St Albans City & District Local Plan – Transport Modelling Narrative – July 2025

Executive Summary

- Hertfordshire County Council (HCC) have a Countywide Strategic Transport Model (COMET) which has been used to test the implications of Local Plan growth in St Albans district.
- Following checks of how well the model is representing current traffic patterns in the district, a number of runs have been undertaken to test the impact of the St Albans Local Plan allocations. These have included modelling the associated infrastructure (as identified in the Infrastructure Delivery Plan) with some allowance for a shift to more sustainable modes (the level of which is based on earlier work – Opportunity to Shift Modes (2024))

The results of this process indicate the following:

- There is predicted to be significant growth in traffic in the St Albans District area as a result of development already planned (before the Local Plan sites come forward) by 2041.
- St Albans City & District Local Plan growth adds between 5-9% additional traffic on top of this depending on the level of mode shift applied.
- Adding in additional transport schemes (from the Infrastructure Delivery Plan) alleviates some of the pressure particularly around the A414 in Hemel Hempstead and northern St Albans District and on more rural routes which could be potentially used as ‘rat runs’.
- Implementing infrastructure and other supporting measures to encourage a shift towards more sustainable modes of travel is also key to the efficient operation of the highways network.
- The focus for National Highways is the impact of growth on the Strategic Road Network. The modelling work has shown potentially large changes in traffic flow at M1 Junctions 8 and 9 and work has identified modifications to junction layouts at these locations, which could be implemented, if and when required. The current layout of M1 Junction 8 however is predicted to accommodate the additional SADC

Local Plan traffic providing changes are made to the A414 / Green Lanes junction on the Local Highway Network (which consist of signalisation).

- The Dacorum Local Plan is being developed in parallel and a series of model runs have also been undertaken to support this process. As a large proportion of Dacorum's growth is focussed on Hemel Hempstead there is a need for HCC as local highway authority to understand the potential impact of both sets of growth on the Local Highway Network.
- A key issue is whether the current layout of M1 Junction 8 can accommodate the combined levels of growth in the Local Plan period. The tests indicate whilst the revised A414/Green Lanes junction works better than the current layout, there are increases in delay and a risk of westbound queues into the junction, blocking back onto the M1 northbound off slip.
- An alternative layout has been developed for M1Junction 8 providing an overbridge over the M1. This provides a direct connection into East Hemel (central zone), relieving pressure on the A414/Green Lanes Junction. This alternative design has also been tested with the combined growth and shows that with some tweaks to the layout delays and queueing with the combined growth are reduced.
- The initial modelling work has assumed 8,000 jobs will be provided in the East Hemel employment zone, however recent evidence suggests that this may now be reduced and as a result a test has been undertaken assuming 4,000 jobs. Further testing has been undertaken with this lower employment number and has indicated reduced delays in the A414/Green Lanes area and queues that can be accommodated within the highway space available with no blocking back.
- This finding is backed up by local modelling work undertaken using the Hemel Hempstead Paramics Model. Local Modelling work undertaken using the Hemel Hempstead Paramics models indicates that the queues can be accommodated. Given the differences in the model outcomes and the ongoing uncertainty around future jobs growth it is suggested that a monitor and manage approach is adopted at this location.
- An initial set of model tests has been undertaken to look at the impact of the full Hemel Garden Communities Growth by 2050 which includes an additional 4,700 homes post the Local Plans period (including 1,200 homes in St Albans District). These tests highlight the areas where there will be additional pressure on the transport network and how the additional post plan infrastructure passenger transport measures may work in practice. The results are indicative at this stage and further work will be required to develop these measures in more detail.
- Table 1 at the end of this Transport Narrative document summarises the model runs undertaken.

1. Background

1.1 What is the COMET model / what can it do

Hertfordshire County Council (HCC) has developed a Strategic Transport Model which covers the whole county. This is known as the Countywide Model of Transport (COMET). COMET is a multimodal model developed using the Department of Transports Transport Appraisal (TAG) guidance. It is able to predict changes in travel demand for cars, vans, heavy goods vehicles, buses and trains.

The model covers the motorway and trunk road network (operated by National Highways), as well as the network operated by HCC and includes all A, B and main C roads and some key rat runs in residential areas. The county is split into a number of zones generally based on areas used in the National census (Medium Super Output Areas) and the model also includes key surrounding areas such as Luton, Aylesbury and London. In broad terms the model estimates the number of trips between zones during different times of the day and allocates them to the type of transport and a specific route. A summary of the model can be found at COMET - Countywide Model of Transport (COMET model brochure).

