

Figure 8-13 - Queue Impact Plot – Scenario 4 vs Scenario 5 - Evening Peak



8.4.15 As demonstrated, within the Cumulative scenario there are no significant impacts generated from the Proposed Development. This is as a result of the connection through East Hemel, offering an alternative route for vehicles travelling south, as well as the delivery of Project Breakspear which alleviates the pressures along the A414 corridor. The interventions at the A414/ Maylands Avenue roundabout address queueing along the Maylands Avenue corridor.

8.4.16 The full suite of Paramics model outputs and results spreadsheet can be issued upon request.

8.5 Standalone Junction Models

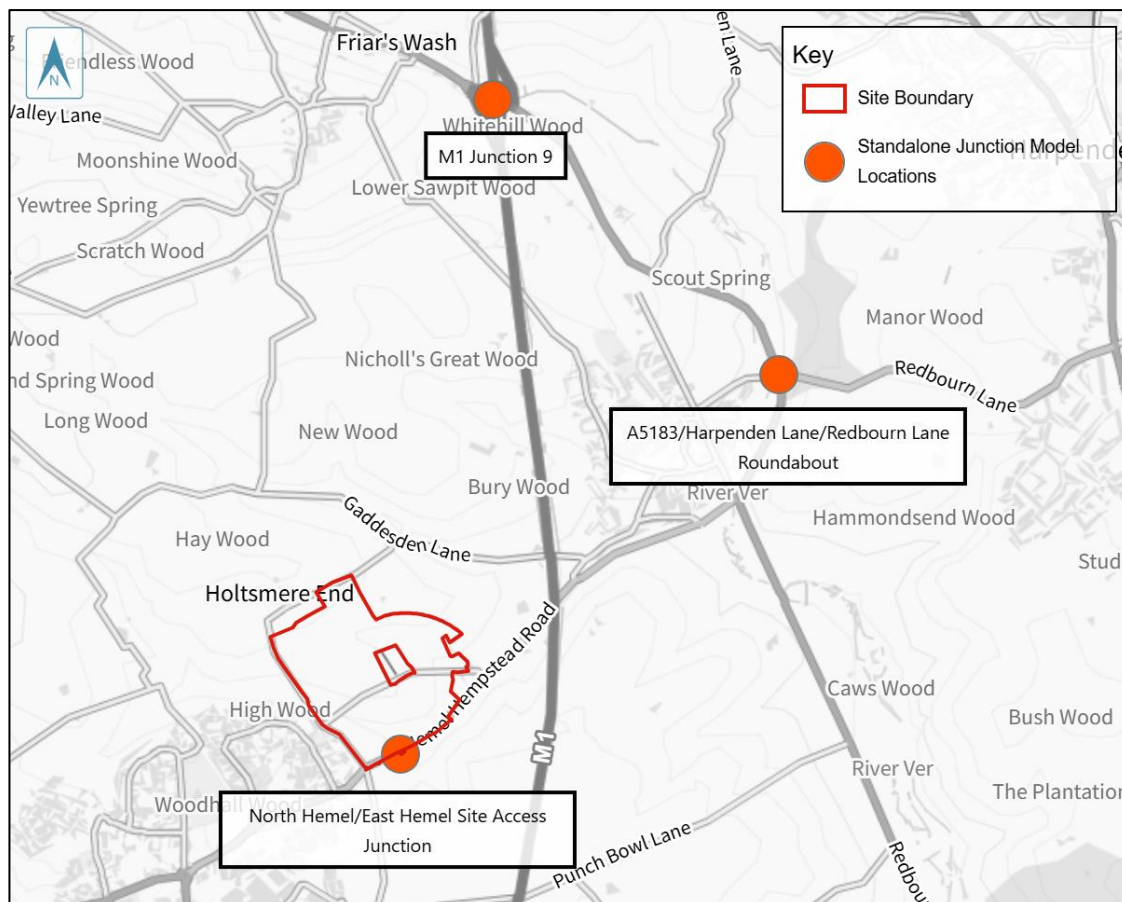
8.5.1 The Paramics model extends up to the M1 boundary, to the east of the Site. As highlighted from the trip assignment, a moderate proportion of vehicle movements are expected to route east, beyond the model extents towards Redbourn, Harpenden and M1 Junction 9 to the north.

