car-free active travel route facilitating east west connections across the Site and providing access to Holtsmere End. Pedestrian access to PRow 13 will be greatly improved through the implementation of footway/cycle provision along B487 Redbourn Road past the PRow access to the Eastern Junction.
- 9.8.14 In the Cumulative Scenario, there will also be pedestrian and cycle desire lines south towards East Hemel. The internal walking and cycling network within the Site will be designed to facilitate these movements, with good quality routes served by crossing points.
- 9.8.15 This route will include connectivity to and between the two key strategic transport corridors: the Sustainable Travel Corridor and Green Loop, which will run along Holtsmere End Lane. North-south movements between the site and East Hemel will be encouraged at these two locations. At the Eastern Junction there will be suitable pedestrian and cycle crossing points, as well as a crossing at the Green Loop location. The STC included in the Cumulative Scenario will be designed to prioritise active travel offering direct journeys along wide footways/cycleway.
- 9.8.16 All of the considered links are subject to two-way flow of less than 1,400 vehicles per hour which categorises them as having a 'Negligible' impact, as per IEMA guidance. Furthermore, the proposed connections outlined above offer excellent off-road active travel provision in both Core and Cumulative Scenarios to key destinations.
- 9.8.17 In the Core Scenario, Cherry Tree Lane, Three Cherry Trees Lane and Green Lane may experience a minor increase in active travel trips from the Development although journeys towards Maylands will be encouraged to use B487 Redbourn Road with interventions along this corridor. Following the future buildout of the HGC considered in the Cumulative Scenario, Cherry Tree Lane will become an active travel route as part of the proposed Green Loop.
- 9.8.18 All considered links across the Core Scenario has 'Negligible' Magnitude of Impact with regards Pedestrian / Cycle Delay and Amenity. Although the Cherry Tree Lane, Three Cherry Trees Lane and Green Lane links do not meet the inclusion criteria to be assessed in the Cumulative Scenario, they would be considered to have a 'Low' (positive) Magnitude of Impact. This considers the link sensitivities and significantly improved provision of active travel infrastructure along the Green Loop and Sustainable Travel Corridor.
- 9.8.19 All considered links in the Cumulative Scenario can be considered to have a 'Low' (positive) Magnitude of Impact, given the wide and direct active travel infrastructure along the Sustainable Travel Corridor and the segregated Green Loop servicing similar destinations.

9.8.20 Table 9.24 summarises the Magnitude of Impact for Pedestrian / Cycle Delay and Amenity.

Table 9.24: Pedestrian / Cycle Delay and Amenity

Link	Magnitude of Impact (Significance of Effect)
<i>Core Scenario</i>	
Cherry Tree Lane	Negligible (Negligible)
Three Cherry Trees Lane (E of Buncefield Lane)	Negligible (Negligible)
Green Lane (N of Boundary Way)	Negligible (Negligible)
<i>Cumulative Scenario</i>	
North Green Lane Bypass	Low (positive) (Negligible)
Scheme Road North S	Low (positive) (Negligible)
Scheme Road North Central	Low (positive) (Negligible)
Scheme Road North N	Low (positive) (Negligible)

9.8.21 The assessment above demonstrates that in the Core Scenario the Development would have a 'Negligible' Significance of Effect on the considered links.

9.8.22 With regards the Cumulative Scenario, the provision of the active travel connections south from the Development through the East Hemel Site, including the Sustainable Travel Corridor and Green Loop, would result in a 'Negligible' Significance of Effect on the considered links.

Fear and intimidation on and by road users

9.8.23 The criteria used to define the degree of hazard to pedestrians is average peak hour traffic flow, 18-hour HGV flow and average vehicle speed along each considered link. Each threshold across the criteria represents a degree of hazard score, the sum of which determines the Level of Fear and Intimidation.

9.8.24 Table 9.25 shows how the Magnitude of Impact is determined across relevant categories and confirms that is 'Negligible' for all considered links.

