Transport Topic Paper

October 2024

Wiltshire Council

Contents

1. Introduction

1.1. This document provides an overview and summary of work undertaken to inform the transport evidence base for the Wiltshire Local Plan review and details work undertaken following the Regulation 19[1] consultation to address comments submitted by National Highways.

1.2. The transport evidence base was initially commenced in 2019 to inform the Regulation 18 Wiltshire Local Plan consultation undertaken in 2021. Subsequent work carried out up to May 2023 incorporated detailed consideration of sites included within the sustainability appraisal prepared to inform the Wiltshire Local Plan - Pre-Submission Draft Plan (September 2023' and subsequent strategic transport and carbon modelling carried out by Wiltshire Council's term consultant AtkinsRealis.

1.3. A third evidence base was produced in 2024 to respond to consultation responses to the formal Regulation 19 consultation of the Local Plan. This evidence base focussed upon delivering an increased level of clarity on work that had already been consulted upon and no new conclusions or recommendations have been made, other than to address an increased level of detail.

1.4. The following chapters firstly summarise the inputs into the sustainability appraisal, before considering strategic modelling assessment of sites evidence bases in chronological order and the supporting work undertaken by officers of Wiltshire Council.

1.5 Over the plan preparation cycle from 2017 to date, the Local Highway Authority have advised on early phases of work, including the consideration of the Alternative Development Strategies. This work is covered in more detail in other parts of the Council's Local Plan review evidence base.

2. Local Highway Authority consideration of sites – Sustainability Appraisal

2.1. The sustainability appraisal is a multi-disciplinary consideration of each site submitted by landowners and developers for inclusion in the adopted local plan. The Local Highway Authority provided the inputs into the site assessments within the sustainability appraisal, which consider the scale of each site, the accessibility demands by mode and a high-level consideration of transport mitigation measures.

2.2. Each site assessment considered the following items in turn, in compliance with national guidance and the existing Wiltshire Core Strategy Policy 61 – Transport and New Development:

- General location and accessibility – locality, topography, severance etc;
- Access by pedestrians and cyclists – connections by existing, proposed, or possible cycle and walking infrastructure measures;
- Proximity to existing bus service provision and infrastructure – bus service frequency and destination choice and distance to existing and bus stops;
- Proximity to railway stations – accessibility of stations by active and public transport;
- Accessibility to service vehicles – capability of sites to accommodate refuse trucks and other large service vehicles;

[1] The Town and Country (Local Planning) (England) Regulations 2012

- Impact of private car use – determined as a function of trip generation by dwelling numbers and desk top understanding of capacity of local highway network;
- Local constraints and mitigation measures – Identified means to address insufficiencies.

2.3. The sustainability appraisal for the Local Plan review was informed by input from the Local Highway Authority. Assessments were undertaken against parameters for individual sites including site area and housing delivery, against defined housing density. The appraisal was undertaken concurrently with other disciplines and thus other constraints that would reduce the scale of housing delivery were not considered, e.g., protected habitats and critical flood zones etc. The Local Highway Authority appraisal considered sites identified in the Strategic Housing and Employment Land Availability Assessment (SHELAA). Often at the initial assessment stage the SHELAA sites covered large areas of land. But through the assessment process these sites were contracted to form the basis of what became the eventual allocation proposals. As such, the proposed highway interventions/mitigations, access/movement strategies and infrastructure requirements, in specific circumstances, were adjusted to level proportionate to the scale of the proposed allocations.

3. Strategic Modelling assessment of Sites

3.1. The Local Highway Authority and their consultants have provided technical support to fully understand the cumulative impact of prospective allocations, through the utilisation of strategic traffic modelling. This support culminated in three separate stages of assessment, summarised in the following reports:

1. January 2021 – Wiltshire Local Plan Transport Review
2. May 2023 – Wiltshire Local Plan Review 2022 Transport Evidence Base
3. July 2024 – Wiltshire Local Plan Review (2024) Wiltshire Transport Model: LPR (2024)

3.2. Each of the respective transport papers utilised data extracted from the Wiltshire Transport Model (WTM), producing representations of existing and forecast traffic flows. The model originated as a ‘cordon’ of a National Highways Regional Model, incorporating traffic data collected in 2018 in the form of automated and annual traffic counts, Automated Number Plate Recognition data (ANPR), National Highways Webtris data and TrafficMaster™ journey time data. This data was used to develop an Area of Detailed Modelling (AoDM) which encompasses Wiltshire and Swindon and extends into South Gloucestershire and Bath and North East Somerset. The following figure depicts the extent of the Wiltshire Transport Model:

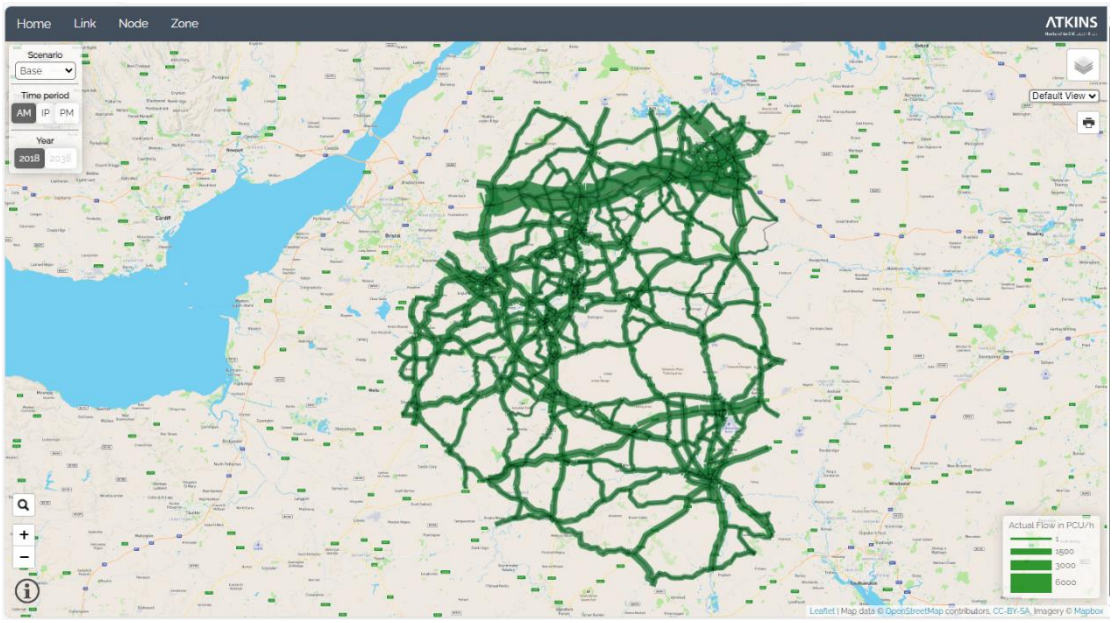


Figure 1: Wiltshire Transport Model Extents

4. Wiltshire Local Plan Transport Review (January 2021)

4.1. The Wiltshire Local Plan Transport Review (hereafter the '2021 evidence base') was developed to inform Regulation 18 consultation documents prepared to inform the preparation of a draft Local Plan up to 2036 and was consulted upon between 13th January 2021 and the 9th March 2021 (subsequent transport evidence base documents were based on a plan period to 2038, as explained below at paragraph 5.3).