8.5.2 Standalone junction modelling has therefore been undertaken for the two key junction to the east of the Site, using Junctions 11 ARCADY modelling software, as listed below:

- M1 Junction 9
- A5183/Harpenden Lane/Redbourn Lane Roundabout

- 8.5.3 The observed traffic flows have been provided by SLR on behalf of TCE and are derived from junction turning count surveys undertaken on 15th May 2025. The growth from the observed flows to the future baseline flows for the 2041 Reference Case and the 2041 Local Plan Reference Case have been derived by calculating the overall growth factor from the Paramics model, between the 2024 surveyed data the model is based on the future year, as set out below:
- 2024 to 2041 Reference Case = 1.24 in the morning and 1.21 in the afternoon
 - 2024 to 2041 Local Plan Reference Case = 1.38 in the morning and 1.28 in the afternoon
- 8.5.4 The observed traffic surveys used are included within **Appendix G**. The junction geometries have been derived from OS mapping, the geometry drawings for both junctions are included as **Appendix H**.
- 8.5.5 The Proposed Development vehicle movements travelling between the Site and east along the B487 Hemel Hempstead Road have then been distributed through the junctions based on the turning proportions from the observed junction turning counts. To provide a worst-case assessment, it has been assumed that all movements from the Proposed Development route through these junctions, however in reality a proportion of these will route south and east towards St Albans and Harpenden rather than travelling through the junctions assessed.
- 8.5.6 In addition, standalone modelling of the Eastern Junction has been undertaken to inform the proposed design. This has been undertaken using LinSig modelling software and vehicle movements from the Cumulative scenario (2041 Local Plan Reference Case + Proposed Development) flows from the Paramics model outputs. This ensures consistency of the assessment against the Paramics modelling. Results for two layout options are presented, the layout as proposed and an alternative lane arrangement for the Site access arm of the junction.
- 8.5.7 The location of the standalone junctions assessments are highlighted in **Figure 8-14** overleaf.

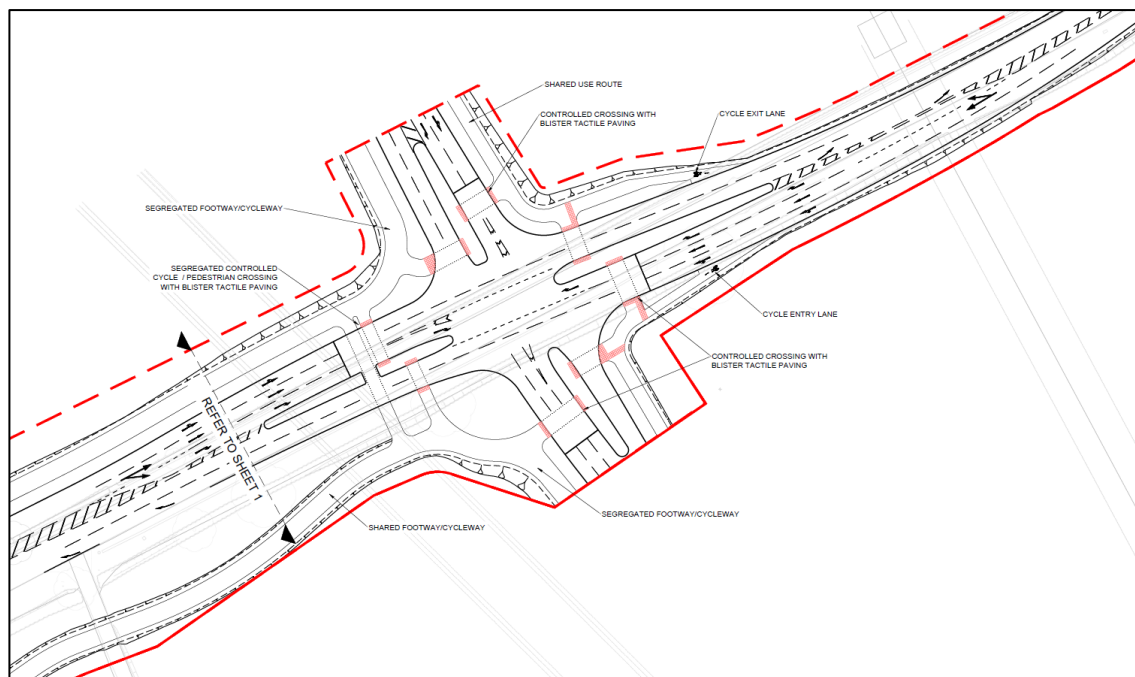
Figure 8-14 Standalone Junction Model Locations