Table 9.25: Fear and Intimidation

Link	Hourly Vehicles	HGV AAWT	Vehicle Speed (Weekday 85th Percentile)	Total Score	Magnitude of Impact (Significance of Effect)
<i>Core Scenario</i>					
Cherry Tree Lane	129	0	29	10	Negligible (Negligible)
Three Cherry Trees Lane (E of Buncefield Lane)	143	23	20	10	Negligible (Negligible)

Green Lane (N of Boundary Way)	145	20	19	0	Negligible (Negligible)
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Cumulative Scenario

North Green Lane Bypass	293	140	21	10	Negligible (Negligible)
Scheme Road North S	211	140	20	10	Negligible (Negligible)
Scheme Road North Central	146	64	21	10	Negligible (Negligible)
Scheme Road North N	151	28	21	10	Negligible (Negligible)

Road user and pedestrian safety

- 9.8.25 This assessment applied the methodology outlined in Table 9.21 which states that the Magnitude of Impact can be considered 'Negligible' if there is an expected change in accident risk of less than 5%.
- 9.8.26 Accident data has been obtained from HCC for the previous 5 years along B487 Redbourn Road/ B487 Hemel Hempstead Road, the results of which are included in the TA. CrashMap has also been reviewed across all links considered within this assessment (i.e. those surpassing the IEMA thresholds for consideration).
- 9.8.27 There have been no recorded accidents along Cherry Tree Lane in the last 5 years, 1 recorded 'slight' accident along Three Cherry Trees Lane (E of Buncefield Lane) and 2 'slight' and 1 'serious' accident along Green Lane (N of Boundary Way). This demonstrates that there are no 'accident hotspots' along any of the assessed links in Core Scenario.
- 9.8.28 All the links assessed for the Cumulative Scenario are along the proposed Sustainable Travel Corridor which will be designed to enforce high standards of road safety, as well as fully segregated active travel provision.
- 9.8.29 The Development will temporarily increase flows along Cherry Tree Lane, Three Cherry Trees Lane and Green Lane in the Core Scenario. However, active travel interventions focused along B487 Redbourn Road which will be implemented as part of the Core scenario will offer a safe route for pedestrians and cyclists towards Hemel Hempstead and Maylands, likely distributing trips more widely across the network as a result of the additional route options.
- 9.8.30 Furthermore, in the longer term with the implementation of the STC, traffic will be alleviated and displaced from Cherry Tree Lane, Three Cherry Trees Lane and Green Lane onto this corridor. The STC will offer wide segregated active travel corridors, controlled vehicle speeds and pedestrian and cycle priority. There will also be an accompanying Green Loop which will offer full segregation from any traffic.
- 9.8.31 Table 9.26 summarises the Magnitude of Impact and significance of effect for Road User and Pedestrian Safety.