4.2. The 2021 evidence base utilised the Wiltshire Transport Model in the development of forecast scenarios to reflect future potential Local Plan allocations and planned transport improvement schemes. In order to compare and contrast the impact of delivering a Local Plan growth agenda and associated infrastructure, the following scenarios were developed:

- Do Nothing: includes all identified Wiltshire Core Strategy development and infrastructure.
- Do Minimum: Do Nothing plus prospective Local Plan growth and minimal access infrastructure; and
- Do Something: Do Minimum with prospective Local Plan growth plus transport mitigation measures.

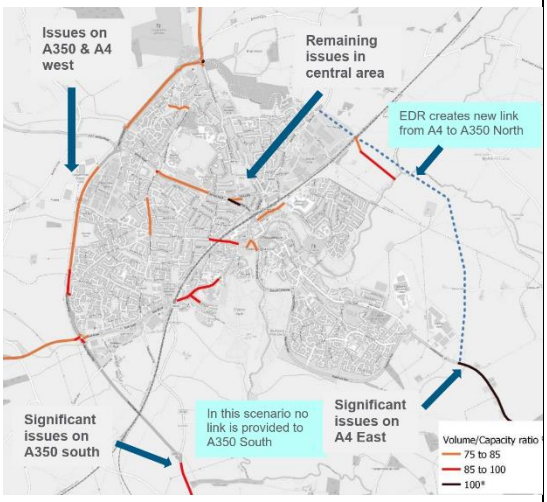
4.3. For the 2021 evidence base, specific locations for prospective growth were only established for Wiltshire's Principal Settlements of Salisbury, Chippenham, and Trowbridge, with additional consideration of locations for Melksham due to interrelated impacts along the A350 corridor. Growth in the remaining market towns was presented as a uniform uplift in travel demand across the respective town, with traffic distributed as a function of existing travel profiles and network capacities. The mimicking of current travel profiles in forecast scenarios is considered as a 'Business As Usual' model.

Chippenham

4.4. Within the 2021 evidence base, the prospective allocation for Chippenham was 5,100 new homes, with potential development between the A350 and A4 corridors to the south of the town and north of the A4 to the east.

4.5. The Chippenham Site Allocations Plan (CSAP, May 2017) and its evidence base considered the need for an Eastern Distributor Road (EDR) stretching from the A4 to the east of the town, leading through allocated development at Rawlings Farm and connecting across the railway to Parsonage Way and the subsequently opened Kilverts Way. A Southern Distributor Road (SDR) linking the A4 and A350 was also considered at the time. Following on from this work, the 2021 evidence base tested the proposed 5,100 dwellings without an EDR, with an EDR and also with an additional road to the south of Chippenham connecting the A4 to A350, thereby representing the SDR. The following figure depicts the findings from this study for the AM peak:

	
2036 Without Local Plan Without SDR or EDR	2036 With Local Plan Without SDR or EDR



2036 With Local Plan Without SDR With EDR

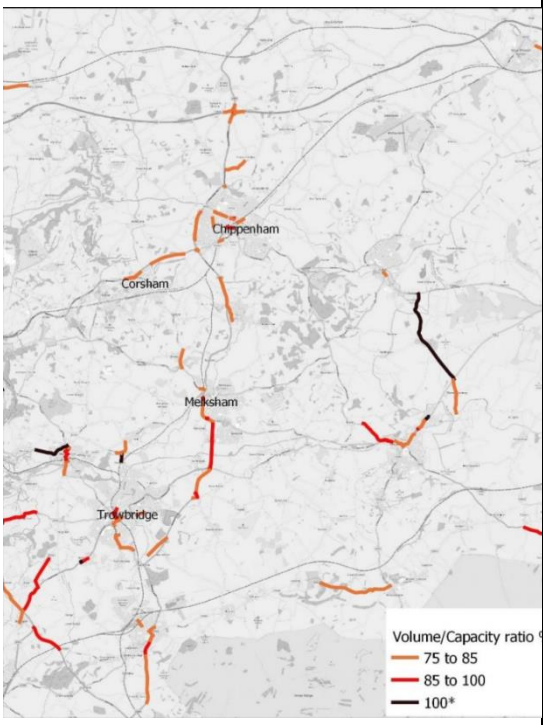
2036 With Local Plan With SDR and EDR

Figure 2: Assessment of Chippenham distributor road options (2021 evidence base)

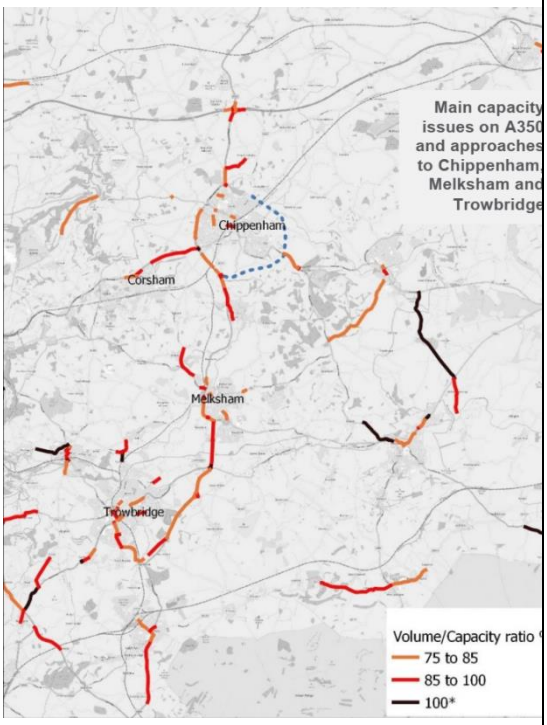
4.6. As illustrated in the previous figure, even with the intervention of the Eastern Distributer Road, Chippenham experiences congestion on a number of roads as a result of the delivery of circa 5,100 dwellings, and this is only predominantly resolved through the intervention of delivery of the Southern Distributor Road. With consideration for this data, the addition of both the Southern Distributor Road and Eastern Distributor Road was included as part of necessary access infrastructure to serve the large Chippenham allocation and hence form part of the Do-Minimum scenario.