Eastern Junction Assessment

- 8.5.8** The Eastern Junction will be in the form of a signalised crossroads on the B487 Hemel Hempstead Road facilitating connections between the Site and East Hemel. The form of the junction as a crossroads facilitates direct connections between both Sites, enabling all modes to cross the B487 Hemel Hempstead Road conveniently, with minimal delays. The junction permits all turning movements and offers an all-green phase for pedestrians and cyclists.
- 8.5.9** The proposed junction layout has been designed jointly with the East Hemel applicant. The drawing presented has been prepared by SLR on behalf of TCE for the East Hemel application.
- 8.5.10** The proposed layout is presented in **Figure 8-15** and the full design is included as **Appendix D**.

Figure 8-15 – Eastern Junction Proposed Layout



8.5.11 As illustrated, the proposed junction layout includes the following:

- **Hemel Hempstead Road West** – single lane approach, branching into three lanes: ahead and left, ahead only and right-turn only. There are two exit lanes from the junction, which merge back into one lane beyond the junction.
- **Hemel Hempstead Road East** – single lane approach, branching into three lanes: ahead and left, ahead only and right-turn only. There are two exit lanes from the junction, which merge back into one lane beyond the junction.
- **Site Access** – single lane approach, branching into two lanes: ahead/ left and right only. There are two lanes exiting the junction, merging into one.
- **East Hemel Access** – single lane approach, branching into three lanes: left turn only, ahead only and right turn only. There is a single exiting the junction into East Hemel.
- **Pedestrian / Cycle Arrangements** – staggered toucan crossings on all arms, except the western arm which includes a sparrow crossing, with separate pedestrian crossing.

8.5.12 The results of the modelling for the Eastern Junction as proposed (undertaken by SLR) are presented in the following table. This demonstrates that the junction operates within capacity. The full model outputs are included in **Appendix I**.

Table 8-3 Eastern Junction – Proposed Layout Model Results

	AM Peak Hour		PM Peak Hour	
	DOS %	MMQ	DOS %	MMQ
2041 Local Plan Dev Case				
Hemel Hempstead Road West – Ahead Left	85.0%	14.0	67.2%	10.2
Hemel Hempstead Road West – Right	32.5%	0.9	19.4%	1.1
Site Access – All Movements	84.1%	6.9	48.1%	2.3
Hemel Hempstead Road East – Ahead Left	55.6%	7.4	76.1%	12.3
Hemel Hempstead Road East – Right	9.0%	0.6	27.2%	1.8
East Hemel Access – Left	34.5%	1.9	27.7%	1.2
East Hemel Access – Ahead Right	77.4%	4.5	75.8%	3.6
Practical Reserve Capacity	5.9		18.2	

Source: SLR

- 8.5.13 An alternative junction layout has also been tested, which utilises the same junction footprint as the proposed layout but reallocates the unused two-lane exit on the Site arm of the junction to an additional approach lane. This replicates the layout on the East Hemel arm of the junction, with the approach comprising of left-turn only lane, ahead only lane and right-turn only lane.
- 8.5.14 The rest of the junction layout remains the same as proposed including all crossing provision.
- 8.5.15 The results for the alternative layout for the Eastern Junction are including in the following table. The full model outputs are included in **Appendix J**.

Table 8-4 Eastern Junction – Alternative Layout Model Results

	AM Peak Hour		PM Peak Hour	
	DOS %	MMQ	DOS %	MMQ
2041 Local Plan + Development				
Hemel Hempstead Road West – Ahead Left	79.0%	13.2	66.3%	9.9
Hemel Hempstead Road West – Right	32.5%	2.0	19.4%	1.1
Site Access – Left	56.1%	2.9	34.6%	1.7
Site Access – Ahead Right	50.6%	2.4	34.1%	1.5
Hemel Hempstead Road East – Ahead Left	51.3%	7.0	75.2%	12.0
Hemel Hempstead Road East – Right	9.0%	0.6	27.2%	1.8

	AM Peak Hour		PM Peak Hour	
	DOS %	MMQ	DOS %	MMQ
East Hemel Access – Left	43.2%	1.9	27.7%	1.2
East Hemel Access – Ahead Right	77.4%	3.8	58.2%	2.9
Practical Reserve Capacity	13.9		19.7	

8.5.16 The above results demonstrate that the alternative layout improves the operation of the junction, improving the flow of vehicles on Hemel Hempstead Road and the Site access. The overall Practical Reserve Capacity (PRC) of the junction also increases in this scenario. This would future proof the junction for potential additional demand generated from future HGC development to the north, whilst retaining the overall junction footprint and carriageway space.