1.2 Use of the model in a Local Plan context

One of the key uses of the model is to look at the impact of future development on the transport network. The increase in housing (and / or jobs) within a certain location can be added to the appropriate model zone. The model then calculates the number of additional transport trips generated by that growth and forecasts where those trips will go. A particular focus is on additional vehicle trips and whether additional congestion problems are caused as a result of the new developments. The strategic nature of the model means that it is able to test the implications of multiple development sites and their total impact over the wider area (and not just in the immediate vicinity of the site). It enables a prediction of the impacts across the local road network within St Albans district for the local highway authority (Hertfordshire County Council) as well as the impact on the Strategic Road Network (SRN) for National Highways.

Whilst we have more detailed town based models covering Hemel Hempstead and parts of St Albans City these are not able to model all the developments across the district and can't predict how many trips might use public transport and also are unable to show the wider impacts of the growth (for example on the motorway network) or in neighbouring authorities.

The COMET model has already been used to support Local Plan work elsewhere in Hertfordshire and also to underpin planning of individual development sites and the development of major transport infrastructure schemes.

1.3 Model base

Given the long lead in time for getting the evidence together for the Local Plan, use was made of the model available at the time which is the original COMET model with a 2014 base year. This simulates how people are already travelling around the county based on a comprehensive data collection exercise undertaken in 2013/2014 involving mobile phone data, traffic and public transport counts and data from the National Travel Survey. The modelled flows were then compared with independent counts and journey times in a process called calibration and validation to check how close to reality the forecasts are against pre-determined criteria from the Department of Transport.
The DfT require models to be kept up to date. However, the Covid pandemic delayed the update process. Data collection for the new version of the model took place as soon as the DfT enabled us to do so (from March 2023) and this has been used to develop an updated countywide model – however this has not been available in time to support the St Albans City & District Local Plan work.

At the start of this Local Plan modelling process a check was undertaken of the existing base model performance in the St Albans District area. This involved rechecking the model set up, its local performance and also how well the 2014 estimates compared with current (2023) traffic flows.
St Albans Base Year Model Review Technical Note - April 2024
St Albans Base Year Model Review Technical Note & Addendum – July 2024

Generally, the model performance met the required criteria in the St Albans District area. Some areas for improvement were identified with minor adjustments made to the detail of the coding e.g. speeds allowed on certain links. The comparison against recent traffic counts indicated that generally 2023 flows were lower than the 2014 flows during the peak hours (0800-0900 and 1700-1800). A review of congestion and journey time data also indicated that delays and congestion were generally in the same areas and it was concluded that the base year model was suitable for ongoing forecasting and provided a robust assessment. The results are summarised in Chapter 2 of the Forecast Report COMET- St Albans LP Modelling Report FINAL 22.05.2025 and more detailed information can be found in the St Albans Base Year Model Review Technical Note and Addendum.

1.4 The Strategic Road Network and National Highways

A key stakeholder for the Local Plan is National Highways. They operate the motorway and trunk road network known as the Strategic Road Network (SRN) (i.e. the M1 and the M25 in the St Albans District area) and therefore require evidence of the impact of the development growth on these routes (and in particular at the motorway junctions). The focus for National Highways is the impact of individual Local Plans on their network.

As part of the Duty to Cooperate discussions, a series of meetings have been held with HCC, SADC and National Highways supported by information exchange. The first stage

was to demonstrate that the COMET model is accurately reflecting the traffic conditions on the motorway network. A separate comparison was undertaken of the modelled versus observed flows on the Strategic Road Network and confirmed overall that the model met the required comparison criteria during all model time periods.
240409 COMET 2014 Base Year Model Review-SRN

A specific comparison was undertaken of the performance of the M25 against National Highways own data was also undertaken at their request and was found to meet the required criteria on the majority of sections.
240701 COMET 2014 Base Year Model Review-SRN

National Highways subsequently confirmed that they were satisfied with the performance of the model for Local Plan testing purposes.

2. Forecasting the future

2.1 Future Base Forecast (Option 0)

The first stage of forecast modelling is to develop a comparative forecast -this shows what will happen to the transport network in the future before the additional Local Plan growth is added. This is sometimes called a Do Minimum forecast. It takes account of the following:

- Developments that have already been built (since 2014) in St Albans District and Dacorum.
- Changes to the road network (since 2014)
- Developments that are committed (i.e. already have planning permission but are not yet built) in St Albans District and Dacorum.
- Changes to the transport network which are highly likely to happen (i.e. they have a detailed design and funding identified) – for example the changes associated with the Radlett Rail freight development.
- Allowance for growth outside St Albans district and Dacorum – taken from government forecasts from the National Trip End Model (NTEM)

Using this information a 2041 'Do Minimum' forecast was built. This is known as **Option 0.** Further information on the assumptions and how this forecast was built up are included in ***Chapter 5*** of the forecast report - COMET- St Albans LP Modelling Report FINAL 22.05.2025

This Do Minimum Future year was then compared with the Base 2014 year. As a result of recently built and committed developments the total number of vehicles trips across St Albans District are forecast to increase by 10,500 vehicles (or 18%) in the AM peak hour and 7,800 vehicles (or 13%) in the PM peak hour. This results in a number of roads experiencing increases in delay which has the effect of reducing average vehicle speeds by around 11%.