Do-Minimum Impacts

4.7. The outputs from the strategic modelling exercise can be presented illustrating a number of different metrics, and the use of Volume/Capacity (V/C) ratio is an industry recognised indicator of existing and forecast congestion – Volume representing the demand traffic on a road or junction and Capacity representing the finite capacity of the road or junction; increases in traffic flow may dictate further detailed analysis but may not determine an issue at the strategic level. The following Figure depicts the V/C ratio results for the comparable impacts of the Do-Minimum scenario, i.e. with Local Plan, against the Do-Nothing scenario for the AM peak – V/C ratio of 100%+ represents absolute theoretical capacity, 85% represents a typical allowable threshold for development impacts:

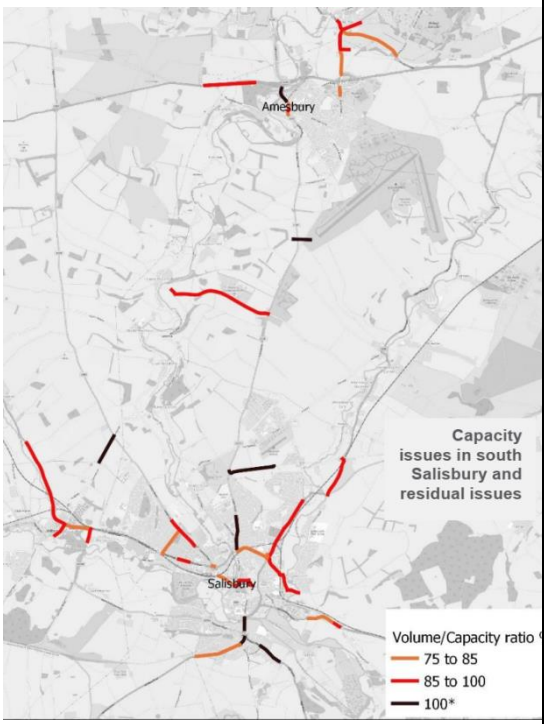


2036 Do-Nothing



2036 Do-Minimum

2036 Do-Nothing



2036 Do-Minimum

Figure 3: Comparable of unmitigated Local Plan traffic impacts.

4.8. As illustrated in the above figure, there are a series of locations across the county that would require mitigation measures to be implemented to resolve the increase in traffic flow that arises from Local Plan growth.

Mitigation Measures

4.9. The 2021 evidence base provides a series of measures to address the congestion points where previously illustrated. These measures addressed the modal hierarchy secured by current Core Strategy Policy and focus on the delivery of enhanced walking, cycling and public transport measures, before establishing the residual need for highway capacity enhancements. Because the strategic model is a traffic model, the application of walking, cycling and public transport measures are coded as a reduction in vehicle trips of a length or distribution appropriate for the alternative mode.

4.10. Walking and cycling infrastructure measures were identified for each of the Principal Settlements and Melksham. The result of delivering the enhanced infrastructure in these town was estimated to deliver an additional 6,000 cycle trips per day, and an equivalent drop in car usage.

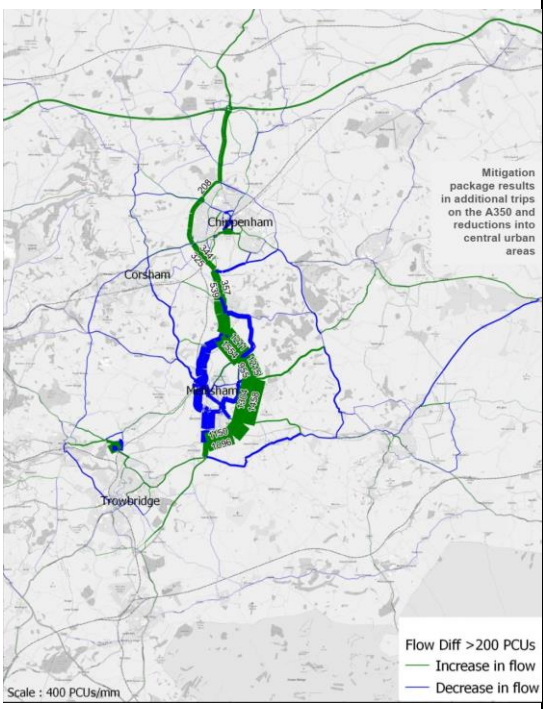
4.11. The impact of rail interventions was not considered as materially effective or deliverable within the plan period, save for enhanced accessibility of stations through measures brought in line with active travel aims.

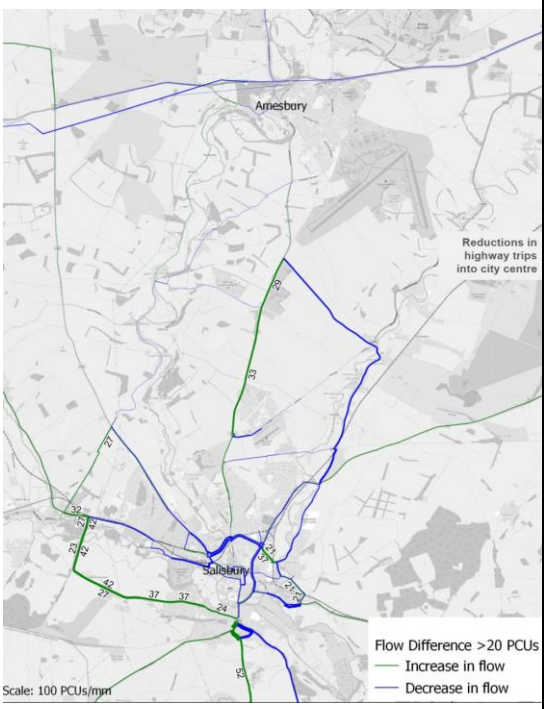
4.12. Bus service enhancements were considered to deliver a material benefit, however the focus of these were constrained to the A350 corridor between Chippenham and Trowbridge, in part due to the limited and constrained nature of the impact assessment being focussed on the principal settlements only. The report suggests wholesale enhancements to waiting facilities at bus stops and interchanges, application of Real Time Information, increased numbers of services and diversions of existing services to serve development and an investigation into Dynamic Demand Responsive Transport (DDRT) solutions.

4.13. Further to the active travel and public transport interventions considered, a series of highway capacity enhancements were required to address residual congestion. The application of these measures was found to materially improve the operation of town centre highway networks along the A350 corridor and in Salisbury city centre. The following highway schemes were tested:

- A350 Melksham Bypass – Major Road Network funded scheme;
- A350 Phase 4 and 5 Dualling - Major Road Network funded scheme;
- M4 Junction 17 - Major Road Network funded scheme;
- A338 Salisbury Junctions – Salisbury Transport Strategy Scheme – developer funded scheme;
- Dualling of the A350 from Lackham roundabout to the proposed Melksham bypass;
- Dualling of the A350 from the Littleton roundabout near Semington to the new junction with the proposed Melksham bypass (new scheme);
- Melksham Bypass and capacity improvements at the A350/A361 roundabout near Semington (new scheme); and
- Staverton Bridge/Staverton Diversion: Improvements to the operation of Staverton Bridge (new scheme).

4.14. Figure 4 depicts the change in traffic flows resulting from the highway scheme interventions – blue depicts a decrease in traffic flows, green depicts an increase in traffic flows:





A350 Corridor – Chippenham, Melksham, Trowbridge	Salisbury and Amesbury

Figure 4: Traffic Flow alterations

2021 Evidence Base Conclusions

4.15. The 2021 evidence base concludes that in order to deliver the level of planned growth considered within the emerging draft Local Plan, a series of transport measures would need to be implemented in order to simply accommodate the modal transport demands of development - i.e., accommodate new development in accordance with current levels of accessibility, sustainability and modal share.

4.16. The conclusion of the report further provides a broad understanding of the cost of mitigating the growth agenda and suggests the following:

- Active Travel intervention costs = £31.7 Million (in 2020 values);
- Public Transport intervention costs = £10.5 Million (in 2020 values);
- Highway Capacity intervention costs = £306 Million (in 2020 values).
- Total = £348.2 Million (in 2020 values).

4.17. The significant costs of delivering a Business As Usual growth strategy further influenced the methodology for assessing alternative scenarios in subsequent transport assessment, which consider more detailed proposals for housing.