8.5.17 The Applicant welcomes HCC's and SACDC's feedback on the proposed junction layout and would support the implementation of either option, in agreement with TCE and East Hemel.

M1 Junction 9

8.5.18 M1 Junction 9 is located 7km from the Site and is accessible by a 7-minute drive east from the Site along B487 Hemel Hempstead Road and past the village of Redbourn on Dunstable Road.

8.5.19 The junction is grade separated, with a roundabout either side of the M1 providing access to M1 slip roads. The western roundabout facilitates access and egress from the M1 northbound, as well as Dunstable Road (A5183) east to Redbourn and west to Dunstable, and Watery Lane, which provides access via rural connections north toward Luton. The eastern roundabout provides access and egress from the M1 southbound as well as Dunstable Road (A5183).

8.5.20 The ARCADY model results for the M1 Junction 9 are demonstrated in the following table. The full model outputs are included in **Appendix K**.

Table 8-5 M1 Junction 9 - Model Results

	AM Peak Hour		PM Peak Hour	
	RFC	Queue	RFC	Queue
2025 Observed				
Western Roundabout - Dunstable Road	0.4	0.7	0.65	1.8
Western Roundabout - M1 Northbound	0.27	0.4	0.39	0.6
Western Roundabout - A5183	0.61	1.5	0.29	0.4
Western Roundabout - Watery Road	0.46	0.8	0.12	0.1

	AM Peak Hour		PM Peak Hour	
	RFC	Queue	RFC	Queue
Eastern Roundabout - Dunstable Road	0.62	1.6	0.84	5
Eastern Roundabout - A5183	0.27	0.4	0.14	0.2
Eastern Roundabout - M1 Northbound	0.31	0.4	0.34	0.5
2041 Reference Case				
Western Roundabout - Dunstable Road	0.49	1	0.76	3.1
Western Roundabout - M1 Northbound	0.34	0.5	0.49	1
Western Roundabout - A5183	0.76	3.1	0.35	0.5
Western Roundabout - Watery Road	0.74	2.6	0.15	0.2
Eastern Roundabout - Dunstable Road	0.77	3.3	1.03	44.1
Eastern Roundabout - A5183	0.35	0.5	0.17	0.2
Eastern Roundabout - M1 Northbound	0.40	0.7	0.43	0.7
2041 Local Plan Reference Case				
Western Roundabout - Dunstable Road	0.55	1.2	0.77	3.3
Western Roundabout - M1 Northbound	0.39	0.6	0.52	1.1
Western Roundabout - A5183	0.86	5.7	0.37	0.6
Western Roundabout - Watery Road	1.00	13.2	0.16	0.2
Eastern Roundabout - Dunstable Road	0.86	5.9	1.09	88.5
Eastern Roundabout - A5183	0.39	0.6	0.18	0.2
Eastern Roundabout - M1 Northbound	0.47	0.9	0.46	0.8
2041 Reference Case + Proposed Development				
Western Roundabout - Dunstable Road	0.49	1	0.75	3
Western Roundabout - M1 Northbound	0.34	0.5	0.5	1
Western Roundabout - A5183	0.77	3.3	0.37	0.6
Western Roundabout - Watery Road	0.75	2.8	0.15	0.2
Eastern Roundabout - Dunstable Road	0.8	4	1.05	56.4
Eastern Roundabout - A5183	0.36	0.6	0.18	0.2
Eastern Roundabout - M1 Northbound	0.41	0.7	0.44	0.8
2041 Local Plan Reference Case + Proposed Development				