Table 9.26: Road User and Pedestrian Safety

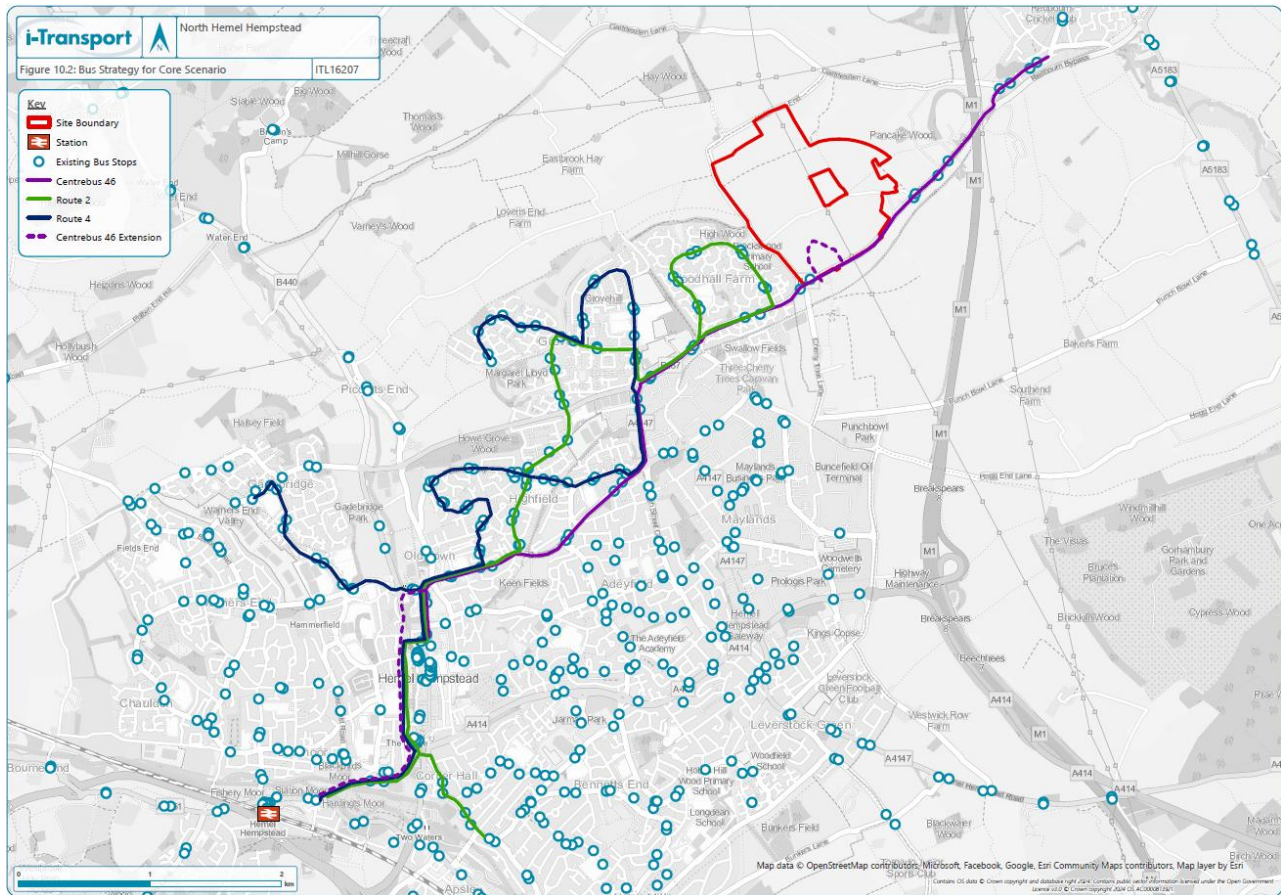
Link	Magnitude of Impact (Significance of Effect)
<i>Core Scenario</i>	
Cherry Tree Lane	Negligible (Negligible)
Three Cherry Trees Lane (E of Buncefield Lane)	Negligible (Negligible)
Green Lane (N of Boundary Way)	Negligible (Negligible)
<i>Cumulative Scenario</i>	
North Green Lane Bypass	Low (positive) (Negligible)
Scheme Road North S	Low (positive) (Negligible)
Scheme Road North Central	Low (positive) (Negligible)
Scheme Road North N	Low (positive) (Negligible)

9.8.32 Considering the link sensitivity (as presented in Table 2.23) and Magnitude of Impact across these links, amounts to a 'Negligible' significance of effect across all.