5. Wiltshire Local Plan 2022 Transport Evidence Base (May 2023)

5.1. The Wiltshire Local Plan 2022 Transport Evidence Base, hereafter referred to as the '2022 Evidence Base', sought to provide clarity to the 2021 evidence base by further assessing all proposed allocations across the county, rather than being constrained to the Principal Settlements and Melksham, which was the subject of the evidence that supported the Regulation 18 consultation. The revised assessment considered updated housing numbers and their distribution. This stage of developing the evidence base also considered site options at Wiltshire Market Towns. Proportionate and reasonable assumptions were applied to the consideration of site options.

5.2. Judgements regarding the acceptability of housing sites in highway terms were based upon the consideration of 1) consultation responses collated through the development of the draft Local Plan; and 2) revisions to site boundaries. The work fed into the draft Local Plan Sustainability Appraisal and accurately reflected the fact that the boundaries of emerging proposed allocations had changed over time. This evidence also examined a proportionate level of highway infrastructure considered necessary to support the level of growth being planned at the Principal Settlements and Market Towns.

5.3. For the 2022 evidence base, a 2038 plan period was adopted, however this was considered as a proxy of projected position in 2036 – i.e. traffic forecasts reflected a 2036 forecast year, with all proposed growth built out in this period and hence the remaining 2 years (2036 to 2038) represented nil growth from localised development and strategic growth was deemed negligible. As the Local Plan review will be updated regularly, so will the transport evidence base and hence the 'gap' between the forecast years 2036 and 2038 will be kept under review.

5.4. The initial assessment of the anticipated transport impacts associated with planned housing delivery considered a 'Business-as-Usual' scenario, where forecast developments would mimic current rates of modal share across active travel, public transport usage, private car travel and HGV movements. The Business-as-Usual scenario was fully reported upon in **Appendix A** of the 2022 evidence base.

5.5. In addition to the 'Business-as-Usual' assessment, the evolution of the transport evidence responded to the Wiltshire Climate Strategy (2022-2027) adopted in February 2022, which set the aim 'to seek to achieve carbon neutrality by 2030' (Wiltshire Climate Strategy Foreword, February 2022), and the subsequent 'Wiltshire Carbon Emissions Baselines and Reduction Pathways' report (Anthesis and Wiltshire Council, March 2022) summarised the transport targets for achieving this.

5.6. Four 'vision' scenarios relating to the objective reduction of carbon relating to the development profile set out in the draft Local Plan were assessed, and these were compared against the strategic model baseline year, a 'Core' forecast year and the Business as Usual scenario.

5.7. Three interconnected planning Scenarios were built that picked up on the proposed changes to housing and employment growth (i.e. what became the Revised

Spatial Strategy for the purposes of the Pre-submission Regulation 19 consultation in 2023):

- Base (2018) - 'Existing' situation in 2018 without any agreed development from the Local Plan.
- Core (2038) - Forecast situation for 2038 based on the adopted 2015 Local Plan, 'committed' development between 2018 and 2038 as per the uncertainty log and a global factor addressing strategic growth beyond the influence of local policy (Base 2018 + Committed Growth + Strategic growth factor).
- Forecast Scenario 1 - Business as Usual (BAU) Local Plan Review (LPR) (2038) - Forecast situation for 2038 based on the revised allocations in the Local Plan Review of 2022. (Base 2018 + Committed Growth + LPR Growth).

5.8. In addition to the planning scenarios, there are three Intervention Scenarios defined by the Local Highway Authority. These Scenarios were used to determine the level of interventions required to achieve different carbon and/or infrastructure related outcomes:

- Forecast Scenario 2 - Do Minimum – to understand if active travel and public transport interventions can be provided to avoid new and costly highway construction identified within the previous Local Plan Review work (2021 evidence base) necessary to accommodate growth by 2038.
- Forecast Scenario 3 - Do Something – to develop a package of interventions which focuses on reducing the carbon emissions generated by the LPR growth. This is based on the Tyndall Centre climate commitments report for Wiltshire Council, which identifies a decarbonisation pathway target of reducing carbon by 95.7% from 2015 levels by 2040.
- Forecast Scenario 4 - Do Maximum – to develop a package of interventions which seeks a greater reduction in transport related carbon emissions than Scenario 3 and achieve the Anthesis High Ambition pathway, in alignment with Wiltshire Council's aspiration presented in the draft Climate Strategy. The High Ambition pathway assumes a 77% reduction in all-sector emissions in Wiltshire between 2019 and 2045. A full list of mode shift targets is available on page 53 of the 2023 evidence base, which represents a summary of 2040 intervention milestones presented in Section 5.2 of the published Anthesis Report.

Forecast Scenario 1 Business as Usual -

5.9. The Business-as-Usual scenario in the 2023 evidence base focussed on the detailed consideration of allocations, at housing quantum's that met local demand. Specific employment sites were not identified and thus not geographically considered in scenario testing, instead, employment was considered proportionate to housing growth for main settlements, with job generation represented as a trip factor in a global growth factor.

5.10. Within the context of Business as Usual, a series of model outputs were generated to reflect differing access strategies for the proposed Chippenham allocation. The following provides a summary of the Business as Usual model scenarios:

Scenario	Demand Growth Assumptions	Infrastructure Assumption
2018 Base	Base (2018)	Base (2018)
2036 Core Do-Nothing (DN)	2036 DN: Base (2018) + Core (2036), with background growth constrained to NTEM. This **excludes** prospective Local Plan growth.	Base + Core infrastructure (Uncertainty Log, Appendix A)
2036 Do-Minimum (DM)1a	2036 DM: Base (2018) + Core + LP (2036), with background growth constrained to NTEM. This **includes** prospective Local Plan growth.	DN + site specific access points Chippenham **northern distributor** road with connection to Rawlings Green Road and railway bridge, **without** connection to the A4 east of Stanley Park Playing Fields
2036 DM1b	Same as DM1a	DN + site specific access points Chippenham northern distributor road with connection to Rawlings Green Road and railway bridge, **with** connection to the A4 east of Stanley Park Playing Fields
2036 DM2a	Same as DM1a	DN + site specific access points Chippenham **southern distributor** road, **without** connection to the A4 at Forest Farm
2036 DM2b	Same as DM1a	DN + site specific access points Chippenham **southern distributor** road, **with** connection to the A4 at Forest Farm

Business as Usual Model Conclusions

5.11. The 2022 evidence base considered an increase of + 14,965 households (7% increase) compared to the Core Strategy. This additional housing relates directly to an additional 3,811 AM Peak Hour trips (+4% compared to the Core Strategy), 1,962 Interpeak trips (+2%), and 1,726 PM Peak Hour trips (+2%).

5.12. Modelling outputs indicate that the impacts of the refined proposed allocations considered in the 2022 evidence base would be less than the anticipated impacts set out in the 2021 evidence base, with each of the key roads identified experiencing reduced growth, corresponding with the overall reduction in dwellings of -5,401 between the 2021 and 2022 evidence bases.