	AM Peak Hour		PM Peak Hour	
	RFC	Queue	RFC	Queue
Western Roundabout - Dunstable Road	0.55	1.2	0.74	2.8
Western Roundabout - M1 Northbound	0.39	0.6	0.52	1.1
Western Roundabout - A5183	0.86	5.9	0.38	0.6
Western Roundabout - Watery Road	1.01	14.4	0.16	0.2
Eastern Roundabout - Dunstable Road	0.91	9.1	1.15	136.7
Eastern Roundabout - A5183	0.4	0.7	0.19	0.2
Eastern Roundabout - M1 Northbound	0.48	0.9	0.48	0.9

- 8.5.21 The results of the model demonstrate that the junction currently operates within capacity. Whilst the junction operates well in all scenarios assessed, when considering the background growth of approximately 25% in the 2041 Reference Case, the Dunstable Road arm of the Eastern Roundabout exceeds an RFC of 1.00 in the evening peak. This indicates that the theoretical capacity of the junction is exceeded and queueing may result. This is caused by background growth and occurs in the future despite the Proposed Development coming forward.
- 8.5.22 When considering the robust addition of Proposed Development trips to the 2041 Reference Scenario, there is a minor increase in RFC from 1.03 to 1.05 in evening peak hour and all other arms remain within capacity in both peak hours. The very limited impact is a result of the junction already operating over capacity in the future and the worst-case assessment of Proposed Development trips which subsequently have a disproportionate impact on the results reported.
- 8.5.23 The impact of the DBC and SACDC Draft Local Plan Sites (not including the Proposed Development) is equivalent to an increase in junction throughput of approximately 30-40% from the 2025 Observed. This causes the Dunstable Road arm of the Eastern Roundabout to increase to 1.09 RFC in the evening peak hour and the Watery Lane arm to increase to 1.00 RFC in the morning peak hour. Furthermore, the A5183 arm of the Western Roundabout and Dunstable Road of the Eastern Roundabout surpass 0.85, indicating that the arms will be operating at their practical capacity, and queues and delays may occur at these arms in the morning peak hour.

8.5.24 When considering the addition of the Proposed Development trips to the 2041 Local Plan Reference Case scenario in the morning peak hour, the A5183 arm of the Western Roundabout does not increase in RFC, Dunstable Road of the Eastern Roundabout increases slightly but remains within absolute capacity and Watery Lane increases by an RFC of 0.01. In the evening peak hour, Dunstable Road of the Eastern Roundabout increases slightly from 1.09 to 1.15.

In both the Core and Cumulative scenarios, the moderate delays at the junction occur in the future year despite the Proposed Development coming forward. As a result, the additional flows through the junction generated from the Proposed Development have a disproportionate impact on queuing. The Proposed Development impacts at this junction therefore are not considered 'severe'.

A5183 / Harpenden Lane / Redbourn Lane

8.5.25 A5183 / Harpenden Lane / Redbourn Lane roundabout is located east of the village of Redbourn, 4km from the Site and is accessible by a 4-minute drive along B487 Hemel Hempstead Road.

8.5.26 This roundabout connects to Redbourn along the western arm, Harpenden along the eastern arm, the M1 along the northern arm, and Hemel Hempstead along the southern arm.

8.5.27 The ARCADY model results for the roundabout are demonstrated in the following table. The full model outputs are included in **Appendix L**.

Table 8-6 A5183 / Harpenden Lane / Redbourn Lane Roundabout Model Results

	AM Peak Hour		PM Peak Hour	
	RFC	Queue	RFC	Queue
2025 Observed				
A5183 North	0.93	10.4	0.79	3.7
Redbourn Lane	0.96	14.0	0.87	6.0
A5183 South	0.78	3.3	0.98	19.5
Harpenden Lane	0.35	0.5	0.36	0.6
2041 Reference Case				
A5183 North	1.22	147.6	0.97	17
Redbourn Lane	1.20	125.2	1.14	83.1
A5183 South	0.97	16.9	1.22	150.8
Harpenden Lane	0.52	1.1	0.46	0.8
2041 Local Plan				