Public Transport

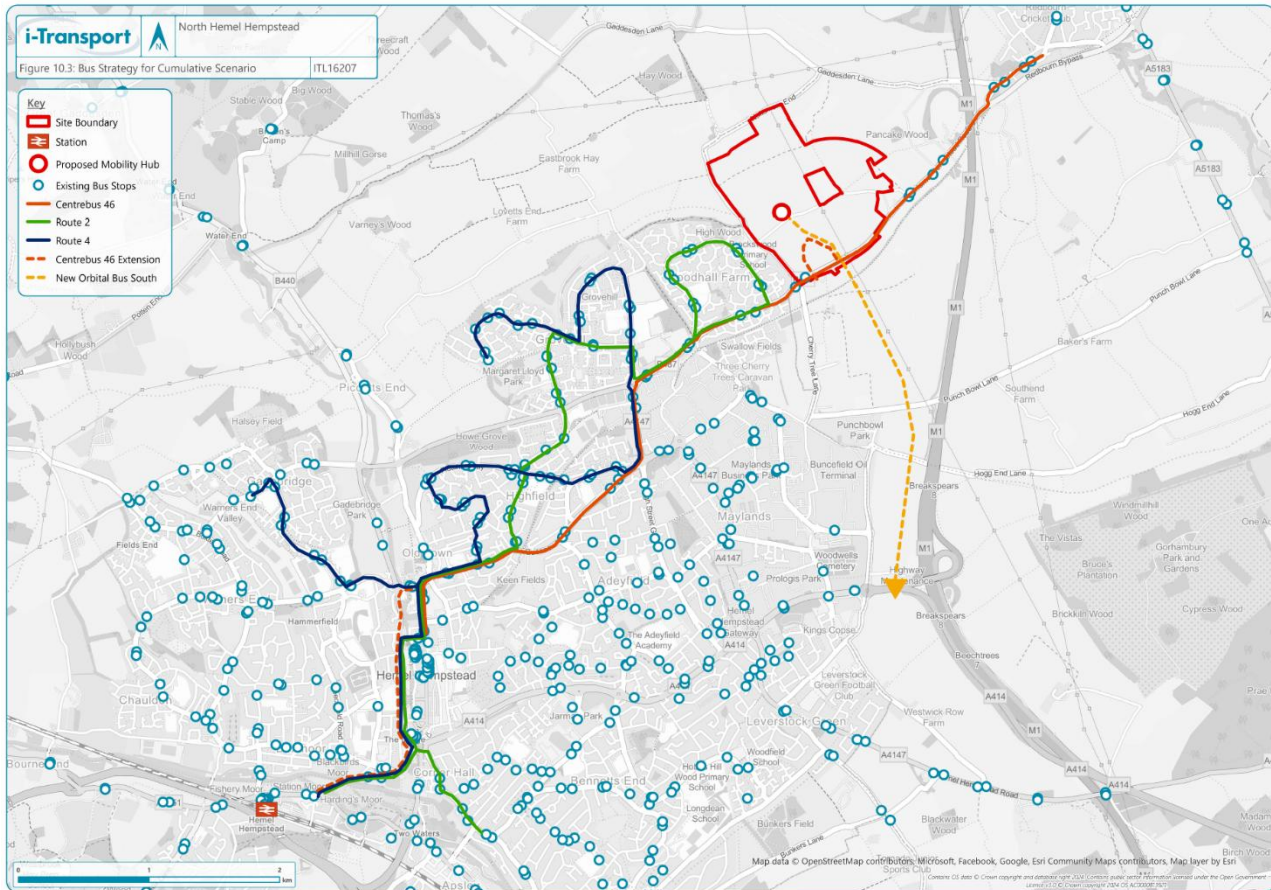
- 9.8.33 A trip generation and distribution model has been produced to predict and distribute public transport trips associated with the Development. The methodology and assumptions used in this model is detailed in the Transport Assessment. The trip model outputs presented in Section 9 of the Transport Assessment highlight the importance of a suitable bus strategy to facilitate sustainable movements between the Site, town centre and station.
- 9.8.34 The model outputs demonstrated that in the Core scenario, the Development would generate **743** daily bus trips and **145** daily rail trips.
- 9.8.35 The uplift in bus trips resulting from the Development will be accommodated via a developed bus strategy that will eventually serve the wider HGC and improve public transport access for existing residents in Hemel Hempstead. The bus infrastructure associated with the Core Scenario is demonstrated in Figure 9.10.
- 9.8.36 The Site currently benefits from being located on the route of the existing Centrebus 46 service which runs along Hemel Hempstead Road between Hemel Hempstead town centre and Luton. It is anticipated that this will be the main bus used by future users of the Development. The impacts of the Development do not require the need for public transport mitigation for EIA purposes; however it is anticipated there will be improvements to bus routes along B487 Redbourn Road corridor towards the town centre and station which is the Development will support.
- 9.8.37 There can be up to 6 peak hour trains to and from London meaning the effect of the per train uplift resulting from the Development would be negligible.
- 9.8.38 It is concluded that the Significance of Effect on the public transport network can be considered 'Negligible' (positive) in both the Core and Cumulative Scenarios as a result of the bus infrastructure improvements.