5.13. The forecast impacts on highway capacity are mixed and are summarised as follows:

- In the Chippenham, Calne, Melksham area proposed draft Local Plan growth would likely lead to an increase in Volume/Capacity (V/C) assessments above 85%, or exacerbate links with high V/C on the A350 south of Chippenham, the A4 Bath Road, the A4 London Road through Calne and the A350 at Melksham - this in line with 2021 evidence base results, however the overall magnitude of change is reduced.

- In the Trowbridge, Westbury, Warminster area links such as the A350 between Westbury and Warminster, the A350 east of Trowbridge, and the A361 – already experiencing high V/C percentages are forecast to see small increases of 1-2%
- In the Salisbury and Amesbury area the change in V/C is shown to be greater with 2022 evidence base growth than with 2021 evidence base growth, likely as a result of additional housing allocations for the Salisbury Housing Market Area (HMA) (+2,840 dwellings compared to 2021 evidence base). In particular, the A354 approach to Harnham Junction is forecast for V/C to increase from 85% to 97%.
- In Royal Wootton Bassett there is an increase in V/C on Nore Marsh Road and at the Bincknoll Lane / Swindon Road (A3102) junction, both of which are already predicted to be operating close to capacity in the Core scenario.

Baseline – Interim Strategic Modelling (ISM)

5.14. The ISM model was developed to evaluate the linkages between demographics and land use data with changes in transport supply. Coordinated inputs sought to establish whether a series of appropriate levers could influence travel choice and ultimately address carbon emissions associated with the transport element of the local plan.

5.15. The model incorporated a sectoring system which allocated 60 sectors across the entirety of England and Wales and 6 trip purposes. Against each trip purpose were allocated a 'main mode' choice of car, public transport, walk and cycle. In addition, the potential trip choice by mode was further considered against the economic demographic of the traveller, e.g., employed age 17-74 with car etc.

5.16. To allocate trips by modal choice, a series of trip cost factors were introduced such as value of time and operating costs for cars, against fares etc for public transport and distance for active travel. A total of 41 cost formulations were applied across the modes with many being applicable to multiple modes.

5.17. Following validation and calibration, the ISM compared well with the outputs of the baseline Wiltshire Transport Model, confirming its robustness to test changes to travel supply and demand and to enable comparison across the remaining forecast scenarios.

Forecast Scenario 2 – Avoid costly highway infrastructure

5.18. In order to avoid the delivery of highway capacity interventions as identified in the 2021 evidence base, a number of interventions or levers were considered in the ISM. Each intervention was supported by a comprehensive evidence base, and when manipulated each intervention resulted in an increasing level of mode shift to active and public transport.

A full list of the interventions applied is available on page 38 of the 2023 evidence base.

Scenario 2 Conclusions

5.19. The aim of this Scenario was to see if planned infrastructure, such as the schemes described in the 2021 evidence base, around the county's highway network could be reduced in scale or avoided completely. The interventions tested succeed in

reducing the number of car trips generated by the changes in the Local Plan, to 1% less than the Core (2038) situation. There was also the equivalent reduction in carbon emissions from cars, back to Core (2038) levels. However, the changes to traffic levels are minimal and the growth planned as part of the committed Local Plan would still need to be accommodated in some way. As such there is no evidence to suggest that the levers proposed in Scenario 2 would result in enough change to avoid the need for transport schemes needed to accommodate growth from the Local Plan. Additional levers, such as those considered in Scenarios 3 and 4, would be necessary to achieve a greater level of change.

5.20 In conclusion, the infrastructure measures identified in the 2021 evidence base, are unavoidable and are necessary to accommodate both the Core Strategy and Local Plan additional growth.

Forecast Scenario 3 – Tyndall Curve Carbon Target

5.21. Scenario 3 reflects the ambition for a package of levers to go some way towards achieving countywide carbon reduction targets, by offsetting the emissions impacts of the LPR growth. This is to be assessed against the Tyndall Centre carbon reduction pathway for Wiltshire which identifies the need for a 95.7% reduction in carbon emissions to be achieved by 2040 (relative to 2015).

5.22. As per Scenario 2, a full and comprehensive evidence was provided to justify model inputs. A full list of the interventions applied is available on page 44 of the 2023 evidence base.

Scenario 3 Conclusions

5.23. The Scenario 3 levers applied are estimated to more than achieve the relevant Tyndall Curve target, reducing countywide emissions to 2% lower than in the 'pre-LPR' Core (2038) Scenario.

5.24. The strength of the levers applied is in their range and scale of implementation which result in significant change to travel behaviour for trips to, from and within the Local Plan growth areas and consequently on carbon emissions generated.

5.25. Whilst Scenario 3 'Do Something' does mitigate the carbon emissions from the LPR growth, it only reduces countywide emissions by a small margin.

Scenario 4 – Do Maximum

5.26. Scenario 4 is described as 'Do Maximum' because it aims to go beyond Scenario 3 in terms of ambition of testing levers that could considerably contribute towards transport carbon reduction targets across the county as a whole. The Council's ambition for the pathway towards net zero for transport is defined as the 'High Ambition' pathway and is set out in the Anthesis Report. This ambition is defined for comparison in terms of achieving a desired change across a range of modes from 2019 to 2040. A full list of the interventions applied is available on page 54 and 55 of the 2023 evidence base.

Scenario 4 Conclusions

5.27. Car trips decreased by three times as much as Scenario 3, with 22% fewer car trips compared to the Local Plan Committed Growth without any mitigation. The scenario also resulted in a big increase in bus and rail trips. Both cycle and walking

trips have also increased by around fourfold. Overall, the total number of trips has decreased by 4% compared to the Core Scenario.

5.28. Scenario 4 is the only Scenario that results in fewer car trips than the Base (2018) Scenario and as a result, some of the planned infrastructure improvements required to support the Local Plan growth may not be required under this scenario.

5.29. Carbon emissions from cars, in line with changes in trips, also reduce by 23% across Wiltshire compared to the Core (2038) Scenario. Across all carbon emitting modes this results in a reduction of 10%, reflecting a greater reduction in carbon than in total trips (4%) indicating how the balance in trips has shifted to active travel.

Conclusion

5.30. The level of planned growth set out within the draft Local Plan is not significant in terms of traffic levels across Wiltshire as a whole, with an expected increase in car trips of 1% and 1.5% trips across all modes. However, the aim to be carbon neutral by 2030 sets a challenge to reduce travel demand and thus emissions.

5.31. Three Scenarios were tested to understand how applying different levers through influencing behaviours can reduce the Local Plan growth (Business as Usual) of car trips and carbon and potentially support wider carbon neutrality aims.

5.32. Scenario 2 did mitigate the increase in car trips generated by the Local Plan, although not enough to remove the need for additional infrastructure on the highway to accommodate background growth and did not achieve a net carbon effect for the increase in trips across all modes.

5.33. Scenario 3 achieved the aim of mitigating the number of trips and carbon emissions to pre-Local Plan levels, although only marginally and would not have a significant effect in reducing levels across the County as a whole.

5.34. Scenario 4 demonstrated how by applying both ambitious ‘avoid, shift and improve’ measures, travel behaviours can be significantly influenced resulting in a threefold reduction in car usage and a fivefold reduction in carbon emissions.