2.2 Future Local Plan tests – What happens to the transport network if you add the St Albans City & District Local Plan sites?

In order to test the impact of the Local Plan growth a number of forecasts were developed and compared with the 2041 Do Minimum (Option 0). The forecasting methodology was discussed and agreed with National Highways as part of the Duty to Cooperate discussions. The following paragraphs outline the tests undertaken. More detailed results of the model tests are reported in Chapter 8 of the forecasting report COMET- St Albans LP Modelling Report FINAL 22.05.2025

Option 1

Based on business as usual assumptions with no mode shift, this is a worst case scenario which assumes that the Local Plan development sites in St Albans District are

added without any supporting infrastructure (other than the access links – including the East Hemel development Spine Road). Estimates of the amount of traffic from the individual developments were taken from supporting technical work (Transport Assessments) where available. In other cases, more generic estimates were used. These were based on the number of trips per dwelling or jobs (known as Trip Rates) multiplied by the size of development and were consistent with the estimates used in the AECOM Transport studies. Further information on the assumptions can be found in ***Chapter 6*** of the forecast report COMET- St Albans LP Modelling Report FINAL 22.05.2025

Compared with the Do Minimum (Option 0) the addition of the Local Plan sites adds a further 5,500 vehicle trips (8% increase) in the AM peak and 5,700 trips (9%) increase in the PM peak. This leads to additional pressure on a number of roads, particularly between Hemel Hempstead and St Albans and on the A414 in Hemel Hempstead and north of St Albans with increases in delay and a further reduction of 6-7% in average vehicle speeds.

Option 2

Option 1 is not a realistic scenario as in reality the Local Plan developments would provide additional infrastructure beyond just their accesses and would also contribute financially to other transport improvements. There are also a number of other ongoing initiatives in the County e.g. Introduction of 20mph schemes, introduction of new cycling infrastructure and travel planning initiatives which would be expected to reduce the number of car trips more generally.

Option 2 attempts to represent this by including additional changes to the transport network identified in the supporting Local Plan Infrastructure Delivery Plan (IDP) INF 01.01 - SADC Infrastructure Delivery Plan (2024).pdf

It should be noted that given the strategic nature of the COMET model only schemes directly affecting the highway network (and highway capacity) can be modelled. A list of the schemes included are given in Table 7.1 of the Forecast Report and include the changes to the A414 / Green Lanes Junction in Hemel Hempstead (proposed as part of the East Hemel Hempstead development), implementation of further 20mph areas and schemes already identified as part of technical work undertaken for the new developments. The test also includes adjustments to existing traffic signal times to reflect the new patterns of traffic flows (known as signal optimisation) – this is realistic as most of HCCs signals are adaptive to changing traffic flows.

It should be noted that this scenario also included restriction of Punchbowl Lane and Hogg End Lane (country lanes between St Albans and Hemel Hempstead) to through traffic as the Option 0 modelling work indicated these could be used as rat runs from the East Hemel development (something they are unsuitable for given their rural nature with single track running).

In order to allow for the impact of other measures that can't be directly modelled (e.g. cycle schemes, car share, travel planning) a generic 10% mode shift away from the car was also applied to trips with origins and destinations in St Albans district (external longer distance trips were not affected). This along with the additional mitigation measures results in a lower level of traffic increase than Option 1 with around 3,500 - 3,700 additional vehicles in the Peak hours (representing an increase of 5-6%).

Although traffic levels are higher than the Do Minimum (Option 0) due to the additional Local Plan growth, there is an improvement in traffic conditions compared to Option 0 due to the mitigation measures introduced and the level of rat running is reduced. There are particular reductions in delay on the A414 Breakspear Way in Hemel Hempstead indicating that the changes to the A414 / Green Lane Junction (signalisation) are needed to accommodate the traffic from the East of Hemel development. As long as this scheme is introduced the current layout of M1 Junction 8 is forecast to cope with the additional traffic from the St Albans Local Plan allocations.

Local Plan growth generates traffic increases elsewhere in the district but generally the highway network performs better with the mitigation measures proposed. Further technical work has been undertaken to look at the detail of impacts and possible solutions at M1 Junction 9 and M25 Junction 22 for National Highways.