Figure 9.10: Proposed Bus Strategy for the Core Scenario



9.8.39 The model outputs demonstrate that in the Cumulative scenario, the Development generates **604** daily bus trips and **93** daily rail trips. This is slightly fewer public transport trips than for the Core Scenario due to the higher propensity for shorter trips (predominantly to the amenities / facilities / employment within East Hemel), which will be undertaken by walking or cycling. For the Cumulative scenario, a new Orbital bus route will begin to serve the HGC as shown on Figure 9.11.

Figure 9.11: Proposed Bus Strategy for the Cumulative Scenario



9.8.40 The developed public transport strategy for the Site and the plans for public transport through the wider HGC will facilitate the modelled mode shift away from private car use and will help reduce mode share within Hemel Hempstead. The mode shift for movements associated with the Development has been accounted for within the flows used within the assessment.

Public Rights of Ways

- 9.8.41 A qualitative assessment on the impact of the Development on the PRow network is included in this Section.
- 9.8.42 PRow 13 routes south from the B487 Redbourn Road at the south of the Site, through land to the south to provide access to Cherry Tree Lane and the Nickey Line. Currently there is no footway access along B487 Redbourn Road. The wide grass verges provide some protection for pedestrians although fear and intimidation can be high along this link.
- 9.8.43 Both operational and construction traffic will increase along B487 Redbourn Road (albeit not to an extent to warrant further investigation in the main assessment). However, embedded in the Development's active travel strategy are PRow improvements, including the provision of pedestrian access to PRow 13. This will be through the implementation of footway/cycle provision along B487 Redbourn Road past the PRow access to the Eastern Junction.
- 9.8.44 The Development will support SADC's Rights of Way Improvement Plan Statement of Action (Section 6) by improving access to existing PRow routes as detailed further in

Section 5 of the TA. The proposed internal network within the Site will also extend the existing walking and cycling routes including connections to the south and towards Hemel Hempstead Town Centre. Furthermore, access to the existing PRowS via the public transport network will be improved through the proposed bus strategy, including bus stops within the Site. Use of PRow routes will be encouraged through measures outlined in the Travel Plan. The implementation of the Green Loop will also help people wishing to improve or maintain their health by offering the traffic free tarmacked route. Furthermore, the provision of controlled crossing points over the B487 Hemel Hempstead Road will overcome the right of way severance the road currently creates.

Additional Mitigation, Monitoring and Residual Effects

- 9.8.45 The Core Scenario will have an overall negligible effect in terms of transport impact although the assessment did demonstrate a medium Magnitude of Impact for road vehicle driver and passenger delay at Green Lane (N of Boundary Way). This effect becomes negligible when considering the implementation of the STC considered in the Cumulative Scenario.
- 9.8.46 The Cumulative Scenario will have an overall negligible effect in terms of transport impact.
- 9.8.47 A Framework Travel Plan (FTP) has been prepared (Appendix 9.2) for the Application. The purpose of the FTP is to set out the overarching aims and objectives for reducing single vehicle occupancy vehicle trips. The Framework Travel Plan will set measures and targets for the Site as a whole. Individual Travel Plans (TPs) for the specific land uses across the Site will draw on the FTP for the overarching aims and objectives with more specific targets and measures that may be relevant for those specific purposes.
- 9.8.48 The principal aim of the FTP is in line with the HGC Transport Vision, that is, for 40% of journeys from/to/within Hemel Hempstead and 60% of journeys from/to/within new HGC will be completed by sustainable modes of travel.
- 9.8.49 Targets are identified for reducing single occupancy car journeys to and from the Site at the outset with performance monitored and reviewed through the implementation period. The FTP also sets out the mechanisms through which ongoing monitoring, review and intervention would be enforced.
- 9.8.50 The FTP sets out an action plan which details the proposed measures, trigger points, commitments and obligations that the developer and future occupiers will be required to adhere to. These may be subject to change depending on the phases and timing of Development; however, it should provide a good approximate time frame for the implementation of the required measures.
- 9.8.51 There will be a Travel Plan Co-ordinator (TPC) who will oversee the framework and co-ordinate between all the individual Travel Plans and Travel Plan Co-ordinators across the Site to ensure the aims and objectives are aligned with the FTP.