6. Regulation 19 Consultation

6.1. Through the Regulation 19 consultation on the Pre-Submission draft Local Plan which concluded on the 22nd November 2023, National Highways presented a comprehensive response which sought further detail relating to the proposed Local Plan allocations that were considered to lead to potential impacts on the Strategic Road Network (SRN). Cited as particular concerns were the accurate representation of allocation proposals, capacity implications at Junctions 16 and 17 of the M4 motorway, traffic flow increases on the A36 corridor through Salisbury and along the wider A36 and A303 corridors.

6.2. To address the concerns raised by National Highways and their technical consultants WSP, AtkinsRealis were commissioned to develop an update to the strategic traffic model and report (the Wiltshire Transport Model), prepare model visualisation tools for key highway junctions/routes, micro-simulation modelling of Junctions 16 and 17 of the M4 motorway and micro-simulation modelling of the proposed Harnham Gyratory and Exeter Street junction enhancement works in Salisbury.

6.3. The following text summarises the work undertaken to address the regulation 19 consultation responses.

7. Wiltshire Local Plan Review (2038) Wiltshire Transport Model: LPR (2024)

7.1. Post Regulation 19, AtkinsRealis produced updates to the transport evidence base which is included at Appendix A of this report. This updated evidence base now includes an additional 270 dwellings to be constructed between 2020 and 2038, compared to the previous the 2023 evidence base dwelling allocation. Although there is minimal change in the total dwelling allocation across Wiltshire (i.e., 270 dwellings), the quantum of change as to where these houses are to be built has been amended slightly:

- There is a slight reduction in dwelling provisions in Chippenham (-315) and Swindon (-275) HMAs, whilst there is a subsequent increase in Salisbury (+170) and Trowbridge (+690) HMAs.
- The greatest change in Chippenham HMA is the reduction of dwellings in Melksham (-445) and Devizes (-330), whilst an amendment to dwelling allocations in Royal Wootton Bassett (-445) is the main driver of change in Swindon HMA.
- There is an increase in dwellings allocated to Salisbury (+275) within the Salisbury HMA, plus the proposed Salisbury 'New Community' has also increased in size (+100).
    - The Salisbury 'New Community' was previous located at High Post in the LPR (2022); however, the specific location of the development site is currently under review by the Council. To address this, an 'area of search' has been geographically determined for the new community and this is used as a 'proxy' for the location of the settlement.
- All settlements within Trowbridge HMA show an increased dwelling allocation, with Trowbridge (+475) exhibiting the greatest change.

7.2. In addition to overall level and location of housing allocations, the revised evidence base also considers an additional circa. 52 hectares of employment land to be constructed between 2020 and 2038.

Model Scenarios

7.3. As per previous evidence bases, model scenarios were chosen to represent a fully built out Core Strategy, plus scenarios with Local Plan growth and a series of highway mitigation measures. The following scenarios were generated:

Planning scenarios

- Base (2018): 'existing' scenario as of 2018.
- Core (2038): committed development and highway infrastructure scheduled to be completed in or before 2038, as specified in the WTM Uncertainty Log.
- LP Do-Minimum (DM) (2038): the 'Core' scenario, plus development and highway infrastructure associated with the Wiltshire LPR (2024).

Intervention scenarios

- LP Do-Something (DS) 1 (2038): the LP DM scenario, plus inclusion of the Chippenham Southern Distributor Road (SDR).

- LP Do-Something (DS) 2 (2038): the LP DS1 scenario, plus an infrastructure mitigation package intended to alleviate congestion across the county. The additional infrastructure interventions include the Major Road Network (MRN) schemes and previously identified LPR (2020) mitigation measures.

For each scenario, an AM and PM peak period was considered.

7.4. The infrastructure interventions included in the Do-Something 2 scenario comply with those originally itemised in the 2021 evidence base and confirmed necessary without the Local plan in the 2023 evidence base. The following provides a description of the interventions considered:

*Table **1**: Do-Something interventions*

Type	Scheme	Description
Major Road Network	M4 J17	Junction improvements including widening and signals.
	Melksham Bypass	Bypass to the east of Melksham.
	A350 Dualling	A350 Chippenham Bypass Phases 4 and 5 dualling
Additional Intervention Measures Identified in 2021 evidence base	A350 Lacock dualling	Dualling of the A350 between Lackham roundabout and the northern terminus of Melksham Bypass.
	A350 Melksham dualling	Dualling of the A350 between Littleton roundabout and the southern terminus of Melksham Bypass.
	Staverton Bridge	Improvements to the operation of Staverton Bridge (B3105 / B3016 junction).

Model Conclusions

7.5. Outputs extracted from the WTM LPR (2024) scenarios provide an indication of the predicted impact of the revised Local Plan assumptions on the highway network in 2038. Comparisons were drawn incrementally between the three WTM LPR (2024) scenarios, with key predictions as follows:

- 2038 DM – 2038 Core: the increase in demand associated with the LPR (2024) has resulted in an increase in vehicle volumes across Wiltshire, increasing congestion and further exacerbating capacity constraints at several key locations (e.g., the A350 corridor and Chippenham town centre). Vehicle volumes and journey times have slightly increased on the M4 and A303, whilst there is no material impact on the A36 through Wiltshire.
- 2038 DS1 – 2038 DM: the inclusion of the SDR in the DS1 scenario leads to the re-routing of vehicles in and around Chippenham, alleviating capacity constraints in Chippenham town centre, the A4 and A350.
- 2038 DS2 – 2038 DS1: the introduction of the MRN schemes and previously identified mitigation measures are predicted to lead to the re-routing of vehicles across Wiltshire, alleviating capacity constraints at several key locations (e.g., the A350 Corridor and M4 J17).

Salisbury

7.6. National Highways, through their Regulation 19 consultation response, raised specific concern regarding the A36 corridor through Salisbury. Having directly analysed this network, it is clear that the Churchill Way South and Wilton Road elements of the A36 experience capacity constraints in all scenarios following the Core. In this regard, whilst congestion will exist with the intervention of Local Plan growth, the origins of congestion precede the Local Plan.

A303 – Ludgershall

7.7. National Highways raised concern for the impact of allocated development at Ludgershall on the A303 corridor. A visualisation tool was provided to National Highways, and this did not illustrate any capacity constraints on this area of the network.

Conclusion

7.8. The 2024 evidence base provides clarity on various issues raised by National Highways, Swindon Borough Council, Hampshire County Council and Somerset in relation to the SRN network and the additional modelling/assessment work is set out in draft Statements of Common Ground (SoCGs) with each party. The primary objective of these SoCGs is to resolve all technical issues set out in National Highway's Regulation 19 consultation response to the draft Local Plan and thereby reach agreement that the draft Local Plan should proceed through the examination process.

M4 Junction 16 Impacts

7.9. Junction 16 of the M4 provides Strategic Road Network access to Royal Wootton Bassett and a western access to Swindon; Junction 15 provides an easterly access to Swindon. In recent years, whilst forming part of Wiltshire's highway network, Swindon Borough Council, in collaboration with development partners, has taken temporary authority control of the junction for the purpose of carrying out capacity enhancements to accommodate local development within Swindon Borough Council's authority control.

7.10. The works to enhance the junction were substantially complete in May 2018 and were designed to accommodate the west Swindon development of Wichelstowe, which will accommodate circa. 4,500 new homes and unlock 12.5 hectares of employment generating around 2,000 jobs.