Option 3

A final option was tested which looked at a more sophisticated and nuanced way of applying the mode shift reductions. This was based on earlier work undertaken (Opportunity to Shift Modes tool) which looked at the type of people living in different areas of the district, the types of trip they were making and how likely they were to switch journeys from the car if the right infrastructure was provided. Different mode shifts were applied to different areas of the district – for example it recognises that younger people renting in more central areas of St Albans City have a greater opportunity and propensity to shift travel away from the car than older people living in more rural areas. Further information on this analysis is provided at:
INF 09.12 - Transport Impact Assessment St Albans Modal Shift Report (2024).pdf

Overall, this equated to a 24% reduction in internal vehicle trips within St Albans district (although this varies by model zone) and a 5% reduction in vehicle trips from St Albans district to other destinations. No reduction is applied for trips coming into St Albans district from elsewhere or for trips passing through.

These reductions have been applied instead of the 10% global reduction applied in Option 2 along with the infrastructure schemes. Further information on this approach is included in Chapter 7 of the Forecasting report. COMET- St Albans LP Modelling Report FINAL 22.05.2025

Overall, the levels of traffic generated are slightly lower than Option 2 with around 3,200 additional vehicle trips (5% increase) compared with the Do minimum (Option 0) in the

AM peak hour and around 3,000 additional vehicle trips (4.5% increase) in the PM peak hour. Results are similar to Option 2 although there is a general improvement in delay in the St Albans City area due to the higher level of mode shift applied here.

Summary of St Albans City & District Local Plan tests

Key points to note from the various Local Plan model tests are as follows:

- There is predicted to be significant growth in traffic in the St Albans district area as a result of development already planned (before the Local Plan sites come forward) by 2041.
- St Albans City & District Local Plan growth adds between 5-9% additional traffic on top of this depending on the level of mode shift applied.
- Adding in additional transport schemes (from the Infrastructure Delivery Plan) alleviates some of the pressure compared to Option 1, particularly around the A414 in Hemel Hempstead and on more rural routes which could be potentially used as 'rat runs'.
- The current layout of M1 Junction 8 appears to accommodate the additional St Albans Local Plan traffic providing changes are made to the A414 / Green Lanes Junction.

3. Combined Tests with Dacorum Local Plan Growth

3.1 Background and Dacorum Growth

Whilst the Option 0-3 forecasts show the discrete impact of just the St Albans District Local Plan growth and take into account development growth outside (based on the government forecasts), Dacorum Local Plan is also being developed and as a key neighbouring authority this will have impacts on St Albans District.

Dacorum Borough Council have also commissioned a series of modelling runs to test the implications of their own growth using the COMET model. As with St Albans district, a baseline (Do Minimum) option was developed (Option A) along with the worst case (Local Plan sites added with no mitigation – Option B) and then a combination of mode shift assumptions / additional infrastructure assumptions (Options C – E).

Further detail on these forecasts can be found on the Dacorum Borough Council Evidence base at https://letstalk.dacorum.gov.uk/local-plan-to-2041-and-evidence including DBC documents:
TRA04.1 Dacorum Local Plan Traffic Modelling Report (Nov 2024)
TRA04.2 Dacorum Local Plan Traffic Modelling Addendum (Mar 2025)

SADC are relying on their specific development tests (Options 1-3) to illustrate the specific impact of their Local Plan growth on the transport network, and this is also the focus for National Highway's review of the impacts on their Strategic Road Network. However, given that a large proportion of Dacorum's growth is focussed on Hemel Hempstead model runs have also been undertaken to understand the potential impact of both sets of growth on the highway network. This is a particular area of concern for HCC who seek to understand whether the proposed infrastructure in the SADC plan (particularly around the A414 and M1 Junction 8) can accommodate planned growth in the Dacorum Local Plan in addition to the St Albans East Hemel Local Plan allocations.

3.2 Combined Forecast work

In order to test the cumulative impacts of planned growth for both Local Plans, a joint test has been undertaken for both Local Plans in 2041. The starting point was the development of a new Do Minimum base taking into account recently built developments and those committed in the planning system in both St Albans District and Dacorum (whilst growth elsewhere is as per the government NTEM forecasts). This was known as **Option 0A.** More detailed information on this option is included in Chapter 4 of the St Albans and Dacorum Combined Local Plan run report.
2041 St Albans and Dacorum Combined Local Plans COMET Forecasting Report- May 2025

As a result of this committed growth a number of key roads in Hemel Hempstead's local network are subject to a high level of traffic stress and some are forecast to be over capacity including in the Two Waters, Maylands and A414 Breakspear Way areas. The

A414 / Green Lane Junction comes under significant pressure indicating that the current roundabout configuration is unable to cope with the future committed growth (before additional Local Plan growth is added).