	AM Peak Hour		PM Peak Hour	
	RFC	Queue	RFC	Queue
A5183 North	1.38	306.5	1.02	37
Redbourn Lane	1.32	247.2	1.22	126
A5183 South	1.08	62.7	1.29	214.3
Harpenden Lane	0.61	1.5	0.48	0.9
2041 Reference Case + Development				
A5183 North	1.23	163	1.04	45.6
Redbourn Lane	1.21	132.4	1.19	103.2
A5183 South	1.06	49.4	1.26	183
Harpenden Lane	0.54	1.2	0.46	0.8
2041 Local Plan + Development				
A5183 North	1.38	316.7	1.09	75.5
Redbourn Lane	1.34	256.4	1.25	146.2
A5183 South	1.15	104.9	1.32	249.6
Harpenden Lane	0.61	1.5	0.48	0.9

8.5.28 The results demonstrate that the roundabout is currently approaching theoretical capacity in both morning and evening peak hours. When considering the additional junction throughput resulting from the future growth to 2041, the performance of the junction exceeds the theoretical capacity of 1.00 RFC. This is exacerbated further by the addition of Local Plan growth.

8.5.29 The capacity issues experienced at this junction also occur in the future despite the Proposed Development, with interventions at the junction likely to be required in the future. Against this baseline, the worst-case Proposed Development impact assessed cannot be concluded to have a 'severe' impact, with the already excessive modelled RFCs only increasing marginally.

8.6 Summary

8.6.1 The Paramics modelling shows that most vehicle movements associated with the Proposed Development route west toward the town centre and south in the AM peak, with return flows in the PM, while eastbound movements towards A5183/M1 J9 remain consistent across scenarios. In the Cumulative scenarios, the East Hemel link significantly alters routing by diverting southbound traffic away from Cherry Tree Lane and reducing pressure on Redbourn Road.

- 8.6.2 Across all scenarios, the network performance remains within acceptable limits. The Proposed Development adds only 14 seconds to the morning peak journey times and no evening peak increase in the Core scenario, and Cumulative impacts remain minimal with a 6-second morning peak increase and an 8-second evening peak reduction. Queue analysis shows moderate impacts at already-congested locations along the A414 corridor. The Proposed Development is also indicated to have an impact on junctions along the Redbourn Road corridor.
- 8.6.3 The impacts along the Redbourn Road corridor are effectively addressed by targeted interventions at the Redbourn Road/ Three Cherry Trees Lane and Redbourn Road/ Link Road junctions in the Core scenario. The queues which occur in the future year along the A414 corridor are addressed in the Cumulative scenario from Project Breakspear, targeted interventions along Maylands Avenue as well as vehicle re-routing from the link through East Hemel.
- 8.6.4 Standalone junction modelling of the junctions to the east of the Site which sit outside the Paramics model extent has also been undertaken, as well as the Eastern Junction. Traffic flows were obtained from recent traffic surveys and uplifted to 2041 using growth factors from the Paramics model, with Proposed Development trips assigned on a worst-case basis.
- 8.6.5 At M1 Junction 9, both roundabouts currently operate within capacity, but several arms exceed RFC thresholds in future due to background and Local Plan growth. Adding flows from the Proposed Development causes only marginal increases and does not materially worsen conditions, meaning the impacts are not severe. A similar pattern occurs at the A5183/Harpenden Lane/Redbourn Lane roundabout, which is already at theoretical capacity in 2041. The Proposed Development's contribution is small relative to wider growth, while future interventions will likely be required, the Proposed Development does not create a severe impact.
- 8.6.6 The proposed Eastern Junction, a signalised crossroads connecting the Site with East Hemel, operates within capacity in the Cumulative, 2041 Local Plan + Development scenario. An alternative layout, which utilises the same footprint and carriageway space enhances the junction performance by replacing one of the unused exit lanes for an additional approach lane from the Site. This improves capacity on Hemel Hempstead Road, the Site access, as well as raising the overall Practical Reserve Capacity, thereby providing additional resilience for future growth to the north without requiring more land. The Applicant is open to feedback from HCC and SACDC and is willing to proceed with either layout option in agreement with TCE and East Hemel.

- 8.6.7 Overall, the assessment demonstrates that the Proposed Development can be accommodated on the surrounding highway network without resulting in severe impacts, with any localised pressures either already present in the 2041 future baseline or effectively mitigated through committed and targeting proposed highway interventions, ensuring the surrounding network continues to operate within acceptable limits both in the Core and Cumulative scenarios.