7.11. Through the Regulation 19 consultation, the housing demand and delivery in Royal Wootton Bassett was confirmed as four separate allocations, with a total housing allocation of 1,080 dwellings.

7.12. The impact of the planned housing delivery for Wichelstowe and Royal Wootton Bassett was initially tested in September 2023 to assess the capacity impacts at Junction 16 and to finalise the preferred Wiltshire housing spatial strategy. This work was undertaken utilising strategic modelling outputs stemming from the 2021 evidence base model which forecast a 2036 Local Plan. Subsequent work was commissioned in June 2024 to update this work against a 2038 Local Plan and to take into consideration additional localised development proposals.

7.13. The assessment of Junction 16 incorporated the utilisation of National Highways microsimulation model (VISSIM) of the junction, which was developed on behalf of National Highway by WSP in March 2023. In order to reflect the forecast year of 2038 in the microsimulation model, the Wiltshire Transport Model (WTM) was run

for the 2018 base and 2038 with Local Plan scenarios, from which the growth between the two scenario years can be calculated. If the growth between the two years is considered linear, then a proportional 2023 year can be determined and the resultant percentage growth from 2023 to 2038 can be applied as a percentage to the 2023 VISSIM baseline model to reflect a 2038 with Local Plan forecast.

Local Development traffic flows

7.14. The proposals for Wichelstowe include a delivered tunnel under the M4 Motorway, which delivers connection onto the B4005 providing direct access to Junction 16. The potential distribution to travel south was further enhanced through the proposed policy application of bus gates that would prejudice personal car traffic movements to the north into Swindon main and the town centre. In a policy compliant future scenario, the Wichelstowe development would focus much of its traffic onto the B4005, thereby directly impacting upon Junction 16.

7.15. The consideration of Wichelstowe within the strategic model was to provide direct access to the A3102, thereby adding traffic to A3102 Swindon Road / Wootton Bassett Road and onto Great Western Way. This representation of the development was therefore incorrect and to resolve this, model 'zones' that presented the modelled development traffic to the network were 'removed' from the simulation and traffic reflecting the fully built development was directly applied to the VISSIM model. The relevant traffic flows to represent Wichelstowe were directly received from National Highways.

7.16. In addition to Wichelstowe, a planning application (PL/2023/09142) was also formally made for development of a new Motorway Service Area (MSA) to be served from the B4005. This development proposal was assessed as part of the modelling input.

Scenario Testing

7.17. In order to test the impacts of the Local Plan, in association with other locally competing factors, the following scenarios were developed:

- 2023 Reference Case – Existing model as received from WSP which represents Junction 16, and the localised network as surveyed in 2023;
- 2038 DM6 – Do-Minimum – Highway network remains the same as Reference Case, with traffic flows encompassing the WTM growth to 2038, including the Local Plan, the MSA and the re-profiled Wichelstowe development demand;

7.18. In addition to the reference case and do-minimum scenarios above, a mitigation strategy was devised to maximise connectivity between Swindon and Royal Wootton Bassett and provide two dedicated lanes between Great Western Way to the east of the junction and Swindon Road to the west. This mitigation was deemed necessary to accommodate the increased levels of traffic imparted as a result of the Local Plan prospective allocations.

Conclusions to Modelling

7.19. The council is continuing to work with National Highways on several forecast scenarios to accurately assess the impact on Junction 16's operation and performance. Of particular interest is the application of forecast traffic flows for Wichelstowe and the impact of the submitted planning application which compete for

available capacity at the junction. Following completion of modelling work, a further report will be published for the assessment of Junction 16.

M4 Junctions 17 Impacts

7.20. Junction 17 provides the principal Strategic Road Network access junction for both Chippenham and Malmesbury and is subject to localised development in the form of distribution employment at Indurent Park (formerly Chippenham Gateway/St Modwen Park) and office and technical employment at Dyson located at Hullavington Airfield.

7.21. In order to correctly represent the junction operation a forecast microsimulation model was developed, as advised by National Highways, and this incorporates the existing lane allocation on the A350 as applied on the 15th and 16th July 2024.

Committed Development

7.22. The impact at Junction 17 is, in part, related to housing allocations at Chippenham and along the A350 corridor at Melksham, as well as proposals for '*additional national and regional logistics development adjacent to M4 Junction 17'* (Policy 64, Local Plan Review Pre-Submission). Proposals for such employment have been developed as follows:

- A429/Scotland Hill Development - 48,183 sqm of B2/B8 employment situated to the north-east of Junction 17. Access via an upgraded A29/Scotland Hill junction located to the north of Junction 17. Proposals are not within the VISSIM model extent, however, associated development trips are included and assigned accordingly via Junction 17.
- Dyson Hullavington Airfield Development - development subject to planning application 19/02543/FUL, located to the west of the A429 between the villages of Lower Stanton St Quintin to the southeast and Hullavington to the west. The development amounts to the 'construction of new hangar adjacent to Hangars 85 & 86 and associated works, extension to existing runway and provision of new runway lighting, and erection of new airfield fencing' (Wiltshire Planning Explorer).

7.23. The principal elements of the Hullavington Airfield development have previously been considered in isolation to one another, with the runway use and associated trips discounted due to the cancellation of the Dyson Battery Electric Vehicle in 2020. However, upon consultation with National Highways and in line with relevant Transport Appraisal Guidance, the full development has been considered in the junction capacity assessment.

Scenario Testing

7.24. The following scenarios have been used in the capacity analysis of Junction 17:

- 2024 Local Authority Test – Baseline+ - 2024 Baseline survey plus lane reallocation on A350
- 2038 Do minimum – Junction network as per above, with proportionate Local Plan Growth from 2024 to 2038 applied as per Junction 16. Committed development trips applied directly to the VISSIM model.
- 2038 Do Something – Local Plan growth and necessary mitigation.

7.25. Do Something Network alterations are as follows:

- Signalisation of the A429 north approach and opposing circulatory, making the roundabout fully signalised;
- An additional lane on the southern, eastern and western sections of the circulatory, whilst the lane capacity is increased from 2 lanes to 4 lanes on the northern circulatory;
- All approaches to the roundabout have been increased capacity from 2 lanes to 3, with assumed lane allocations for each approach as follows;

  The A429 approach - nearside lane is designated for the left turn to M4 eastbound and straight ahead to B4122. The middle and offside lanes are to the A350, whilst the offside lane is for M4 westbound;

  o The M4 westbound off slip - nearside lane is for the B4122, all three lanes can be used for the A350, whilst the offside lane is for the A429;

  o The B4122 - nearside lane is for the A350, nearside and middle lane for the M4 westbound, middle lane for A429 and the middle and offside for M4 eastbound;

  o The A350 - nearside and middle lanes for the left turn to M4 westbound, the middle lane is for the A429, with middle and offside for M4 eastbound. The offside lane is also for traffic travelling to B4122; and,

  o The M4 eastbound off slip - nearside lane is for the A429, the middle lane is used for the B4122, while the middle and offside are for A350 traffic.

7.26. The Do-Something scheme of works is directly representative of proposals that have passed the Outline Business Case stage for Department of Transport (DfT) funding through the Major Road Network fund.