In St Albans areas around the north and west of the city experiences the most traffic stress.

3.3 Combined Local Plan impact

The next stage was to combine the developments proposed in both St Albans City & District and Dacorum Local Plans along with their associated infrastructure (from their respective Infrastructure Delivery Plans). This is known as **Option 4a** and is made up of the following assumptions:

- St Albans City & District local plan growth with mitigation plus allowance for mode shift **(Option 3).** This includes a revised layout with signals at the A414 /Green Lanes Junction.
- Dacorum local plan growth with mitigation (from the Infrastructure Delivery Plan) plus allowance for mode shift **(Option E)**.
- Changes to signal timings to reflect the changes in flows at junctions (signal optimisation)
- M1 Junction 8 is as per its current layout.

Chapter 5 of the combined forecast report gives further details of what was included in this test.
2041 St Albans and Dacorum Combined Local Plans COMET Forecasting Report- May 2025

The results of Option 4a are presented in Section 7.2 of the Forecasting Report and indicate similar results to those of the individual Local Plan tests. The focus of this work is the performance of the highway network in the eastern part of Hemel Hempstead. Whilst the A414 /Green Lanes Junction works better than the current roundabout layout the amount of traffic in the combined test results in the approaches to the junction becoming over capacity leading to increases in delay compared to Option 0A. The key issue is on the westbound approach to the Green Lanes Junction from the M1 where there are forecast to be over 2minutes of additional delay in the AM peak and up to a minute in the PM peak queues in the AM peak are longer than the space available meaning a likelihood that they will block back through the signals at the top of the M1 slip road . The layout of M1 Junction 8 (long section of northbound slip road running parallel to the M1) reduces the likelihood of these queues then blocking back to the main motorway carriageway however delays are significant and lead to ‘rat running’ onto other routes.

Increases in delay are also evident on the East Hemel Spine Road approaches to Redbourn Road and A4147 and on Redbourn Road at the Three Cherry Trees Lane junction.

A potential revision to the layout has been identified at M1 Junction 8. This consists of a new bridge over the motorway to the north of the junction providing a direct link into the employment part of East Hemel development site. This has been tested in the model as **Option 4b**. Further details are given in Section 6 of the Forecast Report.

The key impact of the new layout is to reduce the amount of traffic coming into the A414 /Green Lanes junction from the East Hemel North site and the traffic previously travelling into this development from the M1 (as this is given an alternative access to the motorway). This means that the westbound approach into the Green Lanes junction from the M1 is now able to operate within capacity with much reduced delay. Delay is also reduced around the East Hemel Spine Road / Redbourn Road junction (as less traffic travels north towards M1 Junction 9 to avoid the delays in the vicinity of Junction 8).

The modelling however indicates issues with delays on the eastbound approach to the new roundabout at M1 Junction 8. A sensitivity test with a revision to the layout with two circulatory lanes has been tested and demonstrates that the delays forecast in Option 4b can be relieved if such arrangements are assumed and practically deliverable on the ground.

The COMET model is a strategic tool, which whilst able to estimate changes in traffic volumes at junctions and flag up potential delays is too high level to be able to undertake a detailed operational assessment of the adequacy of the junction layout and that more localised modelling is required (see Section 4 below).

3.3 Trigger Point Analysis

The SADC Local Plan allocations assume around 8,000 jobs on the East Hemel Central employment zone (H3) in SADC and combined option tests were based on this number. Recent work led by Hertfordshire Futures (formerly the Hertfordshire Local Enterprise Partnership) has assessed recent employment growth in the Maylands area and revised future employment projections. Changes in the type of employment (away from office / business uses) and increasing automation in warehouses and distribution facilities suggest a lower number of jobs in the area and future projections suggest this trend will continue. SADC and DBC officers, as well as the Crown Estate (as landowner) have considered the recent Hertfordshire Futures work, and consider around 4,000 jobs to be a reasonable assumption to make at this time.

A further sensitivity test was therefore undertaken assuming a 50% reduction in the number of jobs would be provided in the East Hemel Central Employment Zone (down from 8,000 to 4,000 jobs). The main aim of the test is to look at the A414 / Green Lanes and M1 Junction 8 area to see what impact the trip reduction has on queues and delays in this area. As with Option 4A it was assumed that the A414/ Green Lanes junction is signalised but that M1 Junction 8 retains its current layout.

The results of this test are summarised in HGC Trigger Point Technical Note.
HGC Trigger Point Technical Note

Halving the assumed employment levels has the effect of reducing vehicle trips to/from the East Hemel employment site by around 550 vehicles in the AM peak hour and 500 vehicles in the PM peak hour Although still at capacity, this reduces the length of the queue on the westbound approach to the A414 / Green Lanes junction by around 70 metres in the critical morning peak and the queue is easily accommodated within the highways space available ahead of signals at the top of the M1 slip road reducing the likelihood of any blocking back of queues towards the motorway.