9.9 Cumulative Effects

Construction

Assessment

- 9.9.1 It is anticipated that the SADC will require all developers to manage cumulative construction impacts in the typical manner and the developer will cooperate with this process.

Mitigation, Monitoring and Residual Effects

- 9.9.2 The mitigation and monitoring arrangements are to be detailed in CTMPs prior to the build out of the Development and the respective cumulative schemes.

Completed Development

Assessment

- 9.9.3 As noted in the methodology section, the main assessment includes the potential trip generation associated with other cumulative schemes in the Cumulative Scenario. As such, the main assessment includes the effects of the Development with and without other cumulative schemes.

9.10 Summary

- 9.10.1 A summary of the residual effects is provided in Table 9.27.

Table 9.27: Summary of Residual Effects

Effect	Receptor (Sensitivity)	Magnitude of Impact	Scale of Effect	Additional Mitigation and Monitoring	Residual Effect
Development Scenarios					
Construction					
Severance of communities	No links qualify for assessment in accordance with IEMA guidance.	Negligible	Negligible - Not significant	No additional monitoring and mitigation required.	Negligible (not significant) temporary at the local level
Road vehicle driver and passenger delay					
Non-motorised user delay					
Non-motorised user amenity					
Fear and intimidation on and by road users					
Road user and pedestrian safety					
Completed Development - Core Scenario					
Severance of communities	Cherry Tree Lane Negligible	Low	Negligible - Not significant	No additional monitoring and mitigation required	Negligible (not significant), temporary, medium-term
	Three Cherry Trees Lane (E of Buncefield Lane) Negligible	Low	Negligible - Not significant		
	Green Lane (N of Boundary Way)	Low	Negligible - Not significant		

Effect	Receptor (Sensitivity)	Magnitude of Impact	Scale of Effect	Additional Mitigation and Monitoring	Residual Effect
	Medium				
Road vehicle driver and passenger delay	Cherry Tree Lane Negligible Three Cherry Trees Lane (E of Buncefield Lane) Negligible Green Lane (N of Boundary Way) Medium	Negligible Low Medium	Negligible - Not significant Negligible - Not significant Moderate adverse – (significant)	Vehicle delays are increased along Green Lane. This will improve significantly with implementation of the STC which will allow general traffic to bypass this link.	Negligible (not significant), temporary, medium- term Although this eventuality is unlikely. It is acknowledged that without the STC the Moderate adverse (significant) impact may persist.
Non-motorised user delay	Cherry Tree Lane Negligible Three Cherry Trees Lane (E of Buncefield Lane) Negligible Green Lane (N of Boundary Way) Medium	Negligible Negligible Negligible	Negligible - Not significant Negligible - Not significant Negligible - Not significant	No additional monitoring and mitigation required	Negligible (not significant), temporary, medium- term
Non-motorised user amenity	Cherry Tree Lane Negligible	Negligible Negligible	Negligible - Not significant	No additional monitoring and mitigation required	Negligible (not significant), temporary, medium- term

Effect	Receptor (Sensitivity)	Magnitude of Impact	Scale of Effect	Additional Mitigation and Monitoring	Residual Effect
	Three Cherry Trees Lane (E of Buncefield Lane) Negligible	Negligible	Negligible - Not significant		
	Green Lane (N of Boundary Way) Medium		Negligible - Not significant		
Fear and intimidation on and by road users	Cherry Tree Lane Negligible	Negligible	Not significant	No additional monitoring and mitigation required	Negligible (not significant), temporary, medium- term
	Three Cherry Trees Lane (E of Buncefield Lane) Negligible	Negligible	Not significant		
	Green Lane (N of Boundary Way) Medium	Negligible	Not significant		
Road user and pedestrian safety	Cherry Tree Lane Negligible	Negligible	Not significant	No additional monitoring and mitigation required	Negligible (not significant), temporary, medium- term
	Three Cherry Trees Lane (E of Buncefield Lane) Negligible	Negligible	Not significant		
	Green Lane (N of Boundary Way) Medium	Negligible	Not significant		