Modelling Conclusions

7.27. The modelling results demonstrate that:

- Journey times, queues and delays under the 2038 DS scenario are forecast to improve for all approaches when compared to the 2038 DM during both hours of the AM and PM peak periods;
- The most notable improvements are occurring along the B4122 during the AM peak, as a result of increasing capacity for the approach;
- Queues along the A350 approach remain long under the DS scenario during the first hour but are significantly lower from 08:15. It is noticed that the 3 lane flare is underutilised by traffic from A350 to the M4 westbound. An increase to the length of this flare lane should be considered to reduce queuing in the first hour of the morning peak; and,
- During the PM peak, the biggest improvement is observed along the A429 as a result of increasing capacity and signalising the approach.

7.28. The detailed results illustrate that the Do-Minimum scenario, i.e., with the current network arrangement, cannot adequately accommodate forecast Local Plan

growth as tested. Whilst the mainline M4 carriageway remains unaffected, peak AM queues on the A350 could reach in excess of 2.2km and on the A429 in the PM peak 1.8km in the Do-Minimum scenario.

7.29. In conclusion, committed development and that proposed by Policy 64 of the emerging plan, require the intervention of the proposed Major Road Network scheme. Further modelling is being undertaken at Junction 17, to assess the implication of further development at Junction 17, at Land North of St. Modwen Park (Indurent Park) Chippenham, for the erection of two units falling within Use Class B8 (storage and distribution), together with associated earthworks, parking, strategic landscaping and ancillary development. Following completion of modelling work, a further report will be published for the assessment of Junction 17.

Salisbury Junction Impacts

7.30. In August 2022, Wiltshire Council commissioned AtkinsRéalis to undertake traffic modelling of the A338 Harnham Gyratory to assess a capacity improvement scheme along the A338 between the Exeter Street Roundabout and Harnham Gyratory to the south of Salisbury. The scheme was initially conceived as part of the Salisbury Transport Strategy and was submitted to the Major Road Network (MRN) funding programme but did not meet stringent financial and budget requirements and was removed from the programme by Wiltshire Council.

7.31. Despite being removed from the MRN programme, the scheme continued to be developed as a key element of the Salisbury Transport Strategy against developer funding; sizeable financial contributions have been secured against development at Netherhampton Road, which directly impacts upon the junctions.

The Scheme

7.32. The general arrangement drawings for the scheme are published on the Wiltshire Council website (Salisbury junction improvements - Wiltshire Council), but comprises the following:

- To maintain two long lanes for the A338 and A354 movements, New Bridge Road southbound has been converted to a similar layout as in base, but with an extended right turn lane to approximately 150m to increase the capacity at the Gyratory;
- The Churchill Way South road markings on the approach to the Exeter Street Roundabout have been retained so that vehicles travelling to the A354 can use both lanes at the Churchill Way approach;
- The double right turn from New Bridge Road to Churchill Way South is provided on Exeter Street Roundabout, along with the additional pedestrian crossings and cycle lanes; and,
- New pedestrian crossings are provided over New Bridge Road and Downton Road

Modelling

7.33. A microsimulation model (VISSIM) was produced for the locality in 2015, with revised traffic surveys carried out in May 2022 to update the model to current traffic conditions. In 2023, the VISSIM model was fully validated and calibrated with all materials shared with National Highways who represent the highway authority for the adjoining A36 (**Appendix B and C**).

7.34. Upon the baseline, an initial 2026 forecast and 2036 sensitivity study model was generated and this informed decision making about the forward funding of the scheme. These scenarios were constructed without finalised Local Plan growth and hence a further 2038 with Local Plan scenario has been produced to inform the plan.

7.35. As per previous microsimulation models generated for Junctions 16 and 17 of the M4 Motorway, the protocol for generating a forecast year model incorporates isolating the proportional growth from the Wiltshire Transport Model (WTM) between the survey date of 2022 and the forecast year of 2038 and then added this additional growth to the baseline.

7.36. In addition to the growth presented in the WTM, which includes both Core Strategy growth and prospective Local plan growth, additional traffic flows were applied directly to the VISSIM model to reflect Salisbury Hospital HEAT project; Health Education and Technology (HEAT). Traffic flow generation and distribution profiles for the development were submitted for inclusion direct from the Hospital Trust appointed transport consultant.

Model Conclusions

7.37. The conclusions flowing from the model illustrate that the enhancements at Harnham Gyratory and Exeter Street junctions are required to accommodate and mitigate the draft Local Plan proposals around Salisbury. Whilst the enhancements do not fully mitigate the increase in traffic - i.e., to mimic current levels of delay and queuing, the relative increases are within reasonable parameters.

7.38. Individual route statistics are available in the representative 'A338 Salisbury Local Plan VISSIM Assessment' report.

7.39. Whilst it is clear that New Harnham Road will experience a significant increase in queues in both the AM peak do-minimum and do-something scenarios, this is mitigated by a reduction in delay. This is a result of increased capacity at the signal stop line and the capability to release more traffic, thereby dispersing the longer queues. In the PM peak, New Harnham Road does not experience the highest increase in delay, however the report confirms that the do-minimum increases delay by 76 seconds and the do-something increases the baseline delay by 39 seconds. Whilst this increase in delay may be considered material, this is a function of the highway network accommodating and processing an additional 640 vehicles in the PM peak.

7.40. With regards to Hospital traffic, from the report it is also possible to determine that Coombe Road will experience an additional 25 second delay in the AM peak and 20 seconds in the PM peak, even with the scheme of works implemented. For ambulances however, it is considered that the use of sirens and lights will allow the bypass of queues and reduce this delay. In the development of the proposed scheme, officers will continue to collaborate with the hospital trust to ensure that hospital traffic, especially emergency vehicles are not unduly delayed.

Conclusion

7.41. It is clear that the implementation of the Local plan will require works at Harnham Gyratory and Exeter Street junctions to accommodate the increase in traffic flows. However, the increase in traffic also illustrates the increased pressure that the localised area of Salisbury network will be under in 2038 and hence there will be an

impetus to implement further works and incentives associated with the current and renewed Salisbury Transport Strategy.

Appendices Documentation

- **Appendix A -** 'WTM_WLP_Review-2024_v1.0.pdf': (Wiltshire Transport Model: LPR 2024) Follow Link

- **Appendix B** - 'Salisbury 2038 Local Plan VISSIM Assessment Rev.01.pdf' (A338 Salisbury Local Plan VISSIM Assessment) Follow Link

- **Appendix C** - 'WCTHCC-ATK-HGN-TOB038-RP-CH-000003.pdf' (A338 Salisbury Junctions VISSIM Local Model Validation Report) Follow Link

- **Appendix D** – 'Wiltshire Traffic Forecasting Report Issue 6c_v1.0.pdf': (Wiltshire Strategic Model Traffic Forecasting Report) Follow Link

- **Appendix E -** 'Wiltshire_2018_Base_Model_LMVR_Issue_6c_v2.0.pdf': (Wiltshire Strategic 2018 Base Model Local Validation Report in Support A350 Chippenham FBC) Follow Link

- **Appendix F -** 'WC_MBP-ATK-GEN-XX-RP-TB-000008.pdf': (Melksham Bypass OBC Model Forecasting Report Issue 6a) Follow Link