A second sensitivity test was also undertaken – this halved the growth from the Hemel Garden Community developments (North Hemel in both SADC and DBC Local Plans and East Hemel north and south in SADC Local Plan). In the morning peak delays reduced by over 100 seconds on the westbound approach to the A414/Green Lanes junction with queues reducing by around 100m so easily accommodated in the space available without affecting the operation of the M1 off slip.

The sensitivity tests indicate that at least half the Local Plan development growth can come forward before triggering the need for further changes to M1 Junction 8. Based on the current trajectory information for Hemel Garden Communities, this is expected to happen by around 2038. Alternatively, if the number of jobs generated by employment in the East Hemel employment allocation is lower than originally anticipated, then potentially the full Local Plan housing growth could come forwards. Given the uncertainty over employment numbers and the phased buildout of the Hemel Garden Communities development. It is recommended that a monitor and manage approach is adopted to understand performance of the highway network in this area as different phases of development are built out.

4. Local modelling

HCC have also developed a more detailed local transport model covering the Hemel Hempstead urban area. This is known as a microsimulation model and has been developed in Paramics software. This model has more detailed coding of the local road network in Hemel and simulates the behaviour of individual vehicles and allows testing of improvements to the road network and different levels of development growth within the area of the model. Further information on the Hemel Paramics model coverage is available at Hemel Hempstead Model Information.

The focus of the local modelling is on the Hemel Hempstead area as the model is being used by developers of the East Hemel allocation (consultants Vectos SLR on behalf of The Crown Estate) to help with their masterplanning exercise. There is also a need for more detailed modelling of the area around M1 Junction 8 due to the complexity of the layout here and the sensitivity of the network.

The base year of the model was updated by Vectos SLR in 2021 (based on 2019 observed data) and has since been audited by Systra and by National highways which confirmed it was an appropriate base to carry out forecasting and test the HGC proposals. It has been agreed with National Highways that due to the complexity of the highway layout around M1 Junction 8, there is a need for more detailed operational testing in this area.

Vectos SLR have tested the implications of the combined Local Plan growth by 2041 using this model. The 2041 growth aligns with the COMET model Joint Local Plan forecasts (Option 4a). This has been done by extracting the flows coming into and out of Hemel Hempstead in 2041 in the COMET model (a process known as cordoning) and using them as an overall cap on the level of future traffic flow.

Vectos SLR have coded in the access arrangements associated with the East and North Hemel Developments including the East Hemel Spine Road and signalisation of the A414 /Green Lanes (Breakspear) junction along with the mitigation measures identified with both Dacorum and St Albans City & District Local Plans which have been included in the COMET model. The resulting model is known as M007 and is reported in: SLR Vectos - 000197.R002 Hemel Local Plan Modelling report.

The Paramics modelling work indicates that the locations of queueing and delay across Hemel Hempstead are broadly consistent with those identified in the COMET model with the combined local plan growth up to 2041. At the A414 /Green Lanes (Breakspear) junction whilst there is an increase in delay in the Paramics model, this is less than predicted in the strategic COMET model and queues can be accommodated within the highway space available and do not block back along the M1 Junction 8 slip roads.

There will inevitably be some difference in the levels of delays and queuing experienced between a local microsimulation model such as Paramics and a more strategic model such as COMET as they model vehicles differently. A microsimulation model captures real time vehicle interactions and simulates individual vehicle behaviour such as lane changing, acceleration and deceleration and models the build up of congestion whereas a strategic model such as COMET is based on hourly averages. Section 4 of the report outlines these differences in more detail.

The differences in the modelling results in the Hemel area are also explained by differences in the flow levels in the models. COMET has a base year of 2014 and year on year growth is applied up to 2041. Paramics has a base year of 2019 (growth from 2014 – 2019 was therefore omitted and further growth was not applied until 2022 (to take account of COVID). Some other adjustments were undertaken in Paramics to apply some additional mode shift in trips to and from the town centre (see Chapter 5 of the report). The combined impact means that there are 11% less trips in the Paramics model in the AM peak and 10% less trips in the PM peak compared to COMET.

There are also some differences in the infrastructure assumed in the Paramics model with a couple of the IDP infrastructure measures omitted in the town centre area due to sensitivity of traffic in this area and some additional measures proposed elsewhere to improve the operation of other junctions.

The Paramics report concludes that despite some differences in assumptions and the form of the model, there is a reasonable synergy between the impacts identified in the local model and those presented in COMET but that the local modelling demonstrates that changes to M1 Junction 8 are not required until beyond the current local plan period.