Effect	Receptor (Sensitivity)	Magnitude of Impact	Scale of Effect	Additional Mitigation and Monitoring	Residual Effect
<i>Completed Development – Cumulative Scenario</i>					
Severance of communities	North Green Lane Bypass Medium	Negligible	Negligible - Not significant	No additional monitoring and mitigation required	Negligible (not significant), permanent at the local level
	Scheme Road North S Medium	Negligible	Negligible - Not significant		
	Scheme Road North Central Medium	Low	Minor - Not significant		
	Scheme Road North N Medium	Low	Minor - Not significant		
Road vehicle driver and passenger delay	North Green Lane Bypass Medium	Negligible	Negligible - Not significant	No additional monitoring and mitigation required	Negligible (not significant), permanent at the local level
	Scheme Road North S Medium	Negligible	Negligible - Not significant		
	Scheme Road North Central Medium	Negligible	Negligible - Not significant		
	Scheme Road North N Medium	Medium	Minor - Not significant		

Effect	Receptor (Sensitivity)	Magnitude of Impact	Scale of Effect	Additional Mitigation and Monitoring	Residual Effect
Non-motorised user delay	North Green Lane Bypass Medium	Low - Positive	Minor Beneficial	No additional monitoring and mitigation required	Minor Beneficial, permanent at the local level
	Scheme Road North S Medium	Low - Positive	Minor Beneficial		
	Scheme Road North Central Medium	Low - Positive	Minor Beneficial		
	Scheme Road North N Medium	Low - Positive	Minor Beneficial		
Non-motorised user amenity	North Green Lane Bypass Medium	Negligible	Negligible - Not significant	No additional monitoring and mitigation required	Negligible (not significant), permanent at the local level
	Scheme Road North S Medium	Negligible	Negligible - Not significant		
	Scheme Road North Central Medium	Negligible	Negligible - Not significant		
	Scheme Road North N Medium	Negligible	Negligible - Not significant		
Fear and intimidation on and by road users	North Green Lane Bypass Medium	Negligible	Negligible - Not significant	No additional monitoring and mitigation required	Negligible (not significant), permanent at the local level
		Negligible			

Effect	Receptor (Sensitivity)	Magnitude of Impact	Scale of Effect	Additional Mitigation and Monitoring	Residual Effect
	Scheme Road North S Medium	Negligible	Negligible - Not significant		
	Scheme Road North Central Medium	Negligible	Negligible - Not significant		
	Scheme Road North N Medium		Negligible - Not significant		
Road user and pedestrian safety	North Green Lane Bypass Medium	Low - Positive	Minor Beneficial	No additional monitoring and mitigation required	Minor Beneficial, permanent at the local level
	Scheme Road North S Medium	Low - Positive	Minor Beneficial		
	Scheme Road North Central Medium	Low - Positive	Minor Beneficial		
	Scheme Road North N Medium	Low - Positive	Minor Beneficial		

References

¹ Department for Communities and Local Government, (2025). National Planning Policy Framework.

² Hertfordshire County Council, (2018), Hertfordshire's Local Transport Plan (2018 – 2031)

³ St Albans City and District Council, (2024), Draft SADC Local Plan – Draft Local Plan 2041 ('Emerging Local Plan')

⁴ Department for Communities and Local Government, (2016), Planning Practice Guidance (PPG) (Live Document)

⁵ Hertfordshire County Council, (2024), HCC Highways Place and Movement Planning and Design Guide

⁶ Hemel Garden Communities, (2024), HGC Framework Plan

⁷ Hemel Garden Communities, (2024), HGC Strategic Design Code

⁸ Hemel Garden Communities, (2024), HGC 2050 Transport Vision & Strategy