SECTION 9 Summary and Conclusions

9.1 Summary

- 9.1.1** Bloor Homes and Pigeon (Hemel Hempstead) Ltd are submitting an outline planning application for a residential-led mixed-use development of up to 1,500 homes, a care home, primary school, local centre, mobility hub, green infrastructure and associated access, located north of the B487, with all matters reserved except for access from the B487. This Transport Assessment evaluates the transport impacts of the Proposed Development, setting out the strategy for creating a well-connected development that capitalised on the Site location and prioritises sustainable travel.
- 9.1.2** The Site benefits from being well located close to key employment areas, established residential communities, the Maylands employment zone, and the wider HGC Growth Area. It's allocation in the Draft Local Plan allocation H1 highlights its role in delivering sustainable growth for St Albans.
- 9.1.3** Extensive engagement with SACDC, HCC and the HGC team has informed the transport strategy, including access provision, public transport and active travel connections. Several key principles have been agreed during the pre-application engagement which have informed the TA including the assessment and modelling methodology, trip generation assumptions, the use of the Hemel Hempstead Paramics model, and the principle of two signal-controlled access junctions from the B487, including an all-modes Eastern Junction and a bus-only Western Junction.
- 9.1.4** The Proposed Development's transport Vision aligns with HGC's ambition of achieving a 60% sustainable mode share, prioritising walking, cycling and public transport. Core elements of the strategy include delivery of the Sustainable Transport Corridor (STC), safeguarded links for future development, a comprehensive internal walking and cycling network with external connections. Enhanced active travel links along key desire lines, including Redbourn Road and improved access to Hemel Hempstead town centre and station underpin the transport strategy.
- 9.1.5** The Paramics modelling shows that the highway network can accommodate the Proposed Development. In both the Core and Cumulative scenarios, overall network performance remains within acceptable limits, with minimal changes to journey times and queues. Localised impacts on the Redbourn Road corridor are addressed through targeted interventions in the Core scenario. The impacts on the A414 corridor are addressed in the Cumulative scenario as a result of wider interventions including Project Breakspear, and vehicles routing through East Hemel.

9.1.6 Standalone junction assessments demonstrate that, although junctions to the east including M1 Junction 9 and A5183/Harpenden Lane/Redbourn Lane roundabout operate at or near capacity in the future year scenarios, this is due to background growth. The Proposed Development does not materially worsen conditions. The proposed Eastern Junction operates satisfactorily with the Proposed Development, and alternative layout offers additional resilience for future expansion.

9.1.7 Collectively, the transport strategy prioritises sustainable travel, including walking, cycling and public transport. The assessment undertaken demonstrates the Proposed Development can be accommodated within the transport network and will not generate severe residual impacts.

9.2 Conclusions

9.2.1 The Proposed Development satisfies the key transport tests within paragraph 115 of the NPPF:

- 1 There are excellent **opportunities for sustainable travel to be taken up appropriately**. The Site benefits from a range of internal complementary land uses (which will increase with the buildout of the rest of HGC), and is well connected via active travel corridors, to reduce the need external travel. This is supported by enhanced access to the existing (and improved) bus network as well as enhancements pedestrian and cycle connectivity, particularly between the Site, town centre and employment areas.
- 2 **Safe and suitable access** will be provided via two new signal-controlled junctions from B487 Hemel Hempstead Road. The Western Junction will be for buses only. The Eastern Junction will form access for general traffic, with suitable, safe pedestrian and cycle crossings. As part of the proposals, Holtsmere End Lane and Cherry Tree Lane will be restricted to traffic, becoming part of the proposed HGC Green Loop in the future.
- 3 **The Site layout** will be developed as part of subsequent reserved matters, taking into consideration the principles and aspirations set out within this outline application.
- 4 The Site will be designed to ensure high levels of internalisation and real alternatives to private car use. **The impacts on the highway network** have been assessed as part of the assessment using the Paramics model available for Hemel Hempstead. Following the proposed highways interventions, the impacts can will not be severe.