5. Post Plan growth

The modelling work to date has focussed on local plan growth up to 2041, however the Hemel Garden Communities programme includes a further 4,700 home (including 3,500 in Dacorum Borough and a further 1,200 homes in St Albans District) which are expected to come forward by 2050). Some initial indicative modelling work has been undertaken to test the full Hemel Garden Communities buildout in COMET and Vectos SLR have also tested a scenario with this full growth. It should be noted that a 2050 year is at the limits of forecasting and therefore a greater degree of uncertainty in the results. Further information on this work is contained in Annex 1.

Summary and Conclusions

A series of tests have been undertaken using the COMET model to test the implications of St Albans City & District Local Plan growth across the district. These indicate that committed growth results in increased traffic flows and additional pressure across the highway network.

Once the St Albans City & District Local Plan allocations are added, traffic increases further. Improvements in infrastructure and a shift towards sustainable modes of travel are required to ensure the highway network operates effectively. There remain parts of the network where there will be increases in delay with Local Plan growth, but it is envisaged that impacts could be monitored and managed through further investigation of mitigation measures.

A particular area of focus has been the impact of Local Plan growth on the Strategic Road Network (operated by National Highways). This has shown potentially large changes in traffic flow at M1 Junctions 8 and 9 and work has identified potential changes to junction layouts at these locations which could be implemented if and when required. The strategic modelling work has shown that the St Albans City & District Local Plan growth can be accommodated with the current M1 Junction 8 layout providing the A414 / Green Lanes (Breakspear) junction is signalised. However when the Dacorum growth is added the strategic model predicts some large delay increases in this area and some risk of queues blocking back to the M1 northbound off slip (although not the main motorway). This risk is reduced if a lower level of jobs comes

forward in the East Hemel employment allocation. It should also be noted that the more detailed local Paramics modelling indicates lower levels of delay and that the queues can be accommodated within the current M1 junction 8 layout. Given the differences in the model outcomes and the ongoing uncertainty around future jobs growth it is suggested that a monitor and manage approach is adopted. It can also be noted that, as with the 2041 Combined St Albans and Dacorum Option 4b Sensitivity test, the results show that with two lanes on the circulatory carriageway of the proposed M1 Junction 8 layout, it can accommodate the 2050 growth in the Vision & Validate scenario.

Table 1 summarises the tests undertaken and the key outcomes.

Table 1 – Summary of Modelling work undertaken

Document File name	When published	Content	Key outcomes
St Albans Base Year Model Review Technical Note - April 2024	3 April 2024	Review of the coverage and performance of the original base model in the St Albans City & District area. Also compares 2014 traffic flows with 2024 traffic flows.	Coverage of model is good but there are some weaknesses in performance in the original model (especially in the AM peak) and flags up areas for improvement. 2023 traffic flows are below 2014 levels indicating use of 2014 base is likely to be robust.
St Albans Base Year Model Review Technical Note & Addendum – July 2024	1 July 2024	Applies network coding improvements (mainly speed changes) to the base model in order to improve performance of the base model	Shows an overall improvement in model performance compared with the original base and this model version formed the basis for ongoing forecasting.
240409 COMET 2014 Base Year Model Review-SRN	15 February 2024	Review of base year model to understand performance of model on SRN and key connecting roads	Indicates model replicates flows on SRN roads well with calibration counts meeting TAG criteria and journey time being close to criteria.
240701 COMET 2014 Base Year Model Review-SRN	1 July 2024	Additional review of base year model performance against National Highways flow information on the M25	Indicates improved performance against M25 flows with SADC model revisions with the majority of links meeting the required difference criteria.
COMET- St Albans LP Modelling Report FINAL 22.05.2025 (Revision 3)	May 2025	Summarises results of the SADC Local Plan tests options 0-3	There is a significant increase in traffic on the network as a result of committed and consented developments before Local Plan growth is added (Option 0). Adding local plan growth adds to the pressure and improvements in infrastructure plus a shift towards more sustainable modes of travel is required to mitigate against the additional development growth and ensure

			the highway network operates satisfactorily.
2041 St Albans and Dacorum Combined Local Plans COMET Forecasting Report- May 2025	May 2025	Summarises results of the combined SADC and DBC 2041 local plan tests (option 4a) plus the predicted changes with the proposed upgrade to M1 Junction 8 (test 4b)	DBC and SADC local plan allocations are forecast to generate increased traffic pressure & mitigation measures and mode shift are required to offset this. M1 Junction 8 upgrade provides additional benefits but potential changes to the layout are required
HGC Trigger Point Technical Note	21 May 2025	Summarises sensitivity tests of the combined SADC and DBC 2041 local plan growth with (i) a 50% reduction in jobs from the East Hemel employment site and (ii) a 50% reduction in traffic demand from the HGC developments	Reduced traffic demand from lower job numbers reduces delays around A414 Breakspear Way and queues can be accommodated within the highway space available with no change to M1 Junction 8. Test ii indicates that at least half of the HGC development can come forward without the need for further changes to M1 Junction 8.
2050 St Albans and Dacorum Combined Local Plan Comet Forecasting Report	24 June 2025	Presents results of 2050 model runs with combined SADC and DBC Local Plan growth plus full buildout of Hemel Garden Communities. Incudes a Vison and Validate test with 60% sustainable mode share in new developments (as per the HGC Transport Vision and Strategy) and a direct test of the post 2041 infrastructure.	Indicates some significant traffic pressure on parts of the network, the importance of locking in mode shift and the need for further work on mitigation measures

Annex 1: What happens beyond the Local Plan period 2041?

Post Plan Growth

As part of the Hemel Garden Communities programme a total of 11,000 new homes are due to be delivered around North and East Hemel Hempstead by 2050. This means that around 4,700 units will come forward after 2041 (3,500 in the North Hemel Hempstead area within Dacorum's boundary and a further 1,200 in North East Hemel Hempstead within St Albans district (current assumptions are that this would be made up of 375 homes at H1 North Hemel, 365 homes at H2 East Hemel Hempstead North and 460 homes at H4 East Hemel Hempstead South).

The COMET model has been used to undertake an assessment of the potential impact of the full buildout of Hemel Garden Communities. It should be noted that 2050 is the furthest year that government (DfT) growth predictions cover and with a year this far in the future there is a higher degree of uncertainty with the modelling process. Any results therefore should be taken as indicative at this stage.

Three modelling scenarios have been developed for 2050 as follows:

- Option 0A
- Vision and validate
- Infrastructure test

The key features of these are listed below – further detail is given in the 2050 St Albans and Dacorum Combined Local Plan Comet Forecasting Report

Option 0A

This is the 2050 forecast base. This includes committed growth up to 2041 in both St Albans and Dacorum and additional growth to 2050 from national government forecasts - (taken from the National Trip End Model – NTEM) and acts as a comparator

Vision and Validate Option

This takes Option 0A as a base and adds in the 2041 Local Plan growth and associated infrastructure for both St Albans and Dacorum plus the additional 4,700 homes post plan period in North Hemel. The sustainable mode shares applied in the 2041 modelling in the Hemel Hempstead area are increased to 60% for trips to and from and within the Hemel Garden Communities growth areas and up to 40% sustainable mode share in other areas of Hemel. No additional post 2041 infrastructure has been added and it is assumed that North Hemel Hempstead will continue to be accessed via Leighton Buzzard Road to the west and Redbourn Road to the east.

The purpose of the model run is to test how the transport network may operate if the sustainable mode targets set out in the 2050 HGC Transport Vision and Strategy are

achieved. More detailed results of this process are contained in Chapter 7 of the report but initial indications are that the post plan growth results in additional traffic and delays in a number of areas including around the North Hemel Hempstead access junctions, Leighton Buzzard Road, Link Road / Redbourn Road corridor and on the A4147 in the Leverstock Green area. This indicates the need for additional infrastructure to support non car modes and that further work is required to develop the mitigation measures associated with this additional growth.

As with the 2041 Combined St Albans and Dacorum Option 4b Sensitivity test, the results show that with two lanes on the circulatory carriageway of the proposed M1 Junction 8 layout, it can accommodate the 2050 growth in the Vision & Validate scenario.

2050 Infrastructure Test

A further model test was undertaken to start assessing the impact of some of the post plan growth infrastructure measures as identified in the Hemel Garden Communities IDP. It should be noted that not all of the measures could be tested in the strategic model and that the focus of this work was to look at the impact of the proposed changes to bus services including an orbital bus route serving North and East Hemel Hempstead and the implementation of the western part of the Hertfordshire and Essex Rapid Transit system (HERT). Associated priority infrastructure was also included in the model run. Further details of this test are given in Chapter 6 of the report.

Chapter 7 of the report gives an indication of the predicted patronage of these services and indicates strong demand for a new orbital bus service between the station and North Hemel Hempstead and also providing access to the East Hemel Hempstead employment area from the south.

The HERT route between Hemel Hempstead and St Albans generates a good level of patronage showing the importance of high-quality public transport links between these areas.

The resulting mode shift from these measures is however limited which shows that whilst these measures improve connectivity and improve transport choice they do need to be part of a broader package of measures including improvement to active travel links, other measures such as travel information provision, travel planning and financial incentives as well as potentially disincentives to using cars.