FIGURES

— Major Road Network



Key

 Site Boundary

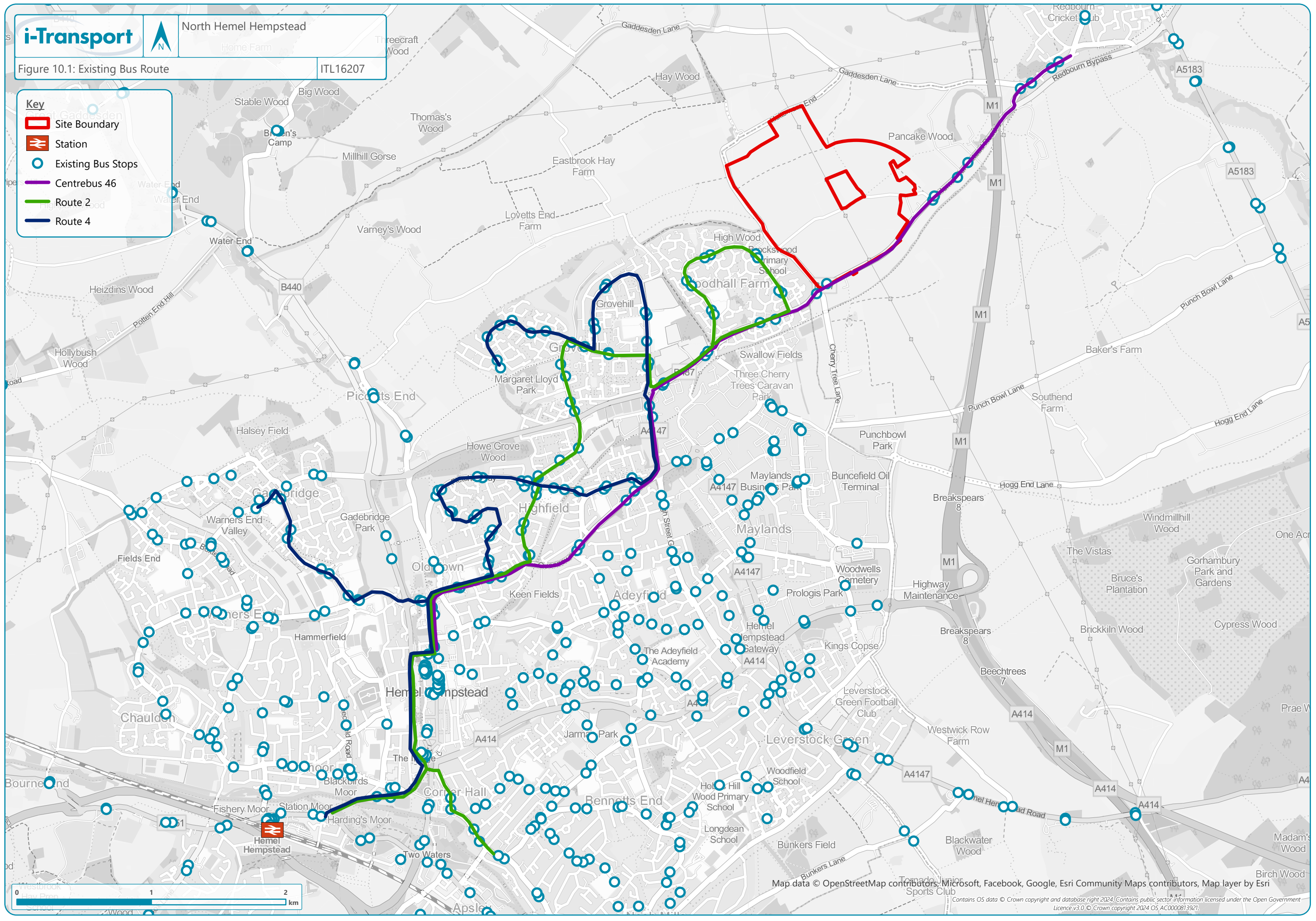
 Station

 Existing Bus Stops

 Centrebus 46

 Route 2

 Route 4





Key

- Site Boundary
- Hemel Hempstead Town Centre
- Maylands Business Park
- East Hemel
- Prospective Primary School
- Prospective Secondary School
- Prospective Local Centre
- Prospective Sports Pitch
- Sainsbury
- ⚓ Station
- Proposed Mobility Hub
- Centrebus 46 Extension
- Centrebus 46
- Route 2
- Route 4
- New Orbital Bus
- Sustainable Transport Corridor
- Bus Priority Connection
- Green Loop
- Hemel Hempstead Road Active Travel Link
- Active Travel Improvements to Town Centre
- Active Travel Improvements Through Maylands
- The Nickey Line
- Little Revel End Lane Active Travel Route
- Bridleway
- Footpath

